Asia-Pacific Journal of Accounting & Economics

ISSN: 1608-1625 (Print) 2164-2257 (Online) Journal homepage: http://www.tandfonline.com/loi/raae20

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To cite this article: Ahrum Choi, Byungcherl Charlie Sohn & Desmond Yuen (2016): Do auditors care about real earnings management in their audit fee decisions?, Asia-Pacific Journal of Accounting & Economics, DOI: 10.1080/16081625.2016.1231580

To link to this article: http://dx.doi.org/10.1080/16081625.2016.1231580

Published online: 14 Sep 2016.

ASIA-PACIFIC JOURNAL OF ACCOUNTING & ECONOMICS, 2016
http://dx.doi.org/10.1080/16081625.2016.1231580

Routledge
Taylor & Francis Group

Do auditors care about real earnings management in their audit fee decisions?

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ABSTRACT

This study investigates whether auditors incorporate the implications of potential litigation risk arising from their client firms' using real earnings management (REM) to manage earnings. Using a large sample of US firms, we find that REM is positively related to audit fees and that this relation is incremental over and beyond the effects of accrual-based earnings management and other control variables. We also find that the positive relation between REM and audit fees is stronger for firms with sophisticated investors or higher stock price sensitivity to accounting earnings. Finally, we find that this positive relation is more pronounced for firms with financial constraints where REM is more likely to stem from managerial opportunism and is perceived as riskier by auditors. These findings are robust to endogeneity controls and various sensitivity tests.

ARTICLE HISTORY
Received 26 January 2015
Accepted 29 August 2016

KEYWORDS
Real earnings management; accrual-based earnings management; audit fees

1. Introduction

This study investigates whether auditors in their audit fee decisions incorporate the implications of potential litigation risk that may arise from their client firms' earnings management through real activities manipulations. Healy and Wahlen (1999) state that there are two different ways to manage current-period reported earnings: through discretionary accruals and real business activities. The former, accrual-based earnings management (hereafter AEM), usually occurs toward the end of an accounting period. While it directly influences the amount of accounting accruals and thus reported earnings, AEM has no direct effect on cash flows. The latter involves adjusting real business activities. Specifically, managers can alter the timing and scale of sales, production, investment, and financing activities to manage earnings. These activities are conducted throughout the accounting period in such a way that a specific earnings target can be met (Zang 2012). Following Roychowdhury (2006), these real operation management activities that deviate from normal business practices with the primary objective of manipulating current-period earnings are referred to as real earnings management (hereafter REM).

Unlike AEM, REM can have direct consequences on current and future cash flows (as well as accounting accruals), is more difficult for average investors to understand, and is normally subject to less external monitoring and scrutiny by auditors, regulators, and other outside stakeholders (Cohen,

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Dey, and Lys 2008). Furthermore, REM boosts short-term earnings at the expense of real operations (Roychowdhury 2006), as it causes real operations to deviate from their optimal levels, thereby dampening a firm's ability to generate future cash flows in the long run.

Earnings management by firms or managers is a central issue in accounting research because it causes severe damage to investor confidence and capital markets (Levitt 1998; Healy and Wahlen 1999). Thus, it has received a great deal of attention from both regulators and academics, and many prior studies have investigated various related issues. However, most of the prior studies related to earnings management limit their focus to AEM. With respect to the auditor's perspective, studies document that auditors play an important role in restricting AEM (Becker et al. 1998; Fan and Wong 2005). In addition, AEM is shown to be related to higher audit fees because AEM reflects higher inherent risks (Gul, Chen, and Tsui 2003; Krishnan et al. 2013). Thus, auditors need to charge higher audit fees so that they can expand the scope of an audit to compensate for the increased audit risk.

Unlike AEM, the effect of REM on the auditor behavior is *ex ante* not clear. On one hand, auditors may not care about their client firms' REM activities when determining the audit scope. First, it is not easy for auditors, as an outsider, to disentangle REM from optimal business decisions. Second, though auditors may detect REM, it is usually not under their direct jurisdiction (Chi, Lisic, and Pevzner 2011). On the other hand, there is a possibility that auditors charge higher audit fees to firms with more REM activities. Auditors may charge higher audit fees to REM-intensive firms because REM increases the shareholder litigation risk. Furthermore, extant literature suggests that clients' stakeholders are likely to sue auditors for alleged financial losses for which auditors are not directly responsible, because the stakeholders expect an insurance role from the auditors (O'Malley 1993; Menon and Williams 1994; Baber, Kumar, and Verghese 1995; Willenborg 1999; Mansi, Maxwell, and Miller 2004). Given the potential litigation risk due to REM (Kim and Park 2014), auditors have incentives to require a corresponding compensation for REM in the form of a higher fee premium. Therefore, it is an empirical question whether REM is positively related to the level of audit fees, especially after considering other audit fee determinants and AEM. We investigate this hitherto unexplored research question in the paper.

Regressing the natural log of audit fees on the proxies for REM and AEM, and other audit fee determinants during 2000–2008 sample period, we find that REM is significantly and positively related to audit fees, and this relation is incremental over and beyond the effects of AEM and other control variables. We also find that the positive relation between REM and audit fees is more pronounced in firms with a higher level of (1) institutional ownership, (2) stock price responsiveness to earnings, or (3) financial constraint. These findings are robust to endogeneity controls and various sensitivity tests.

This study contributes to extant literature on REM and audit fees. To our best knowledge, this is the first study to examine the impact of REM on audit fee determination. Thus far only AEM has been investigated as a potential earnings-quality-related audit risk factor in determining audit fees (Gul, Chen, and Tsui 2003; Abbott, Parker, and Peters 2006; Antle and Gordon 2006). This paper presents evidence that REM is an additional and incremental earnings-quality-related audit risk factor when auditors determine their audit fee levels. The findings in this paper also have important policy implications. Both REM and AEM deteriorate earnings quality and corporate managers choose them depending on the relative costs. Auditors react to managers' use of AEM and REM by adjusting their audit fees. Regulators who are concerned with the quality of reported earnings should understand this dynamic, and take it into account when setting financial reporting and auditing policies.

2. Related research and hypothesis development

2.1. Extant research on audit fees and REM

Simunic (1980) identifies major demand-side determinants of audit fees and categorizes them into three distinct groups: auditee size, operation complexity, and inherent audit risk. Auditors charge higher audit fees for larger, more complex, and riskier firms because these firms require a greater

amount of auditing resources. After controlling for these three groups of fee determinants, subsequent studies explore a variety of additional audit fee determinants, which can be broadly categorized as other client characteristics, auditor characteristics, and audit environments.[1]

However, studies on the relation between earnings management and audit fees are relatively scarce and, if any, are only concerned with AEM.[2] Gul, Chen, and Tsui (2003) document empirical evidence that audit fees increase with the level of unsigned discretionary accruals. Additionally, Abbott, Parker, and Peters (2006) report that the impact of discretionary accruals on audit fees is positive in the magnitude of income-increasing but negative in the magnitude of income-decreasing accruals due to the asymmetric litigation risk for auditors. Similarly, Krishnan et al. (2013) report that audit fees are positively related to signed discretionary accruals.[3] In sum, these studies suggest that auditors expand audit scope to deal with the increased managerial opportunism to report inflated earnings using AEM. To our knowledge, however, none of the literature on audit fees thus far has investigated whether and how client firms' REM influences the level of audit fees auditors impose.

Graham, Harvey, and Rajgopal's (2005) survey results show that the majority of managers are willing to delay the timing of new investment projects to meet a certain earnings target even when such a deferment has adverse implications on long-term value. Roychowdhury (2006) has developed empirical models that allow researchers to separate the normal levels of real operational activities as reflected in cash flows from operations, production costs, and discretionary expenditures from their abnormal levels. His analysis shows that managers engage in real activities manipulation to meet certain earnings targets.

One strand of previous REM research has focused on whether managers use REM as a substitute for or complement to AEM when making strategic decisions on the timing and magnitude of earnings manipulation. For example, Cohen, Dey, and Lys (2008) examine the impact of the SOX passage on managerial choice between AEM and REM. They document that firms were heavily involved in AEM pre-SOX, but it declined significantly post-SOX. Their finding shows that the passage of SOX motivated firms to switch from AEM to REM. This occurs because REM is harder for external auditors, regulators, and other stakeholders to detect compared to AEM. Further, expected legal liability costs associated with AEM have increased significantly in the post-SOX environment due to heightened financial reporting regulations and additional certification requirements, while the same costs associated with REM have not. As a result, REM has become (relatively) less costly in the post-SOX period. Zang (2012) investigates a substitutive relation between AEM and REM and reports that AEM (REM) decreases (increases) when the cost of AEM is higher (e.g. high audit quality) and REM (AEM) decreases (increases) when the cost of REM is higher (e.g. high tax rate). This evidence is consistent with the analytical results of Ewert and Wagenhofer (2005) who demonstrate that managers switch from AEM to REM in an environment of tightened accounting standards or more stringent enforcements. Similarly, the results of a cross-country study by Choi, Choi, and Sohn (2015) reveal that firms switch from AEM to REM in countries with a more stringent legal regime.

