Does Executive Compensation Affect Accounting Irregularities? Evidence From Listed Firms in Indonesia

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Abstract
This research examined the association between executive compensation and accounting irregularities in Indonesia. Employing 1,100 firm-year observations during 2014 to 2017 period, we found that executive compensation is positively associated with accounting irregularities. This result is robust after we mitigated a serial order correlation of accounting irregularities and a self-selection bias using propensity score matching. We also discovered a positive relationship after considering alternative measures of accounting irregularities. Furthermore, we documented that the positive association between executive compensation and accounting irregularities is stronger for firms with higher board independence. Our findings provide important insights for regulators and Asian emerging market regulators who are considering promoting equity incentives for listed firms.

Keywords
executive compensation, accounting irregularities, board independence, CEO compensation, emerging markets

Introduction
Executive compensation is frequently linked to the performance of the company to promote goal alignment. However, this mechanism potentially creates an incentive for executives to manipulate their company’s performance. Evidently, there is a linear movement between executive compensation and accounting irregularities. Despite such association, it is worth noting that researchers find mixed evidence on the relationship between executive compensation and financial irregularities (see, e.g., Bergstresser & Philippon, 2006; Burns & Kedia, 2006; Chu & Song, 2012; Erickson et al., 2006; Harris & Bromiley, 2007). Majority of the evidence, however, are documented from developed countries such as United Kingdom, U.S., Australia, and others. The paucity of evidence in emerging countries setting is mainly attributed due to the lack of disclosure requirements on executive compensation (Wahyuni et al., 2020). As such, this study aims to fill in the gap on the issues on whether executive compensation can lead to accounting irregularities in a developing country setting, specifically, Indonesia.

Indonesia offers an exciting insight to examine the association between executive compensation and accounting irregularities for several reasons. First, regarding the size of capital market, stock exchange in Indonesia is expected to be Southeast Asia’s largest capital market because of its $529 billion valuation (Miller & Nguyen, 2020). Second, despite its potential size and significance, Indonesian capital market environment still requires some improvements. In fact, Brown et al. (2014) classified Indonesia in low rank category (i.e., 46 from 51 jurisdictions) according to their audit regulation and accounting enforcement categorization. Third, upon the decision to converge national accounting standard with International Financial Reporting Standards (IFRS) in 2008, Indonesia had adopted International Accounting Standards (IAS) 24 “Related Party Disclosures” in 2011 into its local standard of Pernyataan Standar Akuntansi Keuangan (PSAK) 7. The standard requires the disclosure of key management compensation and also the disclosure of related parties’ relationships, transactions, and balances, including commitments, in the financial statements (Wahyuni et al., 2020). This enable us to glean the data regarding executive compensation in Indonesian listed firms. Finally, financial reporting misrepresentations in Indonesia are rampant. For

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instance, accounting fraud in PT Indosat Tbk, PT Bank Bukopin Tbk, PT Hanson International, and recently, PT Garuda Indonesia Tbk—a national commercial carrier, offer indication that accounting misdemeanors persist (Soepriyanto & Zudana, 2020).

The motivation of this study is threefold. First, whilst the study of executive compensation in Asia has been addressed in several research (see, e.g., S. L. Sun et al., 2010), a specific investigation to examine executive compensation and accounting irregularities is limited. Conyon and He (2016) empirically investigate how corporate fraud affects Chinese executive compensation. Hass et al. (2016) explores how managers’ and supervisors’ equity incentives impact the likelihood of committing corporate fraud in Chinese-listed firms. Apart from those studies in China, there is a paucity of study to examine the association between executive compensation and related accounting misdemeanor. This study seeks to extend our understanding on how executive compensation can affect financial reporting numbers in a different setting, namely Indonesia. Indeed, Indonesia and other Asia emerging market countries are unique given the status of institutional context, ownership, and board characteristics (see for details in Oehmichen, 2018).

Second, there was a recent scandal of accounting irregularities driven by executive compensation in Indonesia. PT Bank Bukopin, one of prominent commercial banks in Indonesia, has made several modifications on its financial reports in 2015, 2016, and 2017, particularly on the net income as well as fees and commissions which included income from credit cards and an allowance for impairment losses on financial assets (Arief, 2018). Such revelation was linked with PT Bank Bukopin’s plan in September 2018, to issue stock options through its Management Employee Stock Option Program (MESOP) by issuing 347,383,400 shares or 2.90% from the additional paid-in capital, which amounted to Rp1.12 trillion. From this case, it shows that there may be a link between executive compensation and accounting irregularities.

Finally, according to a recent survey conducted by the Association of Certified Fraud Examiners (ACFE) in 2017, most of the fraud perpetrators were at the management level, which included the executive members (ACFE, 2017). At the same time, the director of IDX is currently promoting and encouraging the Employee Stock Option Program (ESOP) and Management Stock Option Program (MSOP) for Indonesian firms (Hariana, 2018). In that case, executive compensation may play an important role in accounting irregularities in Indonesia. The effects of executive compensation on accounting irregularity practices may be further aggravated by Indonesia’s high level of executive salaries and bonuses.

