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Audit partner busyness and cost of equity capital

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This paper examines the effects of audit partner busyness on the cost of equity capital. We argue that audit partner busyness affects auditors' work processing accuracy negatively and reduces professional skepticism, thus resulting in higher information risk and, hence, an increased cost of equity capital. Using data from Australian listed companies, we find that the cost of equity capital is indeed higher for firms audited by busy audit partners. However, an additional test documents that this effect is primarily driven by non-Big 4 observations. Our mediation test results indicate that this positive association is mediated through poor quality financial reporting but is driven by non-Big 4 observations. Our results are robust to endogeneity concerns emanating from firms' deliberate decisions to choose audit partners. Our study contributes to both the auditing and to the cost of capital literature.

KEYWORDS

audit partner busyness, Australia, cost of equity capital, discretionary accruals

1 | INTRODUCTION

This research examines the impact of audit partner busyness, defined as the number of clients being audited by an individual partner, on the cost of equity capital in Australia. Auditors play a vital role in providing credible financial statements and in mitigating the agency problem between management and investors (Dopuch & Simunic, 1982; Mansi, Maxwell, & Miller, 2004). Audit quality is thus an area of extensive academic research. Prior research takes either an audit-firm-level perspective (Becker, DeFond, Jiambalvo, & Subramanyam, 1998; Behn, Choi, & Kang, 2008; Francis, Maydew, & Sparks, 1999; Palmrose, 1988; Teoh & Wong, 1993) or an office-level perspective (Choi, Kim, Kim, & Zang, 2010; Francis & Michas, 2012; Francis, Michas, & Seavey, 2013; Francis & Yu, 2009; Krishnan, 2005; Li, 2009; Reynolds & Francis, 2000) in investigating the relationship between auditor attributes and audit quality. These studies implicitly assume that, through standardized firm-wide quality control and knowledge sharing, audit quality within an audit firm or a practice office remains uniform (Zerni, 2012). However, an individual auditor performs a variety of audit tasks to form an overall assurance or attestation opinion and, hence, disclosing the identity of audit individuals likely provides useful information to market participants for gauging audit efficiency. James Doty, the Chairman of the Public Company Accounting Oversight Board (PCAOB), mentions the following:

> *Auditing is a profession built on reputation, and one important way investors can assess the quality of an audit is to know who conducted that audit … By knowing who the engagement partner is, investors would be able to track certain aspects of the individual engagement partner's history, including his or her industry expertise, restatement history, and involvement in disciplinary proceedings or other litigation. All of these factors provide valuable information for an investor to fully understand the riskiness of an audit. And it sharpens the mind.*[1]

Such information also allows investors to infer the audit partner's client portfolio and, hence, the extent of that partner's work stress. Prior research provides generally consistent evidence that audit partner busyness reduces audit quality, probably because busy audit partners can allocate fewer resources and audit hours to each client (Caramanis & Lennox, 2008). Lai, Sasmita, Gul, Foo, and Hutchinson (2018) and Gul, Ma, and Lai (2017) found that busy audit partners are associated with high earnings manipulation. Sundgren and

Svanström (2014) evidenced that an auditor-in-charge (e.g., audit partner) who audits too many clients is less likely to issue a going-concern opinion to firms facing potential bankruptcy risk in Sweden.

However, Goodwin and Wu (2016) found no association between audit partner busyness and audit quality using data from Australia. They argue that preserving reputational capital plays a vital role in making the trade-offs between holding too many or too few clients. Reputational capital is a key factor when performing effective audit work (Carcello & Li, 2013; Watts & Zimmerman, 1983), and hence audit partners must consider the potential loss of reputational capital before engaging in an extra audit assignment. Profit maximization theory might suggest that audit firms could maximize their revenues by increasing the number of clients in their portfolios (Burrows & Black, 1998; Coram & Robinson, 2017). However, audit firms use a variety of metrics to measure professionalism (e.g., results of internal and external reviews, risk management and independence monitoring, technical excellence, and compliance with policies and procedures). Hence, an argument other than audit partner busyness might explain an adverse effect on audit quality. The limitations of performance-based compensation could induce audit partners to serve more clients and to shirk on tasks that are more difficult to measure (e.g., independence and effort). As the result of less time and effort spent on audit assignments, audit quality may be adversely affected.

We test whether firms audited by busy audit partners incur higher costs of equity capital. Market participants consider firm-provided financial statements as the primary source of information about the business (Sloan, 2001). Financial statements allow investors to assess the investment risks, a crucial component of the cost of sourcing funds. The estimation and the likely determinants of the cost of equity is of paramount importance in accounting and finance research. This is frequently used in settings such as the estimation of equity risk premiums, firm valuation, and capital budgeting, and in investment management practices such as portfolio allocation, performance evaluation, active risk management, and attribution analysis (Câmara, Chung, & Wang, 2009; Hou, Van Dijk, & Zhang, 2012). The cost of equity depends on firms' economic fundamentals, including corporate governance mechanisms among other determinants (Banz, 1981; Fama & French, 1989; Gebhardt, Lee, & Swaminathan, 2001). We incorporate audit quality, measured at the audit partner level, as a likely determinant of the cost of equity capital.

Audit quality contributes to the credibility of financial disclosures and, to the extent that more credible financial statements reduce contracting costs, higher audit quality reduces the cost of capital (Jensen & Meckling, 1976; Watts & Zimmerman, 1986). But audit quality suffers when audit partners take on a large pool of clients. Partners may suffer from 'capacity stress' when the number of their clients increases, with the unintended consequence of lowering audit quality. Moreover, a heavy workload could distract an audit partner from ensuring adequate assurance services and could motivate the audit partners to perform shortcuts instead of gathering the audit evidence required (PCAOB, 2015). Caramanis and Lennox (2008) document that low audit effort increases aggressive earnings management. Low audit quality introduces noise into the information signal disseminated to the market, and thus increases information risk and cost of equity capital (Lambert, Leuz, & Verrecchia, 2007).

Using data from Australian listed companies[2] during the 2001–2015 sample period, we find that firms employing busy audit partners (measured as the number of public clients) incur a higher cost of capital. The reported coefficient in the baseline models suggests that a one standard deviation increase in the number of clients is associated with an 86-basis-point increase in the cost of equity capital. However, an additional test documents that this effect is primarily driven by non-Big 4 observations (coefficients on audit partner busyness are positive and significant for the non-Big 4 group but insignificant for the Big 4 group). The insignificant association between audit partner busyness and cost of equity capital may be consistent with the "equilibrium theory," supporting the notion that Big 4 audit firms, as they tend to be concerned about their reputational capital, choose an optimum level of audit clients to ensure the provision of high-quality audits. We further find that poor earnings quality mediates the positive association between audit partner busyness and the cost of equity capital, although the direct effect of audit partner busyness on cost of equity capital dominates the effect.

Our research responds to the call for additional research at the audit partner level, to better understand how audit partner attributes affect audit quality, which is incremental to audit-firm-level attributes (e.g., DeFond & Francis, 2005; Lennox & Wu, 2018). Gul, Wu, and Yang (2013) suggested that academic research should consider the individual auditor as the unit of analysis, since audit partners supervise the work of audit employees and subordinate auditors and are responsible for the output of the audit teams. Second, we contribute to the determinants of the cost of capital literature. Prior evidence documents a negative association between audit firm reputation (Big 4 audit firm and/or industry-specialist auditors) and cost of capital (Khurana & Raman, 2004; Mansi et al., 2004), but how audit quality at the individual auditor level affects the cost of capital remains unanswered. We fill this void in the literature.

The remainder of the paper is organized as follows. Section 2 presents the existing literature on audit partner busyness and develops the hypotheses. The research methods and sample selection are described in Section 3. Descriptive statistics and test results are reported in Section 4. Section 5 concludes the paper.

2 | LITERATURE AND HYPOTHESIS

The estimation and the likely determinants of the cost of equity are important, since these are frequently used in settings such as the estimation of equity risk premiums, capital budgeting, firm valuation, portfolio allocation, and performance evaluation (Câmara et al., 2009; Hou et al., 2012). Easley and O'Hara (2004) stated that the quantity and quality of information affect the cost of equity. Hence, the extant literature discusses the role of information from two related perspectives: *information asymmetry* and *information risk* (e.g., Bhattacharya, Ecker, Olsson, & Schipper, 2012; Diamond & Verrecchia, 1991; Easley & O'Hara, 2004; Hughes, Liu, & Liu, 2007; Lambert et al., 2007). Diamond and Verrecchia (1991) argued that information asymmetry would heighten in the absence of disclosures. Since informed investors are privy to private information, they are more likely to make better portfolio decisions than their uninformed counterparts. Thus,

uninformed investors would require a higher return to compensate them for the new form of systematic risk they face (Easley & O'Hara, 2004). Therefore, firms can reduce information asymmetry, and hence the cost of equity, by disseminating more information to the public (Diamond, 1985).

