Internal audit function and real earnings management practices in an emerging market

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Abstract

Purpose – This study aims to investigate the monitoring role of internal audit function (IAF) on real earnings management (REM) practices. It examines the effect of investment in IAF (IIAF) and IAF sourcing arrangements on REM, unlike prior literature which has mainly examined the effects of IIAF on accrual-based earnings management.

Design/methodology/approach – This study uses a sample of 1,056 observations from an emerging market, Malaysia, between 2013 and 2016. Feasible generalised least square (FGLS) regression is used to analyse the data. To corroborate the results of this study, the authors use an ordinary least square (OLS) regression model with robust standard errors adjusted and also consider alternative REM measures.

Findings – The results of this study suggest that IIAF has a significant negative relationship with REM practices. Further, in-house IAF sourcing has a significant negative association with REM. The additional analysis supports the main results confirming the essential role of IAF in reducing REM in the Malaysian market.

Practical implications – The evidence relates to the important role of IAF in mitigating REM practices. High-quality of IAF impairs managers' ability to manage earnings in their own interests. The findings may be useful in informing regulators, managers, shareholders and other investors, as well as researchers, about improving the role of IAF.

Originality/value – This study contributes to the existing literature by providing the first evidence of the significant role of IIAF and IAF sourcing arrangements in mitigating REM in an emerging country.

Keywords Real earnings management, Investment in internal audit function, Internal audit function sourcing, Auditing, Corporate governance, Emerging market

Paper type Research paper

1. Introduction

Researchers have begun to pay more attention to real earnings management (REM) because companies, for various reasons, prefer to manage earnings through real business activities

rather than through accrual-based earnings management (AEM) (Abad *et al.*, 2018; Chi *et al.*, 2011; Cohen *et al.*, 2008; Das *et al.*, 2017). Tighter accounting standards, mandatory adoption of the IFRS, passage of Sarbanes–Oxley Act and high-quality audit scrutiny restrict managers in using AEM. Thus, managers might be expected to prefer earnings management through real business activities, which is less detectable (Chi *et al.*, 2011; Cohen *et al.*, 2008; Ewert and Wagenhofer, 2005; Ho *et al.*, 2015; Ipino and Parbonetti, 2017).

Previous studies extensively investigated the role of corporate governance mechanisms (such as board of directors and its subcommittees and external audit) in mitigating earnings management (a form of agency problem). Although internal audit function (IAF) plays a vital role in enhancing good corporate governance, with its primary monitoring function to ensure the reliability of financial reporting and internal controls (Christopher, 2019; Davidson *et al.*, 2005; Roussy and Perron, 2018), there are few studies on IAF's monitoring role in reducing the agency problem. Limited publicly available data on IAF could be a reason for this dearth of studies (Abbott *et al.*, 2016; Al-Qadasi *et al.*, 2019). Despite the few empirical studies that investigated the relationship between investment in IAF (IIAF) and financial reporting quality as measured by AEM (Al-Rassas and Kamardin, 2016; Johl *et al.*, 2013), no study has investigated this relationship using REM, especially with the claim that IAF is mostly concerned with improving company audits at the operational level of governance (Christopher, 2019; Institute of Internal Auditors (IIA), 1999). Thus, our study fills this gap by examining the effect of IIAF and IAF sourcing arrangements (IAFSOAs) on REM.

Earnings management is more widespread in emerging markets than in developed markets like the USA and Europe (Zweig, 2019). Malaysia, as an emerging country in Southeast Asia, adds an interesting dimension to this study, for three reasons. First, REM is pervasive in the Malaysian market (Abdul Rahman *et al.*, 2018; Enomoto *et al.*, 2015; Nasir *et al.*, 2018). Second, Securities Commission Malaysia (SCM) requires listed companies, under the Malaysian Code of Corporate Governance rules, to establish IAF to safeguard the company's assets and shareholders' investments (SCM, 2007). Third, listed companies in the Malaysian markets are required to disclose information on IAF. The Main Market Listing Requirements (MMLRs) (Appendix 9C, Part A, Paragraph 30) mandate that companies should disclose their IAF sourcing, whether in-house or out-sourced. Companies are also required to disclose the IAF costs incurred in the financial year (Bursa Malaysia, 2018). This IAF public information makes archival study possible, and the Malaysian market offers an ideal setting for examining the monitoring role of IAF in mitigating opportunistic managerial practices that could be harmful to investors' interests.

The study uses a sample of 1,056 company-year observations from the manufacturing sector in Malaysia, for the period 2013–2016. REM appears to be more pronounced in manufacturing companies (Brown *et al.*, 2015; Roychowdhury, 2006), and overproduction, one of the REM strategies, is only available in manufacturing companies (Jarvinen and Myllymaki, 2016; Roychowdhury, 2006). This study finds a strong negative relationship between IIAF and REM, suggesting that companies that invest heavily in IAF protect shareholders' wealth by reducing REM practices. The study also finds a significant negative association between the IAFSOAs and REM, suggesting that audit by an internal department is more effective in curbing REM than outsourcing IAF. This evidence supports the view that auditors from the internal audit department have a better understanding of company operations, activities and financial reporting processes than the external providers (Coram *et al.*, 2008; Lin *et al.*, 2011). The findings of the current study support previous evidence that IAF quality (measured by investment and sourcing) plays a vital role in enhancing financial reporting quality, audit quality and also reducing audit delay in the Malaysian market (Al-Qadasi *et al.*, 2019; Al-Rassas and Kamardin, 2016; Johl *et al.*, 2013;

Wan Hussin and Bamahros, 2013). The main findings remain the same under different
additional tests.

This paper contributes to the accounting literature in two ways. First, its results provide
strong support for the agency theory argument that managers of companies with a high
level of monitoring mechanisms (i.e. well-funded IAF) are less likely to manipulate real
business activities (reducing REM practices). Second, we provide evidence that audit
through the internal source (i.e. in-house IAF) is more effective in restricting REM practices
than by outsourcing. Although Malaysian regulators (e.g. SCM) have paid considerable
attention to IAF, they may benefit from the results of this study to further strengthen the
rules regarding IAF. Also, other regulatory bodies in other markets (emerging and
developed markets) may consider this significant role of IIAF and IAFSOAs in mitigating
REM and further develop the monitoring role of IAF. Listed companies in Bursa Malaysia
(formerly known as the Kuala Lumpur Stock Exchange) and other emerging markets may
benefit from the current study's findings and pay more attention to the role of IAF.
Shareholders may consider the greater IIAF as a signal of strict internal monitoring that
preserves their investment. Researchers should pay attention to IAF as an effective form of
internal governance monitoring in curbing not only AEM but also REM.