By investigating the association between executive compensation and accounting misreporting in Indonesia, we offer some contributions. First, we fill the gap in a paucity of research that examine the association between executive compensation and accounting irregularities in a developing market environment. As such, this research offers insights concerning executive compensation and financial reporting misrepresentation in an under-researched area and to enhance executive compensation and financial reporting regulations beyond Indonesian context, including bordering nations that share comparable political and socioeconomic factors.

Next, we contribute to the existing Indonesian regulators, that is, the Financial Service Authority (OJK), the Finance Ministry, the management board of the Indonesia Stock Exchange (IDX), and other accounting professionals, particularly in the context of executive compensation and accounting irregularities. As the director of IDX is currently promoting and encouraging the MSOP and ESOP to Indonesian firms (Hariana, 2018), we provide evidence that may be useful for those regulators in formulating additional rules to mitigate the negative effects of executive compensation on accounting irregularities. Finally, we add to the literature that examines the effects of executive compensation on accounting transgressions (Armstrong et al., 2010; Baber et al., 2007; Bergstresser & Philippon, 2006; Burns & Kedia, 2006; Chu & Song, 2012; Denis et al., 2006; Efendi et al., 2007, Erickson et al., 2006; Harris & Bromiley, 2007). More specifically, we extend those studies using an Indonesian context.

Using a sample of 1,100 firm-year observations on Indonesian listed firms over the period of 2014 to 2017, we find that executive compensation is positively related to accounting irregularities. The result is robust after we mitigate an endogeneity test using a propensity score matching approach. We remain to find a positive relationship between executive compensation and accounting irregularities using an alternative measure of accounting misreporting. The results are robust after we mitigate a self-selection bias and a serial order correlation of accounting irregularities that may influence our results. Our results are also economically meaningful. An increase of executive compensation by one standard deviation is related to a 4.08% level increase of accounting irregularities. Following Brogaard et al. (2017), we multiply the executive compensation’s coefficient regression in Table 2 Column 2 (.669) with its standard deviation in Table 2 (.061), to get 4.08%. Over the $F$-Score sample mean, it is equivalent to an increase of 7.2% $F$-Score. These results, therefore, support several previous studies that document a positive association between executive compensation and accounting irregularities (Bergstresser & Philippon, 2006; Burns & Kedia, 2006; Denis et al., 2006; Efendi et al., 2007; Harris & Bromiley 2007).

To examine the effect of corporate governance on the positive connection between executive compensation and accounting irregularities, we test the influence of board independence on that relationship. Prior results on the association between corporate governance (proxied by board independence) and earnings management is mixed (Chen et al., 2015; Davidson et al., 2005; Klein, 2002; Park & Shin, 2004). Hence, we expected that the positive relationship
between executive compensation and accounting irregularities may form either stronger or weaker firms with a higher or lower board of independence. In this exercise, we partitioned our sample based on the annual median value of board independence to group firms with high and low corporate governance. We document that a positive association is stronger for firms with higher board independence. This result therefore support previous studies that find the inefficiency of board independence in providing monitoring mechanism (Chen et al., 2015; Park & Shin, 2004).

The remainder of this paper proceeds as follows: Section 2 provides a brief review of the institutional background and the hypothesis development on the impact of executive compensation and accounting irregularities; Section 3 discusses the proxies we employ for the executive compensation and accounting irregularities, the research method, and the sample; Section 4 explains the univariate analysis of the sample and the main regression results; Section 5 discusses the robustness test using an alternative proxy of accounting irregularities; Section 6 shows the additional tests; and section 7 concludes the study.

Institutional Background and Hypothesis Development

The occurrence of accounting irregularity practices has persistently increased throughout the world, including in Indonesia. There are several cases related to accounting irregularities, such as the PT Timah case in 2016, the PT Sunprima Nusantara Pembiayaan (SNP) case in 2018, the PT Bank Bukopin case in 2018, and the PT Garuda Indonesia case in 2019. PT Timah is suspected of having manipulated its financial statements in the first half of 2015 by stating that the firm had a temporary positive performance increase, while it actually faced a loss of Rp59 billion. PT SNP was accused of committing credit fraud, resulting in a loss of Rp14 trillion, and five executive members were named as suspects. PT Garuda Indonesia was also suspected of manipulating its 2018 financial reports, particularly on its accruing income, which resulted in a major improvement in its reported profit to $809 million in 2018, from having a $216.58 million loss in the previous year (Soepriyanto et al., 2020). This issue was first brought up by two commissioners of the firm’s own major shareholders, who gave dissenting opinions and hence did not sign the financial report.

Related to executive compensation, PT Bank Bukopin was revealed to have made several modifications on its annual reports in 2015, 2016, and 2017, while in September 2018, PT Bank Bukopin further planned to issue stock options through its MSOP program, by issuing 347,383,400 shares or 2.90% from the additional paid-in capital, which amounted to Rp1.12 trillion. Moreover, according to a recent study conducted by the ACFE Indonesia, in 2017, most of the fraud perpetrators were at the management level, which included the executive members. The effects of executive compensation on accounting irregularity practices may be further aggravated by the high level of executive salaries and bonuses in Indonesia. Dessy and Gede (2018) revealed that stock option compensations and earnings management are positively correlated. However, this research only employed a sample of 16 manufacturing firms listed under IDX with 81 observed data items. In related emerging country setting, Al Farooque et al. (2019) found positive association between compensation and performance, as well as between corporate governance and performance for listed firms in Thailand.

