



FINANCIAL STATEMENT FRAUD AND FIRM PERFORMANCE: EMPIRICAL EVIDENCE FROM INDONESIA

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Info Artikel :

Diterima : 26 September 2021

Disetujui : 4 Oktober 2021

Dipublikasikan : 13 Oktober 2021

ABSTRACT

Keywords :

Financial statement fraud; financial ratio; propensity score matching.

Fraudulent financial reporting is an intentional misstatement of the financial statements, which is the incorrect representation intentionally used to manipulate the decision of stakeholders by ensuring that they make their decision based on incorrect information. This study examines factors affecting the likelihood of financial statement fraud occurrences and differences between fraudulent and non-fraudulent companies listed in Indonesia Stock Exchange with respect to the company's profitability over the period 2010 to 2018. Empirical results indicate that the ratio of current assets to total assets, long-term debt to total equity, total sales to total equity, and the cost of goods sold to sales have significant impact on affecting the likelihood of financial statement fraud. Based on the propensity score matching using cross-sectional data, the study finds that profitability has no significant difference between fraudulent and non-fraudulent companies

Introduction

Financial statement fraud is a big issue that continues to attract the interest of academics and practitioners. The company's management, as a party responsible to disclosure financial statements, has a strong motivation to create the best financial statement condition. However, to make their financial statements look better, some managers would manipulate the figures to exaggerate their performance.

This type of behavior affects the decision making of interested parties or stakeholders, and it will affect the trustworthiness of the results. Conflict of interest between management and shareholders which often benefit one party can lead to financial statement fraud. The conflict of interest will occur when the management has a different interest or purpose from the shareholders. In general, the conflict of interest can cause the management to act outside the interests and goals of a company. Hence, the management faces varied pressure to find ways to show their good performance.

According to the Association of Certified Fraud Examiners (ACFE), the world's largest anti-fraud organization, "a financial statement is materially misleading when its presentation contains fictitious transactions, improper valuations, inappropriate transaction timing, omissions, and false statements that either individually or in the aggregate are important enough to affect the decisions of its users" (ACFE, 2017, 13). This means that fraudulent financial reporting is the incorrect representation that is intentionally used to manipulate the decision of stakeholders by ensuring that they make their decisions based on incorrect information.

Financial statement fraud has major financial and non-financial impacts on companies. Several instances such as Enron, WorldCom, Global Crossing and Tyco have endured the disastrous consequences of fraud. Enron's case in 2001 is one of the famous ones, which was a gigantic energy company headquartered in Houston, Texas, which falsified its amount of net profit. This crime was not only associated with the company itself but also its accounting firm, Arthur Andersen. In their financial statement, they presented high profit, but in fact, they suffered enormous losses after an in-depth audit. Consequently, Enron was then bankrupt, and the U.S. monetary agency cancelled Arthur Andersen's permit (Li, 2010)

Financial statement fraud is a huge problem affecting different countries on different continents. ACFE released Report to the Nations: 2018 Global Study on Occupational Fraud and Abuse.

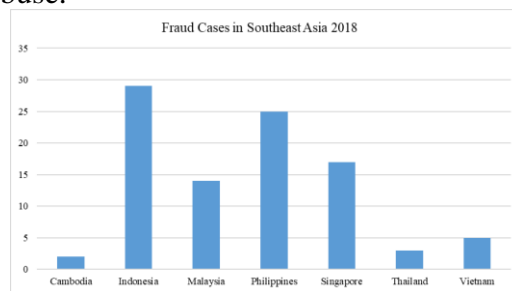


Figure 1: Report to the Nations 2018

Source: Report to the Nations: 2018 Global Study on Occupational Fraud and Abuse.

This report revealed the high number of fraud cases occurring in the Southeast Asia region such as in Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam. Indonesia registered the highest number of fraudulent cases than other nations.

Indonesia as the largest economy in Southeast Asia and an emerging market has a potential benefit to provide outstanding opportunities for investor. However, Indonesia faces a serious business integrity concern and nowadays fraud continues to be a significant concern. In 2018, Transparency International, the global coalition against corruption, stated that Indonesia scored 38 points out of 100 on the Corruption Perceptions Index (CPI). This reveals a challenge for companies operating in Indonesia to be more aware of the likelihood of fraud.

The identification of fraud is not easy because of the different fundamental motivations and the number of techniques (Brennan and McGrath, 2007). Nevertheless, according to ACFE, occupational fraud cases can be divided into three broad categories; asset misappropriation, corruption, and financial statement fraud. As the survey conducted by ACFE in 2018, it shows that financial statement fraud is the fraud category that gives the biggest median losses.

An example of financial statement fraud in Indonesia is Garuda Indonesia, the biggest flag carrier listed company in Indonesia. Garuda Indonesia stated net profit of USD 809,000 for the fiscal year 2018 and this figure increased sharply compared to 2017, which suffered USD 216.5 million loss. The financial report has drawn controversy after the two commissioners of the company questioned the financial report. PT Mahata Aero Teknologi, as a third party, has a debt related to the installation of Wi-Fi that has not been paid and Garuda Indonesia recognized it as revenue, and it does not comply with the Indonesia Financial Accounting Standard No.23. The Financial Services Authority

coordinated with Finance Ministry and Indonesia stock exchange in conducting the investigation and found that Garuda published an incorrect financial statement. The investigation also showed that the opinions of the public accounting firm and auditor were not true reflection of the data. Consequently, Garuda Indonesia, its director, and the commissioner paid the fines. The auditor and the accounting firm got sanctions from the Financial Services Authority as well (CNN Indonesia, 2019).

Spathis, Doumpos, & Zopounidis (2002) stated that the falsification of financial statements comprises mainly of manipulating components by overestimating assets, revenues, and profit or understating liabilities, expenditures or losses. Financial statement fraud as one form of fraud is a phenomenon that requires to be examined more carefully.

Detecting the likelihood of fraudulent financial fraud has been investigated by many scholars. Financial ratio analysis is one of the ways fraud that can be identified. A ratio expresses two measurements relative to each other and consists of assessing a company's performance by using present and historical reporting information. The information from the reports are used to compare the efficiency of a business over time to evaluate whether the business is improving or declining, to match the economic position of a business with the business standard, or to match a business with one or more other businesses operating in its sector to see how the business is stacking up.

One of the most significant account to be prone to manipulate in financial statement is earnings. Meanwhile, profitability refers to the ability of a company to generate earnings, which is one of the most useful indicators that can be used to identify companies, whether in a potentially troubled financial situation or not.

In order to evaluate management performance, profitability is often used in assessing and determining bonuses, wage growth (Skousen, Smith, and Wright, 2009). Likewise, when businesses do not perform as anticipated, managers tend to manipulate financial reporting to cover the poor profitability condition (Jofre and Gerlach, 2018; Kotsiantis, Koumanakos, Tzelepis, & Tampakas, 2006). Consequently, it is expected to find higher levels of profitability in fraudulent companies than non-fraudulent ones.

Theoretical studies indicate that financial ratios are effective tools to detect fraud (Spathis et al., 2002; Persons, 1995; Dalnial, Kamaluddin, Sanusi, & Khairuddin, 2014) agree that financial ratios are a good instrument in detecting fraud. A financial ratio is an indicator based on two relationships' financial scores, which is a percentage or decimal connection between one amount and another that can show the financial condition of the company (Jofre and Gerlach, 2018). However, Kaminski, Wetzel and Guan (2004) concluded that financial ratios are not effective to detect fraud.

