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ISSN: 1648-0627 / eISSN: 1822-4202

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## PREDICTING FRAUDULENT FINANCIAL STATEMENT USING CASH FLOW SHENANIGANS

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Received 10 July 2021; accepted 29 July 2022

**Abstract.** Detection of fraudulent financial stewardship in the cash flow section is an exciting thing and is rarely studied. This research empirically tests the discovery of fraudulent financial statements based on basic cash flow shenanigans. The sample of this study amounted to 470 data mining companies in Indonesia, Malaysia, China, and Japan. The analysis method used is a positive approach. The results show that all ratios used can predict fraudulent financial statements. Three ratios of cash flow shenanigans, namely change in receivable to cash flow operations, days payable outstanding, and change in inventory to cash flow operations, significantly affect the F-Score. Meanwhile, the six cash flow shenanigans ratios, namely cash flow operations to current liability, operating cash flow ratio, free cash flow, cash flow operations to total liability, days payable outstanding, and change in inventory to cash flow operations, have a significant effect on the M-Score.

**Keywords:** fraudulent financial statement, financial shenanigans, cash flow shenanigans, m-score, f-score, detection.

**JEL Classification:** E44, F36, G32, M40.

### Introduction

Over the last few decades, auditors and investors have preferred to discover fraudulent financial reporting using the accrual basis for income statements (Schilit et al., 2018). However, financial statements, including auditors and forensic experts, still use the accrual basis because they argue that cash flow statements are relatively more immune to the effects of number manipulation than the accruals section, such as statements of financial position and income statements (Deo & Liu, 2016). Another factor is that auditors experience difficulty detecting fraud in cash flows (Dimitrijevic et al., 2020). This gap is used by management to manipulate the cash flow section. Therefore, It is as well as the study (Stevanovic et al., 2013) which states that cash flow and its elements can be used by management to manipulate.

Fraud cases at WorldCom prove that cash flow is not an area that is immune to number manipulation (Deo & Liu, 2016; Schilit, 2010; Schilit et al., 2018). WorldCom easily increases operating revenues and cash flow by recognizing expenses as assets. It quickly increases operating

income and cash flow by recognizing expenses as assets. In addition, WorldCom deliberately misclassified operating cash flows as investing cash flows. Several other significant cases have occurred, such as the case of the Delphi Corporation in the 2000s, which recognized bank loans as income so that they could increase their operating cash flow, which should have entered into financial cash flows (Schilit et al., 2018). Netflix has also been recorded manipulating operating cash flows by misclassifying the purchasing inventory cost in 2007 (Deo & Liu, 2016; Schilit et al., 2018). Another case was carried out by Zoomlion Heavy Industry Science and Technology Co., Ltd in 2014, which rapidly utilized receivables to increase operating cash flow (Schilit et al., 2018).

According to survey performed by the Association of Certified Fraud Examiners (ACFE) in 2020, it was found that fraudulent financial statements caused the most significant losses in the world (ACFE, 2020a). The losses incurred reached a median loss of \$954,000 even though it was only a 10% incident percentage (ACFE, 2020a). The losses incurred reached a median loss of \$954,000 even

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though it was only a 10% incident percentage (ACFE, 2020a). On the other hand, the financial statement fraud scheme (overstatement and understatement) caused a loss of \$39,800 per month. In addition, losses incurred due to corruption amounted to \$11,100, non-cash schemes of \$6,000, and billing of \$4,200 (ACFE, 2020a).

The losses were even more significant in the Asia Pacific region (ACFE, 2020b). Furthermore, the type of industry that was most disadvantaged was the mining industry, which reached a median loss of \$475,000 (ACFE, 2020a). Meanwhile, the largest mining companies in the Asia Pacific, such as Indonesia, Malaysia, China, and Japan (PwC, 2019). In addition, countries such as Indonesia, Malaysia, China, and Japan are most disadvantaged by fraud (ACFE, 2018).