Drawing on the organization theory, there are two justifications of how executive compensation can affect accounting numbers, namely through self-interest and stewardship. Under the self-interest perspective, an executive is a rational agent who seeks to maximize his/her individual benefit with the least possible outflow (Jensen & Meckling, 1976). The self-interest perspective is ingrained in agency theory and accepts that an executive is opportunistic (Eisenhardt, 1989) and undertakes actions which often differ from those required to maximize shareholders’ benefit (Pratt & Zeckhauser, 1985). Under the stewardship perspective, however, an executive is a steward who represents pro-organizational and collectivistic behavior (Davis et al., 1991). As a steward, an executive is motivated to act in the best interests of the principals (Donaldson & Davis, 1991). In short, the argument on how executive compensation influences accounting report is contingent on whether the objective of the executive involvement in reporting the numbers is to either opportunistically advance his/her personal interests or protect shareholders’ interests.

Previous studies had mixed evidence on the relationship between executive compensation and accounting irregularities. On one hand, several prior researchers showed a positive association (Bergstresser & Philippon, 2006; Burns & Kedia, 2006; Denis et al., 2006; Efendi et al., 2007; Harris & Bromiley, 2007; Hass et al., 2016). Burns and Kedia (2006) that the sensitivity of a CEO’s portfolio options to stock prices is positively related to restatements of financial statements. In a similar vein, Bergstresser and Philippon (2006) notice that CEO compensation that is closely tied to the value of stock and option holdings is related to earnings manipulation. Furthermore, Harris and Bromiley (2007) discover that CEO compensation paid as stock options is positively related to financial statement misrepresentations. In a more recent study, Hass et al. (2016) show that managers’ equity incentives increase their propensity to commit corporate fraud in China. This stream of research supports the argument that an executive compensation scheme is not effective in solving the agency problem and is actually an agency problem (Bebchuk & Fried, 2003; Bertrand & Mullainathan, 2001; Yermack, 1997).

Optimally, shareholders will design an executive compensation scheme that does not consider observable luck, that is, an improvement in performance which is not under the CEO’s control. However, a study by Bertrand and
Mullainathan (2001) found that the CEO’s compensation responds significantly to changes in the firm performance beyond the CEO’s control. Healy (1985) argued that executives rewarded with an earnings-based bonus scheme tend to select managerial accrual and accounting procedure decisions that will maximize their compensation value. Hence, by scaling executive compensation to total revenue, more profitable firms pay higher executive compensation. To total revenue because there is a possibility that bigger or total revenue. We employ the ratio of executive compensation of the firm relative to the firm size, measured by the test variable used by this study is the total executive compensation.

Executive Compensation Measurement

The sample selection process is explained in section 3.4. In section 3.2, the research model is described. 3.1. A discussion of accounting irregularities is provided in section 3.3. The research model is described. The executive compensation proxy is explained in section 4.

Sample and Research Design

The executive compensation proxy is explained in section 3.1. A discussion of accounting irregularities is provided in section 3.2. In section 3.3, the research model is described. The sample selection process is explained in section 3.4.

Accounting Irregularities Measurement

There are several proxies that are commonly used to measure the indication of accounting irregularities. These measures include, but are not limited to, the Working Capital Accruals Model, Beneish’s M-score, Dechow et al.’s F-score, Dechow and Dichev’s Accrual Estimation Model (DD), the Modified Jones Model, and the Unexplained Audit Fee Model (UAF). Arguably, DD and UAF are deemed to be the best performing accounting risk measurement as highlighted by Price et al. (2011). However, these two models are associated with their own drawbacks. As DD requires the calculation of prior-year, current-year, and future-year cash flows, it may create a look-ahead bias as it relies on data that is not available during the period being studied. Consequently, it may deliver results that are expected to be similar to the desired outcomes which tend to be inaccurate and biased (Corporate Finance Institute, 2019).

Specific for UAF, this measure might not be the best fit for an Indonesian context, because audit fee disclosure is a voluntary disclosure in Indonesia. In that case, there is only a limited number of firms that state audit fees in their annual reports (Hazmi & Sudarno, 2013). Out of 555 firms listed in IDX during the period of 2012 to 2016, only 92 firms disclosed their audit fee amounts (Sinaga & Rachmawati, 2018). Considering those above explanations, this study will use Dechow et al.’s F-score to measure accounting irregularities. Aghghaleh et al. (2016) claimed that Dechow et al.’s F-score is effective in predicting manipulator and non-manipulator firms with an average accuracy of 76.22%.