From an *information risk* perspective, the precision of information has a significant effect on the cost of capital. Lambert, Leuz, and Verrecchia (2011) documented that, in perfectly competitive markets, information asymmetry plays no role in determining the costs of equity. Rather, the cost of equity is driven by the average precision of the available information. Bhattacharya et al. (2012) decomposed the effects of earning quality on the cost of equity into information risk and information asymmetry risk, and found that reducing information risk, rather than information asymmetry risk, has a greater effect on reducing the cost of equity.

As is well known, market participants consider firm-provided financial statements as the primary source of information about a business. Financial reporting provides the primary source of independently verified information to the capital providers about the performance of managers (Sloan, 2001). This facilitates efficient resource allocation decisions by signaling changing investment opportunities to managers and outside investors, disciplining self-interested managers to invest in value-maximizing projects, and reducing firms' cost of capital (Bushman & Piotroski, 2006). External auditors play an instrumental role in independently verifying financial information (Watts & Zimmerman, 1986). Previous studies suggest that the perceived audit quality of Big 4 firms is higher than their non-Big 4 counterparts, since the former have more reputational concerns as well being more exposed to litigation risk (e.g., Beatty, 1989; DeAngelo, 1981; Khurana & Raman, 2004). With respect to the effects of high-quality auditing on the cost of equity, existing research documents a reduction in the cost of equity and debt financing (Blackwell, Noland, & Winters, 1998; Fortin & Pittman, 2007; Li, Xie, & Zhou, 2010; Mansi et al., 2004; Robin, Wu, & Zhang, 2017) and a reduction in initial public offering underpricing (Beatty, 1989; Willenborg, 1999). For example, Fortin and Pittman (2007) reported that financial statements audited by Big 4 auditors are identified as more credible resources by debt markets, and this reduces the contracting costs. Also, Li et al. (2010) found that debt investors perceive a lower information risk for firms audited by office-level specialists and, hence, require a lower cost of debt capital.

However, these studies implicitly assume that, through standardized firm-wide quality control and knowledge sharing, audit quality within an audit firm or a practice office remains uniform (Zerni, 2012) and, thus, the choice of audit firm as the unit of analysis is well justified. However, the managerial literature shows that people (i.e., managers) rather than firms make decisions (Bamber, Jiang, & Wang, 2010; Dyreng, Hanlon, & Maydew, 2010). The role of audit partners in audit teams is similar to that of managers in their firms, implying that the quality of audit services is determined by audit partners rather than by audit firms or offices. Nelson and Tan (2005, p. 42) stated that "… auditors need to perform a variety of tasks to form an overall assurance or attestation opinion. To do so, various personal attributes of the auditor (e.g., skills and personality) influence the outcome." Chin and Chi (2009) reported that the issue of reputation is different with regard to audit firms and individual auditors, because the former have more power to resist a client's aggressive accounting treatment, and the latter may face more risk of audit failure and reputational damage.

Disclosing audit partners' names increases their exposure and accountability risks. DeZoort, Harrison, and Taylor (2006) found that auditors under higher levels of accountability pressure spend more time on tasks. This, therefore, suggests that audit partner identification should provide an additional incentive for reputation building. Carcello and Li (2013) documented that both audit quality and audit fees increased in the UK after implementing the signature requirement. Their results suggest that the disclosure requirements for engagement partners provide useful information to investors, while also leading to higher audit fees. They attribute the results to the increased accountability of auditor partners after disclosing their identity. Knechel, Vanstraelen, and Zerni (2015) found that the credit market penalizes firms audited by partners who are known to have aggressive audit reporting styles (i.e., low-quality audits), since styles are expected to persist over time. Aobdia, Lin, and Petacchi (2015) documented higher earnings response coefficients when firms switch to higher quality audit partners, as they are perceived to provide more informative earnings information. Also, they found such firms receive better contract terms when borrowing funds from banks, resulting in lower costs of debt capital.

Investors may perceive information verified by audit partners to be of high quality, based on the preceding arguments of accountability and reputational concern, and this enhances the perception of competence and independence (DeAngelo, 1981). Empirical research suggests that both competence and independence are influenced by several factors, such as audit firm size (Cano-Rodríguez, 2010; DeAngelo, 1981; Van Tendeloo & Vanstraelen, 2008), auditor expertise (Balsam, Krishnan, & Yang, 2003; Chi & Chin, 2011; Chin & Chi, 2009; Ittonen, Johnstone, & Myllymäki, 2015; Karjalainen, 2011; Wang, Huang, Chiou, & Huang, 2017; Zerni, 2012), auditor tenure (Azizkhani, Monroe, & Shailer, 2013; Carey & Simnett, 2006; Chen, Lin, & Lin, 2008; Litt, Sharma, Simpson, & Tanyi, 2014; Mansi et al., 2004),[3] and auditor busyness (Goodwin & Wu, 2016; Karjalainen, 2011; Lai et al., 2018; Sundgren & Svanström, 2014).

There are two competing arguments regarding the effectiveness of busy individuals: the *busyness* hypothesis and *reputation/expertise* hypothesis. The former perspective contends that a person's time and effort are finite; thus, doing too many tasks overcommits an individual, resulting in poor performance (Beasley, 1996; Core, Holthausen, & Larcker, 1999). In contrast, the reputation/expertise perspective suggests that multiple engagements increase an individual's reputational capital and experience over time and, thus, enhance their performance (Fama & Jensen, 1983; Gilson, 1990; Kaplan & Reishus, 1990; Shivdasani, 1993; Vafeas, 1999).

However, overwhelming evidence in the extant literature finds that busier audit partners produce low-quality audits[4] (Gul et al., 2017; Karjalainen, 2011; Lai et al., 2018; Sundgren & Svanström, 2014). For example, Sundgren and Svanström (2014) found that the larger the client base the lower the propensity was to issue a going-concern opinion, for potentially bankrupt Swedish small and medium-size firms. Since low-quality audits introduce noise into the information signal, information risk increases, and so does the cost

of equity capital. Overall, we argue that an audit partner's time pressure affects that auditor's work processing accuracy negatively (McDaniel, 1990) and diminishes professional skepticism (Braun, 2000), thereby failing to provide "reasonable assurance" that the financial statements are free from material misstatement, thus accentuating information risk and, hence, the cost of equity capital.

> **H1.** Audit partner busyness increases cost of equity capital.

3 | RESEARCH DESIGN

3.1 | Sample and data

We retrieve data on audit committee equity ownership and other governance variables from the Securities Industry Research Center of Asia-Pacific Corporate Governance database. This database covers corporate governance data for the top 1,500 listed Australian firms. Relevant financial data are retrieved from the COMPUSTAT global vantage. We estimate our regression models over the period 2001–2015. We chose 2001 as the initial sample year because the data coverage by Securities Industry Research Center of Asia-Pacific is quite inadequate prior to 2001. Our initial sample was 13,461 firm-year observations. We then (a) removed 823 observations pertaining to financial institutions (Global Industry Classification Standard [GICS] code 40); (b) deleted 3,631 firm-year observations with no audit committee (one of our control variables is *AC_HOLD%*, which is applicable only for companies with an audit committee); and (c) deleted 298 firm-year observations with missing audit committee ownership data. We then merged this sample of 8,709 firm-year observations with the population of companies listed on the Australian Securities Exchange and covered by the I/B/E/S International database. We lost a substantial number of observations during this matching process because of the requirements for companies to have nonmissing current and 1-year-ahead forecasted earnings per share, and nonmissing closing stock price data. Our final sample, therefore, consists of 2,825 firm-year observations and 551 unique firms. A total of 1,107 unique partners audited our sample firms during the sample period.