The remainder of the study is organised as follows. The second section reviews the
literature and develops hypotheses. The third section discusses the research design,
including sampling, variables measurement and research models. The fourth section
describes the study data and discusses the empirical results. The fifth section reports the
additional tests confirming the robustness of the main results. Finally, the sixth section
concludes the study and admits the limitations of its findings.

2. Literature review and hypothesis development

2.1 Investment in internal audit function and real earnings management

IAF is one of the important mechanisms in corporate governance, along with management,
directorship and external audit (Anderson *et al.*, 1993; Gramling *et al.*, 2004; Mihret and
Grant, 2017). Institute of Internal Auditors (IIA) (1999) defines it as follows:

> Internal auditing is an independent, objective assurance and consulting activity designed to add
> value and improve an organization's operations. It helps an organization accomplish its objectives
> by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk
> management, control, and governance processes.

Based on the agency theory, monitoring is one of the solutions to reducing the conflict
between agents and owners (Type I) or minority and majority shareholders (Type II). Hence,
IAF can monitor management behaviour and contributes to the protection of shareholders'
wealth. Regulators (e.g. securities and exchange commission in the USA and securities
commission of Malaysia) emphasise the potential role of IAF, particularly after global
accounting scandals, such as Enron and WorldCom (Carcello *et al.*, 2005; SCM, 2007).
Therefore, IIAF is considered as a part of the cost of monitoring spent by the company to
ensure effective internal control and low risk. It also means that IAF plays a vital role in
mitigating information asymmetries between shareholders and managers (Sarens and
Abdolmohammadi, 2011).

IAF improves the monitoring environment in companies. Usually, companies invest in
the internal control system to improve productivity and increase returns (Mihret and Grant,
2017). Ege (2015) assumes that well-funded IAF is more effective at monitoring management
because of the rich resources at its disposal. Companies with IAF are found to be better able
to detect fraud than those without IAF (Coram *et al.*, 2008). These findings suggest that IAF

is an important governance mechanism for companies in improving and monitoring their environment. However, Davidson *et al.* (2005) report that the voluntary establishment of IAF is not associated with a low AEM.

Previous studies argue that competent IAF can improve financial reporting quality. High IAF quality can reduce earnings management practices and boost financial reporting quality (Abbott *et al.*, 2016; Al-Rassas and Kamardin, 2016; Alzoubi, 2019; Prawitt *et al.*, 2009). Al-Thuneibat *et al.* (2016) argue that IAF is a comprehensive monitoring function that is correlated with internal control components and is able to monitor all activities at different levels of management. These arguments suggest that IAF plays an essential role in corporate governance effectiveness and financial reporting quality. Greater investment in resources enables managers to hire more competent internal auditors and improve the quality of IAF consulting and assurance activities, which ultimately improves the quality of financial reporting (Abbott *et al.*, 2016; Lin *et al.*, 2011). In other words, investing more in IAF indicates more staff in internal audit and, hence, more monitoring (Sarens and Abdolmohammadi, 2011).

In Malaysia, IAF plays an essential role in corporate governance and financial reporting procedures (SCM, 2007; Wan Hussin and Bamahros, 2013). Johl *et al.* (2013) report that IIAF reduces the level of abnormal accruals in Malaysian companies, supporting the claim that investing more in IAF would enhance monitoring ability to constrain managers' opportunistic behaviour. Al-Rassas and Kamardin (2016) reveal an association between IIAF and earnings quality (measured by discretionary accruals) in the Malaysian market. Zakaria *et al.* (2016) examine the impact of internal control weaknesses on fraudulent activities in an oil and gas company in Malaysia as a case study and report that poor internal control leads to these practices. Furthermore, Wan Hussin and Bamahros (2013) report a negative relationship between IIAF and audit delay in Malaysia. Al-Qadasi *et al.* (2019) conclude that more IIAF is positively related to audit quality (choice of a specialist auditor and paying higher audit fees).

Some studies report a positive relationship between disclosing internal control weaknesses and REM (Jarvinen and Myllymaki, 2016; Lenard *et al.*, 2016). These findings are in line with a study conducted by KPMG (2013) in Malaysia, which reported that weak internal controls, lack of internal audit teams' skills and lack of fraud awareness are the three main factors that allow fraud to occur. However, no study has examined the role of IIAF on REM. It is still not clear how investing in IAF will affect REM practices.

Considering the prediction of the agency theory that monitoring mechanisms can reduce the conflict of interests between parties (Jensen and Meckling, 1976), corporate governance is an important monitoring tool to align the interests of shareholders and managers. IAF is one of the cornerstones of governance monitoring and is expected to mitigate managers' opportunistic earnings activities. The studies discussed above support the potential role of IAF in reducing earnings management practices. Further, IAF quality plays a significant role in reducing management misconduct (Ege, 2015). It is expected that a well-funded and robust IAF will reduce REM practices. Therefore, the following hypothesis is predicated:

H1. There is a negative relationship between investment in internal audit function and real earnings management.

2.2 Internal audit function sourcing arrangements and real earnings management
IAF can be performed by the internal audit department (in-house) or provided by a third party from outside the company (outsourced) or by a combination of both (Baatwah and Al-Qadasi, 2019; Wan Hussin and Bamahros, 2013). The MMLRs in Malaysia (Appendix 9C,

Part A, Paragraph 30) mandate that companies should disclose the IAF source, whether performed in-house or outsourced. Previous studies argued that there are differences between in-house and outsourced internal auditors' incentives and motives because of the differences in institutional arrangements (Glover *et al.*, 2008). In-house internal auditors have daily contact with the company that allows them to find problems through their relationships with employees. Thus, they have more influence over management's daily decisions (Glover *et al.*, 2008). Abbott *et al.* (2016) claim that greater investment in in-house IAF yields a greater increase in financial reporting quality. However, some researchers consider that in-house internal auditors are less independent and have incentives to provide information that meets management's expectations (Ahlawat and Lowe, 2004; Al-Rassas and Kamardin, 2016).