Dechow et al. (2011) develop a model to calculate the propensity of firms to engage in material accounting misstatements using three distinct methods. Method 1 derives from financial reports variables; method 2 contains off-balance sheet and non-financial indicators; and method 3 is comprised of market-related variables. In particular, Dechow et al. (2011) show that method 1 offers the "bulk of the power" in forecasting material accounting misstatements. As such, this study uses the first method in calculating the probability of material accounting misstatements. The F-score is calculated with the following formula:

Predicted Value (e) = −7.893 + 0.790RSST Accruals + 2.518∆REC + 1.191∆INV
+ 1.979 Soft Assets + 0.171∆Cash
Sales − 0.932∆ROA + 1.029Issue.
Where:

\[
RST\ Accruals = \frac{\Delta WC + \Delta NCO + \Delta FIN}{Average\ Total\ Assets}, \text{ where:}
\]

\[
WC = [Current\ Assets - Cash\ and\ Shortterm\ Investments] - [Current\ Liabilities - Debt\ in\ Current\ Liabilities];
\]

\[
NCO = [Total\ Assets - Current\ Assets - Investments\ and\ Advances] - [Total\ Liabilities - Current\ Liabilities - Longterm\ Debt]; \text{ and}
\]

\[
FIN = [Shortterm\ Investments + Longterm\ Investments]\ [Longterm\ Debt + Debt\ in\ Current\ Liabilities +Preferred\ Stock];
\]

\[
\Delta REC = \frac{\Delta Accounts\ Receivables}{Average\ Total\ Assets};
\]

\[
\Delta INV = \frac{\Delta Inventory}{Average\ Total\ Assets};
\]

\[
Soft\ Assets = \frac{Total\ Assets - PPE - Cash\ and\ Cash\ Equivalents}{Average\ Total\ Assets};
\]

\[
\Delta CASH\ SALES = [Sales - \Delta Accounts\ Receivables];
\]

\[
\Delta ROA = \frac{Net\ Income_t}{Average\ Total\ Assets_t} - \frac{Net\ Income_{t-1}}{Average\ Total\ Assets_{t-1}};
\]

\[
Issue = \text{dummy variable coded 1 if a company issued securities during year } t
\]

The predicted value is, therefore, transformed into a probability using the subsequent formula:

\[
Predicted\ Probability = \frac{e^{predicted\ value}}{1 + e^{predicted\ value}}.
\]

Lastly, the predicted probability is deflated by the unconditional probability of a misstatement to get the F-score. The unconditional misstatement probability value of \( p = .0037 \) was from the original study of F-Score (Dechow et al., 2011) which derived from the number of (predicted) misstatement firms divided by the total number of firms in the sample.

\[
F\ -\ score = \frac{Predicted\ Probability}{0.0037}. \tag{1}
\]

Research Design

We estimate the following cross-sectional model to test our hypothesis concerning the association between the executive compensation and accounting misstatements:

\[
FSCORE_{it} = \beta_0 + \beta_1 \cdot EC_{it} + \beta_2 \cdot CONTROLS_{it} + \epsilon. \tag{1}
\]

where, \( FSCORE \) is the accounting irregularities; \( EC \) is the executive compensation calculated in year \( t \), and \( CONTROLS \) is control variables’ vector in year \( t \). A finding of a significant positive or negative value for \( \beta \) would provide evidence to reject our hypothesis.

Several control variables related to Fraud Triangle and Fraud Diamonds models are included to account for factors that drive accounting misstatements. The pressure factor is measured by profitability (used to proxy the financial goal) and firm size (used to account for firm solidity) (Nurbaiti & Hanafi, 2017); secondly, firm type, board independence, and Big 4 auditors are used to proxy opportunity since they gauge the monitoring mechanism (Rezaee, 2002); thirdly, changes in auditors are used to measure rationalization (Surjaatmaja, 2018); lastly, CEO age is employed as a measure of capability (Troy et al., 2011).

The firm’s profitability was measured by deflating the firm’s net income with its total assets; this profitability was multiplied by 100. We did not have a predicted sign as prior research found contrasting results concerning to the effect of profitability on earnings management (Burgstahler & Dichev, 1997; Ghazali et al., 2015; Manahan, 2018). Firm size was measured by the natural logarithm of the firm’s total revenue in Rupiah. To include the monitoring mechanism, we added the fraction of independent boards to the entire board members.
in the company. The empirical evidence on the influence of corporate governance (as proxied by board independence) on earning management is inconsistent (Chen et al., 2015; Davidson et al., 2005; Klein, 2002; Park & Shin, 2004). As such, board independence may positively or negatively associated to accounting misreporting. Next, Francis and Yu (2009) find that Big 4 audit firms’ clients engaged in less aggressive earnings management activities. Therefore, we used an indicator variable coded 1 if the firm was audited by a big four audit firm, and 0 otherwise. We classify Deloitte, PWC, EY, and KPMG as the Big 4 audit firms. Smaili and Labelle (2009) discovered that the accounting irregularities level will be reduced if firms do not switch auditors during the year. Thus, we included an indicator variable coded 1 if the firm does change its independent auditors, and 0 otherwise.

Furthermore, J. Sun et al. (2019) as well as Huang et al. (2012) stated that firms with older CEOs/CFOs are associated with less fraudulent financial statements. As such, we considered CEO age as a control variable measured by taking the absolute value of CEO age. Soepriyanto et al. (2019) found that firm participation in tax amnesty program in Indonesia is associated with accounting manipulations. Therefore, we use a categorical variable coded 1 if the firm joined in a tax amnesty program (either in year 2016 or 2017), and 0 otherwise. Warganegara et al. (2013) stated that state-owned enterprises (BUMN) have better corporate governance than private firms in Indonesia. As such, we added a categorical variable coded 1 if the firm is BUMN, and 0 otherwise.