Another study by Cohen and Zarowin (2010) investigates the use of REM and AEM prior to seasoned equity offerings (SEOs), the periods during which managers have relatively high incentives to artificially inflate current-period earnings. Consistent with Cohen, Dey, and Lys (2008) and Zang (2012), they also find that SEO firms have substituted REM for AEM in the post-SOX period as SOX has made AEM more costly than REM. This, taken as a whole, suggests that managers take into account potential costs and benefits associated with their choice between AEM and REM.

While the primary concern of the aforementioned studies is the trade-off between AEM and REM as a means to meet earnings management objectives, the other strand of REM research focuses on the economic consequences of REM. For example, Gunny (2010) finds that firms' future profitability is higher when they use REM to meet or just beat analysts' forecasts, implying that REM plays a signaling role. Using a sample of SEO firms, Mizik and Jacobson (2007) find that to temporarily inflate stock prices at the time of SEOs, managers engage in boosting reported earnings via cutting marketing expenses, but in the long run, such managerial myopia leads to a decline in stock market performance. Kim and Sohn (2013) predict and find that the cost of equity capital increases with firms' REM as well

as AEM activities. To our knowledge, however, none of the previous research on REM investigates whether and how REM of their clients influences auditors' decision on the level of audit fees.

2.2. The impact of REM on audit fees

Unlike AEM, the effect of REM on the level of audit fees is *ex ante* not clear. Specifically, it is unclear whether auditors need to consider REM in their audit processes. There are two competing views on this issue. On one hand, REM can have limited impact on the audit fee level. REM is defined as deviations from normal operating activities. However, many types of REM captured from a statistical analysis can be the result of optimal business decisions.[4] Thus, it is difficult for auditors to distinguish opportunistic REM from the real activity adjustments based on optimal business decisions. Even when auditors suspect an opportunistic REM, it is usually not under their direct jurisdiction. As long as firms comply with the existing Generally Accepted Accounting Principles in preparing their financial statements, auditors should not have incentives to expand the audit scope and thus charge higher audit fees to restrict the detected REM (Chi, Lisic, and Pevzner 2011). Consistent with this argument, Cohen, Dey, and Lys (2008) document that firms switched easily to REM after the enforcement of SOX because auditors were less concerned about REM than AEM. According to these arguments, the extent of the opportunistic REM does not affect the level of audit fees.

On the other hand, it can be argued that auditors may have incentives to charge higher fees to client firms that engage in more extensive REM since REM may increase shareholder litigation risk. To the extent that stock prices of firms that use REM to inflate earnings are overestimated, investors are likely to suffer significant wealth losses when the temporarily inflated stock prices fall back to their fundamental levels. Kim and Park (2014) report that REM is related to future investor litigation against auditors. Extant literature also suggests that clients' stakeholders are likely to sue auditors for alleged financial losses for which auditors are not directly responsible, because stakeholders expect an insurance role from the auditors (O'Malley 1993; Menon and Williams 1994; Baber, Kumar, and Verghese 1995; Willenborg 1999; Mansi, Maxwell, and Miller 2004). Given that the risk of litigation may increase due to REM, auditors have incentives to be *ex ante* compensated for this increased risk through higher audit fees (Simunic 1980; Choi et al. 2009). Consistent with this argument, Kim and Park (2014) document that REM plays a role in an auditor's decision to retain a client. They report that auditors resign from risky clients that use REM to inflate earnings to an intolerable level.[5]

Therefore, given the two conflicting predictions, it is an empirical question whether REM is positively related to the level of audit fees, especially after controlling for the effects of other audit fee determinants and AEM. For the ease of positioning, however, we state our main hypothesis in alternative form:

H1: *Audit fees increase with the intensity of REM, all else being equal.*

3. Measurement of main variables and empirical specification

3.1. Intensity of AEM and REM

As in other studies, we use discretionary accruals (*DAC*) as the proxy for AEM. To divide total accruals into normal accruals and abnormal accruals, we employ the modified Jones (1991) model as proposed by Dechow, Sloan, and Sweeney (1995).[6] The model is estimated cross-sectionally for each two-digit standard industrial classification (SIC) code and in each year with at least ten observations. The residual from this estimation is *DAC*, which is the main proxy for the intensity of AEM. The greater the value of *DAC* is, the greater the magnitude of income-increasing accrual management is.

Similar to Roychowdhury (2006), Cohen, Dey, and Lys (2008), and Cohen and Zarowin (2010), we focus on three different types of real activity manipulation: (1) offering excessive sales discounts or lenient credit terms to temporarily boost sales revenues in the current period, (2) conducting

overproduction to report a lower cost of goods sold in the current period, and (3) reducing discretionary expenditures in the current period.

As in other studies, we divide actual cash flows from operating activities (CFO) into normal CFO and abnormal CFO by estimating Equation (1) for each industry and year with at least ten observations. The normal CFO is assumed to be a linear function of sales and changes in sales:

$$\frac{\mathrm{CFO}_{jt}}{A_{j,t-1}} = a_1 \frac{1}{A_{j,t-1}} + a_2 \frac{Sales_{jt}}{A_{j,t-1}} + a_3 \frac{\Delta Sales_{jt}}{A_{j,t-1}} + \varepsilon_{jt}. \tag{1}$$

Income-boosting strategies via overproduction and cutting discretionary expenditures lead to abnormally high production costs and abnormally low discretionary expenses relative to sales (Roychowdhury 2006). To compute abnormal production costs and discretionary expenses, we estimate Equations (2) and (3), respectively, for each industry and year with at least ten observations:

$$\frac{Prod_{jt}}{A_{j,t-1}} = a_1 \frac{1}{A_{j,t-1}} + a_2 \frac{Sales_{jt}}{A_{j,t-1}} + a_3 \frac{\Delta Sales_{jt}}{A_{j,t-1}} + a_4 \frac{\Delta Sales_{j,t-1}}{A_{j,t-1}} + \varepsilon_{jt} \tag{2}$$

$$\frac{DiscE_{jt}}{A_{j,t-1}} = a_1 \frac{1}{A_{j,t-1}} + a_2 \frac{Sales_{j,t-1}}{A_{j,t-1}} + \varepsilon_{jt} \tag{3}$$

where for each firm j and year t, *Prod* refers to production costs, which is the sum of cost of goods sold and change in inventory, and *DiscE* denotes discretionary expenses computed by the sum of advertising expenses, R&D expenses, and selling, general and administrative expenses. Abnormal *CFO*, abnormal *Prod*, and abnormal *DiscE*, denoted by *AbCFO*, *AbProd*, and *AbDiscE*, respectively, are the differences between actual values of lagged asset-deflated *CFO*, *Prod*, and *DiscE* and their normal levels (i.e. the fitted values of Equations (1)–(3), respectively). We multiply (−1) to *AbCFO* and *AbDiscE* to make the higher values represent more income-increasing REM before we use them as the dependent variables for the first stage of 2SLS regressions as in column (1) of Table 3.

Firms that boost reported earnings via REM may use one or all of three REM strategies (Cohen, Dey, and Lys 2008). To capture the effect of REM via all three strategies or various combinations of the three strategies on audit fees, we develop a single, comprehensive measure of REM, denoted by *AbREM*.[7]

It is possible that REM and audit fee decisions can be endogenously determined. A firm with a higher audit fee (thus high audit quality) can have a limited ability to engage in earnings management through accrual manipulations because high-quality audits deter AEM. As a result, managers may switch to REM to achieve their earnings targets. To address the endogeneity concern, we conduct 2-stage least squares (2SLS) regressions: In the first stage, we regress our individual or aggregate REM measures on the instrumental variable and other explanatory variables (see column (1) of Table 3 for the specification). Using the estimated parameters from these OLS regressions, we compute the predicted values of REM (i.e. *P_AbCFO*, *P_AbProd*, *P_AbDiscE*, and *P_AbREM*), and use them for the second-stage model.

