

## DETERMINANTS OF REAL EARNINGS MANAGEMENT IN A DEVELOPING ECONOMY: THE RISK STRUCTURE AND AUDIT QUALITY

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### Abstract

Firm's risk structure and audit quality are considered as two of the most important factors which affect earnings management. Thus, this study aims to examine how the risk structure and audit quality affect real earnings management from the context of a developing economy. The risk structure in this study is classified into operational risk and financial risk which are proxied by Degree of Operating Leverage (DOL) and Degree of Financial Leverage (DFL), respectively. Audit quality is measured by Big-N audit firms clients and auditor industry specialization. This study employs the Roychowdhury real earnings management model which comprises of sales manipulation, discretionary cost reduction, and overproduction. This study's sample is 219 firm-years of manufacturing companies listed on the Indonesia Stock Exchange between 2014 and 2016. The results show that auditor's affiliation with Big-N audit firms are more effective than industry specialization in reducing real earnings management practices.

**Keywords:** Real Earnings Management, Risk Structure, Audit Quality, DOL, DFL.

### I. INTRODUCTION

This study seeks to empirically examine whether risk structure and audit quality are associated with real earnings management from the perspective of a developing economy. Earnings and other measures of performance such as return on investment and earnings per share encourages management to report result which is in line with management's expectation and specific goals such as deciding on capital investment and honoring contracts' covenant. Therefore, earnings information is susceptible of being managed.

Before the revelation of the ENRON Corp. and Xerox Corp. fraud cases, earnings management is generally performed by managing accounting policies through discretionary accruals [1]. Managers engage in earnings management by managing discretionary accounting policies such as accruals to adjust the company's profits to be higher or lower based on management objectives. Consequently, earnings management distorts earnings figure which in turn will mislead stakeholders about the company's true economic performance or influence the outcome of contracts that depend on reported accounting practices [2].

However, the second type of earnings management involves managing company's actual business activities [3]. Prior study shows that financial executives show a greater willingness to manipulate

income through actual activity than managing accounting accruals [4].

The increase in earnings reflects the company's good performance. Real earnings management deviates from true earnings by increasing reported earnings over the current period [3]. Roychowdhury [5] found that real earnings management is conducted by increasing sales, reducing discretionary costs, and increasing production. However, various factors are considered by managers when engaging in real earnings management, including the company's risk structure and also the quality of the company's audits.

The risk structures employed in this study cover both the operational and financial risks. Companies with low operational and financial risks are more likely to increase profits through real earnings management compared to accruals earnings management. Conversely, highly leveraged companies have lower levels of real earnings management [6]. Thus, companies with high risk structure are more likely to engage in real earnings management which will further increase the company's risk, and adversely investors' performance judgment.

In addition to a company's risk structure, earnings management is often associated with audit quality. Nastiti and Gumanti [7], Khalil and Ozkan [8], and Sanjaya [9] found that audit quality negatively affects earnings management and reduces the prevalence of real earnings management. Audit quality proxied with auditor industry's specialization has negative

association with earnings management. On the other hand, Christiani and Nugrahanti [10] show that firms audited by Big-N auditors do not affect earnings management. The inconsistency of prior empirical studies and the lack of studies examining risk structure, audit quality and real earnings management in the context of a developing country motivate this study.

## II. LITERATUR REVIEW & HYPOTHESES

### A. Real Earnings Management

Earnings management occurs when managers intend to amend financial statements accounts related to a company's economic performance or influence the outcome of contracts that depend on reported accounting numbers [2]. In line with the agency's theory, management seeks to maximize compensation, avoids breaching obligations in bond debt agreements that protect dividend payments, and minimizes profit reporting to prevent government interference [11].

According to Roychowdhury [5], real earnings management can be carried out through 3 methods: sales manipulation, discretionary cost reduction, and overproduction. Sales manipulation increases sales temporarily by offering discounted prices and relaxing credits requirements. As a result, increase in sales volumes causes high current year profits but a lower future cash flow due to credit sales and rebates. Discretionary cost reductions can be made on advertising, research and development, sales, and general and administrative costs which inflate profits.