We used industry and annual dummy variables to mitigate the impact of industry and year effects. The standard errors are clustered at the firm and year level. To alleviate the issue of outliers, we winsorized all the continuous variables at the 1st and 99th percentiles.

**Empirical Results**

This part reports the empirical results on the association between executive compensation and accounting irregularities. Section 4.1 shows the descriptive statistics of our sample. Section 4.2 shows the main regression results. In section 4.3, we mitigated the endogeneity issue by employing a propensity score matching approach.

**Descriptive Statistics**

The final full sample is summarized in Table 2. The mean value of FSCORE 56.7%, while its median is 41%. The mean (median) value of EC is 0.025 (0.010). For the related control variables, the mean values of profitability (ROA) and firm size (SIZE) are 2.5 and 12.02, correspondingly. Next, 34.5% of our firm-year data were audited by BIG4 companies, and 16.1% of the observations switched their auditors during the study period. The mean (median) value of board independence (BOARDS) is 27.7% (27.3%).

To detect multicollinearity, we performed a correlation analysis to show the correlation strengths and the relationship direction between two variables. As seen in Table 3, multicollinearity
cannot be spotted as no variables have a significant and strong correlation with one another. In general, the majority of the variables have a relatively weak correlation to one another (the correlation strengths are generally lower than .3, or higher than −.3), except for the correlation of SIZE and EC, which is significantly and moderately correlated at −.5210, and firm size to the type of external audit firms, which is significantly and moderately correlated at .4452.

Baseline Results

Column 1 of Table 4 reports the results of estimating equation (1) without including the year and industry fixed effects. We found that EC is positively related to FSCORE. Specifically, we saw that the estimated coefficient of EC is .842 and significant at a 1% level. Column 2 of Table 4 depicts more comprehensive results when we included both year and industry fixed effects. It shows that EC is positively related to FSCORE with .669 at a 5% level. This indicates that firms with higher executive compensation are more likely to have higher accounting irregularities. It also lends supporting evidence for several prior studies that noticed a positive association between executive compensation and accounting irregularities (Bergstresser & Philippon, 2006; Burns & Kedia, 2006; Denis et al., 2006; Efendi et al., 2007; Harris & Bromiley, 2007). The results reported in Table 4 provide support evidence to reject our hypothesis.
Table 4. Executive Compensation and Accounting Irregularities.

|               | Column 1          | Column 2          |
|---------------|-------------------|-------------------|
| EC            | 0.842*** (2.07)   | 0.669** (1.98)    |
| ROA           | 0.002** (2.25)    | 0.001 (1.60)      |
| SIZE          | 0.040 (1.45)      | 0.060** (2.18)    |
| BOARDS        | 0.001 (0.01)      | 0.053 (0.46)      |
| BIG4          | −0.087 (−1.18)    | −0.084 (−1.19)    |
| ACHANGE       | −0.030 (0.52)     | 0.025 (0.52)      |
| CEOAGE        | −0.004*** (−2.80) | −0.004*** (−2.89) |
| AMNESTY       | 0.050 (1.38)      | −0.008 (−0.20)    |
| BUMN          | 0.089 (0.84)      | −0.040 (−0.39)    |
| Constant      | −0.316 (0.91)     | −0.016 (−0.05)    |
| Year fixed-effect | No      | Yes | No |
| R²            | .0215            | .0800             |
| Adj. R²       | .0134            | .0638             |
| N             | 1,100            | 1,100             |

Note. This table shows the regression results on the impact of executive compensation (EC) on accounting irregularities (FSCORE). Column 1 shows when the industry and year fixed-effect on the regression estimation are not included. Column 2 presents the results when the industry and year fixed-effect on the regression estimation are included. Continuous variables were winsorized at the 1% and 99% levels. Standard errors are clustered at the firm and year level. The t-statistics are presented in parentheses. Definitions of the variables are provided in Table 2. ***, and *** indicate a statistical significance at the 10%, 5%, and 1% levels, respectively.

Regarding variables of control, column 2 of Table 4 illustrates that ROA, SIZE, and CEOAGE are significantly related to FSCORE. Particularly, we discovered that accounting misreporting is greater for firms with higher profit. This result supports Ghazali et al. (2015) who observed that Malaysian firms with higher profitability tend to engage in earnings management. Similarly, Manahan (2018) claimed that profitability has a significant influence on profit management. The results also support Amertha et al. (2014), who argued that a larger firm size might increase management’s incentive to perform earnings management, in a sense that bigger companies tend to have more complex operational activities and are more pressured to meet investors’ expectations, hence pressuring management to engage in the earnings management practice. We also observed that firm with older CEO has fewer accounting irregularities.

Endogeneity Test: Propensity Score Matching Approach

There was a self-selection issue connected to firm-related characteristics that could influence our results. In addition to including firm-specific control variables, we further minimize the concern of firm-specific characteristics that may influence firms self-select on executive compensation by a propensity score matching (PSM) approach (Rosenbaum & Rubin, 1983). In Indonesian context, Soepriyanto et al. (2021) also use PSM method to investigate the association between annual report readability and accounting irregularities.