3.2 | Empirical model

We develop the following model to test H1:

$$\begin{aligned} COE_{i,t} = {} & \beta_0 + \beta_1 AP\_BUSY_{i,t} + \beta_2 AP\_SPEC_{i,t} + \beta_3 TENURE\_FIRM_{i,t} \\ & + \beta_4 TENURE\_AP_{i,t} + \beta_5 BIG4_{i,t} + \beta_6 CITY\_SPEC_{i,t} \\ & + \beta_7 AOPIN_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 BTM_{i,t} + \beta_{10} BETA_{i,t} \\ & + \beta_{11} LEV_{i,t} + \beta_{12} DISTRESS_{i,t} + \beta_{13} BSIZE_{i,t} + \beta_{14} BIND_{i,t} \\ & + \beta_{15} ACSIZE_{i,t} + \beta_{16} ACEXPERT_{i,t} + \beta_{17} AC\_HOLD\%_{i,t} \\ & + Industry\ \ Dummy + Year\ \ Dummy + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where the dependent variable is either the price–earnings–growth (PEG) or modified PEG (MPEG) measures of cost of equity capital (see Section 3.2 for detailed estimation procedures). Our variable of primary interest is audit partner busyness. We use two variants of busyness: the number of clients the same partner audited during the year (*AP_BUSY*) and *LN_BUSY*, which is the natural log of *AP_BUSY*. We include a set of audit and partner characteristics likely to affect cost of equity capital, including audit partner specialization (*AP_SPEC*), audit firm tenure (*TENURE_FIRM*), audit partner tenure (*TENURE_AP*), BIG 4 auditor (*BIG4*, a dummy variable, coded 1 if a Big 4 audit firm audits a firm and 0 otherwise), auditor city specialization (*CITY_SPEC*), and audit opinion (*AOPIN*, an indicator variable, coded 1 if the firm received a modified audit opinion and 0 otherwise).

We control for a number of risk factors and firm characteristics likely to determine the cost of equity capital. Firm size reduces the cost of equity capital because large firms have a lower probability of default (Berger & Udell, 1995), are followed more by analysts, and are more liquid. We use the natural log of the market value of equity to measure firm size (*SIZE*). Growth opportunity is characterized by uncertainty and risk and, therefore, is expected to be associated positively with the cost of equity capital (Boone, Khurana, & Raman, 2008; Chan, Hamao, & Lakonishok, 1991; Fama & French, 1992; Khurana & Raman, 2004). We use book-to-market ratio (*BTM*) as a growth proxy. We control for the effect of systematic risk (*BETA*), as this is associated positively with the cost of equity capital (Harris & Marston, 1992; Lintner, 1965; Mossin, 1966; Sharpe, 1964). We include leverage (*LEV*) as a proxy for riskiness of the firm. The higher the level of leverage, the greater the perceived risk associated with the firm and, consequently, the higher the cost of equity capital (Fama & French, 1992; Gebhardt et al., 2001; Modigliani & Miller, 1958; Petersen & Rajan, 1994). Distress risk (*DISTRESS*) is measured as a dummy variable, coded 1 if the firm reported both negative earnings and negative working capital during the year and 0 otherwise. Another set of control variables includes corporate governance variables, including board size (*BSIZE*, number of board members), board independence (*BIND*, the proportion of independent board members), audit committee size (*ACSIZE*, number of audit committee members), audit committee expertise (*ACEXPERT*, an indicator variable, coded 1 if at least one of the audit committee members has financial expertise and 0 otherwise), and finally audit committee members' equity holdings to total outstanding shares (*AC_HOLD%*) (Habib, Bhuiyan, & Wu, 2018).

3.3 | Measurement of cost of equity capital

The cost of equity can be measured using both the implied approach and the realized approach. Estimation of implied cost of equity involves calculating the internal rate of return that equates the stock prices to the present value of forecasted cash flows (Hou et al., 2012). On the other hand, the realized approach uses ex-post stock returns to estimate the cost of equity. However, estimates based on ex-post realized stock returns suffer from measurement errors, such as imprecise estimates of factor risk premium and risk loading (Elton, 1999; Fama & French, 1997). Hence, researchers are increasingly relying on the implied cost of equity capital. In line with previous studies, we use implied approaches to estimate the cost of equity. In particular, we use the Easton (2004) PEG model and the MPEG model. Botosan and Plumlee (2005) document that Easton's (2004) PEG ratio dominates the other alternatives, in the sense that they are consistently and predictably related to various risk measures. The estimation formulas for PEG and MPEG are as follows:

$$PEG = \sqrt{\frac{eps_2 - eps_1}{P_0}} \quad (2)$$

$$MPEG = \sqrt{\frac{eps_2 + (MPEG \times dps_1) - eps_1}{P_0}} \quad (3)$$

where P_0 is the price per share at the current date, dps_1 is 1-year-ahead expected dividend per share, eps_1 is the 1-year-ahead expected EPS, and eps_2 is the 2-year-ahead expected EPS.

3.4 | Measurement of accruals quality

We use the absolute discretionary accruals, calculated using the performance-adjusted modified Jones model (Kothari, Leone, & Wasley, 2005), as our proxy for accruals quality. We estimate the following equation for all firms in the same industry (using the GICS industry code) with at least eight observations in an industry in a particular year, to get industry-specific parameters for calculating the nondiscretionary component of total accruals (*NDAC*):

$$\frac{ACC_{i,t}}{TA_{i,t-1}} = \gamma_0\left(\frac{1}{TA_{i,t-1}}\right) + \gamma_1\left[\frac{\Delta SALES_{i,t} - \Delta RECEIVABLE_{i,t}}{TA_{i,t-1}}\right] + \gamma_2\left(\frac{PPE_{i,t}}{TA_{i,t-1}}\right) + \gamma_3\left(ROA_{i,t-1}\right) + \varepsilon_{i,t} \quad (4)$$

where *ACC* is total accruals calculated as earnings before extraordinary items and discontinued operations minus operating cash flows; *TA* is total assets in year $t - 1$; $\Delta SALES$ is change in sales from year $t - 1$ to year t; $\Delta RECEIVABLE$ is change in accounts receivable from year $t - 1$ to year t; *PPE* is gross property plant and equipment; *ROA* is return on assets, measured as earnings before extraordinary items and discontinued operations for the preceding year divided by total assets for the same year. *DAC* is then the residual from Equation (4): $DAC = ACC - NDAC$.

4 | RESULTS

4.1 | Descriptive statistics

Table 1 reports the detailed descriptive statistics of variables that we used in this study. The means (medians) of the cost of equity capital are 0.16 (0.12) and 0.18 (0.14) for the *PEG* and *MPEG* measures respectively. The average (maximum) number of public clients (*AP_BUSY*) held by each audit partner is 3 (24) in our sample companies. Big 4 audit firms audit 82% of sample firms, with 12% of auditors being city-level industry specialists. The corresponding percentage of audit-partner-level industry specialists is 4%. In addition, 3% of sample firms received qualified audit opinions. The mean values of *SIZE* (19.73) and lower distress occurrence (*DISTRESS* statistic of 0.12) suggest the presence of large and financially sound firms in the sample. Moreover, the mean (0.83) and median (0.55) *BTM* suggest that the sample firms have valuable growth opportunities. The average leverage ratio is 20%. The mean *BETA* (0.74) is similar to that of Chen, Jorgensen, and Yoo (2004) (0.75). The mean (median) |*DAC*|, our mediating variable, is 13% (11%) of lagged total assets. The average board size is 7.5, and the average percentage of independent directors is 73%. The average size of the audit committee is 4.47, with at least one member having financial expertise. About 60% of the firm-year observations come from the Material (GICS 15), Industrials (GICS 20), and Consumer discretionary (GICS 25) industries.

4.2 | Correlation analysis

Table 2 presents the Pearson correlations among all the variables included in this study. The test variables *AP_BUSY* and *LN_BUSY* are correlated with *PEG* significantly and positively (both correlation coefficients are 0.14, $p < 0.01$). This provides univariate support for a positive association between audit partner busyness and the cost of equity. *PEG* is higher for distressed firms (correlation coefficients of 0.26 and 0.24, both significant at $p < 0.01$, for the *DISTRESS* and *BTM* proxies), firms with a high beta and firms receiving a qualified audit opinion, whilst the correlation is negative for larger firms (coefficient −0.29, $p < 0.01$), firms audited by city-specialist auditors (*CITY_SPEC*; coefficient −0.10, $p < 0.01$), and firms with larger boards (coefficient −0.11, $p < 0.01$). None of the independent variables is correlated with each other at $\rho > 0.50$ (the strongest correlation is 0.49 between *BSIZE* and *SIZE*), suggesting there need be no concern for multicollinearity.