Lastly, overproduction is the production of goods that are greater than the company's projected sales. Excess inventory causes the average cost per unit to decrease which will lead to a lower reported cost of goods sold and higher operating margins.

### B. Risk Structure

The company's risk is one of the most important considerations in performance assessment. This study considers two types of corporate risks: operating risks and financial risks. Operating risk describes the extent in which fixed costs are used within the company [12]. The company has a high operational risk if most of the incurred costs is fixed costs. Operating risk can be measured by Degree of Operating Leverage (DOL) that reflects changes or fluctuations in operating profits due to changes in sales [13]. Companies with higher operation leverage incurs a higher business risk [12]. A higher operation leverage is observed if a higher proportion of fixed costs are used relative to variable costs where the value of contribution margin increases [14].

Financial risk is the extent in which fixed financing (debt and preferred shares) represents the

company's capital structure. Financial risk is measured by Degree of Financial Leverage (DFL) that reflects changes or fluctuations in profits per share due to operating profits where financial leverage is positively associated with financial risk.

### C. Audit Quality

Kane and Velury [15] define audit quality as external auditors' capacity to detect material errors and other forms of deviation from accounting standards. Because manipulation of financial statements can degrade the quality of information and eliminate the trust of various parties, auditors are expected to detect and reduce earnings management practices, both accrual and real. Following prior literature [15], this study measured audit quality with two variables: firms' affiliation with Big-N audit firms and auditor industry specialization. In this study, audit firms affiliated with Big-4 audit firms are KAP Satrio Bing Eny & Rekan (Deloitte); KAP Tanudiredja, Wibisana, Rintis, & Rekan ((PwC); KAP Purwantono, Sungkoro, & Surja (EY); and KAP Siddharta, Widjaja, & Rekan (KPMG). Meanwhile, the auditor industry specialization is a dummy that is classified based on the percentage of the number of companies audited by auditors in a particular industry. Auditors are specialists if auditing at least 15% of the total companies in the industry [10]. Discussion on auditor industry specialization literature is covered in Part G, Section II of this paper.

### D. The Effect of Operational Risk on Real Earnings Management

Jelinek [16] found that companies with higher leverage have lower earnings management which implies that the company's operational risks affect real earnings management [1]. Companies with low Degree of Operating Leverage (DOL) are more likely to engage in earnings management that increases profits through real activities such as increasing sales, reducing discretionary costs, and increasing production. Conversely, companies with a high DOL tend to perform real earnings management that lowers its profit. Peranasari and Dharmadiaksa's [17] stated that operating leverage is positively associated with profit-levelling practices.

Companies with high DOL are less likely to participate in real earnings management practices because management does not want to increase the risk of existing businesses and maintain its credibility in the eyes of investors. Conversely, when DOL is lower, companies are more likely to engage in real earnings management. Real earnings management can be done through sales manipulation, discretionary cost reduction, and overproduction.

Sales manipulation could be conducted through managing sales volumes, provision of discounts, and

less restrictive credit to customers. Management may also reduce discretionary costs to report an increased profit. Management may also engage in overproduction that will result in a lower cost of goods sold in the short-term. Thus, the association between DOL and real earnings management is hypothesized as follows:

**H1a:** Company's DOL is negatively associated with real earnings management through sales manipulation.

**H1b:** Company's DOL is negatively associated with real earnings management through discretionary cost reduction.

**H1c:** Company's DOL is negatively associated with real earnings management through overproduction.

#### *E. The Effect of Financial Risk on Real Earnings Management*

Pangaribuan and Ekawati [1] found that the company's financial risks affect real earnings management. Companies with low Degree of Financial Leverage (DFL) tend to perform real earnings management to increase the company's profits. Conversely, when companies have a high DFL, managements are more likely to engage in real earnings management to lower profit. Consistent with the findings of Peranasari and Dharmadiaksa [17] that companies with higher level of financial risk are incentivized to adjust profits in order to avoid violations of debt covenants.