Detection is one of the manners that could be put on to hold down the chance of fraudulent financial statements (Wilhelm, 2004). Several studies focus on the accrual basis of the income statement and statement of financial position, such as the F-score model (Dechow et al., 2011, 2012), earning management (Dechow et al., 1995; Jones, 1991), and financial ratios (Adu-Gyamfi, 2020; Dalnial et al., 2014a, 2014b; Kanapickienė & Grundienė, 2015; Kirkos et al., 2007; Persons, 1995; Rahmatika et al., 2019; Ratmono et al., 2020; Somayyeh, 2015; Yusrianti et al., 2020). On the other hand, several studies also use cash flow detection such as Real Earnings Management (Md Nasir et al., 2018; Roychowdhury, 2006), discretionary accruals (Sayidah et al., 2020), free cash flow (Bukit & Iskandar, 2009), cash flow (Adebayo & Ajao, 2015; Bose et al., 2019; Deo & Liu, 2016; Sayidah & Assagaf, 2020; Stevanovic et al., 2013), cash flow restatement (Alfonso et al., 2018), predicts corporate fraud and non-fraud (Asare, 2019), operating cash flow (Goel, 2013, 2014; Grove & Basilico, 2011; Nagar & Raithatha, 2016; Nobanee et al., 2020; Sakti et al., 2020; Suhardianto & Leung, 2020), and improve prediction accuracy (Jordan & Messner, 2020; Krylov, 2018), and in addition, using cash flow ratios as a means of detecting fraud in financial statements (Abelingga et al., 2021; Dugan & Taylor, 2019). In addition, Some focus on researching ways to manipulate, detect, and prevent fraud on cash flows (Dimitrijevic, 2015). However, research is still rare that predicts cash flow manipulation using financial shenanigans. Based on these arguments, this study predicts fraudulent financial statements based on cash flow shenanigans. The statement also supports this issue that investors have recently begun to have difficulty detecting fraudulent financial statements in the accruals section (Schilit et al., 2018).

This study focuses on predicting the manipulation of cash flow using financial shenanigans. Financial shenanigans divide management into three ways to quickly increase the company's cash flow: removal financing cash inflows to the operating component, moving operating cash outflows to other component, and push operating cash flow using unsustainable activities (Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018). Financing cash

inflows shift to the operating department discusses deliberate misclassification of operating and financial cash inflows. Moving cash outflows to other sections discusses intentional misclassification of operating and investing cash flows. Meanwhile, boosting operating cash flow using unsustainable activities discusses techniques to increase operating cash flow by utilizing unsustainable activities. The three techniques referred to are then called Cash Flow Shenanigans (Schilit et al., 2018).

The cash flow shenanigans ratios used in this study are following the red flag in financial shenanigans. The following are the ratios used to predict fraudulent financial statements, namely the ratio of cash flow operation to short term liability (Abelingga et al., 2021; Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018), operating cash flow ratio (Abelingga et al., 2021; Dimitrijevic, 2015; Dugan & Taylor, 2019; Peasnell et al., 2000; Schilit, 2010; Schilit et al., 2018), change in receivable to cash flow operations (Schilit et al., 2018), free cash flow (Schilit et al., 2018), cash flow operations to total liability (Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018; Schmidgall et al., 1993), Days Payable Outstanding (Schilit et al., 2018), and change in inventory to cash flow operations (Schilit et al., 2018).

This study aims to empirically examine cash flow ratios shenanigan, namely the ratio of cash flow operations to short-term liability, operating cash flow ratio, change in receivable to cash flow operations, free cash flow, cash flow operations to total liability, and Days Payable Outstanding, and change in inventory to cash flow operations against fraudulent financial statements. The objects of this research are mining companies in Indonesia, Malaysia, China, and Japan. The research results are expected to be conducted to detect fraud in financial statements. In addition, They can provide attention for auditors and investors in viewing cash flows that have the potential to be manipulated by management (Deo & Liu, 2016; Dimitrijevic, 2015; Dimitrijevic et al., 2020; Schilit, 2010; Schilit et al., 2018; Stevanovic et al., 2013). Furthermore, this study contributes to detecting fraudulent financial statements and adding new literature on financial shenanigans (Sakti et al., 2020). Finally, it can help auditors reduce bias to provide better opinions (Tarjo & Herawati, 2015).

## 1. Literature review

### 1.1. Opportunity theory

The opportunity arises because there are five driving factors: Exposure, Proximity, Guardianship, Target Attractiveness, and Definitional Properties of Specific Crimes (Cohen et al., 1981). In this context, Exposure refers to the ease of access that fraudsters have in committing financial crimes. Then for Proximity occurs because of the closeness between the perpetrator of the crime and the target. Guardianship is under the effectiveness of supervision that occurs in a company or organization. Finally, attractiveness targets refer to the fraudster's motivation in committing fraud against their victims. Meanwhile, the

Definitional Properties of Specific Crimes is based on the ease with which the perpetrator can break the target.

In this study, management is as Exposure, Proximity, and Target Attractiveness because management has the motivation to benefit itself. The factors of access and proximity to targets make it easy for management to commit fraud. Investors and auditors are Guardianship. Investors and auditors conduct Guardianship so that management does not commit fraud, and effective Guardianship can close the loopholes for fraud. Cash flow is the Definitional Properties of Specific Crimes. Cash flow is an easy place to break into due to a lack of Guardianship.

These five factors will cause opportunities for fraud in the company. However, the main factor was fraud due to the weakness of Guardianship in cash flow. Because Guardianship only focuses on the accrual portion of cash flow (Deo & Liu, 2016; Dimitrijevic, 2015; Dimitrijevic et al., 2020; Schilit et al., 2018). Guardianship also does not examine unsustainable operations in the cash flow (Stevanovic et al., 2013). With some of the disadvantages that exist, it makes cash flow an accessible area to break into. On the other hand, management who has access, closeness, and the desire to earn profits take advantage of weaknesses in the cash flow section to commit fraud. Hence, it can be stated that weak Guardianship in cash flow causes opportunities to emerge so that management can use it to commit fraud.