We choose the degree of product market competition, measured by Herfindahl-Hirschman index (*HHI*) for each industry-year, as the instrumental variable for REM. To be a valid instrumental variable, it must be highly correlated with the endogenous variable in question and uncorrelated with the error term of the second-stage model. When a firm is operating in an industry where the product market competition is intense, the firm cannot easily engage in opportunistic REM, because the cost of deviating from the optimal level of operations is higher. For example, if a firm boosts short-term reported earnings by cutting or postponing R&D and advertising investments, it can lose market share to its competitors, affecting the firm's long-term cash flow. Therefore, REM is expected to have a negative relation with product market competition, or equivalently, have a positive relation with the

HHI.[8] In contrast, there is no theoretical or empirical evidence to predict a direct effect of product market competition on the level of audit fees and the error term of the main regression model. As shown in Table 3, *HHI* is significantly correlated with the aggregate REM (i.e. *AbREM*). Table 2 shows that *HHI* has no significant correlation with audit fees (i.e. *LNAFEE*). In addition, *HHI* is not significantly related to the error term of the main regression model in column (3) of Table 3 (correlation coeff. = −0.001, *p*-value = 0.948).

3.2. Empirical specification

To test our main hypothesis, we estimate the following regression model based on prior studies of audit fees (Simunic 1980; Craswell, Francis, and Taylor 1995; Gul, Chen, and Tsui 2003; Abbott, Parker, and Peters 2006; Choi et al. 2009):

$$\begin{aligned} LNAFEE_{jt} = {} & \alpha_0 + \alpha_1 AEM_{jt} + \alpha_2 REM_{jt} + \alpha_3 LNA_{jt} + \alpha_4 NGS_{jt} + \alpha_5 NBS_{jt} \\ & + \alpha_6 INVREC_{jt} + \alpha_7 ISSUE_{jt} + \alpha_8 FOREIGN_{jt} + \alpha_9 LOSS_{jt} \\ & + \alpha_{10} LEV_{jt} + \alpha_{11} ROA_{jt} + \alpha_{12} BM_{jt} + \alpha_{13} CGSALES_{jt} + \alpha_{14} BIG5_{jt} \\ & + \sum_i \alpha_i IND_i + \sum_t \alpha_t YEAR_t + \varepsilon_{jt} \end{aligned} \tag{4}$$

where for firm *j* and year *t*, *LNAFEE* denotes the natural logarithm of audit fees paid to auditors (in thousands of US dollars) for their financial statement audits. In order to isolate the incremental effect of earnings management on audit fees from the effects of other determinants, we include various control variables commonly adopted in prior studies. The natural logarithm of total assets (*LNA*) is included to control for the effect of client firms' size on audit fees. The number of geographic segments (*NGS*) and the number of business segments measured by 2-digit SIC codes (*NBS*), the ratio of accounts receivable plus inventory over total assets (*INVREC*), equity and debt issuance dummy (*ISSUE*), and foreign operation dummy (*FOREIGN*) are included to control for the effect of client firms' operation complexity on audit fees. The loss indicator variable (*LOSS*), leverage (*LEV*), return on assets (*ROA*), the book-to-market ratio (*BM*), and change in sales (*CGSALES*) are included to control for the inherent audit risk and profitability. A Big 5 auditor indicator variable (*BIG5*) is included to control for the auditor size and brand name effect.[9] To control for the unknown industry or year effects, we include industry (based on 2-digit SIC) and year indicator variables. The Appendix provides the detailed definitions of all the variables used in the study.

In Equation (4), *AEM* refers to *DAC*, while *REM* refers to an individual REM proxy (i.e. *P_AbCFO*, *P_AbProd*, or *P_AbDiscE*) or the comprehensive REM proxy (i.e. *P_AbREM*) depending on empirical specifications.[10] According to Hypothesis 1, we expect α_2 to be positive. Standard errors are corrected for firm-level clustering.

4. Empirical results

4.1. Samples, data sources, and descriptive statistics

We extract financial statement data from *Compustat*, stock price and returns data from *CRSP*, and audit fee and auditor identity data from *Audit Analytics*, respectively. The initial sample starts with firms listed on NYSE, AMEX or NASDAQ for the 9-year sample period, 2000–2008. The sample period starts from 2000 because *Audit Analytics* database's coverage starts from that year. The period ends in 2008 because data up to 2008 only was available when we started this study. To be included in the sample, a firm must have all financial statement data required for computing the research variables, including the REM and AEM proxies, and the audit fee and auditor-related variables for each sample year. We exclude firms in the financial service industry (SIC code 6000 to 6999) to maintain homogeneous

interpretations of various accounting variables across the sample firms in different industries. We also delete observations with negative book values of equity. To alleviate potential problems from extreme observations, we delete observations that fall within the top and bottom 1% of the annual empirical distributions of all the continuous variables included in Equation (4).

After applying the above selection criteria and data requirements, we obtain a sample of 14,678 firm-years for 3184 firms in the sample used for estimating Equation (4). As in Cohen, Dey, and Lys (2008), the final sample consists of larger and more profitable firms than those in the *Compustat* population due to the data requirements.

Table 1 provides descriptive statistics for the sample used to estimate Equation (4). The mean and median of *LNAFEE* are 6.60 and 6.61, respectively, with a standard deviation of 1.13. With respect to AEM-related variables, we find that the mean value of total accruals (*TAC*/*A*) is negative for the sample firms and is about 7% of lagged total assets. Consistent with evidence reported in many other studies, the mean and median values of signed abnormal accruals, that is, *DAC*, are close to zero, though both are negative.

With respect to the three individual REM variables, the mean (median) values of predicted abnormal CFO (i.e. *P_AbCFO*), abnormal production costs (i.e. *P_AbProd*), and abnormal discretionary expenditures (i.e. *P_AbDiscE*) are −5.0% (−9.5%), −2.8% (−3.9%), and 2.4% (3.0%) of lagged total assets, respectively. Their standard deviations are fairly large, indicating that REM practices vary widely across firms.

With respect to control variables, the descriptive statistics on total assets (*LNA*), number of geographic segments (*NGS*), number of business segments (*NBS*), inventory and receivables (*INVREC*), equity and debt issuance dummy (*ISSUE*), foreign operation dummy (*FOREIGN*), loss indicator variable (*LOSS*), leverage (*LEV*), return on assets (*ROA*), the book-to-market ratio (*BM*), sales change (*CGSALES*), and Big 5 auditor indicator variable (*BIG5*) are, overall, comparable to those reported in prior literature.

Table 2 presents the correlation matrix of major variables used in Equation (4). All the correlation coefficients significant at the 1% level or lower are boldfaced, the ones significant at the 5% level are in italics, and the others are insignificant at the 10% level. Consistent with our expectation, *LNAFEE* has positive correlations with *DAC*, *P_AbProd*, and *P_AbDiscE*. In contrast, *LNAFEE* has negative

Table 1. Descriptive statistics.

	n	Mean	Std.	25%	Median	75%
TAC/A	14,678	−0.0727	0.0984	−0.1071	−0.0602	−0.0239
DAC	14,678	−0.0034	0.1409	−0.0459	−0.0044	0.0380
P_AbREM	14,678	0.4524	0.1239	0.3705	0.4441	0.5242
P_AbCFO	14,678	−0.0496	0.3585	−0.2863	−0.0948	0.1592
P_AbProd	14,678	−0.0279	0.2739	−0.1968	−0.0385	0.1270
P_AbDiscE	14,678	0.0241	0.2719	−0.1444	0.0303	0.1977
AFEE	14,678	1381.03	1895.28	326.09	741.50	1600.00
LNAFEE	14,678	6.6048	1.1274	5.7902	6.6100	7.3784
LNA	14,678	13.2474	1.5515	12.1066	13.1967	14.3334
NBS	14,678	2.1080	1.6535	1.0000	1.0000	3.0000
NGS	14,678	2.5164	2.2231	1.0000	2.0000	4.0000
INVREC	14,678	0.2579	0.1703	0.1231	0.2368	0.3602
ISSUE	14,678	0.7527	0.4315	1.0000	1.0000	1.0000
FOREIGN	14,678	0.0046	0.0091	0.0000	0.0008	0.0059
LOSS	14,678	0.2912	0.4543	0.0000	0.0000	1.0000
LEV	14,678	0.4483	0.2117	0.2771	0.4464	0.6040
ROA	14,678	0.0047	0.1638	−0.0121	0.0421	0.0846
BM	14,678	0.5921	0.5346	0.2814	0.4574	0.7120
CGSALES	14,678	0.1019	0.2627	0.0000	0.0675	0.1791
BIG5	14,678	0.9001	0.2998	1.0000	1.0000	1.0000
HHI	14,678	0.0783	0.0736	0.0437	0.0602	0.0783

Notes: This table presents descriptive statistics for the major variables used in the main analyses. *AFEE* is in thousands of US dollars. Refer to the Appendix for detailed variable definitions.

Table 2. Correlation matrix.