Similar to business risk, the increase in financial risk is also hypothesized to limit real earnings management practices because management wants to avoid increasing financial risks and maintain the company's credibility in the eyes of investors. When DFL values are high, the sensitivity of EPS changes relative to EBIT changes is also high. A relatively high increase in EPS is expected even if a small proportion of the EBIT is boosted by real earnings management through sales manipulation, discretionary reduction, and overproduction. Thus, companies with higher DFL are disincentivized to engage in real earnings management due to the increase in financial risk.

Conversely, when DFL values are lower, companies are more likely to perform real earnings management through sales manipulation, discretionary cost reduction, and overproduction. In this scenario, companies with lower DFL have higher allowance to engage in real earnings management that will contribute to higher EPS without incurring significant financial risks. Thus, the proposed hypothesis on the relationship between DFL and real earnings management is expressed as follow:

**H2a:** Company's DFL is negatively associated with real earnings management through sales manipulation.

**H2b:** Company's DFL is negatively associated with real earnings management through discretionary cost reduction.

**H2c:** Company's DFL is negatively associated with real earnings management through overproduction.

#### *F. The Effect of Big-4 Audit Firms on Real Earnings Management*

The size of an audit firm can be considered as one of the determinants of audit quality [18]. This study classified audit firms into two categories: Big-4 audit firms and non-Big-4 audit firms. Gerayli et al. [19] and Sanjaya [9] found that audit firm size negatively affects accrual and real earnings management which implies that Big-4 audit firms could reduce real earnings management practices [20].

An audit firm affiliated with a Big-4 audit firm is believed to have a higher audit quality due to higher quality training, better access to a more sophisticated audit technology or resources, and higher reputational risk. These characteristics contribute to a higher effectiveness in preventing or minimizing the practice of real earnings management. Thus, we proposed that the relationship between Big-4 audit firms and real earnings management is hypothesized as follow:

**H3a:** Companies audited by Big-4 audit firms have a lesser degree of real earnings management through sales manipulation compared to companies audited by non-Big-4 auditors.

**H3b:** Companies audited by Big-4 audit firms have a lesser degree of real earnings management through discretionary cost reduction compared to companies audited by non-Big-4 auditors.

**H3c:** Companies audited by Big-4 audit firms have a lesser degree of real earnings management through overproduction to companies audited by non-Big-4 auditors.

#### *G. The Effect of Auditor Industry Specialization on Real Earnings Management*

Industry specialization provides public accounting firms with a mean to achieve product differentiation and provide higher audit quality to their clients within a particular industry. Auditor's industry specialization arises due to the auditor's experience in serving many clients in the same industry [21]. Therefore, the auditor's industry specialization contributes to a effective audit [22]. Gerayli et al. [19] found a negative relationship between the auditor's industry specialization and earnings management. Rusmin [23] found a negative relationship between auditors' specialization and absolute discretionary accrual, which implies that the auditor's industry specialization can limit earnings management practices.

Auditors' industry specialization represents another dimension of audit quality [24]. The industry specialization is developed by expanding auditing experience, staff training, and investing in audit-related information technology. Relative to non-specialized auditors, industry knowledge helps specialized auditors provide higher quality audit services to clients by limiting the discretionary behavior of management. Auditors with industry specialization are more likely to have high reputation which incentivizes the audit firms to better scrutinize management's real earnings management. Consistent with prior hypothesis, the relationship between auditor industry specialization and real earnings management is hypothesized as follows:

**H4a:** Companies audited by industry specialized auditors have a lesser degree of real earnings management practices through sales manipulation.

**H4b:** Companies audited by industry specialized auditors have a lesser degree of real earnings management practices through discretionary cost reduction.

**H4c:** Companies audited by industry specialized auditors have a lesser degree of real earnings management practices through overproduction.