From another perspective, companies prefer to outsource their IAF to avoid further investment in in-house IAF (Mubako, 2019). Outsourced IAF might be a good choice for companies which have concerns about the independence of in-house IAF staff (Baatwah and Al-Qadasi, 2019). IAF through outsourcing brings potential benefits to the company through auditors with specialised knowledge from an independent audit company; these auditors have less incentive to align with management (Wan Hussin and Bamahros, 2013). Mubako (2019) reports a recent increase in adopting outsourced IAF compared with in-house IAF, arguing for the cost benefit and specialised auditor resources from outsourced IAF. However, Coram *et al.* (2008) report that companies that wholly outsourced their IAF are less likely to identify and report fraud compared with companies with partial or full in-house IAF. Empirical studies in Malaysia have failed to provide any evidence about the effect of IAFSOAs. For example, Al-Rassas and Kamardin (2016) report an insignificant relationship between IAFSOAs and earnings quality. Further, Wan Hussin and Bamahros (2013) find an insignificant association between the IAFSOAs and audit delay.

Based on the literature discussed above, a common perception is that outsourcing is less costly than in-house IAF, encouraging companies to outsource their IAF. Although researchers argue that outsider internal auditors are more efficient than in-house internal auditors because of their wide knowledge and technological efficiency (Carey *et al.*, 2006), an IAF performed by the internal audit department is expected to have an effect on curbing REM. This is because REM is a technique used by managers through real business activities to alter reported earnings, and internal auditors have a day-by-day review of companies' financial transactions. Further, previous studies (such as Chi *et al.*, 2011) report that REM is less likely to be detected under auditors' scrutiny. Given the contradictory evidence on the advantages of IAFSOAs, the following non-directional hypothesis is established:

H2. There is a relationship between internal audit function sourcing arrangements and real earnings management.

3. Research design

3.1 Sample and data collection

The study sample consists of all manufacturing companies listed in the main market of Bursa Malaysia. The study uses information available from the Emerging Markets Information Service (EMIS) to identify the manufacturing companies. The final sample consists of 1,056 company-year observations from 2013 to 2016. The current study follows Roychowdhury (2006) and uses Standard Industrial Classification (SIC) codes to classify manufacturing companies into two-digit industry groups (two-digit SIC codes between 20 and 39) based on companies' main activities. The classification results in 11 industry groups. Table 1 shows the sample selection and industry classification.

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Panel A: Sample selection	No. of companies
All manufacturing companies listed on Bursa Malaysia	357
Excluded companies:	
Companies changing their end of financial year	30
Newly listed or delisted during the period 2013–2016	15
Missing data at any time between 2013 and 2016	33
Missing REM data in any period 2011–2016	*15*
Total excluded companies	93
The final sample	*264*
Total of observations (264 companies *4 years)	1056

Panel B: Sample companies breakdown by industry	No. of companies	Observation	% of the sample
Chemicals and Allied Products	19	76	7.2
Construction Products	19	76	7.2
Electronic and Electrical Equipment	32	128	12.12
Fabricated Metal and Miscellaneous	16	64	6.06
Food and Related Products	28	112	10.61
Machinery and Transportation Equipment	26	104	9.85
Paper and Allied Products	17	68	6.44
Primary Metal Industries	34	136	12.88
Rubber and Plastic Products	28	112	10.61
Textile and Apparel Products	15	60	5.68
Wood and Furniture Products	30	120	11.36
Total	264	1,056	100

Table 1.
Sample selection and industry groups

The reason for focusing on manufacturing companies is that REM appears to be more pronounced in these companies (Brown *et al.*, 2015; Roychowdhury, 2006). Further, the manufacturing sector is playing a significant role in the growth of the Malaysian economy. According to the reports of the International Monetary Fund (2016) and the Bank Negara Malaysia (2015), the manufacturing sector contributed to Malaysia's gross domestic product (GDP) by 23% and to exports by about 80% in 2015. Furthermore, overproduction, which is one of the REM strategies, is only available in manufacturing companies (Jarvinen and Myllymaki, 2016; Roychowdhury, 2006). Data for REM, companies' characteristics and discretionary accruals were collected from Thomson Reuters Datastream. All the data regarding the IAF, family ownership, ownership concentration and other corporate governance variables were collected manually from the annual reports of the respective companies.

3.2 Measurement of dependent variable (REM)

The main model used in the current study to estimate aggregate REM is the cross-sectional version of Roychowdhury's (2006) models for every industry and year. Roychowdhury (2006) argues that companies usually manage real business activities through (1) abnormal cash flow from operations (ACFO), (2) abnormal production costs (APRC) and (3) abnormal discretionary expenses (ADIE) such as advertising, selling, general administrative and R&D expenses [1]. ACFO, APRC and ADIE indicate the difference between actual values of each item minus the normal value calculated by the residuals of equations (1)–(3):

$$\frac{CFO_t}{Assets_{t-1}} = \beta_1 \left(\frac{1}{Assets_{t-1}}\right) + \beta_2 \left(\frac{Sales_t}{Assets_{t-1}}\right) + \beta_3 \left(\frac{\Delta Sales_t}{Assets_{t-1}}\right) + \varepsilon_t \tag{1}$$

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$$\frac{PRC_t}{Assets_{t-1}} = \beta_1\left(\frac{1}{Assets_{t-1}}\right) + \beta_2\left(\frac{Sales_{it}}{Assets_{t-1}}\right) + \beta_3\left(\frac{\Delta Sales_t}{Assets_{t-1}}\right) + \beta_4\left(\frac{\Delta Sales_{t-1}}{Assets_{t-1}}\right) + \varepsilon_t$$

(2)

$$\frac{DIE_t}{Assets_{t-1}} = \beta_1\left(\frac{1}{Assets_{t-1}}\right) + \beta_2\left(\frac{Sales_{t-1}}{Assets_{t-1}}\right) + \varepsilon_t \qquad (3)$$

$$REM = ACFO* - 1 + APRC + ADIE* - 1 \qquad (4)$$

where:

CFO_t = cash flow from operations in period t;

$Assets_{t-1}$ = lagged total assets;

$Sales_t$ = annual sales;

$\Delta Sales_t$ = change in sales relative to the previous period measured by sales in year t less sales in year $t-1$ less sales in year $t-2$;

PRC_t = a sum of the cost of goods sold ($COGS_t$) and changes in inventory (ΔINV) during the year; and

DIE_t = discretionary expenses during the period t; it is the sum of advertising expenses, R&D expenses and selling, general and administrative expenses (SG&A).