As such, we divided our sample using the annual and industry median of executive compensation measurement. We defined firms with high (low) executive compensation as those with an above (below) median executive compensation measurement. Firms in the upper median group were our treatment firms, while those in the lower median group were our control firms. We then applied a logit regression with all control variables to estimate the probability of being assigned to the treatment and control groups. We used the propensity scores from this logit estimation and performed the matching within a caliper of 0.1 without replacement to generate our matched sample. We force out matched sample to come from identical year and industry. This PSM specification resulted in 249 propensity score-matched pairs.

Panel A of Table 5 demonstrates the characteristics of the firms for our matched sample. We discovered that characteristics of the firms for the treatment and control groups are not statistically different for all control variables used in the matching process. We then estimated equation (1) using the matched sample pairs. Panel B of Table 5 shows the estimation results. We found that EC is positive at 2.153, at a 1% level related to FSCORE. The result indicates that our baseline result is not influenced by systematic differences between firms with high and low levels of executive compensation. Overall, we noticed that firms with higher executive compensation are more likely to engage in accounting irregularities.

Alternative Measurement of Accounting Irregularities

To eliminate the possibility of measurement bias, we re-estimated equation (1) employing an alternative proxy of accounting irregularities. In doing so, we utilized the Beneish M-Score (MSCORE) devised by Beneish (1999). A higher MSCORE indicates a greater probability of firms to involve in financial statement misrepresentations. MSCORE is measured as follows:

\[
M\text{-SCORE} = \frac{−4.840 + 0.920DSRI_{it} + 0.528GMII_{it} + 0.404AQI_{it} + 0.892SGI_{it} + 0.115DEP_{it} − 0.172SGAL_{it} + 4.679TATA_{it} − 0.327LGVI_{it}}{Receivables_{it}/Sales_{it} − Receivables_{it-1}/Sales_{it-1}}
\]

where,

\[
DSRI = \text{day's sales receivable index, } \frac{\text{Receivables}_{it}}{\text{Sales}_{it}}\]

\[
MSCORE = \text{M-Score, MSCORE = Beneish M-Score, MS = M-Score, FSCORE = F-Score, ROA = Return on Assets, SIZE = Firm Size, BUMN = Government-Owned Enterprise, CEOAGE = CEO Age, ACHANGE = CEO Change, AMNESTY = Amnesty, BIG4 = Big-4 Auditors, BOARDS = Board Members, GMI = Gross Margin Index, AQI = Asset Quality Index, SGI = Sales Growth Index, DEP = Depreciation, LGVI = Long-term Loan-to-Value Index, TATA = Tangible Asset Turnaround Index.}

Note. This table shows the regression results on the impact of executive compensation (EC) on accounting irregularities (FSCORE). Column 1 shows when the industry and year fixed-effect on the regression estimation are not included. Column 2 presents the results when the industry and year fixed-effect on the regression estimation are included. Continuous variables were winsorized at the 1% and 99% levels. Standard errors are clustered at the firm and year level. The t-statistics are presented in parentheses. Definitions of the variables are provided in Table 2. ***, and *** indicate a statistical significance at the 10%, 5%, and 1% levels, respectively.

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As such, we divided our sample using the annual and industry median of executive compensation measurement. We defined firms with high (low) executive compensation as those with an above (below) median executive compensation measurement. Firms in the upper median group were our treatment firms, while those in the lower median group were our control firms. We then applied a logit regression with all control variables to estimate the probability of being assigned to the treatment and control groups. We used the propensity scores from this logit estimation and performed the matching within a caliper of 0.1 without replacement to generate our matched sample. We force out matched sample to come from identical year and industry. This PSM specification resulted in 249 propensity score-matched pairs.

Panel A of Table 5 demonstrates the characteristics of the firms for our matched sample. We discovered that characteristics of the firms for the treatment and control groups are not statistically different for all control variables used in the matching process. We then estimated equation (1) using the matched sample pairs. Panel B of Table 5 shows the estimation results. We found that EC is positive at 2.153, at a 1% level related to FSCORE. The result indicates that our baseline result is not influenced by systematic differences between firms with high and low levels of executive compensation. Overall, we noticed that firms with higher executive compensation are more likely to engage in accounting irregularities.
Table 5. Propensity Score Matching Regression.

Panel A: Descriptive statistics for the matched sample

| Control variables | Treatment firms | Control firms | t-test |
|-------------------|-----------------|---------------|--------|
| ROA               | 3.558           | 2.686         | 0.85   |
| SIZE              | 12.15           | 12.05         | 1.50   |
| BOARDS            | 0.275           | 0.271         | 0.45   |
| BIG4              | 0.345           | 0.325         | 0.47   |
| ACHANGE           | 0.144           | 0.156         | -0.38  |
| CEOAGE            | 54.19           | 53.96         | 0.27   |
| AMNESTY           | 0.477           | 0.497         | -0.45  |
| BUMN              | 0.004           | 0.000         | 1.00   |

Panel B: PSM regression analysis

| FSCORE | EC 2.153*** (4.89) |
|--------|---------------------|
| ROA    | -0.001 (-0.09)      |
| SIZE   | 0.065 (1.26)        |
| BOARDS | 0.014 (0.05)        |
| BIG4   | -0.054 (-0.55)      |
| ACHANGE| -0.007 (-0.20)      |
| CEOAGE | -0.005 (-1.37)      |
| AMNESTY| 0.028 (0.46)        |
| BUMN   | -0.077 (-1.11)      |
| Constant| -0.020 (-0.03)      |