### III. METHODS

This study examines a sample of companies listed in the Indonesia Stock Exchange (IDX) from 2014-2016. Specifically, the sample of this study covers manufacturing companies in the Basic Industry and Chemicals, Miscellaneous Industry, and Consumer Goods Industry sectors. Regression analysis was performed to find normal and abnormal estimates of operating cash flows, discretionary costs, and production costs. Then we measured the risk structure (DOL and DFL) and audit quality (Big-N audit firms and auditor industry specialization). Finally, multivariate regression analysis is conducted to test each hypothesis simultaneously or partially. The study employed company size, ROA, and market to book as control variables in the regression model. The multivariate linear regression models is presented as follow:

$$REM_t = a + \beta_1 DOL_t + \beta_2 DFL_t + \beta_3 UKAP_t + \beta_4 SIA_t + \beta_5 SIZE_t + \beta_6 ROA_{t-1} + \beta_7 MTB_t + \varepsilon_t \quad (1)$$

#### Annotation:

$REM_t$  : real earnings management, which is classified as abnormal CFO (ABN\_CFO), abnormal production (ABN\_PROD), or abnormal discretionary (ABN\_DISEXP).

$DOL_t$  : operating leverage (percentage change in EBIT in year t scaled by the percentage change in sales in year t).

$DFL_t$  : financial leverage (percentage change in EPS in year t scaled by the percentage change in EBIT in year t).

$UKAP_t$ : dummy variable, equals to 1 for companies audited by Big-4 affiliated audit firms and 0 for companies audited non-Big-4 affiliated audit firms.

$SIA_t$  : dummy variables, equals to 1 for companies audited by industry specialist auditors and 0 for companies audited by non-industry specialist auditors.

$SIZE_t$  : the size of the company measured as the natural logarithm of total assets in the year t.

$ROA_{t-1}$  : return on assets (calculated as earnings after tax scaled by total assets) in year t-1.

$MTB_t$  : market price per share scaled by the equity book value (in year t).

$\varepsilon_t$  : error term in year t.

This study measured the extent of real earnings management ( $REM_t$ ) following Roychowdhury [5] from three perspectives:

#### a. Sales Manipulation

Sales manipulation is represented with abnormal operating cash flows (ABN\_CFO) resulting from actual operating cash flow minus normal operating cash flow. Actual operating cash flows were scaled to the previous year's total assets. Normal operating cash flow is calculated from estimating the coefficients of the following regression equation:

$$\frac{CFO_t}{A_{t-1}} = \alpha_0 + \alpha_1 \left( \frac{1}{A_{t-1}} \right) + \beta_1 \left( \frac{S_t}{A_{t-1}} \right) + \beta_2 \left( \frac{\Delta S_t}{A_{t-1}} \right) + \varepsilon_t \quad (2)$$

where:

$CFO_t$ : operating cash flow in year t

$A_{t-1}$ : total assets in year t-1

$S_t$ : sales in year t

$\Delta S_t$ : sales in the year t minus sales in the year t-1

$\varepsilon_t$ : error term in year t

Real earnings management through sales manipulation occurs if ABN\_CFO is negative.

#### b. Discretionary Cost Reduction

Discretionary costs reduction is represented by abnormal discretionary costs (ABN\_DISEXP), i.e., actual discretionary costs minus normal discretionary costs. Actual discretionary costs are the sum of advertising costs, sales costs, research and development costs, and administrative and general costs; which is scaled by the previous year's total assets. Normal discretionary costs are calculated from estimating the coefficients of the following regression equations:

$$\frac{DISEXP_t}{A_{t-1}} = \alpha_0 + \alpha_1 \left( \frac{1}{A_{t-1}} \right) + \beta_1 \left( \frac{S_t}{A_{t-1}} \right) + \varepsilon_t \quad (4)$$

where:

- DISEXP<sub>t</sub>: operating cash flow in year t
- A<sub>t-1</sub>: total assets in year t-1
- S<sub>t</sub>: sales in year t
- ε<sub>t</sub>: error term in year t

Real earnings management via discretionary costs manipulation occurs if the ABN\_DISEXP is negative.