There is a growing concern in the increase of the financial statement fraud cases. Several instances such as Enron in the United States and Garuda in Indonesia have endured the disastrous consequences of fraud. In Indonesia, there is a growing concern about the rise in instances of fraud (ACFE Indonesia Chapter, 2017). The fraud studies carried out in 2018 by ACFE, as well as the instances recorded in the Financial Services Authority of Indonesia, have emphasized the seriousness of this problem. Therefore, it affects the assets of shareholders and stakeholders, as well as the community (Sadique, 2016).

Financial Services Authority of Indonesia as the capital market regulator has issued a regulation on presentation and disclosure of issuers' or listed entities' financial statements (commonly known as Article VIII.G.7). Financial Service Authority has the authority to execute any financial reporting regulation that it considers fit for publicly listed entities in Indonesia and the Article VIII.G.7 is the authoritative regulation above

Indonesia Financial Accounting Standard. Based on data held by the Financial Services Authority of Indonesia in 2010–2018, there were several listed companies that committed violations and their cases were exposed relating to financial statements and other violations.

There are some studies investigated evidence that listed companies are fraudulent (Dalnial et al., 2014; Sadique, 2016; Jofre and Gerlach, 2018). However, the question is “how can financial statement fraud be detected?” This question is yet to be addressed by research. Therefore, this study fills this gap by investigating how to identify the likelihood of financial statement fraud occurrences using financial ratios in the Indonesia Stock Exchange.

Both fraudulent and non-fraudulent companies were empirically tested and regressed; first to highlight the factors affecting the likelihood of fraud occurrences, then to determine the significant differences between both groups with respect to the company’s profitability ratio. In the present study, an empirical analysis was conducted by using nine financial ratios affecting financial statement fraud in Indonesia Stock Exchange.

This study has two research questions as follows: Are there any significant relationships between financial ratios and likelihood of financial statement fraud occurrences? Is there any difference in the profitability ratios of fraudulent and non-fraudulent companies?

Data analysis research framework was developed based on the research questions. First, the purpose of this research is to investigate the effectiveness of financial ratios in indicating if a company is at risk of fraud. This study analyses the financial ratios of fraudulent and non-fraudulent companies.

The financial data required are financial ratio variables, which can be found from the financial statement of the company. The fraudulent companies were established by reviewing the sanction data released by the Financial Services Authority of Indonesia.

This study examines the usefulness of financial data published to indicate the likelihood of the fraudulent financial statement. This will be accomplished by analysing the differences between fraudulent and non-fraudulent companies. A logistic regression model will be used to determine the relationship between the financial ratio variables and the likelihood of financial statement fraud occurrences.

Hypotheses regarding the indicators of financial ratios will be tested to determine the differences between fraudulent and non-fraudulent companies with respect to profitability ratio using propensity score matching.

Literature Review and Hypothesis Development

Fraud Definition

According to the Black’s Law Dictionary, fraud is “a knowing misrepresentation of the truth or concealment of a material fact to induce another to act to his or her detriment” (Black’s Law Dictionary, 2004). Association of Certified Fraud Examiners, the world’s largest anti-fraud organization, fraud is common and has a lot of meaning, that occurs because of human ingenuity and intended for one party to gain more by giving the incorrect presentation. Uncertainty and the absence of special rules that can serve as the primary means of fraud that consists of surprise, deception, deceit and unnatural way that is used to fool others.

Clearly and in detail, Albrecht et al., (2012, 7) states that fraud is deception composed of several important elements “a representation, about a material point, which

is false, and intentionally or recklessly so, which is believed, and acted upon by the victim, to the victim's damage." The public typically equates fraud to error and or negligence. Within the discipline of accounting, fraud could be a deliberate misstatement, errors are mistakes that relate to an accidental accounting mistake caused by inaccurate mathematical calculations, inaccurate estimates, improper accounting standards estimate as well as misinterpretation. Negligence is an omission or act of thoughtlessness within the same scenario encountered by another individual whose equivalent capacity, accountability or interest is neglected. Fraud relates to intentional mistakes to mislead the reports of the user (Priantara, 2013).

ACFE classifies fraud into three types, namely; corruption, asset misappropriation, and fraudulent statement. Firstly, corruption is the most difficult fraud to detect because it involves cooperation with other parties or collusion. This kind of fraud typically cannot be detected because the parties working along enjoy advantages.

Next, asset misappropriation includes; abuse, theft or larceny of company assets or assets by parties within and or parties outside the company. This kind of fraud is a type of classical fraud and will be most easily detected because it is tangible or is measured and calculated (defined value).

The final type of fraud is financial statement fraud which is often identified as management fraud because most perpetrators are indeed at the level or position in the managerial line (officials or executives and senior managers). The fraudulent statement covers actions carried out by officials or executives and senior managers of a company or government agency to cover actual financial conditions by conducting financial engineering or beautifying the presentation of financial statements to obtain their personal advantages or advantages associated with position and responsibility (Priantara, 2013).

Fraud Triangle Theory

Cressey (1953) investigated a model that examined factors affecting somebody to commit fraud. It consists of three conditions; pressure, opportunity, and rationalization. Simultaneously these three conditions would lead one party to be in a very condition of ethical hazard that justifies committing fraud.

Pressure is the existence of an incentive or needs to conduct fraud and it can be caused by different factors including both financial and non-financial pressure. Opportunity is a situation that opens a chance to commit fraud because the perpetrators believe that their activities will not be detected. If internal control systems are weak and there is ultimately inadequate management control; therefore, there is a high likelihood of fraud. The perpetrators are usually looking for a variety of reasons rationally to justify their actions. Rationalization is a justification against the act committed and can facilitate an individual to cover personal dishonesty. The adoption of fraud triangle theory was in line with studies conducted by Persons (1995); Skousen et al., (2009); Kirkos, Spathis & Manolopoulos (2007) bringing out the motivation for committing fraud.

Determinants of Financial Statement Fraud

ACFE as cited in Rezaee (2002) defines financial statements fraud as the intentional, deliberate, inappropriate and false misconceptions or omissions of material facts or accountable data that are incorrect and, considering all information provided, would lead the reader to alter or modify his judgment or decision.

A fraudulent statement contains behavior committed by a manager of a corporation or public organization for the purpose of covering the real economic situation by creating

or enhancing financial reports in order to gain personal advantages. The fraudulent statement can be analogous to the window dressing, economic shenanigans, book cooking, illegal handling of earnings, earnings smoothing (Priantara, 2013).

According to the Institute of Indonesia Chartered Accountants (IAI), financial statement fraud is:

1. Misstatements arising from fraud in financial reporting, namely misstatement or deliberate omission of amounts or disclosures in financial statements to deceive users of financial statements,
2. Misstatements arising from improper treatment of assets (often referred to as misuse or embezzlement) relating to the theft of an entity's assets resulting in financial statements not being presented in accordance with Generally Accepted Accounting Principles (GAAP) in Indonesia.

Financial Statement Fraud Detection Literature

A ratio expresses two measurements relative to each other and consists of assessing a company's performance by using present and historical reporting information. The information from the reports are used to compare the efficiency of a business over time to evaluate whether the business is improving or declining, to match the economic position of a business with the business standard, or to match a business with one or more other businesses operating in its sector to see how the business is stacking up. Various studies conducted in some countries reveal that financial ratio is one of the effective methods to investigate the likelihood of financial statement fraud.