Year fixed-effect | Yes
Industry fixed-effect | Yes
R² | .0803
Adj R² | .0437
N | 498

Note. This table presents the results on the effect of executive compensation and accounting irregularities using a propensity score matching (PSM) method. Panel A reports the results of the comparison of the characteristics of the treatment and control firms. The treatment (control) firms are those with EC above (below) the yearly industry median value of the EC. Panel B reports the results of the effect of EC on FSCORE based on the matched sample. Continuous variables were winsorized at the 1% and 99% levels. Standard errors are clustered at the firm and year level. The t statistics are presented in parentheses. Definitions of the variables are presented in Table 2. *, **, and *** indicate a statistical significance at the 10%, 5%, and 1% levels, respectively.

GMI = gross margin index, 
\[ \frac{(Sales_{t-1} - COGS_{t-1})}{Sales_{t}} \]

AQI = asset quality index, 
\[ 1 - \frac{(current\ assets_{t-1} + PPE_{t-1})}{Total\ Assets_{t-1}} \]

SGI = sales growth index, 
\[ \frac{Sales_{t}}{Sales_{t-1}} \]

DEPI = depreciation index, 
\[ \frac{Depreciation_{t-1}}{(Depreciation_{t-1} + PPE_{t-1})} \]

SGAI = SG & A expenses index, 
\[ \frac{SGAI_{t}}{Sales_{t}} \]

TATA = [total accruals to total assets, \( \Delta \)Current Assets - \( \Delta \)Casht - (\( \Delta \)Current Liabilities - \( \Delta \)Current Maturities of Long - Term Debt - \( \Delta \)Income Tax Payable) - Depreciation and Amortization] / Total Assets

LVGI = leverage index, 
\[ \frac{(Long - Term\ Debt_{t-1} + Current\ Liabilities_{t-1})}{Total\ Assets_{t}} \]

Column 1 of Table 6 reports the results of estimating equation (1) without including the year and industry fixed effects. Similar to the baseline result, we observed that EC is positively related to MSORE. Column 2 of Table 4 displays more comprehensive results when we included both year and industry fixed effects. It shows that EC is positively related.
Table 6. Executive Compensation and Accounting Irregularities—Alternative Measure.

|            | Column 1 | Column 2 |
|------------|----------|----------|
| EC         | 13.63*** (3.92) | 13.67*** (4.72) |
| ROA        | 0.014 (0.85)  | 0.016 (0.94)  |
| SIZE       | 0.204* (1.65) | 0.293*** (5.01) |
| BOARDS     | 0.814 (0.60)  | 0.441 (0.24)  |
| BIG4       | −0.136 (−1.31) | −0.179* (−1.65) |
| ACHANGE    | 0.825* (1.65) | 0.792 (1.51)  |
| CEOAGE     | −0.016 (−0.77) | −0.019 (−0.84) |
| AMNESTY    | 0.061 (0.20)  | 0.027 (0.10)  |
| BUMN       | 0.271 (0.45)  | −0.160 (−0.36) |
| Constant   | −1.672 (−0.80) | −2.653 (−1.28) |

Note. This table shows the regression result on the impact of executive compensation (EC) on accounting irregularities, using an alternative measure (MSCORE). Column 1 shows when the industry and year fixed-effect on the regression estimation are not included. Column 2 presents the result when the industry and year fixed-effect on the regression estimation are included. The continuous variables were winsorized at the 1% and 99% levels. Standard errors are clustered at the firm and year level. The t-statistics are presented in parentheses. Definitions of the variables are presented in Table 2. *, **, and *** indicate a statistical significance at the 10%, 5%, and 1% levels, respectively.

To see the effect of corporate governance on the positive association between executive compensation and accounting irregularities, we tested the effects of board independence on that relationship. Empirical evidence on the influence of corporate governance (as proxied by independence of the board) on earnings management is inconclusive (Chen et al., 2015; Davidson et al., 2005; Klein, 2002; Park & Shin, 2004). Klein (2002) noticed a negative relationship between board independence and abnormal accruals. Klein (2002) argued that the results support the argument that a more independent board is more effective to provide a better monitoring process on the corporate financial accounting process. In a similar vein, Davidson et al. (2005) stated that a more independent board is related to a lower likelihood of earnings management. On the other hand, Park and Shin (2004) claimed that board independence does not reduce earnings management. Furthermore, they failed to find that earnings management decreases in accordance with an increase of outside directors’ tenure as board members. Based on those previous studies, we expected that a positive relationship between executive compensation and accounting irregularities could form stronger or weaker firms with higher or lower board independence.