Further, the current study follows previous studies that have measured REM as an aggregate of these three measurements (Chi *et al.*, 2011; Cohen *et al.*, 2008; Eng *et al.*, 2019; Jie *et al.*, 2017; Kouaib and Jarboui, 2016). Eng *et al.* (2019) argue that the aggregate measure of REM would better capture earnings management activity than any single measure of REM. Chi *et al.* (2011) claim that the three individual REM variables provide richer information, but aggregate REM indicates the level of overall REM. It is important to mention that low values of ACFO and ADIE indicate higher REM, whereas a high value of APRC indicates higher REM (Cohen *et al.*, 2008; Roychowdhury, 2006). Thus, we follow previous studies and construct an aggregate measure of REM by multiplying standardised residuals from the level of cash flow from operations and discretionary expense by −1 and adding them to the standardised residuals of the PRC equation (Cohen *et al.*, 2008; Eng *et al.*, 2019). Hence, equation (4) is used for calculating REM.

3.3 Measurements for independent and control variables
Independent variables are IIAF and IAFSOAs. IIAF is the natural logarithm of the IAF annual costs (Al-Qadasi *et al.*, 2019; Al-Rassas and Kamardin, 2016; Johl *et al.*, 2013). IAFSOA measures whether the internal auditor was in-house or outsourced (Ahlawat and Lowe, 2004; Al-Rassas and Kamardin, 2016). Both models are controlled by including corporate governance and company characteristics to capture possible effects of these variables on the earnings management behaviour. Previous studies provide evidence that companies with good governance monitoring are more likely to engage in less earnings management. Board independence (BIND) is negatively associated with REM (Chouaibi *et al.*, 2018; Liu and Tsai, 2015). Thus, BIND is measured as the proportion of independent members on the board of directors.

Previous studies argue that there is a potential complementary effect between internal auditing and the audit committee (Sarens and Abdolmohammadi, 2011). They provide evidence that audit committee characteristics are negatively associated with earnings management (Bilal *et al.*, 2017; Lin and Hwang, 2010). Thus, the current study includes audit committee size (ACSZ), audit committee independence (ACIN), audit committee financial expertise (ACFE) and audit

committee meetings (ACME) in the research models. We measure ACSZ by the total number of directors on the audit committee, ACIN by the proportion of independent members on the audit committee, ACFE by the proportion of directors on the audit committee with financial expertise and ACME by the total number of audit committee meetings held during the year (Al-Rassas and Kamardin, 2016; Sun *et al.*, 2014).

Recent empirical studies provide evidence that family ownership (FMOC) plays a monitoring role and mitigates REM (Achleitner *et al.*, 2014; Tian *et al.*, 2018). Thus, we control the effect of FMOC which is measured as a dummy variable equalling "1" if the company has family ownership not less than 20% of the company shares and "0" otherwise (Khan *et al.*, 2015). Further, the ownership of companies in East Asian markets (including Malaysia) is highly concentrated in the hands of a few individual shareholders (Claessens *et al.*, 2000). Previous empirical studies report that ownership concentration has an effect on earnings quality (Al-Rassas and Kamardin, 2016). Therefore, we include ownership concentration in the research models. We measure ownership concentration by the shares of substantial shareholders who hold at least 5% of the company's shares (Al-Qadasi *et al.*, 2019). Prawitt *et al.* (2009) argue that earnings management is likely to be lower for companies audited by the BIG4 audit firms. Thus, we add BIG4 audit firms to the models to control the possible effect of audit quality. It is measured as a dummy variable equal to "1" if a company hired a BIG4 audit firm and "0" otherwise. Recent studies state that a trade-off exists between REM and AEM (Cohen *et al.*, 2008), although other studies indicate that companies use both REM and AEM (Das *et al.*, 2017; Hamza and Kortas, 2019). Thus, we include AEM represented by the absolute value of discretionary accruals (ABDA) as measured by the Jones (1991) model as a control variable [2].

We follow Roychowdhury (2006) to include return on assets (ROA) and market-to-book ratio (MTBV) as control variables in the regression model to control the possible effect of these variables on REM. Dechow *et al.* (2011) find that companies involved in manipulating earnings have an abnormal market-to-book ratio (MTBV). Anagnostopoulou and Tsekrekos (2016), Zamri *et al.* (2013) and Anggraeni and Wardhani (2017) provide evidence that financial leverage is associated with engagement in REM. We, therefore, include company leverage (LEV) in the regression model. Sales growth (SALGR), which reflects the growth rate of sales revenue related to sales in the previous year, is also included. This is because researchers report that managers tend to manipulate earnings if companies have significant sales growth (Anggraeni and Wardhani, 2017). Corporate governance effectiveness may vary depending on the company's industry (Maher and Andersson, 2000). Thus, we further include industry dummies as control variables. A summary of the variable measurements and data sources is presented in Table 2.

3.4 Empirical model

To test the study hypotheses, we use the following two regression models for the sample. Model 1 examines the relationship between IIAF and REM. Model 2 examines the relationship between the IAFSOAs and REM. The Breusch–Pagan/Cook–Weisberg test was performed to check for heteroscedasticity, and the results indicate its presence. The Durbin–Watson statistics test was also applied to detect possible autocorrelation in the research models, and the results confirmed the existence of this problem. To overcome these two econometric problems, we use feasible generalised least square (FGLS), as it is an appropriate estimator that corrects both heteroscedasticity and autocorrelation (Baltagi, 2011; Kouaib and Jarboui, 2016; Wooldridge, 2010). In addition, we winsorise all variables that have extreme values at the top and bottom 1 and 5% to mitigate the influence of outliers. The dependent variable REM is an aggregate measure of the three proxies for REM:

Variable	Definitions	Data source
REM	Real earnings management	DataStream
IIAF	Natural log of company investment in the IAF	Annual Report
IAFSOA	Dummy variable equals "1" if the internal auditor was from the company (in-house auditors) and "0" otherwise	Annual Report
BIND	The proportion of independent members on the board of directors	Annual Report
ACSZ	Number of directors on audit committee	Annual Report
ACIN	The proportion of independent members on the audit committee	Annual Report
ACFE	The proportion of audit committee members with financial expertise	Annual Report
ACME	The total number of audit committee meetings held during the year	Annual Report
FMOC	Dummy variable equals "1" when the family ownership concentration is present in the company and "0" otherwise	Annual Report
BIG4	Dummy variable equals "1" if the auditor of the company is from one of the BIG4 audit firms or "0" otherwise	Annual Report
OWNC	Ownership concentration measured by the sum of substantial shareholders shares not less than 5%	Annual Report
MTBV	Market-to-book value ratio (market value of stock divided by the book value of stock)	DataStream
ROA	Return on assets	DataStream
LEV	The ratio of total debt to total assets	DataStream
SALGRO	The growth rate of sales revenue related to sales in the previous year	DataStream
ABDA	The absolute value of discretionary accruals (ABDA) as measured by Jones' (1991) model	DataStream

Table 2. Variable definitions and data source

abnormal discretionary expenses, abnormal cash flow from operations and abnormal production costs (explained above in Section 3.2):

$$\text{REM}_{it} = \beta_0 + \beta_1 \text{IIAF}_{it} + \beta_2 \text{FMOC}_{it} + \beta_3 \text{BIND}_{it} + \beta_4 \text{ACSZ}_{it} + \beta_5 \text{ACIN}_{it}$$
$$+ \beta_6 \text{ACFE}_{it} + \beta_7 \text{ACME}_{it} + \beta_8 BIG4_{it} + \beta_9 \text{OWNC}_{it} + \beta_{10} ROA_{it}$$
$$+ \beta_{11} \text{LEV}_{it} + \beta_{12} MTBV_{it} + \beta_{13} \text{SALGRO}_{it} + \beta_{14} \text{ABDA}_{it}$$
$$+ \text{Industry dummies} + \varepsilon_{it}$$

(Model 1)

$$\text{REM}_{it} = \beta_0 + \beta_1 \text{IAFSOA}_{it} + \beta_2 \text{FMOC}_{it} + \beta_3 \text{BIND}_{it} + \beta_4 \text{ACSZ}_{it} + \beta_5 \text{ACIN}_{it}$$
$$+ \beta_6 \text{ACFE}_{it} + \beta_7 \text{ACME}_{it} + \beta_8 BIG4_{it} + \beta_9 \text{OWNC}_{it} + \beta_{10} ROA_{it}$$
$$+ \beta_{11} \text{LEV}_{it} + \beta_{12} MTBV_{it} + \beta_{13} \text{SALGRO}_{it} + \beta_{14} \text{ABDA}_{it}$$
$$+ \textit{Industry} \text{ dummies} + \varepsilon_{it}$$

(Model 2)

4. Empirical results

4.1 Descriptive statistics

The descriptive statistics of the research variables are summarised in Table 3. REM is estimated by the three models of Roychowdhury (2006), which are ACFO, APRC and ADIE.

Variable	Mean	SD	Median	Minimum	Maximum
REM	0.000	2.192	0.001	−14.986	14.355
IIAF (RM)	266,751	860,513	54,000	3,000	11,600,000
*Ln*IAF	11.240	1.344	10.897	8.007	16.266
IAFSOA	0.351	0.478	0.000	0.000	1.000
FMOC	0.530	0.499	1.000	0.000	1.000
BIND	0.474	0.121	0.444	0.125	1.000
ACSZ	3.224	0.471	3.000	3.000	6.000
ACIN	0.898	0.146	1.000	0.600	1.000
ACFE	0.454	0.192	0.333	0.000	1.000
ACME	4.855	0.957	5.000	3.000	12.000
BIG4	0.452	0.498	0.000	0.000	1.000
OWNC	0.545	0.159	0.557	0.000	0.883
ROA	0.047	0.096	0.044	−0.743	0.753
LEV	0.169	0.149	0.138	0.000	0.710
MTBV	1.427	3.031	0.785	−1.590	36.740
SALGRO	11.187	108.914	2.433	−92.745	2791.941
ABDA	0.054	0.061	0.039	0.000	0.634

Note: Table 2 summarises variables definitions

Table 3.
Descriptive statistics
of variables

Cross-sectional regression is applied to estimate residual values of these three models over the period 2013–2016 for the 11 industry groups. The residuals of the three regressions are used as an indicator of the existing REM practices (Abad *et al.*, 2018; Roychowdhury, 2006) and combined into a single measurement to calculate the overall REM (Chi *et al.*, 2011; Cohen *et al.*, 2008; Eng *et al.*, 2019). Table 3 shows the mean (median) values of combined standardised residuals of REM as 0.000 (0.001). These values for mean and median REM are similar to those reported by Cohen *et al.* (2008) in the USA and Abdul Rahman *et al.* (2018) in Malaysia. The mean value of combined REM is almost zero; this is because REM is calculated for each industry and year with actual values (positive and negative). In addition, the values of the mean and median of REM proxies are represented by the residuals of ordinary least square (OLS) regressions. These results indicate that manufacturing companies listed in the Main Market of Bursa Malaysia practise both upward and downward REM.

The mean (median) IIAF is RM266,751 (RM54,000), ranging from RM3,000 to RM11,600,000. Data related to IAFSOAs show that about 35% of our sample has a full in-house IAF and 65% outsourced their internal audit. The study by Al-Rassas and Kamardin (2016) reveals that 46.1% of Malaysian companies have in-house IAFs, and the remaining 53.9% outsource it. Companies that have family ownership not less than 20% of company shares represent about 53% of the sample, indicating that family companies are a majority in the listed manufacturing companies (family company-years = 560 observations and non-family company-years = 496 observations). Other descriptive statistics for the study are presented in Table 3.