A study by Persons (1995) examined important variables from the financial statement associated with fraudulent financial reporting using matching method. He applied two stepwise-logistic regression models and matched sample of 103 firms in the first year of occurrence, and 100 firms in the preceding year. The findings concluded that financial leverage, capital turnover, asset composition and size of the company have a significant association with fraudulent financial reporting. Accordingly, the model was able to identify fraudulent financial reporting.

Likewise, Spathis (2002) applied a logistic regression model to develop a model to detect factors associated with false financial statements. He used a matched sample of 38 firms issuing falsified financial statements and 38 firms issuing non-falsified financial statements in Athens Stock Exchange. Initially, he used 17 financial ratios as the explanatory variable and as a result, there are 10 ratios were selected as potential predictors of false financial reporting.

In the same year, Spathis et al., (2002) also applied logistic regression to analyse the effectiveness of an innovative classification technique in detecting falsified financial statements. They used a matched sample of 38 firms issuing falsified financial statements and 38 firms issuing non-falsified financial statements in Athens Stock Exchange. They found out financial ratios such as total debt to total asset ratio, sales ratio inventories, net profit to sales ratio and the sales to total assets ratio have significant relationship with the predicting of misleading financial statements. Hence, the investigation of financial information can help to identify falsified financial statements in listed companies.

Another group of studies has examined whether financial ratios were able to detect fraud. Kaminski et al., (2004) examined ratio analysis used by the auditor to investigate financial statements misleading. In comparing accounting data from fraudulent and non-fraudulent companies, they examined the SEC's Accounting and Auditing Enforcement

Releases published between 1982 and 1999. The findings demonstrated empirical evidence that financial ratios have limited ability to predict fraudulent financial reporting.

Alternative methods have also been adopted to detect financial statement fraud. Kotsiantis et al., (2006) proposed the efficacy of machine learning methods in identifying companies issuing fraudulent financial statements and related variables. A range of studies was carried out using representative learning algorithms that were studied between 2001 and 2002 using a data set of 164 Greek fraud and non-fraud companies. This research concluded that financial information can be used to identify fraudulent financial statements and highlights the significance of financial ratios.

Later, Zainal et al., (2013) investigated whether the distribution of power between Chief Executive Officer and Board of Directors was associated with the likelihood of financial statement fraud. The data collection involved the 202 samples that were evaluated consisting of 101 fraudulent companies and 101 non-fraudulent companies of Indonesia public companies between 2000 and 2011. This study suggested that when the Board of Director expert increases, the likelihood of the financial statement fraud decreases. It means through monitoring and supervising; Board of Director plays an important role in decreasing the likelihood of financial statement fraud.

In addition, Dalnial et al., (2014) examined the relationship between financial statement analysis and fraudulent financial reporting. The data collection involved the 130 samples that were evaluated consisting of 65 fraudulent companies and 65 non-fraudulent companies of Malaysian public companies between 2000 and 2011. The result demonstrated there are significant predictors able to detect fraudulent financial reporting, such as leverage, capital turnover and asset composition. This demonstrates that financial ratios may be useful in detecting financial fraudulent reporting. These findings contribute to the existing literature on the ability to predict misleading financial statements.

Furthermore, Ozcan (2016) develops an empirical model that contributes significantly to the development of a reliable framework of accounting fraud in the Borsa Istanbul listed companies. This research examined 10 accounting factors with an analysis of probit regression and includes 144 companies between 2005 and 2015. The findings show that companies with low liquidity ratios, smaller size, high debt to equity, lower account receivable turnover and inventory turnover are more likely to generate a fraudulent financial statement.

In addition, Sadique (2016) identifies the relationship between corporate governance, earnings management, and corporate fraud in Malaysia between 2003 and 2007. Companies charged with accounting and auditing violations were chosen as the fraudulent sample. Data were collected for the year fraud was charged to firms and the year before that. To determine important differences between fraudulent and non-fraudulent firms in terms of corporate governance characteristics and earning management characteristics both standardized analysis and logistic regression assessment have been carried out. The findings stated that the board size and the proportion of institutional shareholdings had significant interactions over the two-year period studied with the likelihood of corporate fraud occurrences.

Finally, Jofre and Gerlach (2018) proposed a study in detecting accounting fraud using financial ratio analysis. The data collection involves all Accounting Series Releases and Accounting and Auditing Enforcement Releases issued by U.S. Securities and Exchange Commission between 1990 and 2012. Forensic data analytic approach using several machine-learning techniques was implemented to identify companies that tend to

manipulate financial statements. The findings concluded there is a great potential in the improvement of accounting fraud detection.

The study on financial statement fraud still produces inconsistent findings in several countries, (Persons, 1995; Spathis et al., 2002; Dalnial et al., 2014; Kaminski et al., 2004). So, there is a need for further research concerning financial statement fraud and financial ratios. A specific case is more logical because it is hard to make a generalization from inconsistent results. Some explanatory variables for detecting financial statement fraud can be seen on Table 1.

Table 1. Explanatory Variables for Detecting Financial Statement Fraud

Predictor	Study
WCTA	Persons (1995) Spathis (2002) Spathis et al., (2002) Kaminski et al., (2004) Kotsiantis et al., (2006) Kirkos et al., (2007) Pai et al., (2011) Dalnial et al., (2014) Jofre and Gerlach (2018)
CATA	Persons (1995) Lenard et al., (2007) Dalnial et al., (2014) Jofre and Gerlach (2018)
CACL	Kotsiantis et al., (2006) Lenard et al., (2007) Ravisankar et al., (2011) Song et al., (2014) Jofre and Gerlach (2018)
TLTA	Persons (1995) Spathis (2002) Spathis et al., (2002) Kaminski et al., (2004) Kotsiantis et al., (2006) Lenard et al., (2007) Pai et al., (2011) Song et al., (2014) Dalnial et al., (2014) Jofre and Gerlach (2018)
LTDTA	Kirkos et al., (2007) Pai et al., (2011) Jofre and Gerlach (2018)

Source: Compiled from variety of sources

Hypothesis Development

Considering appropriate and important factors arising from previous studies on the subject, this study establishes four main segments of financial ratios as control variables that evaluate most elements of the financial performance of the company, including liquidity, leverage, and efficiency and profitability.

The Relationship Between Liquidity and Financial Statement Fraud

Liquidity relates to the ability of a company to maintain its operational and short-term debt-paying ability. Persons (1995) stated that a company with a low level of liquidity can bring the manager an opportunity to commit fraud. A lower liquidity ratio means that the company cannot pay bills in due time and it is a serious sign of bankruptcy (Attah and Jindal, 2017). This statement is supported by Kreutzfeldt and Wallace (1986)

who exposed that companies with liquidity problems have significant more errors in their financial statements compare to the company without liquidity problems. Thus, this condition can bring the manager to manipulate the liquidity ratio to show a better figure.