To test the influence of board independence on the relationship between executive compensation and accounting irregularities, we made dummy variables based on the degree of board independence measurements. In this case, we divided the sample items based on the median value of the board independence measure. Then the executive compensation measure was interacted with the stronger and weaker board independence and profitability, and these two interaction variables were regressed in an accounting irregularities measure. The continuous variables were winsorized at the 1% and 99% levels. Standard errors are clustered at the firm and year level. The t-statistics are presented in parentheses. *, **, and *** indicate a statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 7. Executive Compensation and Accounting Irregularities—Additional Tests.

|            | HBOARDS × EC | LBOARDS × EC | ROA | SIZE | BIG4 | ACHANGE | CEOAGE | AMNESTY | BUMN | Constant |
|------------|---------------|---------------|-----|------|------|---------|--------|---------|------|----------|
|            | 0.830* (1.75) | 1.354*** (2.89) | 0.001 (1.41) | 0.062** (2.26) | −0.083 (−1.18) | 0.025 (0.53) | −0.004*** (−3.03) | −0.008 (−0.20) | −0.039 (−0.40) | −0.023 (−0.07) |
| Industry fixed-effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| R²         | .0801 | .0281 | .0639 | .0110 | 1,100 | 1,100 |

Note. This table reports the results on how the relation between executive compensation and accounting irregularities varies in high and low board independence. For each fiscal year in the sample period, the firms were sorted into two groups based on the median value of the board independence measure. Then the executive compensation measure was interacted with the stronger and weaker board independence and profitability, and these two interaction variables were regressed in an accounting irregularities measure. The continuous variables were winsorized at the 1% and 99% levels. Standard errors are clustered at the firm and year level. The t-statistics are presented in parentheses. *, **, and *** indicate a statistical significance at the 10%, 5%, and 1% levels, respectively.
Table 8. Executive Compensation and Accounting Irregularities—Serial Order Correlation.

| Variable   | \( \beta \)     | (t-value) |
|------------|------------------|-----------|
| \( EC_t \) | 0.500***         | (2.09)    |
| \( FSCORE_{t-1} \) | 0.288***        | (7.20)    |
| \( ROA_t \)  | 0.001            | (0.62)    |
| \( SIZE_t \)  | 0.053***         | (2.60)    |
| \( BOARDS_t \) | -0.097**       | (-2.28)   |
| \( BIG4_t \)  | -0.034          | (-0.53)   |
| \( ACHANGE_t \) | -0.003          | (-0.06)   |
| \( CEOAGE_t \) | -0.004***      | (-5.14)   |
| \( AMNESTY_t \) | -0.002          | (-0.04)   |
| \( BUMN_t \)  | -0.077          | (-0.97)   |
| Constant   | -0.128          | (-0.52)   |
| Year fixed-effect | Yes            |           |
| Industry fixed-effect | Yes          |           |
| \( R^2 \)   | .1615           |           |
| Adj. \( R^2 \) | .1417          |           |
| \( N \)     | 825             |           |

Note. This table reports the regression results on the effect of executive compensation (EC) on accounting irregularities (FSCORE) after we control for the serial order correlation. To mitigate that issue, we include last year FSCORE as an additional control variable. Continuous variables were winsorized at the 1% and 99% levels. Standard errors are clustered at the firm and year level. The t-statistics are presented in parentheses. Definitions of the variables are provided in Table 2. *,**, and *** indicate a statistical significance at the 10%, 5%, and 1% levels, respectively.

This indicates that the main result is not driven by the influence of last year accounting irregularities on the current practice of those irregularities.

**Conclusion**

This paper investigated the association between executive compensation and accounting irregularities. Employing 1,100 firm-year observations of Indonesian listed firms during 2014 to 2017, we documented a positive relationship between executive compensation and accounting irregularities. We found a positive association after mitigating the endogeneity issue using a propensity score matching approach and a possibility of a serial order correlation of accounting irregularities. Our results are also economically significant. An increase of executive compensation by one standard deviation is related to a 4.08% level increase of accounting irregularities. Over the FSCORE sample mean, it is equivalent to an increase of 7.2% F-Score. The results were also robust after considering the alternative measurements of accounting irregularities. These results, therefore, support several prior studies that discovered a positive connection between executive compensation and accounting irregularities (Bergstresser & Philippon, 2006; Burns & Kedia, 2006; Denis et al., 2006; Efendi et al., 2007; Harris & Bromiley, 2007).

Furthermore, we examined the effect of corporate governance and profitability on the relationship between executive compensation and accounting irregularities. We observed that the positive association between executive compensation and accounting irregularities is more pronounced for firms with higher board independence. This lends supporting evidence that board independence fails to provide a monitoring mechanism to mitigate the opportunistic behavior of executives in the financial accounting process in Indonesia.

Our study is significant for theoretical aspect as it adds to the literature that highlight the positive association between executive compensation and accounting irregularities (e.g., Efendi et al., 2007; Harris & Bromiley, 2007; Hass et al., 2016), and thus view executive compensation as an agency problem. For the practical aspect, our study may be useful for the Indonesian and Asian emerging market regulators in formulating additional rules to mitigate the negative effects of executive compensation on accounting irregularities.

One key limitation of our study is related to our accounting irregularities measure, in this case F-Score. As stated by Dechow et al. (2011), it has a very high potency for false positive. Hence, many firms are classified as manipulator where they did not receive any enforcement actions against them. However, we mitigate that issue by using the continuous measure of F-Score. The similar issue happens to our second measure of accounting irregularities, M-Score.

In considering the overall compensation for all executives, future research may consider examining the connection between executive compensation and accounting in a more specific way. Specifically, future research may consider each type of executive, for example, CEO or CFO, and each type of executive compensation, for example, base salary, bonus, or stock options.

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