	LNAFEE	*DAC*	*P_AbCFO*	*P_AbProd*	*P_AbDiscE*	*P_AbREM*	*LNA*	*NBS*	*INVREC*	*FOREIGN*	*LOSS*	*LEV*	*ROA*	*BIG5*	*HHI*
LNAFEE	**1**	**0.1512**	**−0.0952**	**0.1137**	**0.2006**	**−0.1153**	**0.7205**	**0.2294**	0.0035	**0.2805**	**−0.1733**	**0.3343**	**0.1854**	**0.1517**	−0.0072
DAC	**0.1728**	**1**	**−0.0451**	*−0.0166*	−0.0001	−0.0834	**0.0938**	**0.0520**	**0.2053**	**0.0371**	**−0.1373**	0.0013	**0.1599**	0.0093	**0.0396**
P_AbCFO	**−0.0814**	**−0.0417**	**1**	**0.6372**	**−0.1687**	**0.7097**	**−0.2660**	**0.0564**	**0.2986**	**−0.0704**	**0.4094**	**0.2967**	**−0.4804**	**−0.0840**	**0.0320**
P_AbProd	**0.1324**	−0.0046	**0.6111**	**1**	**0.5482**	**0.7672**	**0.1076**	**0.2784**	**0.1458**	**−0.1221**	**0.2084**	**0.3596**	**−0.2407**	**−0.1122**	**−0.0329**
P_AbDiscE	**0.2036**	−0.0089	**−0.1776**	**0.5202**	**1**	**0.3045**	**0.3216**	**0.2356**	**−0.0608**	**−0.0677**	**−0.1018**	**0.2401**	**0.1334**	**0.1135**	**−0.0582**
P_AbREM	**−0.1020**	**−0.0840**	**0.7045**	**0.7364**	**0.2690**	**1**	**−0.1983**	**0.2134**	**0.5483**	**−0.2155**	**0.1799**	**0.3242**	**−0.2121**	**−0.2191**	**0.0454**
LNA	**0.7002**	**0.1051**	**−0.2439**	**0.1304**	**0.3296**	**−0.1798**	**1**	**0.2256**	**−0.1011**	**0.1868**	**−0.3024**	**0.4136**	**0.3356**	**0.2704**	−0.0111
NBS	**0.1718**	**0.0658**	**0.0630**	**0.3140**	**0.2507**	**0.2377**	**0.1736**	**1**	**0.0928**	**0.0134**	**−0.0886**	**0.1447**	**0.1022**	**0.0459**	*−0.0160*
INVREC	**0.0354**	**0.2405**	**0.2649**	**0.1184**	**−0.0692**	**0.5057**	**−0.0741**	**0.1356**	**1**	**0.1060**	**−0.1388**	**0.0921**	**0.1782**	**−0.0808**	**0.0959**
FOREIGN	**0.4520**	**0.0886**	**−0.0703**	**−0.1515**	**−0.0829**	**−0.1875**	**0.3223**	**0.0693**	**0.2128**	**1**	**−0.1368**	**0.0477**	**0.1627**	**0.0417**	**0.0266**
LOSS	**−0.1741**	**−0.1680**	**0.3980**	**0.1844**	**−0.1083**	**0.1662**	**−0.3045**	**−0.0743**	**−0.1559**	**−0.1628**	**1**	0.0049	**−0.6775**	**−0.0426**	**−0.0255**
LEV	**0.3316**	−0.0060	**0.2974**	**0.3833**	**0.2517**	**0.3417**	**0.4368**	**0.1205**	**0.0877**	**0.0739**	−0.0090	**1**	−0.0092	**0.1015**	**0.0666**
ROA	**0.1319**	**0.1727**	**−0.5169**	**−0.3246**	**0.0321**	**−0.2971**	**0.2499**	**0.0367**	**0.1715**	**0.1899**	**−0.7701**	**−0.1167**	**1**	0.0124	**0.0209**
BIG5	**0.1534**	0.0096	**−0.0770**	**−0.1073**	**0.1192**	**−0.2091**	**0.2793**	**0.0341**	**−0.0740**	**0.0772**	**−0.0426**	**0.1050**	**0.0214**	**1**	**−0.0513**
HHI	−0.0025	**0.0717**	**0.0252**	−0.0075	**−0.0558**	**0.0355**	**0.0480**	−0.0069	**0.0876**	**−0.0298**	**−0.0527**	**0.1409**	**0.0558**	**−0.0201**	**1**

Notes: This table presents the correlation matrix between the major variables used in the main analyses. The values to the upper right are Pearson correlation coefficients, and those in the bottom left are Spearman correlation coefficients. All the correlations that are significant at less than the 1% (5%) level are boldfaced (italicized). Correlations that are neither boldfaced nor italicized are insignificant at any conventional level. Refer to the Appendix for detailed variable definitions.

Table 3. The impact of REM of audit fees.

	(1)	(2)	(3)	(4)
VARIABLES	*AbREM*	*LNAFEE*	*LNAFEE*	*LNAFEE*
DAC		0.619***		0.659***
		(5.063)		(5.023)
P_AbREM			0.592***	0.682***
			(4.873)	(5.625)
LNA	0.013***	0.504***	0.481***	0.479***
	(7.293)	(77.782)	(73.885)	(73.542)
NGS	−0.033***	0.141***	0.211***	0.210***
	(−7.445)	(8.762)	(12.666)	(12.643)
NBS	0.041***	0.071***	0.070***	0.065***
	(8.949)	(4.456)	(3.949)	(3.685)
INVREC	0.532***	0.392***	0.158**	0.086
	(30.807)	(6.625)	(2.433)	(1.316)
ISSUE	0.029***	0.004	−0.057***	−0.060***
	(5.660)	(0.284)	(−4.034)	(−4.256)
FOREIGN	−3.110***	11.763***	15.112***	15.413***
	(−10.050)	(8.590)	(9.126)	(9.320)
LOSS	0.005	0.090***	0.108***	0.107***
	(0.668)	(5.348)	(6.153)	(6.090)
LEV	0.175***	0.362***	0.151***	0.145***
	(12.489)	(7.958)	(3.169)	(3.051)
ROA	−0.420***	−0.728***	−0.791***	−0.795***
	(−16.300)	(−10.984)	(−11.805)	(−11.886)
BM	0.081***	−0.010	−0.110***	−0.118***
	(18.609)	(−0.830)	(−6.930)	(−7.462)
CGSALES	0.063***	−0.068**	−0.050*	−0.064**
	(5.490)	(−2.515)	(−1.761)	(−2.230)
BIG5	−0.051***	0.283***	0.313***	0.315***
	(−7.654)	(11.974)	(12.927)	(13.076)
HHI	0.245**			
	(1.993)			
Constant	0.024	4.928***	5.554***	5.621***
	(0.349)	(29.443)	(69.953)	(69.668)
Observations	14,678	14,678	14,678	14,678
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Clustered by	Firm	Firm	Firm	Firm
Pseudo R^2/Adjusted R^2	0.234	0.824	0.809	0.810

Notes: This table presents the impact of AEM and REM on the audit fees after controlling for various determinants of audit fees. REM variable is instrumented by 2SLS regressions to control for its endogeneity. Column (1) reports the results of the first stage regression. The predicted value of REM is used as the test variable in columns (2) to (4). Both AEM and REM increase audit fees. Refer to the Appendix for detailed variable definitions. The results are based on the pooled ordinary least squares regressions with standard errors corrected for firm-level clustering. The numbers in parentheses are *t*-values, and ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively (two tailed).

correlations with *P_AbCFO* and *P_AbREM*.[11] The negative correlations between audit fees and some of REM measures are possibly due to the fact that the effects of other fee determinants are not yet isolated. For example, audit fees are positively correlated with firm size. Large firms, however, are less likely to engage in income-increasing earnings management. These underlying relations may explain why we observe negative correlations between *LNAFEE* and some earnings management variables. This emphasizes the importance to control for firm size in the multivariate analysis to evaluate the impact of REM on audit fees.

As for the three individual REM proxies, *P_AbProd* is positively correlated both with *P_AbCFO* and *P_AbDiscE*, while the latter two are negatively correlated with each other at the 1% level. The negative correlation between *P_AbCFO* and *P_AbDiscE* could be caused by *P_AbCFO* capturing other REM effect. Abnormal CFO decreases as a result of excessive sales price discounts and lenient credit terms but increases as a result of discretionary expenditure curtailments. As expected, all the individual REM measures are significantly and positively correlated with the comprehensive REM proxy, that is,

P_AbREM, with Pearson correlations of 0.7097, 0.7672, and 0.3045, respectively. These high correlations suggest that the REM proxies capture unique aspects of the same underlying construct, namely, the intensity of REM. Finally, the proxy for the intensity of AEM, *DAC*, is significantly and negatively correlated with *P_AbCFO*. This finding suggests that firms use AEM and REM in a substitutive way to manage earnings. We omit the discussion on control variables because they are self-evident. We fail to find any unusual correlations among them.