The following ratios are mostly used in research studies with regard to financial statement fraud: the working capital to total assets (WCTA) ratio (Persons, 1995; Spathis, 2002; Kaminski et al., 2004; Dalnial et al., 2014; Jofre and Gerlach, 2018), the current assets to total assets (CATA) ratio (Persons, 1995; Lenard, Watkins & Alam, 2007; Dalnial et al., 2014; Jofre and Gerlach, 2018), and also the current assets to current liabilities (CACL) ratio (Kotsiantis et al., 2006; Lenard et al., 2007; Ravisankar, Ravi, Rao & Bose, 2011, Song, Hu, Du & Sheng, 2014; Jofre and Gerlach, 2018). Firstly, working capital to total assets (WCTA) determines the short-term company's solvency by comparing the net liquid assets to the total assets of the firm. Secondly, current assets to total assets (CATA) is an indicator of how much of that portion of total assets is occupied by the current assets. Finally, current assets to current liabilities (CACL) which is an indicator of the ability of a company to pay off its short-term debts. Based on those foundations, the hypothesis was developed as follows:

H1: High liquidity companies tend to be fraudulent in their financial statements.

The Relationship Between Leverage and Financial Statement Fraud

Leverage is defined as the amount of debt a firm uses to finance assets. A high level of leverage is a general cause of financial difficulties since the company may not be able to generate enough cash to maintain its debt obligations. Typically, greater leverage is related to greater potential for credit violations and much less capacity to acquire extra assets through borrowing (Persons, 1995). Firms with difficulties in paying their bonds may be inclined to manipulate financial statements to comply with debt agreements.

The following are considered to be leverage ratios with regard to fraud detection: the total liabilities to total assets (TLTA) ratio (Persons, 1995; Spathis, 2002; Kaminski et al., 2004; Kotsiantis et al., 2006; Dalnial et al., 2014; Jofre and Gerlach, 2018), the long-term debt to total assets (LTDTA) ratio (Kirkos et al., 2007; Pai, Hsu, and Wang, 2011; Jofre and Gerlach, 2018) and the long-term debt to total equity (LTDTE) ratio. The first, total liabilities to total assets (TLTA) is an indicator of how much the company's assets are being financed by the creditors. The second, long-term debt to total assets (LTDTA) is an indicator representing the percentage of the company's asset financed with long-term debt. The final one, long-term debt to total equity (LTDTE) is a measurement of how the company finances its operation by comparing the company's long-term debt with its capital. Based on those foundations, the hypothesis was developed as follows:

H2: Low leverage companies tend to be fraudulent in their financial statements.

The Relationship Between Efficiency and Financial Statement Fraud

Financial efficiency also known as activity ratio is used to evaluate how well the company manages its resources. Efficiency refers to the ability to use the least amount of resources to achieve the highest amount of productivity. In general, the inefficient company involves higher costs which lead to poorer companies' performance that might cause managers to misrepresent financial statements (Jofre and Gerlach, 2018).

The following are considered to be efficiency ratios: the total sales to total assets (SALTA) ratio (Spathis, 2002; Kotsiantis et al., 2006, Kirkos et al., 2007, Lenard et al., 2007, Pai et al., 2011; Jofre and Gerlach, 2018), the total sales to total equity (SALTE)

ratio (Jofre and Gerlach, 2018) and the cost of good sold to sales (COGSSAL) ratio (Kaminski et al., 2004). The first, total sales to total assets (SALTA) is an indicator of how well a company is employing its assets to generate sales. Next, total sales to total equity (SALTE) is a measurement of how well the equity is being used to generate sales. The final one, cost of goods sold to sales (COGSSAL) is an indicator representing how efficient is company's sales operation by comparing cost of good solds with the company's revenue. Based on those foundations, the hypothesis was developed as follows:

H3: High efficiency companies tend to be fraudulent in their financial statements.

The Relationship Between Profitability and Financial Statement Fraud

Based on the prior research and combined with the actual condition of listed company in Indonesia, we include a set of profitability variables that refer to the ability of a company to generate earnings on its resources, measured by using return on assets (ROA), return on equity (ROE), earnings before tax to current liability (EBTCL) and Tobin's-Q. Firstly, return on assets (ROA) ratio is an indicator to evaluate how efficiently a company uses the assets to generate earnings.

ROA is the most popular explanatory variable used to predict the likelihood of financial statement fraud (Spathis et al., 2002; Kirkos et al., 2007, Ravisankar et al., 2011). ROA is also often used to evaluate management performance, (Skousen et al., 2009) and a high number of ROA ratios is an indication of good signal for the company and shareholders. The rationale behind this, the higher the ROA, the higher the likelihood of a company to commit fraud. Summers and Sweeney (1998) stated that ROA between fraud and non-fraudulent company is significantly different.

Secondly, return on equity (ROE) ratio is used as a measurement that represents the ability of a company to generate earnings using its shareholder investment.

Thirdly, earnings before tax to current liability (EBTCL) ratio is used as a profitability measurement that represents how a company generates sufficient earnings to completely cover its debt obligations. Therefore, the higher this ratio is, the better company performs. Springate (1978) shows that EBTCL can be used to determine the likelihood of companies fail. The rationale behind the use of this ratio is that if income projection is not met, then it can be a practical solution for the management to manipulate the profitability.

Finally, Tobin's-Q ratio is the market value of a company divided by its asset replacement cost (Hu, Dou and Wang, 2019) that can represent the condition of fundamental aspects of a company.

Kreutzfeldt and Wallace (1986) stated that companies with profitability problems have significantly more errors in financial statements compare to the company without profitability problems. As consequences, when businesses do not perform as anticipated, managers tend to manipulate financial reporting to cover the poor profitability condition (Kotsiantis et al., 2006; Jofre and Gerlach, 2018). Based on those foundations, the hypothesis was developed as follows:

H4: High profitability companies tend to be fraudulent in their financial statements.

The summary of financial ratios and expected relationship with target variable fraud is shown in Table 2.

Table 2. Financial Ratios and Expected Relation with Target Variable Fraud

Financial Ratio Category	Proxies	Expected Relation
Liquidity	WCTA	Positive
	CATA	Positive
	CACL	Positive
Leverage	TLTA	Negative
	LTDTA	Negative
	LTDTE	Negative
Efficiency	SALTA	Positive
	SALTE	Positive
	COGSSAL	Positive
Profitability	ROA	Positive
	ROE	Positive
	EBTCL	Positive
	Tobin's-Q	Positive

Research methods

Data

This study uses a descriptive analysis approach. This approach emphasizes the character of the variables that have a relevant aspect of the detectability of financial statement fraud using financial ratios and comprehend the distinction between fraudulent and non-fraudulent companies with respect to profitability in the Indonesia Stock Exchange.

This study used secondary sources of information. The fraudulent information of the study is collected from the Financial Services Authority of Indonesia. Under the Financial Services Authority of Indonesia, all companies listed in Indonesia Stock Exchange obliged to publish their annual financial statements.

The financial data required for this study are financial ratio variables, which can be found from the financial statement of the company and obtained from Indonesia Stock Exchange Website (www.idx.co.id); other helpful websites providing relevant financial information of the listed companies, such as Jakarta and Indonesia Stock Exchange Website (www.idnfinancial.com).

The fraud year is defined as the year in which the companies were sanctioned for fraud since it is difficult to determine exactly when the fraud was committed (Sadique, 2016). Since the global economic crisis began to take effect: the cut-off period for the selection of fraudulent companies for this study started in 2010. This study uses fraudulent companies listed in the Indonesia Stock Exchange which got sanctions from the Financial Services Authority of Indonesia over the period 2010 to 2018.