4.3 | Audit partner busyness and cost of equity capital: Baseline regression results

Table 3, panel A, reports the results for H1. We use two measures for audit partner busyness: *AP_BUSY* and *LN_BUSY*. We also use two different measures for cost of equity capital: *PEG* and *MPEG*. The coefficients on *AP_BUSY* for both measures of the cost of equity capital are positive and significant, indicating that firms having busy audit partners incur higher costs of equity (coefficients of 0.003, significant at better than 5% in columns (1) and (2) for *PEG* and *MPEG* respectively). In terms of economic significance, the reported coefficient in column (1) suggests an 86.4 basis point increase in *PEG* for one standard deviation increase in *AP_BUSY*: 0.003(coefficient on *AP_BUSY*) × 2.88(SD of *AP_BUSY*). Our inference remains the same when we include audit partner specialization (*AP_SPEC*) as an additional control variable in columns (3) and (4). We do so because the sample size shrinks to 2,589 firm-year observations for this specification. Columns (5)–(8) re-estimate Equation (1) using *LN_BUSY* as the primary independent variable. Again, we find significantly positive coefficients on *LN_BUSY* across all the four columns (coefficients ranging from 0.02 to 0.015). With respect to the sign and significance of the control variables, we find negative and significant coefficients on *CITY_SPEC*, suggesting that city-level specialization reduces the cost of equity capital (Li et al., 2010). However, the coefficient on *BIG4* is positive and significant across six of the eight models. The coefficients on *SIZE* are negative and significant, whereas those on *BTM*, *LEV*, and *DISTRESS* are positive and significant, which are consistent with prior research. Taken together, our findings suggest that audit partner busyness increases the cost of equity capital.

In our primary test, we inherently treat all clients of differing sizes as being equal in calculating our primary independent variable

TABLE 1 Industry distribution and descriptive statistics.

A. Industry distribution						
Sector	**Name**			***N***		**Distribution (%)**
10	Energy			227		8.06
15	Materials			594		21.10
20	Industries			641		22.77
25	Consumer discretionary			469		16.66
30	Consumer staples			244		8.67
35	Health Care			243		8.63
45	Information technology			272		9.66
50	Telecommunication services			82		2.91
55	Utilities			43		1.53
	Total			2,815		100.00
B. Descriptive statistics						
Variable	**Observations**	**Mean**	**SD**	**First quartile**	**Median**	**Third quartile**
PEG	2,815	0.16	0.14	0.08	0.12	0.19
MPEG	2,746	0.18	0.14	0.11	0.14	0.21
AP_BUSY	2,815	3.00	2.88	1.00	2.00	4.00
LN_BUSY	2,815	1.22	0.54	0.69	1.10	1.61
AP_SPEC	2,589	0.04	0.20	0.00	0.00	0.00
TENURE_FIRM	2,815	6.79	3.91	4.00	6.00	10.00
TENURE_AP	2,815	2.55	1.52	1.00	2.00	4.00
BIG4	2,815	0.82	0.38	1.00	1.00	1.00
CITY_SPEC	2,815	0.12	0.21	0.01	0.04	0.10
AOPIN	2,815	0.03	0.17	0.00	0.00	0.00
SIZE	2,815	19.73	1.80	18.54	19.59	20.85
BTM	2,815	0.83	0.92	0.29	0.55	0.99
BETA	2,815	0.74	1.11	0.33	0.67	1.07
LEV	2,815	0.2	0.17	0.05	0.19	0.30
DISTRESS	2,815	0.12	0.32	0.00	0.00	0.00
|DAC|	2,442	0.13	0.12	0.05	0.11	0.18
BSIZE	2,815	7.50	2.65	6.00	7.00	9.00
BIND	2,815	0.73	0.15	0.67	0.75	0.83
ACSIZE	2,815	4.47	1.93	3.00	4.00	5.00
ACEXPERT	2,815	1.24	0.96	1.00	1.00	2.00
AC_HOLD%	2,815	0.05	0.12	0.00	0.00	0.04

Variables are defined in the Appendix.

AP_BUSY. However, it is intuitive to expect that more complex clients would demand different levels of auditor effort. Therefore, as an alternative independent variable, we construct a client complexity score that reflects differences in the complexity of clients audited by different audit partners. Based on prior studies (e.g., Gul, Chen, & Tsui, 2003; Gul & Goodwin, 2010), we identify four client characteristics that reflect client complexity and affect auditor effort: client size, client growth, client financial performance, and client bankruptcy risk. For each firm-year observation, we create four indicator variables to measure differences in the four client characteristics:

C1 = 1 if a firm is a large client (size of total assets in the upper quartile in year *t*), and 0 otherwise;

C2 = 1 if a firm is a high-growth firm (growth in revenue in the upper quartile in year *t*), and 0 otherwise;

C3 = 1 if a firm has high bankruptcy risk (bankruptcy risk in the upper quartile in year *t*), and 0 otherwise; and

C4 = 1 if a firm has low or negative profit (*ROA* is lower than 10% in year *t*), and 0 otherwise.

The complexity score (*COMPLEX*) is then calculated as follows:

$$COMPLEX = 1 + C1 + C2 + C3 + C4$$

A firm can obtain a score of 1 to 5, reflecting levels of complexity. A high complexity score (e.g., 5) indicates that the client firm is more complex, and a low complexity score (e.g., 1) indicates that the client firm is less complex. Finally, for each audit partner, we calculate the total *COMPLEX* of all the clients audited by the audit partner in year *t*. The untabulated result reveals the coefficient on *COMPLEX* is

TABLE 2 Correlation analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
PEG (1)	—																
AP_BUSY (2)	**0.14**	—															
LN_BUSY (3)	**0.14**	**0.93**	—														
TENURE_FIRM (4)	**0.10**	**0.24**	**0.34**	—													
TENURE_AP (5)	0.01	**0.16**	**0.19**	**0.22**	—												
BIG4 (6)	−0.03	**−0.13**	**−0.09**	0.03	0.00	—											
CITY_SPEC (7)	**−0.10**	−0.04	−0.05	0.04	0.00	0.06	—										
AOPIN (8)	**0.19**	0.02	0.00	−0.02	−0.03	−0.06	−0.01	—									
SIZE (9)	**−0.29**	0.01	0.03	**0.17**	**0.07**	**0.22**	**0.24**	**−0.21**	—								
BTM (10)	**0.24**	0.00	0.02	**0.14**	−0.03	0.00	0.02	**0.16**	**−0.38**	—							
BETA (11)	0.05	**0.11**	**0.11**	0.05	0.00	0.03	0.00	0.01	**0.14**	0.00	—						
LEV (12)	0.02	−0.02	−0.04	**−0.07**	−0.01	**0.12**	**0.15**	0.05	**0.14**	0.02	−0.02	—					
DISTRESS (13)	**0.26**	0.06	0.05	−0.06	0.02	**−0.08**	**−0.07**	**0.24**	**−0.26**	**0.07**	0.05	**−0.07**	—				
BSIZE (14)	**−0.11**	**−0.09**	**−0.09**	0.02	−0.04	**0.19**	**0.22**	−0.05	**0.49**	−0.03	0.05	**0.18**	**−0.07**	—			
BIND (15)	−0.01	−0.02	0.00	**0.17**	0.04	**0.18**	**0.09**	−0.05	**0.16**	0.03	0.00	**0.08**	−0.06	0.02	—		
ACSIZE (16)	0.02	−0.05	**−0.08**	**−0.11**	−0.06	0.06	**0.07**	0.06	**0.07**	−0.02	0.06	**0.07**	0.05	**0.20**	0.03	—	
ACEXPERT (17)	−0.06	−0.03	−0.02	**0.14**	0.02	**0.09**	0.06	−0.04	**0.21**	0.02	0.01	0.06	**−0.13**	**0.24**	**0.12**	**0.14**	—
AC_HOLD% (18)	−0.04	−0.06	**−0.07**	**−0.15**	−0.04	**−0.14**	−0.06	0.03	**−0.20**	−0.06	−0.05	**−0.14**	0.05	**−0.16**	**−0.19**	**0.18**	−0.08

Sample size 2,815. Bold indicates significant at $p < 0.01$. The pairwise correlation between *PEG* and |*DAC*| is 0.18 ($p < 0.01$) and that between *AP_BUSY* and |*DAC*| is 0.09 ($p < 0.01$) (untabulated). Number of observations for this analysis drops down to 2,442 firm-year observations because of missing |*DAC*| values. The correlations are virtually unchanged for the *MPEG* analysis.

positive and significant: coefficients of 0.011 ($p < 0.05$) and 0.0086 ($p < 0.10$) for *PEG* and *MPEG* measures respectively.