4.2. Does REM increase audit fees?

Table 3 reports the results of regressing the audit fee variable (i.e. *LNAFEE*) on the AEM and REM proxies (i.e. *DAC* and *P_AbREM*) with control variables using Equation (4). Column (1) reports the results of the first stage regression. We regress *AbREM* on its instrumental variable, *HHI*, and other explanatory variables included in Equation (4) using an OLS regression method. As expected the coefficient on *HHI* is positive and significant at the 5% level (0.245, $t = 1.993$). Based on the parameters estimated in column (1), we compute the predicted value of *AbREM* (i.e. *P_AbREM*) and use it for the OLS analyses in columns (2) to (4).

We include *DAC* and *P_AbREM* separately in columns (2) and (3), respectively. Consistent with prior studies (e.g. Gul, Chen, and Tsui 2003), the coefficient on *DAC* is positive and significant at the 1% level (0.619, $t = 5.063$) in column (2). This means that auditors charge higher audit fees to firms that conduct more income-increasing earnings management through accrual manipulations. In column (3), the coefficient on *P_AbREM* is also positive and significant at the 1% level (0.592, $t = 4.873$), which is consistent with Hypothesis 1 that audit fees increase with the intensity of REM. Thus auditors charge higher audit fees to firms that engage in more income-increasing earnings management through real operation manipulations, and the effect of REM on audit fee increases is significant after controlling for the effects of the previously known determinants of audit fees. Column (4) shows the result after including both the AEM and REM proxies in the regression. The coefficients on both variables remain positive and significant, implying that the effect of REM on audit fees is incremental beyond that of AEM and other fee determinants, reconfirming our hypothesis. The coefficient on *P_AbREM* (0.682) is also economically significant. Based on the median audit fee of $741,500, the magnitude of this coefficient means that a one standard deviation increase in *P_AbREM* causes 9.0% more audit fees for the median firm after accounting for all other factors.[12]

Turning to control variables (focusing on column (4)), audit fees increase with firm size (*LNA*), operation complexity proxied by the number of geographic and business segments (*NGS*, *NBS*), the ratio of inventory plus receivables over assets (*INVREC*), the existence of foreign operations (*FOREIGN*), and the inherent risk proxied by loss reporting (*LOSS*) and leverage (*LEV*). Audit fees decrease with profitability (*ROA*), the book-to-market ratio (*BM*), and sales growth (*CGSALES*). Consistent with prior studies, Big 5 auditors (*BIG5*) charge higher audit fees. The adjusted R^2s are more than 80% in all three specifications, indicating that Equation (4) is well specified. Overall, these results are consistent with prior studies (Simunic 1980; Palmrose 1986a, 1980b; Francis and Simon 1987; Francis and Wilson 1988; Craswell, Francis, and Taylor 1995; Craswell and Francis 1999; Abbott et al. 2003; Gul, Chen, and Tsui 2003; Whisenant, Sankaraguruswamy, and Raghunandan 2003; Abbott, Parker, and Peters 2006; Hay, Knechel, and Wong 2006). In sum, auditors charge higher audit fees to firms that manipulate real operations to manage current earnings upward, and this effect is not subsumed by AEM or other known audit fee determinants.

4.3. Alternative control for REM endogeneity

In this section, we address REM's endogeneity concern using the change specification. Because the levels of audit fees and earnings management are stable for a firm across years, the causal effect of REM on audit fees will be strongly supported if we find a positive relation between the changes in REM and audit fees. We repeat the main analyses in Table 3 after converting all the dependent and

independent variables to changes (except Big 5 indicator) and report the results in Table 4.[13] When the changes in AEM (*CH_DAC*) and REM (*CH_AbREM*) are included separately in columns (1) and (2), respectively, their coefficients are both positive and significant. When they are included together in column (3), the magnitude and significance of their coefficients are maintained. For example, the coefficient on *CH_AbREM* is 0.054 and significant at the 1% level ($t = 4.488$). These results reinforce the main finding that auditors charge higher fees to firms that engage in more extensive REM.

To further address endogeneity concerns, we replace the AEM and REM proxies in Equation (4) with their one-year lagged values and repeat the main analyses. Untabulated results show that the main implications are unaltered.

5. Sensitivity tests

5.1. Using individual REM measures

Thus far, we have used the aggregate REM measure to proxy for the firms' earnings management through real operation manipulations because the three individual REM measures serve the common construct of REM and the aggregate measure can reduce measurement errors in the individual proxies. However, each individual REM measure may also capture a unique aspect of real operation

Table 4. Change specifications to control for endogeneity.

	(1)	(2)	(3)
VARIABLES	*CH_LNAFEE*	*CH_LNAFEE*	*CH_LNAFEE*
CH_DAC	0.035***		0.034***
	(5.567)		(5.416)
CH_AbREM		0.055***	0.054***
		(4.547)	(4.488)
CH_LNA	0.218***	0.218***	0.219***
	(4.949)	(4.843)	(4.869)
CH_NGS	−0.003	0.002	0.002
	(−0.241)	(0.185)	(0.164)
CH_NBS	0.005	−0.002	−0.002
	(0.632)	(−0.267)	(−0.218)
CH_INVREC	0.001	−0.011*	−0.013**
	(0.144)	(−1.697)	(−1.979)
CH_ISSUE	0.001	−0.001	−0.001
	(1.139)	(−0.729)	(−0.645)
CH_FOREIGN	−0.000	0.000	0.000
	(−0.053)	(0.214)	(0.146)
CH_LOSS	0.002	0.002	0.002*
	(1.437)	(1.629)	(1.792)
CH_LEV	−0.020***	−0.031***	−0.030***
	(−3.315)	(−4.844)	(−4.715)
CH_ROA	0.001	0.009***	0.008***
	(0.747)	(3.873)	(3.679)
CH_BM	−0.001	−0.005***	−0.005***
	(−1.557)	(−4.687)	(−4.411)
CGSALES	0.019***	0.023***	0.022***
	(8.390)	(9.707)	(9.351)
LAG_BIG5	0.013***	0.013***	0.013***
	(19.070)	(18.904)	(18.887)
Constant	14.254***	14.257***	14.249***
	(30.956)	(30.336)	(30.371)
Observations	11,153	11,153	11,153
Clustered by	Firm	Firm	Firm
Adjusted R^2	0.042	0.042	0.043

Notes: This table presents the results of alternative control for REM endogeneity using the change specifications. Change in audit fees are regressed on the changes in AEM and REM and control variables. The main implication that audit fees increase in firms' REM intensity is robust to this alternative endogeneity control. Refer to the Appendix for detailed variable definitions. The results are based on the pooled ordinary least squares regressions with standard errors corrected for firm-level clustering. The numbers in parentheses are *t*-values, and ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively (two tailed).

manipulations. If auditors understand this, they might factor each REM activity into the determination of audit fees differentially. We explore this possibility by replacing *P_AbREM* with *P_AbCFO*, *P_AbProd* and *P_AbDiscE* separately in regessing Equation (4) and present the results in Table 5.

In columns (1) to (3), the coefficients on *P_AbCFO*, *P_AbProd*, and *P_AbDiscE* are all positive and significant, which supports the findings in the main regression results tabulated in Tables 3 and 4. When they are included together in column (4), the positive signs and significances of their coefficients are maintained except the coefficient on *P_AbProd* which becomes insignificant. We do not report the coefficients on control variables in this and subsequent tables because they are not qualitatively different from those tabulated previously.

5.2. Considering stock price sensitivity to accounting earnings

Kim and Park (2014) document that auditors face greater investor litigation risk when client firms engage in REM activities. According to Cohen and Zarowin (2010), firms that engage in REM experience declines in return on assets in the post-SEO period. The decline in firm performance will negatively impact stock prices. Even without the deteriorated fundamentals, the boosted stock prices through REM should fall back when the true level of earnings is revealed afterwards. The decline in stock price will be more pronounced for firms whose stock prices are more sensitive to reported earnings (i.e. firms with greater earnings response coefficients, ERC). Thus, investors in firms with higher ERC are likely to suffer greater wealth losses when these firms engage in REM as compared to investors in firms with low ERC. That is, investors in firms with high ERC are more likely to sue their auditors because the probability for them to experience financial losses due to REM is higher in such firms. Therefore, auditors will be more concerned about REM in firms whose stock prices are more sensitive to reported earnings. In contrast, auditors may not ask for additional risk premium for REM if a firm's stock price is not much affected by earnings changes, because the current stock price is not significantly boosted by the increased earnings from REM and will not fall sharply afterwards. Thus, we expect the coefficients on the REM proxies to be larger for firms with high ERC than for firms with low ERC.

Table 5. Individual REM measures.