The correlation matrix of the variables is presented in Table 4. The results show a high correlation coefficient (0.696) between the IIAF and IAFSOA, indicating a significant positive association between these two variables at 1%. To settle this high correlation, we ran two separate regression models. In addition, Table 4 shows that the correlation coefficients amongst other research variables are significantly different from zero, having correlation coefficients less than 0.60, which do not pose a threat to the estimation variables. Further, variance inflation factors (VIFs) tests are run for each independent variable after each estimation. The results suggest that multicollinearity is not an issue.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 REM	1															
2 IIAF	−0.117***	1														
3 IAFSOA	−0.058*	0.696***	1													
4 FMOC	−0.099***	−0.121***	−0.035	1												
5 BIND	0.009	−0.037	−0.054*	−0.336***	1											
6 ACSZ	−0.085***	0.163***	0.075**	−0.079**	0.054*	1										
7 ACIN	−0.008	−0.151***	−0.118***	0.093***	0.332***	−0.168***	1									
8 ACFE	−0.059*	0.059*	−0.008	0.017	0.022	−0.124**	0.074**	1								
9 ACME	0.069**	0.141***	0.080***	−0.024	0.007	0.011	0.007	−0.011	1							
10 BIG4	−0.046	0.378***	0.273***	−0.004	−0.073**	0.077**	−0.127***	0.060*	−0.044	1						
11 OWNC	−0.023	0.185***	0.117***	0.146***	−0.101***	0.047	−0.093***	0.056*	0.041	0.216***	1					
12 ROA	−0.198***	0.159***	0.088***	0.089***	−0.134***	0.145***	−0.131***	0.024	−0.102***	0.164***	0.198***	1				
13 LEV	0.153***	0.105***	0.102***	0.071***	−0.022	0.008	−0.020	−0.051*	0.082***	0.034	−0.091***	−0.132***	1			
14 MTBV	−0.141***	0.223***	0.168***	−0.140***	0.064***	0.112***	−0.126***	0.115***	−0.066**	0.149***	0.097***	0.534***	−0.081***	1		
15 SALGRO	−0.034	−0.011	−0.022	−0.017	0.041	0.037	−0.063**	−0.027	−0.019	0.009	−0.007	0.032	−0.032	−0.006	1	
16 ABRDA	0.222***	−0.020	−0.024	−0.084***	0.035	−0.034	0.006	0.001	−0.006	−0.039	0.035	−0.166***	0.020	0.006	0.027	1

Notes: *** significant at 0.01 level; ** significant at 0.05 level; * significant at 0.10 level. Table 2 summarises variables definitions

Table 4.
Correlation matrix

4.2 Multivariate analysis

Table 5 presents the FGLS regression results for the two research models. Model 1 is established to examine the effect of IIAF on REM, whereas Model 2 is used to examine the effect of IAFSOAs on REM. The results in Table 5 for Model 1 show that the estimated coefficient on IIAF is significantly negative at 1%, demonstrating that companies with well-funded IAF have lower REM, consistent with *H1*. This result is consistent with the agency theory, that emphasises the importance of monitoring in reducing agency conflict between shareholders and management. This empirical finding also supports previous Malaysian studies which concluded that IIAF is associated with financial reporting quality as measured by abnormal accruals (Al-Rassas and Kamardin, 2016; Johl *et al.*, 2013).

The evidence from the current study is in line with the belief that a well-funded IAF enhances a company's monitoring ability of business transactions and, thus, reduces managers' opportunistic behaviour (Johl *et al.*, 2013; Prawitt *et al.*, 2009). Investing more in IAF enables management to hire more qualified, experienced and skilled personnel to carry out the IAF effectively (Lin *et al.*, 2011). Unlike previous studies which found a positive relationship between investment in external audit (audit fees) and REM (Chi *et al.*, 2011), the current study provides strong evidence that IAF has a significant role in curbing REM; this is because IAF is mostly concerned with companies' audits at the operational level of governance (Christopher, 2019). This finding also indicates that Malaysian manufacturing companies recognise the importance of IIAF as a mechanism to strengthen corporate governance. It supports the Malaysian policymakers' perspective which requires companies, through the code of corporate governance rules, to establish IAF and disclose their IIAF in their annual reports (Bursa Malaysia, 2018; SCM, 2007).

The results reported in Table 5 for Model 2 show that the coefficient of IAFSOA is significantly negative at 5%, which is consistent with *H2*, suggesting that IAF performed in-house is more effective in constraining REM than internal audit conducted by external sources. These findings are consistent with the results of Coram *et al.* (2008), who report that companies that conduct IAF internally are better able to detect and self-report fraud than those which outsource their IAF. This is because auditors from the internal audit department have a better understanding of the company's operations and financial reporting processes than the external providers (Coram *et al.*, 2008; Lin *et al.*, 2011). It is also argued that auditors from the internal audit department have more day-to-day contact with the company, which provides more opportunities for detecting problems and exercising more influence over managements' decisions (Glover *et al.*, 2008). Hence, in-house IAF is more effective than outsourced IAF in curbing earnings management practices.

Importantly, FMOC is negatively and significantly associated with REM, supporting the alignment hypothesis that family-controlled companies have less incentive to practise REM. This finding is in line with recent studies that report a positive role of family ownership on mitigating earnings management (Achleitner *et al.*, 2014; Tian *et al.*, 2018). BIG4 as a measure of audit quality is negatively associated with REM, suggesting that auditors from the BIG4 audit firms (Deloitte, Ernst and Young, KPMG and PriceWaterhouseCoopers) are more effective in mitigating REM. However, OWNC, as measured by substantial shareholders, is positively and significantly associated with REM, suggesting ineffective monitoring by these shareholders. This could be because a large proportion of substantial shareholders are outsiders and with no direct monitoring of real business activities.

Other corporate governance variables show a different influence on REM. For example, BIND and ACFE do not significantly affect REM. ACSZ and ACIN have a significant negative relationship with REM, suggesting that a large number of members and a high proportion of independent directors serving on the audit committee improve the monitoring

Variable	Model 1 (IIAF)				Model 2 (IAFSOA)			
	Coefficient	z-value	p-value	Significance	Coefficient	z-value	p-value	Significance
IIAF	−0.1340	−3.74	0.000	***	−0.2093	−2.33	0.020	**
IAFSOA								
FMOC	−0.5033	−5.71	0.000	***	−0.4870	−5.74	0.000	***
BIND	0.4498	1.27	0.204		0.0712	0.27	0.787	
ACSZ	−0.1422	−2.14	0.032	**	−0.1880	−3.83	0.000	***
ACIN	−0.5883	−2.17	0.030	**	−0.5148	−2.28	0.022	**
ACFE	−0.2418	−1.19	0.235		−0.2525	−1.25	0.211	
ACME	0.0726	1.77	0.076	*	0.0730	1.82	0.069	*
BIG4	−0.1259	−1.36	0.174		−0.2059	−2.32	0.021	**
OWNC	0.6691	2.50	0.013	**	0.5744	2.20	0.028	**
ROA	−4.1214	−6.07	0.000	***	−3.7945	−5.73	0.000	***
LEV	1.6845	5.60	0.000	***	1.7098	5.83	0.000	***
MTBV	−0.2636	−4.52	0.000	***	−0.3004	−5.60	0.000	***
SALGRO	0.0013	1.10	0.271		0.0014	1.43	0.153	
ABDA	1.3377	1.59	0.111		1.3458	1.63	0.103	
_cons	1.8676	3.00	0.003	**	0.8012	1.67	0.095	*
Industry	Included				Included			
Number of observations	1,056				1,056			
Wald Chi^2	314.77				589.83			
Probability > Chi^2	0.0000				0.0000			