c. Overproduction

Overproduction is calculated by abnormal production costs (ABN\_PROD), i.e. the result of actual production costs minus normal production costs. Actual production costs are the sum of the cost of goods sold (COGS) and changes in inventory in the current year, then scaled to the total assets of the previous year. Normal production costs are calculated by estimating the coefficients of the following regression equation:

$$\frac{PROD_t}{A_{t-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{A_{t-1}}\right) + \beta_1 \left(\frac{S_t}{A_{t-1}}\right) + \beta_2 \left(\frac{\Delta S_t}{A_{t-1}}\right) + \beta_3 \left(\frac{\Delta S_{t-1}}{A_{t-1}}\right) + \varepsilon_t \quad (3)$$

where:

- PROD<sub>t</sub>: production costs in year t
- A<sub>t-1</sub>: total assets in year t-1
- S<sub>t</sub>: sales in year t
- ΔS<sub>t</sub>: sales in the year t minus sales in the year t-1
- ΔS<sub>t-1</sub>: changes in sales in the t-1 year
- ε<sub>t</sub>: error term in year t

Real earnings management by overproduction occurs if the ABN\_PROD is positive.

IV. RESULTS AND DISCUSSION

Based on the sample selection criteria – companies listed in the Indonesia Stock Exchange (IDX) with complete financial information from 2014-2016 that operate in the Basic Industry and Chemicals, Miscellaneous Industry, and Consumer Goods Industry sectors – 73 out of the 145 companies met the criteria. The final number of the sample for the period 2014-2016 is 219 firm-years. The descriptive statistics of the sample is presented in Table I.

TABLE I. DESCRIPTIVE STATISTICS

	N	Min.	Max.	Mean	Std. Dev.
ABN_CFO	219	-0,3840	0,4928	-0,000002	0,1212781
ABN_DISEXP	219	-0,4774	0,5034	-0,001498	0,1224204
ABN_PROD	219	-0,9057	0,6284	-0,018266	0,2376939
DOL	219	-54,33	52,52	0,9159	14,88563
DFL	219	-27,95	36,35	0,2594	7,79266
SIZE	219	10,92	18,39	14,5706	1,52523
ROA_1	219	-22,23	42,10	6,9381	9,88703
MTB	219	-2,70	25,47	2,6658	4,48564
Dummy variables	0		1		
UKAP	219	130	89		
SIA	219	168	51		

The average value of negative ABN\_CFO and ABN\_DISEXP indicates that the observed sample

conducted real earnings management through operating cash flow and discretionary cost reduction. Negative ABN\_PROD showed that 1.83% of the study year samples did not overproduce to increase profits.

DOL is an operating leverage level variable with a positive average value of 0.9159, a maximum value of 52.52 and a minimum of -54.33. It indicates that the sample company is at considerable operational risk. Similarly, the financial risk of samples projected with DFL indicates considerable risk. Descriptive statistics for the three control variables are presented: company size (SIZE), the return rate of assets of the previous year (ROA\_1), and market-to-book (MTB). The previous year's ROA had a minimum value of -22.23 and a maximum value of 42.10, with a positive average of 6.9381. It shows that in average the sample has a reasonably good financial performance. Finally, the MTB variable has a minimum value of -2.70 and a maximum value of 25.47, with a positive average value of 2.6658. It shows that in average the sample is actively traded in the market.

UKAP values measured by dummy variables show that 89 companies (40,6% of total sample) were audited by firms affiliated with the Big-4. In addition, companies audited by public accounting firms specializing in the auditor industry amounted to 51 companies (23,3% of total sample). It shows that most of the sample companies are audited by non-Big-4 auditors and have no industry specialization.

TABLE II. GLEISER TEST RESULTS

Model	ABN_CFO		ABN_DISEXP		ABN_PROD	
	t	Sig.	t	Sig.	t	Sig.
(Constant)	2,347	0,020	2,243	.026	3,291	0,001
DOL	-0,444	0,658	-1,516	.131	-0,642	0,521
DFL	1,243	0,215	.260	.795	1,159	0,248
UKAP	.995	0,321	.144	.886	-.110	0,912
SIA	-1,880	0,062	-.207	.836	1,617	0,107
SIZE	-.280	0,779	-.067	.946	-1,487	0,138
ROA_1	-1,191	0,235	.934	.352	1,095	0,275
MTB	1,865	0,064	1,280	.202	1,902	0,059