Table 3, panel B, presents the baseline regression results for Big 4 and non-Big 4 groups separately. The coefficients on *AP_BUSY* are positive and significant for both *PEG* and *MPEG* measures, but only for the non-Big 4 group in columns (3) and (4) (coefficients 0.006 and 0.007, both significant at $p < 0.01$). The respective coefficients are positive but insignificant for Big 4 groups, as reported in columns (1) and (2). A χ^2 test of the equality of the coefficient is rejected. We find similar results when we use *LN_BUSY* as the primary independent variable. Taken together, the reported results in Table 3, panel B, are more in line with the "equilibrium theory" suggested by Goodwin and Wu (2016), at least for the group of Big 4 audit firms. Since prior research suggests that the earnings of firms audited by Big 4 auditors are of higher quality than those of firms audited by their non-Big 4 counterparts (DeFond, Erkens, & Zhang, 2017; Eshleman & Guo, 2014; Lennox & Pittman, 2010), it is plausible that the audit partners of Big 4 audit firms choose their client portfolio optimally to provide high-quality auditing. Khurana and Raman (2004) found that Big 4 auditors are associated with lower costs of equity capital than non-Big 4 auditors are, a finding that is supportive of brand name reputation and litigation arguments.

4.4 | Control for self-selection of busy audit partner

Appointing an audit partner to provide assurance services to a client is a nonrandom decision. The endogeneity problem arises if the unobservable factors that affect this decision may also be associated with the firm-level cost of equity capital. Selection bias, which is one form of endogeneity problem, can lead to inappropriate inferences about treatment effects (Tucker, 2010). Selection bias due to unobservable factors arises because researchers use a small set of observations. In the extant literature, the Heckman two-stage error correction method has been the most popular and widely used approach for controlling this source of bias.

To perform the Heckman test (1979) we proceed as follows. We model firms' decisions to appoint busy audit partners using some observable firm characteristics. Given a lack of prior research on the determinants of appointing a busy audit partner, our choice of the variables should be considered as descriptive. We choose *TENURE_FIRM*, *TENURE_AP*, *BIG4*, *SIZE*, *BTM*, *LEV*, *DISTRESS*, *ACSIZE*, and *AC_EXPERT* as some of the potential determinants of audit partner busyness. Lennox, Francis, and Wang (2011) argued that it is important to impose exclusion restrictions in implementing the Heckman two-stage regression, even though the inverse Mills ratio can be identified by its nonlinear arguments. We include *APBUSY_IND* (industry-year mean audit partner busyness) as the exclusion variable. This should be related positively to the dependent variable, which in our case is a dummy variable coded 1 for firms with *AP_BUSY* greater than median *AP_BUSY* and 0 otherwise (*APBUSY_D*). However, we have no a priori reason to believe that industry-level audit partner busyness has a direct impact on *APBUSY_D* through channels other than firm-level audit partner busyness. We calculate inverse Mills ratio from the first stage probit model and include it as an additional independent variable in the second-stage regression model. Columns (1)–(5) in Table 4 report the regression results for the pooled sample.[5] Consistent with the baseline results, we find the coefficients on *AP_BUSY* and *LN_BUSY* to be positive and significant for both the *PEG* and the *MPEG* measures; for example, the coefficient on *AP_BUSY* is 0.003 (*t*-stat 2.51, $p < 0.05$) and that on *LN_BUSY* is 0.02 (*t*-stat 2.74, $p < 0.01$) for the *PEG* measure. Columns (6)–(9) in Table 4 report the results for the Big 4 and non-Big 4 groups. Consistent with the results

TABLE 3 Audit partner busyness and cost of equity capital. This table reports the regression results of the effects of audit partner busyness on the cost of equity capital

A. Pooled sample[a]									
Variable	Predicted sign	(1) *PEG*	(2) *MPEG*	(3) *PEG*	(4) *MPEG*	(5) *PEG*	(6) *MPEG*	(7) *PEG*	(8) *MPEG*
AP_BUSY	+	0.003**	0.003**	0.003**	0.002**	–	–	–	–
		[2.51]	[2.13]	[2.37]	[2.00]				
LN_BUSY	+	–	–	–	–	0.020***	0.015**	0.019**	0.015**
						[2.75]	[2.24]	[2.56]	[2.06]
AP_SPEC	–	–	–	0.035***	0.035***	–	–	0.034***	0.034***
				[2.77]	[2.70]			[2.74]	[2.68]
TENURE_FIRM	?	−0.001	−0.001	−0.002	−0.001	−0.001	−0.001	−0.002	−0.001
		[−0.58]	[−0.32]	[−0.79]	[−0.46]	[−0.55]	[−0.30]	[−0.75]	[−0.43]
TENURE_AP	?	0.001	−0.000	0.001	−0.000	0.001	−0.000	0.001	0.000
		[0.65]	[−0.03]	[0.60]	[−0.02]	[0.68]	[−0.01]	[0.62]	[0.01]
BIG4	–	0.014	0.016**	0.015*	0.018**	0.013	0.015*	0.015*	0.017**
		[1.60]	[2.01]	[1.73]	[2.13]	[1.53]	[1.95]	[1.68]	[2.09]
CITY_SPEC	–	−0.033***	−0.027**	−0.041***	−0.037***	−0.032**	−0.027**	−0.040***	−0.036***
		[−2.62]	[−2.21]	[−3.14]	[−2.78]	[−2.56]	[−2.16]	[−3.07]	[−2.71]
AOPIN	+	0.055*	0.037	0.050	0.035	0.056**	0.037	0.051*	0.036
		[1.95]	[1.33]	[1.65]	[1.21]	[1.98]	[1.35]	[1.67]	[1.23]
SIZE	–	−0.025***	−0.025***	−0.026***	−0.026***	−0.025***	−0.025***	−0.026***	−0.026***
		[−8.30]	[−8.52]	[−8.21]	[−8.07]	[−8.28]	[−8.52]	[−8.19]	[−8.07]
BTM	+	0.014**	0.017***	0.013**	0.017***	0.014**	0.017***	0.013**	0.017***
		[2.47]	[3.18]	[2.19]	[2.98]	[2.46]	[3.17]	[2.19]	[2.97]
BETA	+	0.004	0.005*	0.004	0.004	0.004	0.005*	0.004	0.004
		[1.55]	[1.72]	[1.39]	[1.34]	[1.52]	[1.70]	[1.35]	[1.32]
LEV	+	0.083***	0.087***	0.091***	0.092***	0.084***	0.088***	0.092***	0.093***
		[2.60]	[2.84]	[2.77]	[2.92]	[2.63]	[2.86]	[2.80]	[2.94]
DISTRESS	+	0.061***	0.047***	0.063***	0.049***	0.061***	0.047***	0.063***	0.049***
		[4.58]	[3.38]	[4.57]	[3.42]	[4.60]	[3.39]	[4.59]	[3.43]
BSIZE	–	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		[1.45]	[1.52]	[1.41]	[1.40]	[1.45]	[1.52]	[1.41]	[1.40]
BIND	–	−0.006	−0.005	−0.006	−0.004	−0.006	−0.005	−0.006	−0.004
		[−0.28]	[−0.23]	[−0.25]	[−0.19]	[−0.28]	[−0.24]	[−0.25]	[−0.20]
ACSIZE	?	0.002	0.002	0.001	0.002	0.002	0.002	0.001	0.002
		[0.92]	[0.95]	[0.77]	[0.96]	[0.93]	[0.95]	[0.77]	[0.96]
ACEXPERT	–	−0.002	−0.001	−0.001	−0.001	−0.002	−0.001	−0.001	−0.001
		[−0.54]	[−0.35]	[−0.42]	[−0.28]	[−0.50]	[−0.32]	[−0.38]	[−0.26]
AC_HOLD%	?	−0.048*	−0.034	−0.036	−0.021	−0.049*	−0.034	−0.036	−0.021
		[−1.93]	[−1.46]	[−1.35]	[−0.80]	[−1.96]	[−1.48]	[−1.37]	[−0.81]
Constant		0.597***	0.598***	0.626***	0.614***	0.584***	0.589***	0.613***	0.605***
		[9.88]	[10.11]	[9.61]	[9.46]	[9.62]	[9.88]	[9.38]	[9.25]
Industry		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2		0.25	0.24	0.12	0.15	0.25	0.25	0.26	0.25
Observations		2,815	2,746	2,589	2,525	2,815	2,746	2,589	2,525