VARIABLES	(1) *LNAFEE*	(2) *LNAFEE*	(3) *LNAFEE*	(4) *LNAFEE*
DAC	0.545***	0.529***	0.461***	0.567***
	(4.138)	(4.022)	(3.499)	(4.315)
P_AbCFO	0.191***			0.311***
	(6.692)			(5.568)
P_AbProd		0.254***		−0.104
		(4.699)		(−1.248)
P_AbDiscE			0.106***	0.265***
			(2.734)	(4.889)
Constant	5.806***	6.009***	5.834***	5.965***
	(75.164)	(63.563)	(67.858)	(59.096)
Control variables	Included	Included	Included	Included
Observations	14,678	14,678	14,678	14,678
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Clustered by	Firm	Firm	Firm	Firm
Adjusted R^2	0.809	0.809	0.809	0.811

Notes: This table presents the impact of REM on the audit fees using three individual REM proxies. Each individual REM variable is instrumented by 2SLS regressions to control for their endogeneity (see Table 3 column (1) for the first stage regression specifications). In columns (1) to (3), we include each individual REM proxy separately. The coefficients on *P_AbCFO*, *P_AbProd*, and *P_AbDiscE* are all positive and significant, implying that auditors charge higher fees to the firms manipulating sales prices and credit terms, production costs, and discretionary expenditures. In column (4), we include three individual REM proxies together. The coefficients on *P_AbCFO* and *P_AbDiscE* are positive and significant. Refer to the Appendix for detailed variable definitions. The results are based on the pooled ordinary least squares regressions with standard errors corrected for firm-level clustering. The numbers in parentheses are *t*-values, and ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively (two tailed).

We estimate ERC by regressing one-year buy-and-hold raw returns on the contemporaneous earnings changes (deflated by beginning year stock price) in each year and 2-digit SIC industry and interact it with the AEM and REM variables in Equation (4). The result is summarized in Table 6. As expected, the coefficients on *DAC*ERC* and *P_AbREM*ERC* in columns (1) and (2) are positive and significant at the 10 and 1% levels (0.032 and 0.077), respectively. The coefficients on *DAC* and *P_AbREM* maintain their positive signs even though their magnitudes marginally change compared to those reported in Table 3. When AEM and REM variables and their interactions with ERC are included together in column (3), the coefficients on *DAC*ERC* and *P_AbREM*ERC* are positive, exhibiting similar magnitudes and significances with those in columns (1) and (2). This indicates that auditors charge higher audit fees to firms engaging in extensive earnings management through AEM or REM, and that this penalty (i.e. positive relationship) is intensified for firms whose stock prices are more sensitive to the reported earnings. This finding supports the investor litigation risk-based explanations for higher audit fees among firms with greater REM.

5.3. The effect of investor sophistication

If auditors increase audit fees when facing higher litigation threats from investors in firms with more extensive REM, we expect this relation to be stronger when those investors are more sophisticated in understanding managerial opportunism through REM. Therefore, we expect that the positive relation between REM and audit fees is more pronounced in firms with a higher level of investor sophistication. To explore this possibility, we measure investor sophistication using the existence of institutional ownership (*INST_OWN*),[14] and include this variable and its interaction with *DAC* and *P_AbREM* in Equation (4). The regression results are reported in Table 7.

When *INST_OWN* is interacted with *DAC* in column (1), its coefficient is positive and significant at the 1% level (2.497, $t = 4.938$). This indicates that auditors charge higher fees for their clients' AEM when institutional investors own the firms. When *INST_OWN* is interacted with *P_AbREM* in column (2), its coefficient is positive and significant at the 1% level (0.480, $t = 5.948$). This means that auditors

Table 6. Stock price sensitivity to earnings.

VARIABLES	(1) *LNAFEE*	(2) *LNAFEE*	(3) *LNAFEE*
ERC	−0.044***	−0.016***	−0.030***
	(−3.408)	(−2.606)	(−3.171)
DAC	0.438***		0.590***
	(3.414)		(5.678)
*DAC*ERC*	0.032*		0.022*
	(1.775)		(1.690)
P_AbREM		0.466***	0.593***
		(3.194)	(6.883)
*P_AbREM *ERC*		0.077***	0.066***
		(4.316)	(5.188)
Constant	5.681***	5.000***	5.037***
	(70.927)	(30.221)	(40.631)
Control variables	Included	Included	Included
Observations	14,678	14,678	14,678
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Clustered by	Firm	Firm	Firm
Adjusted R^2	0.808	0.817	0.818

Notes: This table presents the effect of stock price sensitivity to earnings on the positive relation between REM and audit fees. Stock price sensitivity is measured using the earnings response coefficient (ERC), which then is interacted with AEM and REM variables. REM variable is instrumented by 2SLS regressions to control for its endogeneity (See Table 3 column (1) for the first stage regression specifications). The impact of REM is more pronounced for firms with higher ERC. Refer to the Appendix for detailed variable definitions. The results are based on the pooled ordinary least squares regressions with standard errors corrected for firm-level clustering. The numbers in parentheses are *t*-values, and ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively (two tailed).

Table 7. The effect of investor sophistication.

	(1)	(2)	(3)
VARIABLES	*LNAFEE*	*LNAFEE*	*LNAFEE*
INST_OWN	−0.022	−0.280***	−0.214***
	(−0.588)	(−7.964)	(−4.891)
DAC	0.284**		0.560***
	(2.224)		(4.507)
*DAC*INST_OWN*	2.497***		1.283**
	(4.938)		(2.514)
P_AbREM		0.476***	0.597***
		(3.707)	(4.724)
*P_AbREM *INST_OWN*		0.480***	0.459***
		(5.948)	(5.640)
Constant	5.684***	5.061***	5.106***
	(72.580)	(31.002)	(30.994)
Control variables	Included	Included	Included
Observations	14,678	14,678	14,678
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Clustered by	Firm	Firm	Firm
Adjusted R^2	0.809	0.818	0.819

Notes: This table presents the effect of investor sophistication on the positive relation between REM and audit fees. Investor sophistication is measured using the existence of firm's institutional ownership, which then is interacted with AEM and REM variables. The REM variable is instrumented by 2SLS regressions to control for endogeneity (See Table 3 column (1) for the first stage regression specifications). The impact of REM is more pronounced for the firms with institutional investors. Refer to the Appendix for detailed variable definitions. The results are based on the pooled ordinary least squares regressions with standard errors corrected for firm-level clustering. The numbers in parentheses are *t*-values, and ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively (two tailed).

require higher risk premiums for their clients' REM in the presence of institutional investors. When *DAC*INST_OWN* and *P_AbREM*INST_OWN* are included together in column (3), their coefficients are both positive and significant. In sum, this supports the claim that auditors charge higher fee premiums against their clients' REM activities, and that this is more pronounced for the firms with institutional investors because more sophisticated investors better understand managerial opportunism through REM. Thus, they are more likely to sue auditors for their financial losses.[15]

5.4. The effect of financial constraint

REM proxies measured using regression residuals may be vulnerable to measurement errors, and thus may capture firms' normal business activity adjustments based on optimal operations rather than managerial opportunism. This concern is less serious for the firms that are more financially constrained because the incentives for managers to boost reported earnings to achieve short-term earnings targets are stronger. Therefore, REM in these firms is more likely to be opportunistic. Moreover, REM in financially constrained firms may be perceived as riskier by auditors than it is in financially healthy firms. REM, which dampens firms' long-term cash flow generating abilities, threatens firm fundamentals and competitiveness more seriously in financially constrained firms than it does in financially non-constrained firms. Therefore, the probability of shareholder litigation due to REM is higher for these firms, and auditors have incentives to be compensated for the increased risk.

To investigate this possibility, we interact our AEM and REM variables with various proxies for financial constraint and include these interaction terms in Equation (4). We adopt seven financial constraint measures from the prior literature: Hadlock and Pierce's index (HP_Index), net leverage, free cash flow, firm size, dividend payout, Kaplan and Zingales index (KZ_Index), and the aggregate measure for these six variables (Kaplan and Zingales 1997; Hadlock and Pierce 2010; Campello and Graham 2013; Linck, Netter, and Shu 2013).[16] The results are presented in Table 8.