Notes: *** significant at 0.01 level; ** significant at 0.05 level; * significant at 0.10 level. Table 2 summarises variables definitions

Table 5.
Multivariate analysis

role of the audit committee in reducing the REM level. However, ACME is found to be positively related to REM, suggesting that frequent meetings do not curb REM. This result indicates that more meetings may lead to a routine that makes members uncritical, consequently performing only a ceremonial function (Habbash *et al.*, 2012; Spira, 1999).

Regarding other control variables, the results show that ROA is negatively and significantly associated with REM, suggesting that companies with good performance are less likely to engage in EM. The study also shows that MTBV is negatively and significantly associated with REM, suggesting that companies with lower growth opportunities are more likely to practise REM. Similar to previous work, Anagnostopoulou and Tsekrekos (2016) and Jie *et al.* (2017), the present study finds a significant positive relationship between LEV and REM, suggesting that companies with high leverage practise more REM to avoid the violation of debt covenants. However, results show that SALGRO does not have a significant relationship with REM. The results also reveal that discretionary accruals (ABDA) are positively associated with REM but are not statistically significant. In line with the findings of previous studies (Das *et al.*, 2017; Roychowdhury, 2006), the results suggest that manufacturing companies practise both types of EM in the Malaysian market.

5. Additional robustness checks
5.1 Regression results for alternative REM measurements
As already mentioned, the current study follows previous researchers in measuring REM as an aggregate value of the residuals estimated by the three REM measurements (Chi *et al.*, 2011; Cohen *et al.*, 2008; Eng *et al.*, 2019). However, others point out that adding the amounts of abnormal production cost to those of abnormal CFO leads to double-counting, as these amounts result from the same activities (Cohen and Zarowin, 2010). Accordingly, researchers measure REM by combining the three residuals into two measurements: REM1 is the sum of discretionary expenses and abnormal production costs, and REM2 is the sum of abnormal discretionary expenses and abnormal operation cash flow (Abad *et al.*, 2018; Cohen and Zarowin, 2010). Therefore, the current study re-examined the FGLS estimation for REM1 and REM2. Table 6 reports the results for both models based on the two aggregate REM measurements. We found almost the same results as those from the main analysis, indicating that IIAF and IAFSOA are negatively and significantly associated with REM measured by different aggregate measurements.

5.2 Regression results with additional control variable
Researchers have argued that company size (CSIZE) has an effect on earnings management practices. Larger companies have more complex operations and more stockholders than do smaller companies. Prior studies disagree on the impact of CSIZE on earnings management (Siregar and Utama, 2008). Some researchers report a positive correlation between CSIZE and REM, suggesting that bigger companies are more likely to practise REM (Abad *et al.*, 2018; Ferentinou and Anagnostopoulou, 2016). However, Abdul Rahman and Ali (2006) and Klein (2002) document that large companies have less incentive to practise earnings management because of market monitoring. To control any possible effect of CSIZE on the main analysis results, we re-estimated our main models by including CSIZE in the regression, measured by the natural logarithm of total assets (Abad *et al.*, 2018; Ferentinou and Anagnostopoulou, 2016). The results reported in Table 7 show a significant positive relationship between CSIZE and REM, suggesting that large companies are more likely to practise REM. Our findings are robust in this new model, where IIAF and IAFSOA are negatively and significantly associated with REM.

| Variable | Model 1 (IIAF) | | | | | Model 2 (IAFSOA) | | | |
	REM Coefficient z-statistics		REM1 Coefficient z-statistics		REM2 Coefficient z-statistics		REM1 Coefficient z-statistics		REM2 Coefficient z-statistics
IIAF	-0.1340*** -3.74		-0.0146*** -5.99		-0.0113*** -5.44				
IAFSOA							-0.0294*** -4.43		-0.0109** -2.19
FMOC	-0.5033*** -5.71		-0.0287*** -4.43		-0.0258*** -5.19		-0.0237*** -3.66		-0.0211*** -4.28
BIND	0.4498 1.27		0.0047 0.17		0.0084 0.42		0.0113 0.41		0.0219 1.09
ACSZ	-0.1422** -2.14		-0.0177*** -3.96		0.0001 0.03		-0.0168*** -3.75		-0.0029 -0.88
ACIN	-0.5883** -2.17		-0.0674*** -3.32		-0.0270* -1.79		-0.0551*** -2.72		-0.0271* -1.82
ACFE	-0.2418 -1.19		-0.0053 -0.36		-0.0257** -2.21		-0.0069 -0.46		-0.0271** -2.29
ACME	0.0726* 1.77		0.0046* 1.67		0.0052** 2.34		0.0045* 1.66		0.0031 1.43
BIG4	-0.1259 -1.36		0.0005 0.07		-0.005 -0.98		-0.0032 -0.49		-0.0119** -2.44
OWNC	0.6691** 2.50		0.0196 0.95		0.0297* 1.88		0.0124 0.60		0.0221 1.42
ROA	-4.1214*** -6.07		-0.2364*** -5.22		-0.1692*** -4.52		-0.2392*** -5.26		-0.1677*** -4.48
LEV	1.6845*** 5.60		0.0584*** 2.85		0.0860*** 5.04		0.0520** 2.47		0.0765*** 4.55
MTBV	-0.2636*** -4.52		-0.0170*** -4.09		-0.0179*** -5.37		-0.0190*** -4.65		-0.0191*** -5.87
SALGRO	0.0013 1.10		0.000 0.44		0.000 -0.13		0.000 0.31		0.000 -5.87
ABRDA	1.3377 1.59		-0.0228 -0.45		0.0881* 1.81		-0.0167 -0.34		0.0921* 1.89

(continued)

Table 6.
Multivariate analysis
results of FGLS
regression with
alternative REM
measurements (REM,
REM1 and REM2)

Table 6.