B. Big 4 versus non-Big 4 partitions[b]									
	Big 4 group		Non-Big 4 group		Big 4 group		Non-Big 4 group	
Variables	(1) PEG	(2) MPEG	(3) PEG	(4) MPEG	(5) PEG	(6) MPEG	(7) PEG	(8) MPEG
AP_BUSY	0.002	0.001	0.006***	0.007***	—	—	—	—
	[1.00]	[0.73]	[2.96]	[3.12]				

(Continues)

TABLE 3 (Continued)

B. Big 4 versus non-Big 4 partitions[b]								
	Big 4 group		Non-Big 4 group		Big 4 group		Non-Big 4 group	
Variables	(1) PEG	(2) MPEG	(3) PEG	(4) MPEG	(5) PEG	(6) MPEG	(7) PEG	(8) MPEG
LN_BUSY	—	—	—	—	0.011	0.008	0.050***	0.046***
					[1.30]	[0.94]	[3.88]	[3.64]
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.624***	0.636***	0.578***	0.581***	0.615***	0.629***	0.556***	0.562***
	[9.63]	[9.82]	[3.95]	[4.07]	[9.37]	[9.62]	[3.89]	[4.06]
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.28	0.26	0.31	0.29	0.28	0.26	0.32	0.30
Observations	2,308	2,258	507	488	2,308	2,258	507	488
Test for equality of coefficients between audit groups	χ^2 = 4.55 (p = 0.03) [col. 1 vs. 3]	χ^2 = 7.15 (p = 0.008) [col. 2 vs. 4]			χ^2 = 6.37 (p = 0.01) [col. 5 vs. 7]	χ^2 = 6.86 (p = 0.009) [col. 6 vs 8]		

[a]Our dependent variables are *PEG* and *MPEG*. Columns (1)–(4) report results using *AP_BUSY*, while columns (5)–(8) report results using *LN_BUSY*. Variables are defined in the Appendix. Robust *t*-statistics in brackets. ***p < 0.01, **p < 0.05, *p < 0.10.

[b]Columns (1) and (2) and (5) and (6) report results in Big 4 group, while columns (3) and (4) and (7) and (8) report results for the non-Big 4 group. Variables are defined in the Appendix. Robust *t*-statistics in brackets. ***p < 0.01, **p < 0.05, *p < 0.10.

reported in section 4.3, we find positive and significant coefficients on the audit partner busyness variables for the non-Big 4 group only; that is, the coefficients on *AP_BUSY* and *LN_BUSY* are 0.007 (*t*-stat 2.99, p < 0.01) and 0.051 (*t*-stat 4.01, p < 0.01) respectively for the *MPEG* measure.

4.5 | Mediation test result

So far, we have presented results indicating a significant positive relation between audit partner busyness and cost of equity capital. This result is robust even after controlling for firm-level characteristics and firm and year effects. A related issue is the extent to which busyness affects the cost of equity capital directly (i.e., without mediation) and, through its effect on financial reporting quality, the so-called mediation effect.

We follow the mediation test approach of Baron and Kenny (1986), who proposed that a mediation effect exists when the following three conditions are fulfilled. (1) Path A: Variations in the levels of the independent variable (i.e., audit partner busy, *AP_BUSY*, in our study) account significantly for variations in the proposed mediator (i.e., |*DAC*|; Equation 5A). (2) Path B: Variations in the proposed mediators account significantly for variations in the dependent variable (*COE*; Equation 5B). (3) Path C: The significant relationship between *AP_BUSY* and *COE* (Equation 1) becomes insignificant once paths A and B are controlled (full mediation); or the significant relation is reduced once paths A and B are controlled (partial mediation; Equation 5C). The following set of equations is developed to conduct the mediation tests:

$$|DAC| = \alpha_0 + \alpha_1 AP\_BUSY + \sum Controls + \sum Industry + \sum Year + \varepsilon_{i,t} \quad (5A)$$

$$COE = \beta_0 + \beta_1 |DAC| + \sum Controls + \sum Industry + \sum Year + \varepsilon_{i,t} \quad (5B)$$

$$COE = \gamma_0 + \gamma_1 AP\_BUSY + \gamma_2 |DAC| + \sum Controls + \sum Industry + \sum Year + \varepsilon_{i,t} \quad (5C)$$

The total effect of *AP_BUSY* on *COE* can be decomposed into direct and indirect effects. The direct effect is γ_1 from Equation (5C), whereas the indirect effect is $\alpha_1 \times \gamma_1$ for the financial reporting quality channel. To test for the indirect effect, the null hypothesis may be set as follows: H_o: $\alpha_1 \times \gamma_1 = 0$. For the above estimation we use the two-stage least-squares method as a simultaneous equation model, which controls for the endogeneity problem. We tabulate the direct and indirect effects of audit partner busyness on cost of equity capital for the pooled sample in panel A of Table 5. Columns (1) and (2) document a positive and significant coefficient on *AP_BUSY* and *LN_BUSY* when |*DAC*| is used as the dependent variable for the *PEG* observations (Equation 5A), suggesting that firms audited by busy audit partners report poor-quality earnings: coefficients 0.0023 (p < 0.10) and 0.013 (p < 0.10) respectively.[6] Column (3) reveals that poor-quality financial reporting increases the cost of equity capital: coefficient on |*DAC*| is 0.121 (p < 0.01) (Francis, LaFond, Olsson, & Schipper, 2004). Columns (4) and (5) show that the coefficients for *AP_BUSY* and *LN_BUSY* are positive and statistically significant, with or without the inclusion of the mediator (i.e., |*DAC*|). When we isolate direct and indirect effects of audit partner busyness on the cost of equity capital, we find that busyness (both *AP_BUSY* and *LN_BUSY*) *directly* increases cost of equity capital and indirectly (through |*DAC*|) as well. However, the direct effects constitute the bulk of the total effects. Information and/or insurance value might mediate the credibility of high-quality auditing (Dye, 1993). Specifically, in well-developed countries with strong enforcement (e.g., Australia), high-quality audits increase the credibility of financial information, thereby reducing information risk to investors, and, on the other hand, investors are better able to recover losses through litigation, in the event of an audit failure (Choi, Kim, Liu, &