As the control sample, this study used purposive sampling which each non-fraudulent company was matched with non-fraudulent companies based on the following criteria:

1. Industry: The non-fraudulent companies were chosen from the same industry as the fraudulent companies (based on Jakarta Stock Industrial Classification).
2. Company size: The non-fraudulent companies were chosen based on the similarity of their size to the fraudulent companies. As the measurement of company size, this study uses total assets.

There were 47 listed companies that got sanctions from the Financial Services Authority of Indonesia over the period 2010 to 2018. From the population of the companies which got sanctions, this study used 30 companies as the sample.

As we can see in table 3, it clearly shows the result of sample selection based on purposive sampling method.

Table 3. Sample Selection Procedure for Fraud and Non-fraud Companies

Industry	Fraud firms violating article No. VIII G.7	Fraud firms which has uncompleted data	Fraud firms which has completed data	Non-Fraud Firms	Perc (%)
Agriculture	2	0	2	6	6.7
Mining	7	1	6	18	20
Basic Industry and Chemical	8	4	4	12	13.3
Miscellaneous Industry	4	2	2	6	6.7
Consumer Goods	4	2	2	6	6.7
Property, Real Estate, and Building Construction	8	1	7	21	23.3
Infrastructure, Utilities, and Transportation	3	2	1	3	3.3
Trade, Services and Investment	11	5	6	18	20.0
Total	47	17	30	90	100.0

Source: Sample selection and calculation

The result of sample selection based on purposive sampling brings about 120 public companies includes about 30 fraudulent companies and 90 non-fraudulent companies over the period 2010 to 2018 (the sample did not include financial companies).

Logit Regression Analysis

Analysis of factors affecting the likelihood of committing fraud is estimated by using logit regression. The dependent variable measured by dummy variable equals one if the company commits fraud and zero otherwise.

$$Y = f(WCTA, CATA, TLTA, LTDTA, LTDTE, SALTA, SALTE, COGSSAL)$$

The model of logit function can be expressed as below:

$$Y_{it} = \beta + \beta_1 WCTA_{it} + \beta_2 CATA_{it} + \beta_3 CACL_{it} + \beta_4 TLTA_{it} + \beta_5 LTDTA_{it} + \beta_6 LTDTE_{it} + \beta_7 SALTA_{it} + \beta_8 SALTE_{it} + \beta_9 COGSSAL_{it} + \varepsilon_{it}$$

where:

$Y_{it} = 1$ if fraudulent group, 0 otherwise.

In this study, factors affecting the likelihood of committing fraud is estimated by using the logit function that consists of nine variables defined in table 4. We use industry and year dummies to control for industry and time fixed effects.

Table 4. Research Variables and Sources of Variables

Variable	Description	Source
Dependent variables		
Profitability	<i>Return on Assets (ROA)</i> An indicator to evaluate how efficiently a company uses the assets to generate earnings.	Financial Statement / authors' calculation
	<i>Return on Equity (ROE)</i> A measurement that represents the ability of a company to generate earnings using its shareholder investment.	As above
	<i>Earnings before Tax to Current Liabilities (EBTCL)</i> An indicator of how a company generates sufficient earnings to completely cover its debt obligations.	As above
	<i>Tobin's-Q</i> The market value of a company divided by its asset replacement cost.	As above
Independent variables		
Fraud	Dummy variable equal to one if the company commit fraud and zero otherwise.	Financial Services Authority of Indonesia
Control variables		
Liquidity	<i>Working Capital to Total Assets (WCTA)</i> An indicator of short-term company's solvency by comparing the net liquid assets to the total assets of the firm.	Financial Statement / authors' calculation
	<i>Current Assets to Total Assets (CATA)</i> A measurement of how much of that portion of total assets is occupied by the current assets.	As above
	<i>Current Assets to Current Liabilities (CACL)</i> An indicator of the ability of a company to pay off its short-term debts.	As above
Leverage	<i>Total Liabilities to Total Assets (TLTA)</i> An indicator of how much the company's assets are being financed by the creditors.	As above
	<i>Long-Term Debt to Total Assets (LTDTA)</i> An indicator representing the percentage of the company's asset financed with long-term debt	As above
	<i>Long-Term Debt to Total Equity (LTDTE)</i> A measurement of how the company finances its operation by comparing company's long-term debt with its capital	As above
Efficiency	<i>Total Sales to Total Assets (SALTA)</i> An indicator of how well a company is employing its assets to generate sales.	As above
	<i>Total Sales to Total Equity (SALTE)</i> A measurement of how well the equity is being used to generate sales.	As above
	<i>Cost of Goods Sold to Sales (COGSAL)</i>	As above

Source: Compiled from variety of sources

Propensity Score Matching

To empirically test the hypotheses, the sample is classified into two groups: (1) The treatment group, including fraudulent companies and (2) the control group, including non-fraudulent companies. Furthermore, it is required to control for sample selection bias. Rosenbaum and Rubin (1983) introduced propensity score matching (PSM) method.

PSM is an alternative method for estimating the impact of a treatment on a subject. Precisely, there are some priors studies in finance using propensity score matching method (Lian, Su and Gu, 2010; Hu et al., 2019). In this study, this method is used to estimate the effect of financial statement fraud on profitability.

Moreover, PSM can reduce bias because a matching study usually has a problem in making decisions due to potential cofounding. The effect of cofounding can increase or decrease the actual relationship. So, it is less precise if the two conditions are compared even though adjustments have been made through regression because there is still potential for bias.

The propensity scores (PS) that measure the extent of matching of the fraudulent and non-fraudulent companies can be calculated using propensity score matching approach. To estimate the propensity score, this study uses logit regression analysis.

$$Y_2 = \beta + \beta_i X_i + \varepsilon$$

where:

Y_2 is outcome (profitability), β is intercept, β_i is coefficient, X_i is independent variable, and ε is error term.

In detail, Rosenbaum and Rubin (1983) defined propensity score as “the conditional probability of receiving a treatment given pre-treatment characteristics”.

$$P(X) = Pr[D = 1 | X] = E[D|X]$$

where:

X is the multidimensional vector of characteristics of the control group, D is the treatment group, which equals 1 if fraudulent group, and 0 otherwise.

Next, the matching method used in this study is the Nearest Neighbor Matching (NNM). NNM is the most commonly used technique, each unit adjusts to the closest propensity value, by giving the same weight to each unit by comparing the closest propensity score.

After identifying the matching samples, the average effect of treatment on the treated (ATT) can be estimated and are formulated as follows (Rosenbaum and Rubin, 1984).

$$ATT = E(\Delta | P(X), D=1) = E(Y1 | P(X), D=1) - E(Y0 | P(X), D=0)$$

where:

ATT is average treatment on treated, $D=1$ is treatment group, $D=0$ is control group.

Results and Discussion

Descriptive Statistical Analysis

This section analyses the descriptive statistics of the variables used in the main analysis. Table 5 presents the summary statistics for fraudulent and non-fraudulent companies.