Table 8. The effect of financial constraint.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Financial Constraint Variables	HP_Index	NL	FCF	SIZE	PAYOUT	KZ_Index	Aggregate
FC	0.022***	−0.027***	−0.013***	.	0.009*	0.043***	0.040***
	(3.477)	(−5.176)	(−2.847)		(1.856)	(7.488)	(4.207)
DAC	0.603***	−0.193	0.662***	0.117	0.504**	0.228*	0.323***
	(4.676)	(−1.218)	(2.700)	(1.231)	(2.092)	(1.859)	(2.585)
*DAC*FC*	0.151*	0.200***	0.006	0.036*	0.004	0.692***	0.814***
	(1.891)	(5.970)	(0.152)	(1.735)	(0.085)	(9.408)	(6.763)
P_AbREM	0.217	0.362**	0.697***	0.856***	0.511***	0.794***	0.718***
	(1.336)	(2.478)	(5.752)	(6.035)	(3.956)	(4.642)	(4.115)
*P_AbREM *FC*	0.172***	0.037***	0.166***	0.302***	0.126***	0.010*	0.026*
	(6.052)	(5.308)	(3.041)	(5.051)	(4.330)	(1.760)	(1.866)
Constant	4.053***	5.776***	5.625***	3.172***	4.971***	5.886***	5.891***
	(17.257)	(57.638)	(66.628)	(6.606)	(29.850)	(47.542)	(43.930)
Control variables	Included	Included	Included	Included	Included	Included	Included
Observations	14,678	14,678	11,754	14,678	14,678	14,488	14,678
Industry FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Clustered by	Firm	Firm	Firm	Firm	Firm	Firm	Firm
Adjusted R^2	0.812	0.814	0.810	0.810	0.818	0.814	0.812

Notes: This table presents the effect of financial constraint on the positive relation between REM and audit fees. The REM variable is instrumented by 2SLS regressions to control for endogeneity (See Table 3 column (1) for the first stage regression specifications). Financial constraint is measured by Hadlock and Pierce's index, net leverage, free cash flow, size, payout ratio, Kaplan and Zingales index, and its aggregate measure. Each financial constraint measure is then interacted with AEM and REM variables. The increase in audit fees due to REM is more pronounced for financially constrained firms than it is for non-constrained firms. Refer to the Appendix for detailed variable definitions. The results are based on the pooled ordinary least squares regressions with standard errors corrected for firm-level clustering. The numbers in parentheses are *t*-values, and ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively (two tailed).

When we measure financial constraint using the HP_Index, the coefficient on *P_AbREM* is positive but insignificant in column (1). More importantly, the coefficient on *P_AbREM*FC* is positive and significant at the 1% level (0.172, $t = 6.052$). This means that auditors charge higher fees for their client firms' REM, and that this positive relation is more pronounced in smaller and younger firms. The results based on other financial constraint measures are similar. All the coefficients on *P_AbREM* and *P_AbREM*FC* are significantly positive in columns (2) to (7). For example, when *FC* is the aggregate measure of financial constraint in column (7), the coefficients on *P_AbREM* and *P_AbREM*FC* are positive and significant at the 1% and 10% level, respectively (for *P_AbREM*FC*, coeff. = 0.026, $t = 1.866$).

Overall, the results in Table 8 corroborate our main finding that auditors require higher fee premiums to self-protect against the increased litigation threats from their client firms' investors when the firms engage in more REM. Also, the results show that this phenomenon is more clearly observed in financially constrained firms where the REM measures are more likely to capture managerial opportunism rather than optimal operation adjustments, and where REM activities are perceived as riskier by auditors.

5.5. Other sensitivity tests

We conduct a battery of additional analyses to check the robustness of the main results and find that the main implications are unaltered. Without tabulation, we summarize them in this section. First, we conduct the main and sensitivity analyses using the unsigned measures of AEM and REM instead of signed measures.[17] This is consistent with some prior studies which investigate the effect of AEM on audit fees using unsigned AEM measures (e.g. Gul, Chen, and Tsui 2003). Second, we repeat the main analyses using the performance-adjusted measure of AEM as proposed by Kothari, Leone, and Wasley (2005). Though we believe that total accruals are a better choice to measure discretionary accruals as mentioned in Section 3, we measure the AEM variable using current accruals and repeat the main analyses.

Third, we estimate the main regression in Equation (4) using ranked values of AEM and REM in lieu of their raw values to alleviate concerns over the possibility that residual-based measures are unduly influenced by a small number of outliers and are measured with errors. When we use ranked values of AEM and REM, we find that their coefficients are positive and significant at the 1% level, consistent with our empirical findings. Fourth, we also estimate the main regression in Equation (4) using Fama and MacBeth (1973) annual cross-sectional regressions. Unreported results show that statistical inferences on the test variables are qualitatively similar to those reported in this paper, supporting the robustness of our findings across different years.

6. Concluding remarks

Although high-quality audits can deter AEM, the auditors' role with respect to REM is not clear up to now. This study investigates how auditors consider the level of REM activities of client firms in their audit fee decisions.

We find that REM is positively related to audit fees and that this relation is incremental over and beyond the effects of AEM and other audit fee determinants. This finding suggests that auditors demand a fee premium to self-protect against the increased litigation risk due to their client firms' REM. We also find that the positive relation between audit fees and REM is more pronounced for the firms with higher ERC, more sophisticated investors, and higher financial constraints.

Subject to some caveats discussed previously, the findings in this study provide important implications for managers, auditors, regulators, and researchers. First, recent survey evidence shows that managers are willing to use REM to manipulate reported earnings even though REM activities have adverse consequences on long-term firm value. Our evidence indicates that the use of REM could be costly to a firm because the firm's auditors see through its consequences on cash flows and shareholder litigations and are, thus, able to factor this increased risk into higher audit fees. Second, the results suggest that academic researchers interested in audit fee determinants should consider not only AEM but also REM as an important factor affecting audit risk. Given that little is known about what firm-level and/or institution-level factors influence managers' abilities, incentives, and opportunities to engage in costly REM (relative to AEM) as an earnings management strategy, we recommend further research on the issue.

Notes

1. For example, the other client characteristics include client satisfaction, bargaining power, governance mechanisms, and internal control quality. Auditor characteristics include auditor size, non-audit services, auditor change, direction of auditor change, auditor industry specialization. Finally, audit environments include Sarbanes-Oxley Act (SOX) passage, the legal regime of the country where the client is located, cross-listing, the education requirement for new accountants, and audit market competition (Palmrose 1986a, 1986b; Francis and Simon 1987; Simon and Francis 1988; Craswell, Francis, and Taylor 1995; Behn et al. 1999; Craswell and Francis 1999; Johnstone and Bedard 2001; Abbott et al. 2003; Ashbaugh, LaFond, and Mayhew 2003; Whisenant, Sankaraguruswamy, and Raghunandan 2003; Chaney, Jeter, and Shivakumar 2004; Hay, Knechel, and Wong 2006; Huang et al. 2007; Hogan and Wilkins 2008; Choi et al. 2009; Huang, Raghunandan, and Rama 2009; Allen and Woodland 2010; Hay and Knechel 2010, among others).
2. Frankel, Johnson, and Nelson (2002), Ashbaugh, LaFond, and Mayhew (2003), and Srinidhi and Gul (2007) examine this relation in the reverse direction to our paper, namely, the effect of audit fees (and non-audit fees) on earnings management.
3. However, Antle and Gordon (2006) report a negative relation between audit fees and their measure of signed discretionary accruals, which is inconsistent with Abbott, Parker, and Peters (2006) and Krishnan et al. (2013).
4. The measured REM from statistical models could be due to measurement errors rather than due to firms' actual earnings management through real operation adjustments.
5. Krishnan et al. (2013) report the pecking order of auditor response to risky clients: Auditors first charge higher audit fees as risk increases for clients with an acceptable level of risk. However, if the risk exceed the auditors' tolerance level, auditors resign from their clients. Thus, it is natural to examine the audit fee change first to look at auditors' responses before moving to their resignation decisions.