Variable	Model 1 (IIAF) REM Coefficient z-statistics	Model 1 (IIAF) REM1 Coefficient z-statistics	Model 1 (IIAF) REM2 Coefficient z-statistics	Model 2 (IAFSOA) REM Coefficient z-statistics	Model 2 (IAFSOA) REM1 Coefficient z-statistics	Model 2 (IAFSOA) REM2 Coefficient z-statistics
Constant	1.8676*** 3.00	0.2972*** 7.04	0.1317*** 3.73	0.8012* 1.67	0.1351*** 3.77	0.027 0.96
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,056	1,056	1,056	1,056	1,056	1,056
Wald Chi^2	314.77	214.35	296.28	589.83	190.26	243.26
Probability > Chi^2	0.000	0.000	0.000	0.000	0.000	0.000

Notes: ***significant at 0.01 level; **significant at 0.05 level; * significant at 0.10 level. Table 2 summarises variables definitions

Table 7.
Results of FGLS
regression with
additional control
variable

Variable	Model 1 (IIAF)				Model 2 (IAFSOA)			
	Coefficient	z-value	p-value	Significance	Coefficient	z-value	p-value	Significant
IIAF	−0.2729	−6.06	0.000	***				
IAFSOA					−0.2617	−2.65	0.008	***
FMOC	−0.4895	−5.67	0.000	***	−0.4500	−5.11	0.000	***
BIND	0.3485	1.16	0.245		0.2090	0.72	0.469	
ACSZ	−0.1691	−3.02	0.003	***	−0.1887	−3.52	0.000	***
ACIN	−0.5792	−2.43	0.015	**	−0.5153	−2.21	0.027	**
ACFE	−0.1313	−0.66	0.506		−0.2359	−1.17	0.244	
ACME	0.0657	1.64	0.102		0.0704	1.75	0.080	*
BIG4	−0.2020	−2.16	0.031	**	−0.2440	−2.56	0.010	**
OWNC	0.4949	1.89	0.059	*	0.4968	1.86	0.062	*
ROA	−4.0384	−6.06	0.000	***	−3.8557	−5.78	0.000	***
LEV	1.5457	5.05	0.000	***	1.5959	5.21	0.000	***
MTBV	−0.2753	−4.93	0.000	***	−0.3197	−5.77	0.000	***
SALGRO	0.0013	1.24	0.214		0.0012	1.24	0.217	
ABDA	1.6163	1.95	0.052	*	1.3622	1.65	0.100	*
CSIZE	0.2252	4.53	0.000	***	0.0586	1.41	0.159	
_cons	−0.7315	−0.87	0.383		−0.3280	−0.37	0.711	
Industry	Yes				Yes			
Number of observation	1,056				1,056			
Wald Chi^2	534.23				494.04			
Probability > Chi^2	0.0000				0.0000			

Notes: ***Significant at 0.01 level; **significant at 0.05 level; *significant at 0.10 level. CSIZE is company size measured by the natural log of total assets. Table 2 summarises other variables definitions

5.3 Alternative regression estimation (OLS with robust standard errors)
As explained earlier (Section 3.4), both heteroscedasticity and autocorrelation problems are present in our research models. Although we ran FGLS to control the coefficient estimates for heteroscedasticity and autocorrelation (Baltagi, 2011; Kouaib and Jarboui, 2016; Wooldridge, 2010), we further use OLS with robust standard errors to ensure the robustness of the main results of this study. Untabulated results show a significant negative relationship of both the IIAF and AIF sourcing arrangements with REM. The results confirm the main findings reported in Table 5, suggesting that IAF plays a potential role in curbing REM in the Malaysian market.

6. Conclusions

In recent years, there has been a significant increase in public knowledge of both AEM and REM and a corresponding increase in the quality of financial reporting. Although AEM has received much attention from researchers, REM is considered an emerging topic that is only now attracting attention because companies prefer to use REM rather than AEM. The current role of IAF is to boost governance monitoring across the organisation's insider activities. This study investigates whether the IIAF and IAF sourcing mitigates REM in the Malaysian market. Our results show that companies that make more IIAF are more likely to practise less REM. The results also show that in-house IAF is more effective in reducing REM than outsourcing it. These findings indicate that well-funded and in-house IAF has a significant role in reducing REM practices. Our results are robust under alternative regression models and REM measurements.

The results of our paper have implications for the value of IAF to regulators, managers, shareholders and researchers. Regulators may consider the valuable roles played by IAF in reducing earnings management practices and encourage companies to enhance the quality of IAF. Managers or board members may consider that establishing in-house IAF and greater IIAF are two determinants of effective IAF in curbing REM. Shareholders could gain a better understanding of the potential role of IAF in curbing REM, considering the IIAF as a necessary cost that may protect their interests and wealth. Earnings management researchers should pay attention to IAF as an effective form of internal governance monitoring in curbing not only AEM but also REM.

The results of this study are subject to some limitations. First, all the observations are from listed manufacturing companies and do not reflect the whole market; generalising the results is, therefore, limited to similar sectors in the markets that have the same institutional setting. Second, using REM measurements other than those used in this study may result in different findings. Therefore, the validity of the evidence is subject to the measurements used in the current study. Further research may investigate the association between IAF characteristics other than investment in and sourcing arrangements that may have a different effect on REM. Researchers may also examine the role of IIAF and external audit on the company's trade-off between REM and AEM, especially with the evidence that external auditors are more effective in curbing managerial opportunism through AEM but not REM (Chi *et al.*, 2011; Lin and Hwang, 2010). Valuable insights may also be offered through qualitative research, such as interviews with managers and internal auditors regarding REM.

Notes

1. Advertising and R&D expenses are considered as zero when the data are missing (Cohen and Zarowin, 2010; Roychowdhury, 2006).
2. This study uses the Jones' model (1991) for measuring ABDA as a residual from the following equation: ($\frac{DA_t}{Assets_{t-1}} = \frac{1}{Assets_{t-1}} + \frac{\triangle REV_t}{Assets_{t-1}} + \frac{PPE_t}{Assets_{t-1}} + \varepsilon_t$), where DA_t = company's total accruals at

year t; $Assets_{t-1}$ = company's total assets in year $t - 1$; ΔREV_t = company's change in sales in year t; and PPE_t = company's property, plant and equipment at year t.

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