Table 5. Summary Statistics

Variables	Fraud				No-Fraud				t-statistic	p-value
	Mean	Standard Deviation	Min	Max	Mean	Standard Deviation	Min	Max		
ROA	0.24	0.73	-0.95	2.91	1.34	5.93	-19.56	36.64	1.01	0.31
ROE	1.42	8.00	-1.52	43.76	0.09	0.39	-1.53	2.07	-1.58	0.11
EBTCL	-0.03	1.32	-5.84	3.00	0.46	1.16	-5.52	5.60	1.98	0.04*
TOBINS Q	1.44	1.43	0.43	8.08	1.76	1.96	0.25	11.52	0.81	0.41
WCTA	0.12	0.28	-0.62	0.69	0.20	0.21	-0.23	0.75	1.57	0.11
CATA	0.40	0.26	0.01	0.90	0.45	0.23	0.04	0.99	1.21	0.22
CACL	3.19	5.94	0.02	32.03	2.36	1.79	0.29	9.71	-1.17	0.24
TLTA	0.47	0.28	0.03	1.02	0.45	0.20	0.07	1.03	-0.37	0.70
LTDTA	0.21	0.23	0.00	0.87	0.20	0.16	0.00	0.72	-0.23	0.81
LTDTE	-0.72	8.30	-43.76	8.30	1.01	5.92	-16.77	51.51	1.24	0.21
SALTA	0.49	0.70	0.01	3.75	0.77	0.66	0.00	2.97	1.93	0.05
SALTE	2.22	8.20	-13.05	41.64	1.83	5.19	-24.93	39.17	-0.29	0.76
COGSSAL	0.69	0.33	-0.61	1.20	0.64	0.26	0.00	1.26	-0.69	0.49

Source: Results of the STATA Data Process, 2021

Analysis of both groups indicates that EBTCL ratio shows obvious difference. There are small differences between the two groups with respect to profitability (ROA, ROE, and Tobin's-Q), liquidity (WCTA, CATA, CACL), leverage (TLTA, LTDTA, LTDTE) and efficiency (SALTA, SALTE, COGSSAL). However, it cannot be said that the practices of both groups differed significantly. Further analysis was be carried out to examine whether there was a significant difference between both groups using propensity score matching.

Factors Model Affecting Financial Statement Fraud

Analysis of factors affecting the likelihood of committing fraud is estimated by using logit regression. Factor model affecting financial statement fraud consists of a dependent variable with a variable dummy: fraudulent company then gave the code 1, and 0 otherwise. As for covariate variables, there are nine variables: WCTA (working capital to total assets), CATA (current assets to total assets), CACL (current assets to current liabilities), TLTA (total liabilities to total assets), LTDTA (long-term debt to total assets), LTDTE (long-term debt to total equity), SALTA (total sales to total assets), SALTE (total sales to total equity), COGSSAL (cost of goods sold to sales). This study uses industry and year dummies to control for industry and time fixed effects. Parameters with model factors affecting financial statement fraud can be seen in table 6.

Table 6. Logistic Regression of Financial Statement Fraud

Log likelihood = -43.421559 Number of obs = 120
 LR chi²(23) = 8.12
 Prob > chi² = 0.0016
 Pseudo R² = 0.3565

No	Variable	Coefficient	Z	P> z
1	Constant	-4.1954	-1.47	0.142
2	WCTA	-29.5604	-2.31	0.021**
3	CATA	29.4553	2.36	0.018***
4	CACL	0.3517	1.20	0.229
5	TLTA	-23.3374	-1.89	0.058
6	LTDTA	26.0587	2.08	0.037**
7	LTDTE	-1.0144	-2.35	0.019***
8	SALTA	-9.1498	-3.42	0.001***
9	SALTE	1.1876	2.25	0.025**
10	COGSSAL	5.3416	2.79	0.005***

*p<0.10; **p<0.05; ***p<0.01

Source: Results of the STATA Data Process, 2021

Based on the output, the prediction equation is defined as below:

$$\begin{aligned}
 FRAUD_{it} = & -4.1954 - 29.5604 (WCTA_{it}) + 29.4553 \\
 & (CATA_{it}) + 0.3517 (CACL_{it}) - 23.3374 \\
 & (TLTA_{it}) + 26.0587 (LTDTA_{it}) - 1.0144 \\
 & (LTDTE_{it}) - 9.1498 (SALTA_{it}) + 1.1876 \\
 & (SALTE_{it}) + 5.3416 (COGSSAL_{it}) + \varepsilon_{it}
 \end{aligned}$$

The results show that there are seven variables that significantly affect financial statement fraud. As a measurement of liquidity, there is evidence of a higher probability of financial statement fraud in companies with low working capital to total assets (WCTA) and companies with high current assets to total assets (CATA). As a measurement of leverage, long term debt to total assets (LTDTA) enters regression with a positive sign and is statistically significant at 5% level. Furthermore, long term debt to total equity (LTDTE) is negatively related to the likelihood of financial statement fraud. The study also finds a significantly negative relationship between sales to total assets (SALTA) and the likelihood of financial statement fraud.

On the other hand, sales to total equity (SALTE) and cost of goods sold to sales (COGSSAL) enter the regression with positive signs and are statistically significant at 5% and 1% level. Additionally, current assets to current liability (CACL) and total liability to total assets (TLTA) show no significant relationship with the likelihood of financial statement fraud.

Finally, seven ratios, out of the original nine, will be selected to continue the propensity score matching: WCTA, CATA, LTDTA, LTDTE, SALTA, SALTE, COGSSAL.

Propensity Score Matching Analysis

Propensity Score Matching (PSM) method is used to estimate the effect of financial statement fraud on profitability. Variables used as a covariate in the matching procedure are variables that significantly affect the likelihood of committing fraud, and the outcome that was compared between treatment groups and control groups is profitability. As a result, the logit regression to determine the propensity score can be seen in table 7.

Table 7. Factors Model Determining Propensity Score

No	Variable	Coefficient	Z	P> z
1	Constant	-1.5784	-0.73	0.463
2	WCTA	-3.0031	-1.12	0.264
3	CATA	4.9956	1.76	0.078*
4	LTDTA	2.3036	1.00	0.317
5	LTDTE	-1.1193	-2.60	0.009***
6	SALTA	-9.2283	-3.68	0.000***
7	SALTE	1.3279	2.52	0.012***
8	COGSSAL	2.7259	1.99	0.047**

Source: Results of the STATA Data Process, 2021

As it can be seen from the results, the model reveals the relationship that exists between seven financial ratios and financial statement fraud, and five out of seven ratios are statistically significant.

H1: High liquidity companies tend to be fraudulent in their financial statements

There is a significant relationship between liquidity and financial statement fraud. CATA as a measurement of liquidity has a significant relationship with the likelihood of financial statement fraud at 1% level. The coefficient shows a positive relationship, it means the higher the current assets to total asset ratio, the higher the probability of

committing fraud which is harmony with prior expectation. A current ratio can be manipulated by increasing current assets or by decreasing current liabilities.

Persons (1995) and Spathis et al., (2002) postulated that current assets such as account receivable and inventory are subject to manipulation. This finding corroborate that demonstrated by Jofre and Gerlach (2018), fraudulent companies will tend to exaggerate this ratio as much as possible in order to ultimately establish a desirable economic position.