TABLE III. MULTICOLLINEARITY TEST RESULT

Model	ABN_CFO		ABN_DISEXP		ABN_PROD	
	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF
(Constant)						
DOL	0.956	1.046	0.956	1.046	0.956	1.046
DFL	0.985	1.015	0.985	1.015	0.985	1.015
UKAP	0.406	2.462	0.406	2.462	0.406	2.462
SIA	0.496	2.018	0.496	2.018	0.496	2.018
SIZE	0.738	1.355	0.738	1.355	0.738	1.355
ROA_1	0.562	1.781	0.562	1.781	0.562	1.781
MTB	0.505	1.982	0.505	1.982	0.505	1.982

Before testing the hypothesis, we conducted a series of regression assumptions tests so that the regression models used in the study have appropriate parametric value. The Kolmogorov-Smirnov (K-S)

normality tests showed that the empirical data was normally distributed. K-S results calculated for ABN\_CFO (0.65); ABN\_DISEXP (0.83); ABN\_PROD (0.80) all show values less than K-S table (0.09190). While the Glejser Test showed that the regression models employed in the study was free of heteroskedasticity problems. Significance values (Sig.) for all independent variables on all three models show values greater than 0.05 (see Table II). Last, the multicollinearity test measured variance inflation factor (VIF) and tolerance values, which showed that there was no multicollinearity between independent variables in the three regression models. Table III shows that all VIF values are worth less than 10 and all tolerance values are over 0.01.

The results from Table V showed that operating risks proxied with DOL weakly reduced real earnings management via discretionary cost reduction. These results are consistent with Pangaribuan and Ekawati [1], which found that operational risks affect real earnings management behavior. Table IV and VI showed that financial risks proxied with DFL negatively affect real earnings management through sales manipulation. However, DFL has a statistically significant positive effect on real earnings management through overproduction. The results suggest that companies with higher financial risk incentivize managers to engage in real earnings management through overproduction while reducing real earnings management from sales manipulation. Companies with high financial risk characteristics such as companies with a higher proportion of liabilities compared to assets might be pressured to perform earnings management due to threat of bankruptcy, which is triggered when management could not pay liabilities that are due. These findings are inconsistent with Zamri et al. [6], who found that leverage prevents real earnings management. The findings are also inconsistent with Pangaribuan and Ekawati [1], which found that when financial risks are lower, companies tend to do real earnings management. However, these findings were consistent with Pujilestari and Herusetya [25] and Yulia [26], who found that the companies with higher financial risk are engaging in a more extensive real earnings management.

Table IV shows that Big-4 firms have a limited effectiveness in reducing earnings management practices through sales manipulation. Revenue accounts are one of the accounts the highest inherent audit risk. Therefore, this result could explain the effectiveness of risk-based audit procedures in detecting inappropriate accounting policies. Nevertheless, the effectiveness of this procedure is limited due to management's discretion in performing certain sales policies such as discounting to increase sales that is still reasonable. The results are consistent

with Junius and Fitriany's [27] study, which found that audit firms affiliated with Big-4 audit firms can detect sales manipulation. However, the study was inconsistent with Sanjaya [9], who found that auditors could not prevent real earnings management practices through sales policies.

TABLE IV. ESTIMATION RESULTS OF REAL EARNINGS MANAGEMENT VIA SALES MANIPULATION (DEPENDENT VARIABLE = ABN\_CFO)

Variable	Coef.	t-stat.	p-val.
<i>Constant</i>	0,026	0,382	0,703
<b>DOL</b>	<b>0,001</b>	<b>1,440</b>	<b>0,151</b>
<b>DFL</b>	<b>-0,002</b>	<b>-2,059</b>	<b>0,041**</b>
<b>UKAP</b>	<b>0,036</b>	<b>1,773</b>	<b>0,078*</b>
<b>SIA</b>	<b>-0,006</b>	<b>-0,295</b>	<b>0,768</b>
SIZE	-0,006	-1,270	0,206
ROA_1	0,006	6,489	0,000***
MTB	0,004	2,192	0,029**
<i>Adjusted R Square</i>	0,390		
F-Statistics	20,944		
Prob. F-Statistics	0,000		
N	219		

\*, \*\* and \*\*\* represent statistical significance at the 10%, 5%, and 1% level, respectively.