TABLE 4 Control for self-selection of busy partners and the association between partner busyness and cost of equity capital. This table presents regression results, after controlling for the self-selection problem emanating from firms' non-random decision to appoint busy audit partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
						Big 4	Non-Big 4	Big 4	Non-Big 4
	Probit result	*PEG*	*MPEG*	*PEG*	*MPEG*	*PEG*	*PEG*	*PEG*	*PEG*
AP_BUSY	—	0.003**	0.003**	—	—	0.002	0.007***	—	—
		[2.51]	[2.13]			[1.02]	[2.99]		
LN_BUSY	—	—	—	0.020***	0.015**	—	—	0.012	0.051***
				[2.74]	[2.23]			[1.33]	[4.01]
TENURE_FIRM	0.041**	−0.001	−0.001	−0.001	−0.001	−0.001	−0.004	−0.001	−0.004
	[2.19]	[−0.59]	[−0.33]	[−0.56]	[−0.31]	[−0.48]	[−1.42]	[−0.47]	[−1.36]
TENURE_AP	0.051	0.009	0.008	0.008	0.007	−0.010	0.057*	−0.012	0.061**
	[1.39]	[0.42]	[0.38]	[0.36]	[0.33]	[−0.51]	[1.91]	[−0.57]	[2.08]
BIG4	−0.056	0.003	0.005	0.004	0.006	—	—	—	—
	[−0.30]	[0.10]	[0.19]	[0.13]	[0.22]				
CITY_SPEC	—	−0.056	−0.051	−0.051	−0.047	−0.008	−0.145	−0.005	−0.149*
		[−0.85]	[−0.82]	[−0.78]	[−0.75]	[−0.13]	[−1.56]	[−0.07]	[−1.65]
AOPIN	—	0.055*	0.037	0.056**	0.037	0.041	0.078*	0.042	0.077*
		[1.96]	[1.34]	[1.98]	[1.36]	[1.19]	[1.91]	[1.22]	[1.89]
SIZE	−0.108**	−0.018	−0.018	−0.019	−0.019	−0.034**	0.014	−0.034**	0.016
	[−2.25]	[−1.00]	[−1.06]	[−1.04]	[−1.11]	[−2.00]	[0.50]	[−2.06]	[0.58]
BTM	−0.111*	0.020	0.023	0.019	0.022	0.008	0.045*	0.007	0.047*
	[−1.67]	[1.11]	[1.38]	[1.05]	[1.33]	[0.44]	[1.66]	[0.40]	[1.77]
BETA	—	0.004	0.005*	0.004	0.005*	0.004	0.003	0.004	0.002
		[1.55]	[1.72]	[1.52]	[1.70]	[1.54]	[0.47]	[1.52]	[0.28]
LEV	−0.434	0.051	0.056	0.057	0.060	0.114	−0.074	0.119	−0.091
	[−1.13]	[0.56]	[0.65]	[0.62]	[0.70]	[1.35]	[−0.49]	[1.42]	[−0.62]
DISTRESS	−0.220	0.074**	0.059*	0.072*	0.058	0.054	0.113*	0.053	0.118**
	[−1.13]	[2.01]	[1.69]	[1.95]	[1.63]	[1.55]	[1.96]	[1.50]	[2.09]
BSIZE	—	−0.001	−0.001	−0.001	−0.001	0.006	−0.015	0.006	−0.015
		[−0.14]	[−0.14]	[−0.08]	[−0.08]	[0.73]	[−1.04]	[0.79]	[−1.11]
BIND	—	0.004	0.005	0.002	0.003	−0.023	0.038	−0.024	0.040
		[0.12]	[0.15]	[0.07]	[0.10]	[−0.64]	[0.69]	[−0.67]	[0.74]
ACSIZE	−0.000	−0.001	−0.001	−0.001	−0.001	0.006	−0.017*	0.006	−0.018*
	[−0.00]	[−0.14]	[−0.14]	[−0.08]	[−0.09]	[0.92]	[−1.76]	[0.98]	[−1.95]
ACEXPERT	−0.098	−0.003	−0.002	−0.003	−0.002	−0.001	−0.010	−0.000	−0.010
	[−1.38]	[−0.62]	[−0.50]	[−0.55]	[−0.44]	[−0.14]	[−1.15]	[−0.08]	[−1.24]
AC_HOLD%	—	−0.049**	−0.035	−0.049**	−0.035	−0.081***	0.005	−0.081***	0.009
		[−1.97]	[−1.49]	[−1.99]	[−1.50]	[−2.72]	[0.16]	[−2.74]	[0.24]
APBUSY_IND	1.152***	—	—	—	—	—	—	—	—
	[17.47]								
IMR	-	0.114	0.113	0.096	0.097	−0.134	0.650	−0.150	0.699
		[0.37]	[0.39]	[0.31]	[0.33]	[−0.48]	[1.43]	[−0.54]	[1.57]
Constant	−2.042*	0.383	0.386	0.404	0.405	0.890	−0.613	0.913	−0.725
	[−1.96]	[0.65]	[0.70]	[0.68]	[0.73]	[1.57]	[−0.68]	[1.62]	[−0.82]
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo/adjusted R^2	0.22	0.25	0.24	0.25	0.24	0.27	0.26	0.27	0.27

(Continues)

TABLE 4 (Continued)

	(1) Probit result	(2) *PEG*	(3) *MPEG*	(4) *PEG*	(5) *MPEG*	(6) Big 4 *PEG*	(7) Non-Big 4 *PEG*	(8) Big 4 *PEG*	(9) Non-Big 4 *PEG*
Observations	2,815	2,815	2,746	2,815	2,746	2,308	507	2,308	507
Test for equality of coefficients between audit groups						χ^2 = 4.80 (p = 0.029) [col. 6 vs. 7]		χ^2 = 6.97 (p = 0.008) [col. 8 vs. 9]	

IMR: inverse Mills ratio.

Column (1) reports the probit regression of result *APBUSY_D* (a dummy variable, coded 1 for firms with *AP_BUSY* greater than median *AP_BUSY* and 0 otherwise) on a set of firm-characteristics. We include industry-level audit partner busyness (*APIND_BUSY*) as the exclusion variable. We then calculate *IMR* from the first-stage probit model and include it as an additional independent variable in the second-stage regression model in columns (2)–(9). Variables are defined in the Appendix. Robust *t*-statistics in brackets.

***p < 0.01, **p < 0.05, *p < 0.10.

TABLE 5 Mediation test (ordinary least squares regression) results[a]

A. Pooled sample										
Dependent variable	(1) |*DAC*| Equation (5A)	(2) |*DAC*| Equation (5A)	(3) *PEG* Equation (5B)	(4) *PEG* Equation (5C)	(5) *PEG* Equation (5C)	(6) |*DAC*| Equation (5A)	(7) |*DAC*| Equation (5A)	(8) *MPEG* Equation (5B)	(9) *MPEG* Equation (5C)	(10) *MPEG* Equation (5C)
Model 1 (without the mediator)										
AP_BUSY	0.0023*	—	—	0.0025***	—	0.0021*		—	0.0022**	—
	[1.91]			[2.84]		[1.75]			[2.50]	
LN_BUSY	—	0.013*	—	—	0.014***		0.012*	—	—	0.013**
		[1.94]			[2.72]		[1.91]			[2.61]
Other controls	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes
Industry and year FE	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes
Observations	2,442	2,442		2,442	2,442	2,387	2,387		2,387	2,387
Adjusted R^2	0.12	0.12		0.12	0.12	0.12	0.11		0.11	0.11
Model 2 (with the mediator)										
AP_BUSY	—	—	—	0.0026**	—	—	—	—	0.0018*	—
				[2.61]					[1.89]	
LN_BUSY	—	—	—	—	0.016***	—	—	—	—	0.010*
					[2.87]					[1.89]
|*DAC*|	—	—	0.121***	0.103***	0.103***	—	—	0.128***	0.107***	0.107***
			[3.60]	[4.56]	[4.55]			[3.70]	[4.81]	[4.81]
Other controls			Yes	Yes	Yes			Yes	Yes	Yes
Industry and year FE			Yes	Yes	Yes			Yes	Yes	Yes
Observations			2,442	2,442	2,442			2,387	2,387	2,387
Adjusted R^2			0.28	0.27	0.27			0.27	0.25	0.25
Direct effect			—	0.0026**	0.016***				0.0018**	0.010*
Indirect effect			—	0.00025**	0.0014**				0.00023**	0.0014**
Total effect			—	0.0028***	0.018***				0.0020**	0.011**

B. Big 4 versus non-Big 4 partitions and the mediation test						
	Big 4			Non-Big 4		
Dependent variable	(1) |*DAC*| Equation (5A)	(2) *PEG* Equation (5B)	(3) *PEG* Equation (5C)	(4) |*DAC*| Equation (5A)	(5) *PEG* Equation (5B)	(6) *PEG* Equation (5C)
Model 1 (without the mediator)						
AP_BUSY	0.001	—	0.002	0.0046**	—	0.0058***
	[1.00]		[1.36]	[2.44]		[2.73]
Other controls	Yes	—	Yes	Yes	—	Yes
Industry and year FE	Yes	—	Yes	Yes	—	Yes
Observations	2,045	—	2,045	397	—	397
Adjusted R^2	0.12	—	0.28	0.20	—	0.32
Model 2 (with the mediator)						
AP_BUSY	—	—	0.0015			0.0051***
			[1.19]			[2.86]
|*DAC*|	—	0.093**	0.081***		0.155**	0.126**
		[2.40]	[3.17]		[2.23]	[2.50]
Other controls	—	Yes	Yes		Yes	Yes
Industry and year FE	—	Yes	Yes		Yes	Yes
Observations	—	2,045	2.045		397	397
Adjusted R^2	—	0.27	0.27		0.30	0.31
Direct effect	—	—	0.0015			0.0051***
Indirect effect	—	—	0.0001			0.00063*
Total effect	—	—	0.0016			0.0057***

FE: fixed effect.