H2: Low leverage companies tend to be fraudulent in their financial statements

A significant relationship has also been found between leverage ratio and financial statement fraud. LTDTE shows a negative relationship which is in line with the hypothesis. LTDTE shows the companies' ability to use capital structure to earn better returns. A high ratio indicates excessive use of debt; hence a low ratio is desirable. This ratio is consistent with Spathis et al., (2002) argue that debts are more likely to be manipulated by management in order to meet certain debt covenants. Contrary, Dalnial et al., (2014); Jofre and Gerlach (2018) show the higher the LTDTE ratio, the higher the likelihood of fraud. A manager may be tempted to increase leverage to minimize equity owners' risk in times of difficulty (Jofre and Gerlach, 2018).

H3: High efficiency companies tend to be fraudulent in their financial statements

It is also clearly seen that all efficiency ratios have a significant relationship with financial statement fraud. SALTA shows a negative relationship with financial statement fraud which is not in accordance with the initial expectation. A high ratio of efficiency generally indicates that a company makes efficient use of its assets. Jofre and Gerlach (2018) argue that managers might be tempted to manipulate financial items related to sales when faced with competitive conditions. However, lower SALTA ratios do not always mean negative trends for a company. A growth company might be purchase assets to generate greater earning in the future.

Next, SALTE shows a positive relationship with financial statement fraud which is in accordance the expectation. Higher SALTE reflects the efficient use of equity and shows better equity management by the company. A manager might manipulate this ratio by overstating sales or understating equity. The increase in sales but not in capital can be taken into consideration when investigating financial statement fraud since sales and equity should move together in the same direction (Jofre and Gerlach, 2018).

COGSSAL shows a positive relationship with financial statement fraud which is in accord with what was expected. The higher cost of goods sold and higher sales, or flat cost of goods sold, and higher sales could reflect good management. A manager might manipulate this variable to show better management performance.

Propensity Score Matching in this study is conducted through psmatch2 and the Nearest Neighbor (NN) method. This method is used to match the closest propensity score to each treatment group with the control group. This matching will result in the Average Treatment Effect on the Treated (ATT) which is the difference between the treatment group and the control group. Table 8 shows different outcomes of the treatment group and control groups by means of psmatch2 using STATA 15.

Table 8. ATT Estimation with Nearest Neighbor Method

Variable	Sample	Fraud	Non-Fraud	Difference	S.E.	T-stat
ROA	Unmatched	0.241	1.345	-1.105	1.089	-1.01
	ATT	0.241	1.566	-1.325	0.812	-1.63
ROE	Unmatched	1.421	0.088	1.332	0.839	1.59
	ATT	1.421	0.027	1.394	1.402	0.99
EBTCL	Unmatched	-0.033	0.469	-0.502	0.253	-1.98
	ATT	-0.033	0.236	-0.269	0.253	-1.06
Tobin's-Q	Unmatched	1.443	1.761	-0.317	0.389	-0.82
	ATT	1.443	2.008	-0.565	0.555	-1.02

Source: Results of the STATA Data Process, 2021

As shown in table 8, the effect of financial statement fraud on ROA shows a difference in ROA before matching of -1.015, and after matching decreased to -1.325. The effect of financial statement fraud on ROE shows a difference in ROE before matching of 1.332 and after matching increased to 1.394. The effect of financial statement fraud on EBTCL shows a difference in EBTCL before matching of -0.502 and after matching increased to -0.269. The effect of financial statement fraud on Tobin's-Q shows a difference in Tobin's-Q before matching of -0.317 and after matching decreased to -0.565.

The analysis of the effect of financial statement fraud conducted using `psmatch2` and nearest neighbor method shows there are no profitability ratios increased significantly ($t\text{-stat} > 2$). It means that financial statement fraud has no effect on profitability and there is no significant difference between the two groups.

Table 9. Common Support

Treatment Assignment	Common Support	
	On support	Total
Untreated	90	90
Treated	30	30
Total	120	120

Source: Results of the STATA Data Process, 2021

As shown in table 9, the propensity score matching allows all covariates to get matching pairs. Therefore, there is no observation discarded during the matching process.

Balancing test should be conducted to determine the bias of each variable used in the matching between the treatment group and the control group. In this stage, the output in table 7 was tested to see the possible bias. The balancing test result can be seen in table 10.

Table 10. Difference between Mean of the Treatment Group and Control Group

Variable	Sample	Fraud	Non-Fraud	Difference	S.E.	T-stat
ROA	Unmatched	0.241	1.345	-1.105	1.089	-1.01
	ATT	0.241	2.365	-2.124	1.688	-1.26
ROE	Unmatched	1.421	0.088	1.332	0.839	1.59
	ATT	1.421	-0.168	1.589	1.469	1.08
EBTCL	Unmatched	-0.033	0.469	-0.502	0.253	-1.98
	ATT	-0.033	0.003	-0.036	0.403	-0.09
Tobins-Q	Unmatched	1.443	1.761	-0.317	0.389	-0.82
	ATT	1.443	1.642	-0.198	0.482	-0.41

Source: Results of the STATA Data Process, 2021

As shown in table 10, the difference in ROA before matching of -1.105, and after matching the difference decreased to -2.124. The fraud (treatment) group shows that ROA is 0.241 and non-fraud (control) group the ROA is 2.365. However, t-stat indicates an insignificant decreased ($t\text{-stat} < 2$). It means that the ROA ratio in fraudulent companies is smaller than non-fraudulent companies but there is no significant difference between the two groups.

This is consistent with Persons (1995) and Dalnial et al., (2014) show that profitability measured by ROA has no significant effect on the likelihood of financial statement fraud.

The difference in ROE before matching of 1.332, and after matching the difference increased to 1.589. The fraud (treatment) group shows that ROE is 1.421 and non-fraud (control) group the ROE is -0.168. However, t-stat indicates an insignificant increased ($t\text{-stat} < 2$). It means that the ROE ratio in fraudulent companies is bigger than non-fraudulent companies but there is no significant difference between the two groups.

The difference in EBTCL before matching of -0.502, and after matching the difference increased to -0.036. The fraud (treatment) group shows that EBTCL ratio is -0.033 and non-fraud (control) group the EBTCL is 0.003. However, t-stat indicates an insignificant decreased ($t\text{-stat} < 2$). It means that the EBTCL ratio in fraudulent companies is smaller than non-fraudulent companies but there is no significant difference between the two groups.

The difference in Tobin's-Q ratio before matching of -0.317, and after matching the difference increased to -0.198. The fraud (treatment) group shows that Tobin's-Q ratio is 1.443 and the non-fraud (control) group the Tobin's-Q is 1.642. However, t-stat indicates an insignificant increased ($t\text{-stat} < 2$). It means that the Tobin's-Q ratio in fraudulent companies is smaller than non-fraudulent companies but there is no significant difference between the two groups.

The result after balancing test is not contrary to the result before balancing test. The analysis of the effect of financial statement fraud on psmatch2 and nearest neighbor method after balancing test shows that ROA, ROE, EBTCL, and Tobin's-Q indicates an insignificant different ($t\text{-stat} < 2$). It means that financial statement fraud has no effect on profitability and there is no significant difference between fraudulent and non-fraudulent companies. Therefore, this is one of the advantages of PSM whereas bias is eliminated so that the results gained more accurately.