TABLE V. ESTIMATION RESULTS OF REAL EARNINGS MANAGEMENT VIA DISCRETIONARY COST REDUCTION (DEPENDENT VARIABLE = ABN\_DISEXP)

Variable	Coef.	t-stat.	p-val.
<i>Constant</i>	0,024	0,277	0,782
<b>DOL</b>	<b>-0,001</b>	<b>-1,836</b>	<b>0,068*</b>
<b>DFL</b>	<b>-0,001</b>	<b>-6,641</b>	<b>0,522</b>
<b>UKAP</b>	<b>0,021</b>	<b>0,830</b>	<b>0,407</b>
<b>SIA</b>	<b>0,005</b>	<b>0,179</b>	<b>0,858</b>
SIZE	-0,005	-0,880	0,380
ROA_1	0,004	4,020	0,000***
MTB	0,006	2,343	0,020**
<i>Adjusted R Square</i>	0,232		
F-Statistics	10,411		
Prob. F-Statistics	0,000		
N	219		

\*, \*\* and \*\*\* represent statistical significance at the 10%, 5%, and 1% level, respectively.

TABLE VI. ESTIMATION RESULTS OF REAL EARNINGS MANAGEMENT VIA OVERPRODUCTION (DEPENDENT VARIABLE = ABN\_PROD)

Variable	Coef.	t-stat.	p-val.
<i>Constant</i>	-0,150	-1,221	0,224
<b>DOL</b>	<b>0,001</b>	<b>1,210</b>	<b>0,228</b>
<b>DFL</b>	<b>0,003</b>	<b>2,269</b>	<b>0,024**</b>
<b>UKAP</b>	<b>-0,081</b>	<b>-2,226</b>	<b>0,027**</b>
<b>SIA</b>	<b>0,006</b>	<b>0,152</b>	<b>0,879</b>
SIZE	0,019	2,163	0,032**
ROA_1	-0,011	-7,387	0,000***
MTB	-0,013	-3,555	0,000***
<i>Adjusted R Square</i>	0,499		
F-Statistics	32,013		
Prob. F-Statistics	0,000		
N	219		

\*, \*\* and \*\*\* represent statistical significance at the 10%, 5%, and 1% level, respectively.

Table V showed that Big-4 audit firms did not affect real earnings management through discretionary

cost reductions which include general and administrative cost, advertising, and research and development. Areas of discretionary cost reduction covered in this study include general and administrative cost, advertising, and research and development. Table VI showed that Big-4 audit firms significantly reduce real earnings management through overproduction. Thus, the study supports Sanjaya's [9] finding that quality audits can detect and prevent real earnings management through overproduction.

Results from Table IV, V, and VI showed that auditor industry specialization were not associated with real earnings management through sales manipulation, discretionary cost reduction, or overproduction. These results imply that industry specialist auditors were not focused on detecting and mitigating real earnings management [28]. It can be argued that auditor's industry specialization is more effective in detecting accruals or financial-statements based earnings management than real earnings management via product sales, production processes, and discretionary cost reduction processes [27]. This argument is supported by the findings of Chi et al. [20] which found that the existence of industry specialization auditors limited the company's accrual earnings management and increased the prevalence of real earnings management

## V. CONCLUSION

Based on the empirical results, it can be concluded that operational risks weakly reduce real earnings management through via discretionary cost reduction. Second, companies with high financial risk reduce real earnings management through sales manipulation and overproduction. Third, companies audited by Big-4 affiliated audit firms show negative association with real earnings manipulation through overproduction and sales manipulation. Fourth, an audit firm's industry specialization is not associated with the prevalence of real earnings management practices through sales manipulation, discretionary cost reduction, and overproduction. Overall, this study found that audit firm's affiliation with Big-4 auditors is more effective than industry specialization in preventing real earnings management practices.

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