[a]Model 1 is the regression model without the mediator (i.e., the baseline regression excluding the mediator); model 2 is the regression model with the mediator. The dependent variables are *PEG* and *MPEG*. Our primary independent variables are *AP_BUSY* and *LN_BUSY*. Variables are defined in the Appendix.
***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

Simunic, 2008). The indirect effect result can be explained by the fact that auditing serves as a monitoring device to improve information about the firm's performance. If audit quality is insufficient to constrain earnings management, it will also be insufficient to reduce the information risk faced by investors. Thus, investors will need to ask for a higher rate of return, or a higher required return. Columns (6)–(10) re-estimate the regression equations using the *MPEG* measure of cost of equity, and report similar results to those reported in columns (1)–(5).

In Table 5, panel B, we rerun the mediation test regressions for the Big 4 and non-Big 4 groups and find consistent evidence that the mediating effect of financial reporting quality on the association between audit partner busyness and the cost of equity capital is confined to the firm-year observations audited by non-Big 4 auditors. Results are qualitatively similar for the *MPEG* measure of cost of equity capital, and also when we use *LN_BUSY* as the alternative audit partner busyness measure (untabulated).

Overall, the mediation test results suggest that audit partner busyness increases the cost of equity capital. Moreover, the relation between busyness and cost of equity capital is also mediated by financial reporting quality significantly. However, these results are driven by non-Big 4 firm-year observations.

5 | CONCLUSION

This study examines the effects of audit partner busyness on the cost of equity capital. Following the notion of corporate governance research on "busy director", we use the *busyness hypothesis* to argue that the time and effort of an individual are finite. Thus, serving too many audit clients, and hence the associated task commitments, may result in poor audit performance, which increases information risk and, therefore, the cost of capital. We find support for this view, but only for the firm-year observations audited by non-Big 4 audit firms. We also argue that financial reporting quality mediates the effects of audit partner busyness on the cost of equity capital and find results that are supportive of this prediction as well. However, our documented association of an adverse effect of audit partner busyness on earnings quality contradicts Goodwin and Wu (2016), who found no significant association between partner busyness and earnings quality. Although our results are consistent with recent evidence from the emerging markets, we caution readers not to extrapolate our inference to all listed firms on the Australian Securities Exchange, based on our restricted sample only. Future research needs to further investigate the generalizability of Goodwin and Wu (2016) by investigating the mediating effect of financial reporting quality on, for example, stock price crash risk, which would be amenable to a larger sample size.

Future research should also examine factors that determine an auditor's decision to select potential clients in Australia. Existing research on this issue is mainly survey based and uses data from the USA. For example, Johnstone and Bedard (2003) suggested that auditors assess financial risk, audit risk, and auditor business risk, and consider whether engagement fees are sufficient to cover current and future expected engagement costs when selecting potential clients. Survey design as well as semi-structured interview techniques can

be applied to probe into the issue of how auditors determine the number of clients in their portfolios in Australia.

To date, auditing research examines the association between different attributes of audit firms and the cost of capital. However, recent auditing research suggests that audit partners play a pivotal role in audit-related matters. Our research, thus, responds to the call for additional research at audit partner level, to better understand how audit partner attributes affect audit quality, and are incremental to audit-firm-level attributes. We also contribute to the strand of research that investigates determinants of the cost of capital. Prior evidence documents a negative association between audit firm reputation and cost of capital, but how audit quality at the individual auditor level affects the cost of capital remains unanswered. We fill this void in the literature.

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ENDNOTES

[1] Sources: (1) PCAOB rules to improve transparency by disclosing engagement partner name and information about other audit firms are approved by SEC (https://pcaobus.org/News/Releases/Pages/SEC-approves-transparency-Form-AP-051016.aspx); (2) Should audit engagement partners be required to sign reports with their names? (http://www.workplaceethicsadvice.com/2015/10/should-audit-engagement-partners-be-required-to-sign-reports-with-their-names.html).

[2] Australian Corporations Act 2001 requires that "the auditor of a company or registered scheme is required to sign the auditor's report in both their own name and the name of their firm [section 324AB(3)] or the name of the audit company [section 324 AD(1)], as applicable." Also, the auditing standards regulate the "the auditor's signature is either in the name of the audit firm, the personal name of the auditor or both, as appropriate for the particular jurisdiction" (Auditing and Assurance Standards Board, 2015).

[3] Azizkhani et al. (2013) found a U-shaped relationship between audit partner tenure and the cost of equity capital. They showed that the cost of equity capital decreases up to a threshold year, and then increases as the audit partner tenure increases.

[4] Although busy audit partners can mitigate this problem by increasing the number of employees in the audit team and/or distributing some tasks to subordinate auditors, this does not necessarily solve the problem, since supervising the work of subordinate auditors requires oversight.

[5] To check whether the incorporation of *APBUSY_IND* poses a significant multicollinearity threat, we conduct a multicollinearity diagnostic test. The variance inflation factor related to *APBUSY_IND* is 2.30, which, although it is the highest variance inflation factor among the variables included in the regression model, is well below 10.00 (Marquaridt, 1970).

[6] This finding is in contrast to Goodwin and Wu (2016), who failed to find any association between audit partner busyness and financial reporting quality. However, we caution readers that our results should only be considered in light of the restricted sample used to conduct the *COE* tests: a sample much smaller than that of Goodwin and Wu (2016) and also not completely overlapping with their chosen sample periods. Goodwin and Wu (2016) found that the negative association between audit partner busyness and audit quality appears only when accounting scandals exogenously shocked the Australian audit market during the 2002–2004 period. To rule out the possibility that the positive association documented in our tests is due primarily to the inclusion of this sample period, we rerun our tests for the sample period 2005–2015. We continue to find positive and significant coefficients (coefficients 0.0024, $p < 0.05$, and 0.012, $p < 0.10$, for the *AP_BUSY* and *LN_BUSY* measures respectively).

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APPENDIX

VARIABLE DEFINITION AND MEASUREMENT

Variable	Definition and measurement
Dependent variables	
PEG	Implied return rate (*ICC*), measured as *PEG* (see Equation 2).
MPEG	Implied return rate (ICC), measured as MPEG (see Equation 3)
Independent variables	
AP_BUSY	The number of public audit clients held by each audit partner in each year.
LN_BUSY	The log number of public audit clients held by each audit partner in each year.
Control variables	
CITY_SPEC	Audit firm industry specialization at the city level. An auditor is defined as a city industry leader if, in a particular year, the auditor has the largest market share in a GICS industry and if its market share is at least 10 percentage points greater than the second largest industry leader in a city audit market. We determine auditors' city leadership in each industry for each of our sample years.
AP_SPEC	Audit partner industry specialization. An audit partner is defined as an industry leader if, in a particular year, the audit partner has the largest market share in a GICS industry and if its market share is at least 10 percentage points greater than the second largest industry leader, at the partner level.
TENURE_FIRM	The number of years that the firm is audited by the same audit firm.
TENURE_AP	The number of years that the firm is audited by the same audit partner.
BIG4	Dummy variable, coded 1 if the firm was audited by Big 4 auditors and 0 otherwise.
AOPIN	Dummy variable, coded 1 if the firm had a qualified audit opinion including going-concern opinion and 0 otherwise.
SIZE	Natural log of market value of equity.
BTM	Ratio of book value of equity to market value of equity.
BETA	A measure of systematic risk, extracted from Datastream. Datastream uses a 5-year period and regresses the share price against the respective Datastream total market index using log changes of the closing price on the first day of each month.
LEV	The leverage ratio of firms, which is measured by (short-term debt + long-term debt)/total assets.
DISTRESS	A dummy variable, coded 1 if the firm reported negative earnings and negative working capital in the current year and 0 otherwise
|DAC|	We use the absolute value of the modified Jones model after controlling the prior performance (Dechow, Sloan, & Sweeney, 1995; Kothari et al., 2005). We estimate the model for all firms in the same industry (using the SIC two-digit industry code) with at least eight observations in an industry in a particular year using Equation (4). The *NDAC* is the predicted value of Equation (4). Therefore, the *DAC* is the residual from Equation (4).
BSIZE	Total number of board members.
BIND	The proportion of independent directors on the board.
ACSIZE	Total number of audit committee members.
ACEXPERT	Total number of audit committee members with financial expertise.
AC_HOLD%	The proportion of outstanding shares held by audit committee members.