H4: High profitability companies do not tend to be fraudulent in their financial statements

Kotsiantis et al., (2006) argued that when businesses do not perform as anticipated, managers tend to manipulate financial reporting to cover the poor profitability condition. Consequently, it is expected to find higher levels of profitability in fraudulent companies than non-fraudulent ones. However, the result indicates that there is no significant difference between the fraudulent and non-fraudulent company. Financial statement fraud appears in various ways and the nature of fraud in Indonesia public listed companies shows that profitability ratio is not being an important factor that impacts company's tendency to commit fraud. Furthermore, the certain impact of the existence of liquidity, leverage and efficiency ratio as control variables on profitability was analysed. Table 11 reports the result of the logistic regression examining the effect of liquidity, leverage and efficiency ratio on profitability ratio, with the presence of industry and year fixed effect as mentioned in each column, respectively.

Table 11. Fixed Effect Regression Result

	ROA (1)	ROE (2)	EBTCL (3)	TOBINSQ (4)
WCTA	0.62 (14.071)	-0.71 (-7.036)	2.58*** (10.169)	1.75 (13.587)
CATA	-0.67 (-15.615)	0.90 (9.047)	-2.51*** (-10.045)	-1.64* (-12.924)
CACL	0.22 (0.045)	-0.99 (-0.086)	1.72* (0.060)	0.47 (0.032)
TLTA	0.63 (14.483)	-0.85 (-8.488)	2.30** (9.192)	1.69* (13.310)
LTDTA	-0.69 (-15.945)	1.59* (15.920)	-2.75*** (-10.984)	-1.62* (-12.751)
LTDTE	0.32 (0.040)	-12.43*** (-0.668)	3.09*** (0.066)	-1.08 (-0.045)
SALTA	0.66 (0.876)	-3.43*** (-1.963)	2.34** (0.535)	-0.22 (-0.101)
SALTE	-0.32 (-0.047)	5.38*** (0.352)	-1.52* (-0.039)	0.46 (0.024)
COGSSAL	-0.91 (-2.518)	1.88* (2.261)	-5.86*** (-2.814)	-2.96*** (-2.793)
Constant	0.64 (1.798)	-1.44* (-1.752)	4.86*** (2.370)	2.71*** (2.601)
Year Effect	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes
Pseudo R-square	0.122	0.673	0.488	0.134

Source: Results of the STATA Data Process, 2021

Note: Subscript *, **, *** represents significance at 10%, 5%, and 1%, respectively.

Column (1) provides a result that liquidity, leverage and efficiency ratios have no significant interaction over return on asset. It means that all financial ratio in Indonesia public listed company have no certain impact over return on assets. This contrasts with some studies conducted in other countries (Spathis et al., 2002; Kirkos et al., 2007; Ravisankar et al., 2011).

Accordingly, return to total assets ratio is not an ideal performance evaluation tool in Indonesia listed companies. Likewise, column (2) reveals that there are weak relations between all liquidity ratios and return on equity.

On the other hand, long-term debt to total assets, long-term debt to total equity as the predictors of leverage ratios show significant interaction with return on equity. Long term debt to total asset shows a positive interaction with return to equity. It indicates that company with a high long-term debt to total assets tends to get a high uncertainty of expected return. However, this condition can increase the expected return on equity. In

contrast, long-term debt to total equity shows a negative interaction with return to equity. This indicates a low long-term debt to total equity company has a good ability to use capital structure to generate earnings.

Next, interestingly, all the efficiency (total asset turnover, total equity turnover and cost of goods sold to total sales) have significant interactions with return to equity. Total equity turnover and cost of goods sold to total sales show positive significant interaction with return to equity. For instance, the increasing number of sales or net income will be in harmony with the increasing number of total equity turnover.

In contrast, total asset turnover shows a negative significant interaction with return to equity. This can happen if a company has a high total asset turnover but insufficient equity. A high number of total asset turnover almost always increases the costs, and this condition can decrease income. As a result, capital is one of the most important variables that can use to analyse the efficiency of the company.

Next, as shown in column (3), surprisingly the results show that all the variables (liquidity, leverage, and efficiency) have significant interactions with earnings before tax to current liabilities. Working capital to total assets, current assets to total assets, long-term debt to total assets, long-term debt to total equity, cost of goods sold to sales have significant interactions at 1% level. Springate (1978) demonstrated that earnings before tax to current liabilities can predict the possibility of company failure.

Hence, it indicates all financial ratios in this study have significant impact on predicting the sustainability of the business. Next, column (4) reveals that current assets to total assets, total liability to total assets, long term debt to total assets and cost of goods sold to sales have significant interactions with Tobin's-Q. Tobin's-Q as one of the predictors of the company's value has a strong relationship with company's total assets. The result shows that current assets total assets show negative interactions with Tobin's-Q. Therefore, it indicates that the lower the total asset of a company, the higher the Tobin's-Q ratio. This is in line with Tobin's-Q theory.

Conclusion

This study examined factors affecting the likelihood of financial statement fraud occurrences and investigated the difference between fraudulent and non-fraudulent companies with respect to profitability over the period 2010 to 2018. Empirical results indicate that the current assets to total assets, long-term debt to total equity, total sales to total equity, and the cost of goods sold to sales have significant relationships in affecting the likelihood of financial statement fraud.

Firstly, high liquidity companies tend to be fraudulent in their financial statements. A current asset to total assets ratio can be manipulated by increasing current assets or by decreasing current liabilities. This result corroborates Jofre and Gerlach (2018), fraudulent companies will tend to exaggerate this ratio as much as possible to ultimately establish a desirable economic position.

Next, low leverage companies tend to be fraudulent in their financial statements. A high long-term debt to total equity ratio indicates excessive use of debt, hence a low ratio is desirable. This result is consistent with Spathis et al., (2002) argue that debts are more likely to be manipulated by management to meet certain debt covenants. Then, it also can be clearly seen that all efficiency ratios have a significant relationship with financial statement fraud. Sales to total assets ratio shows a negative relationship with financial statement fraud which is not in accordance with prior expectations. Jofre and Gerlach (2018) argue that managers might be tempted to manipulate financial items

related to sales when faced with competitive conditions. However, the lower the sales to total assets ratio does not always mean negative trends for a company. A growth company might be purchase assets to generate greater earning in the future.

Next, high sales to total equity ratio companies tend to be fraudulent in their financial statements. The higher this ratio reflects the efficient use of equity and shows better equity management by the company. Then the increase in sales but not in capital can be taken into consideration when investigating financial statement fraud since sales and equity should move together in the same direction (Jofre and Gerlach, 2018). Similarly, high cost of goods sold to total sales companies tends to be fraudulent in their financial statements. It represents the higher cost of goods sold and higher sales could reflect good management.

Based on the PSM using cross-sectional data, we find that there is no significantly different between fraudulent and non-fraudulent companies with respect to profitability ratio. This means the nature of fraud in Indonesia public listed companies shows that profitability ratio is not being an important factor that impacts company's tendency to commit fraud.

This study is expected to develop an integrated fraud detection model that use financial statement analysis to assist management, internal auditor and external auditor to detect fraud and is used as reference material in financial and accounting science, especially auditing science. This study provides insight into financial statement fraud and factors affecting it.

Furthermore, it is expected to provide materials for policy-making with the prevention of financial statement fraud action and to be used as an analytical tool for investors in assessing and analysing their investments in certain companies and as a consideration in investment decision making within a company.

Finally, this study has some limitations which can be addressed in future studies. Further research with larger samples will be needed to validate results. This study targets only one country so the research cannot easily be generalized to other countries due to cultural differences.

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