6. We use total accruals as the dependent variable of this model to measure the intensity of AEM instead of current accruals used in Dechow and Dichev (2002) because the competing variable (i.e. REM proxies) includes research and development expenditure (R&D), which is an investment in intangible assets, as one component. Including depreciation and amortization expenses, the latter of which is directly related to intangible assets and R&D expenditures, in measuring AEM variables allows more a reasonable comparison between AEM and REM. However, the main implications are unaltered when using current accruals to measure AEM proxies.
7. We first calculate the standardized ranks of each individual REM measures based on their raw values. Then we take the average of the standardized ranks of three REM proxies and use this average as the 'raw' value of the composite measure of REM (i.e. *AbREM*) as the dependent variable in the first-stage model.
8. Note that *HHI* is an inverse measure of product market competition.
9. We conventionally refer to the successor of Big 5, i.e. Big 4, as Big 5 in this study.
10. The main results are qualitatively very similar when we use the rank values of *DAC*, *P_AbCFO*, *P_AbProd*, *P_AbDiscE*, and *P_AbREM* instead of their raw values.
11. This is consistent with Gul, Chen, and Tsui (2003). They report a significantly positive coefficient on their measure of unsigned discretionary accruals in multivariate regressions. However, the univariate correlation between their unsigned discretionary accruals and the natural logarithm of audit fees is −0.223 and significant at the 1% level in their Table 3.
12. $\exp(6.61 + 0.682 \times 0.1239) - 741.5 = 66.4$, $66.4/741.5 = 9.0\%$, where 6.61 is median *LNAFEE*, 0.682 and 0.1239 are the coefficient on, and the standard deviation of, *P_AbREM*, respectively, and 741.5 is median *AFEE* in thousands.
13. Because the sample proportion for auditor change from a Big 5 (non-Big 5) to a non-Big 5 (Big 5) is very small, a change in a Big 5 indicator is mostly coded as zero, which could result in a spurious coefficient.
14. The variable *INST_OWN* has a value of one if institutional investors own any share in the firm, and zero otherwise. We alternatively measure institutional ownership using a continuous variable (i.e. the percentage of common shares owned by institutional investors to the outstanding shares). The results using this alternative measure are qualitatively similar. When the continuous *INST_OWN* is interacted with *DAC* and *P_AbREM,* the coefficients on *DAC*INST_OWN* and *P_AbREM*INST_OWN* are both positive and significant at the 1% level (*DAC*INST_OWN* = 1.011, $t = 3.246$; *P_AbREM*INST_OWN* = 0.403, $t = 5.585$). We retrieve institutional ownership data from *Thomson-Reuters* database.
15. Interestingly, we find that the coefficients on *INST_OWN* are always negative (and significant in column (2)), suggesting that auditors charge lower audit fees for firms with institutional investors. A potential reason for the negative coefficient is the reduced audit risk for such firms due to strong governance mechanisms (e.g. Griffin, Lont, and Sun 2008).
16. All financial constraint measures are adjusted to make the higher values represent more financially constrained. Refer to the Appendix for the detailed variable definitions.
17. |*DAC*| is used instead of *DAC*, and |*AbCFO*|, |*AbProd*|, |*AbDiscE*|, and |*AbREM*| are used instead of their signed variables to construct *P_*|AbCFO*|, *P_*|AbProd*|, *P_*|AbDiscE*|, and *P_*|AbREM*|. The analyses using the unsigned measures do not consider the direction of earnings management (i.e. income-increasing or income-decreasing earnings management) but focus only on the magnitude of earnings management. Because clients are less likely to use REM to deflate reported earnings than to inflate earnings (Gunny 2010), most prior studies focus on the directional earnings management using the signed measures.

Acknowledgements

We thank Hong Hwang (editor), Raynolde Pereira (associate editor), an anonymous reviewer, Mark DeFond, Clive Lennox, Jong-Hag Choi, Lee-Seok Hwang, Suresh Radhakrishnan, Joseph Weintrop, Gerald Lobo, Yoonseok Zang, Charles Chen, Jay Junghun Lee, and Woo-Jong Lee for their valuable comments and suggestions. The initial version of this paper was developed when B. C. Sohn was a full-time faculty at City University of Hong Kong.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix

Variable definitions and measurements.

A	=	total assets (annual *Compustat* data item AT)
Sales	=	total sales (annual *Compustat* data item SALE)
REC	=	accounts receivable (annual *Compustat* data item RECT)
PPE	=	gross property, plant, and equipment (annual *Compustat* data item PPEGT)
TAC/A	=	total accruals divided by lagged total assets, where total accruals (*TAC*) are computed by income before extraordinary items (annual *Compustat* data item IBC) minus CFO
DAC	=	the level of income-increasing AEM, or equivalently discretionary accruals, estimated by the modified Jones model
NTAC	=	non-discretionary accruals, estimated by the modified Jones model
HHI	=	Herfindahl-Hirschman index, computed by the sum of squared market shares of firms in each Fama and French 48 industries (Fama and French 1997) and year
AbCFO	=	level of abnormal CFO, where CFO is computed by annual *Compustat* data item OANCF minus item XIDOC
AbProd	=	level of abnormal production costs, where production costs are defined as the sum of the cost of goods sold (annual *Compustat* data item COGS) and the change in inventories (annual *Compustat* data item INVT)
AbDiscE	=	the level of abnormal discretionary expenses, where discretionary expenses are defined as the sum of advertising expenses (annual *Compustat* data item XAD), R&D expenses (annual *Compustat* data item XRD), and SG&A expenses (annual *Compustat* data item XSGA)
AbREM	=	the level of income-increasing REM, which is estimated by taking the average of the standardized ranks of each individual REM measures based on their raw values, i.e. (−1)***Standardized rank of AbCFO* + *Standardized rank of AbProd* + (−1)***Standardized rank of AbDiscE*
P_AbCFO	=	predicted value of *AbCFO*, computed using the estimated parameters from the first stage regression of (−1)***AbCFO* on *HHI* and other REM determinants to control for REM endogeneity
P_AbProd	=	predicted value of *AbProd*, computed using the estimated parameters from the first stage regression of *AbProd* on *HHI* and other REM determinants to control for REM endogeneity
P_AbDiscE	=	predicted value of *AbDiscE*, computed using the estimated parameters from the first stage regression of (−1)***AbDiscE* on *HHI* and other REM determinants to control for REM endogeneity
P_AbREM	=	predicted value of *AbREM*, computed using the estimated parameters from the first stage regression of *AbREM* on *HHI* and other REM determinants to control for REM endogeneity
LNAFEE	=	natural logarithm of audit fees paid (thousands of US dollars)
LNA	=	natural logarithm of total assets (thousands)
NBS	=	natural logarithm of one plus number of business segments
NGS	=	natural logarithm of one plus number of geographic segments
INVREC	=	inventory (annual *Compustat* data item INVT) and receivables (annual *Compustat* data item RECT) divided by total assets
ISSUE	=	1 if the sum of debt and equity issues during the past three years are more than 5% of total assets, and 0 otherwise
FOREIGN	=	1 if a firm pays any foreign income tax, and 0 otherwise
LOSS	=	1 if a firm reports a loss during the fiscal year, and 0 otherwise
LEV	=	leverage, computed by total liabilities (annual *Compustat* data item LT) divided by total assets
ROA	=	income before extraordinary items (annual *Compustat* data item IBC) divided by average total assets
BM	=	book-to-market ratio of common equity, computed by the book value of equity (annual *Compustat* data item CEQ) divided by the market value of equity (*CRSP* per share stock price × annual *Compustat* item CSHO) at fiscal year-end *t*, winsorized at 0 and 4
CGSALES	=	sales change from the prior fiscal year divided by the beginning total assets of fiscal year *t*
BIG5	=	1 if a firm's auditor is one of the Big 5 audit firms
ERC	=	earnings response coefficient, measured by regressing one-year raw stock returns on lagged price-deflated earnings changes for each year and 2-digit SIC industry, where raw return is computed by buy-and-hold returns for the fiscal year, and earnings per share is deflated by the stock price at the end of the previous fiscal year
INST_OWN	=	1 if institutional investors own any share in the firm, and 0 otherwise
HP_Index	=	Hadlock and Pierce's index = $-0.737 \times Size + 0.04 \times Size^2 - 0.040 \times Age$, where *Size* is the natural log of book assets, and *Age* is the number of years from the first year that a firm has a non-missing stock price in *Compustat*. Firm-years in the highest (lowest) quintile of *HP_Index* are considered constrained (unconstrained)
NL	=	net leverage, computed by net debt, sum of long-term and short-term debt minus excess cash, scaled by the sum of net debt and shareholder's equity. Firm-years in the highest (lowest) quintile of *NL* are considered constrained (unconstrained)
FCF	=	free cash flow, computed by cash from operations minus average capital expenditure in the past three years, scaled by the sum of long-term and short-term debt. Firm-years in the lowest (highest) quintile of *FCF* are considered constrained (unconstrained)
PAYOUT	=	the ratio of total distributions (dividends plus stock repurchases) to assets. Firms in the lowest (highest) quintile of *PAYOUT* are considered constrained (unconstrained)

(*Continued*)

Appendix (*Continued*)

KZ_Index	=	Kaplan and Zingales index = −1.002(*CF*/*TA*) − 39.368(*DIV*/*TA*) − 1.315(*CA*/*TA*) + 3.139*LEV* + 0.283*Q*, where *CF*/*TA* is cash flow over lagged book assets, *DIV*/*TA* is cash dividends over lagged book assets, *CA*/*TA* is cash balances over lagged book assets, *LEV* is total debt over book assets, and *Q* is the ratio of the market-to-book value of the firm's assets. Firm-years in the highest (lowest) quintile of *KZ_Index* are considered constrained (unconstrained)
Aggregate	=	aggregate financial constraint measure. Firm-years that are classified as constrained in at least three of the six financial constraint measures above are considered constrained, otherwise they are considered unconstrained