## 1.2. Cash flow shenanigans

Financial Shenanigans is a book written by Howard M. Schilit in 1993, 2010, 2018 about the tricks used by large companies that have committed financial statement fraud, such as Enron, WorldCom, and others. In this book, five main chapters discuss what tricks are used to manipulate financial statements. One of the chapters deals specifically with cash flow problems. Over the past years, many practitioners still focus on the accruals part and ignore cash flow. This statement shows that auditors still have difficulty detecting fraud in cash flows (Dimitrijevic et al., 2020). Cash flow is not an area that is immune from financial manipulation (Dimitrijevic et al., 2020). Cash flow is not an area that is immune from financial manipulation (Dimitrijevic, 2015). The case that happened to WorldCom has easily deceived all investors. By manipulating its cash flow, the company can instantly increase its net profit (Deo & Liu, 2016; Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018). Based on these arguments, this study uses financial shenanigans as a guide to detecting the manipulation of numbers in cash flows.

Financial shenanigans mention that there are three tricks used by management in manipulating cash flow. The first technique is Displacement Financing Cash Inflows To The Operating Section (Schilit et al., 2018). This technique discusses three fraudulent tricks, namely, first shifting the inflow of financial cash flows into operating cash flows (Alfonso et al., 2018; Schilit et al., 2018). This trick utilizes accounts in financial cash flows such as bank

loans that are recognized as income so that the inflow into operating cash flows should be part of the financial cash flow inflow (Deo & Liu, 2016; Dimitrijevic, 2015; Schilit et al., 2018; Stevanovic et al., 2013). This technique discusses three fraudulent tricks, namely, first shifting the inflow of financial cash flows into operating cash flows (Alfonso et al., 2018; Schilit et al., 2018). This trick utilizes accounts in financial cash flows such as bank loans that are recognized as income so that the inflow into operating cash flows should be part of the financial cash flow inflow (Deo & Liu, 2016; Dimitrijevic, 2015; Schilit et al., 2018; Stevanovic et al., 2013). This trick involves invoicing aggressively and charging at the wrong time. The effect is that the increase in receivables collection will increase the accounts receivable in the operating cash flow component, and improve its performance. The third track is to create fake receivables to increase operating cash flow (Deo & Liu, 2016; Dimitrijevic, 2015; Schilit et al., 2018; Stevanovic et al., 2013). An instant and easy trick for management to improve operating cash flow, namely by creating false receivables. The trick is to make fake receivables quite risky but potentially free from monitoring by auditors and investors (Schilit et al., 2018).

The second technique is Moving Operating Cash Outflows to Other Sections (Schilit et al., 2018). This technique contains four tricks to make the outflows in the operating cash flow move to another part, such as the investment or finance department. The first trick is to discuss the “boomerang” transaction. The purpose of this transaction is to include an inflow in the operating cash flow component. Hereafter, the outflow that appears at the operating cash flow component was transferred to the investment cash flow component (Deo & Liu, 2016; Dimitrijevic, 2015; Schilit et al., 2018; Stevanovic et al., 2013). One example is a customer advance account. Advances from customers are considered an inflow for the operating cash flow section, but when the advances have been made, they will cause an outflow to the operating cash flow. That should have happened, but management chose to move the outflow to the investment cash flow to continue to increase and would not experience a decrease due to the cash advance outflow. The second trick is a mistake in capitalizing expenses (Schilit et al., 2018). The trick popularized by WorldCom, namely deliberately capitalizing expenses as assets (Deo & Liu, 2016; Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018). The third track is to misrecord inventory purchases (Schilit et al., 2018). This trick is done simply by recording inventory purchases but by reporting the outflow in the investment section. This method is not quite right, and it should be recorded in the operating cash flow section. The fourth track moves unnecessary outflows to the operating cash flow section (Schilit et al., 2018). An example of a transferred account is a pension expense account. However, shifting these outflows will obtain in a significant rise in the share of operating cash flows.

The third technique is Boosting Operating Cash Flow Using Unsustainable Activities (Schilit et al., 2018). This

technique focuses on how to increase operating cash flow with policies that are not sustainable. This unsustainable nature needs to be underlined because these accounts are free from auditors' scrutiny and investor supervision to become one area where management can easily manipulate (Stevanovic et al., 2013). The first trick is to increase operating cash flow by deferring liabilities (Schilit et al., 2018). Even though liabilities are an unsustainable account (Stevanovic et al., 2013). There is often a policy of deferring liabilities to increase income to increase its operating cash flow (Deo & Liu, 2016). The second trick is to speed up the payment of debts from customers. The company tries to convince its customers to pay their obligations as quickly as possible, which is reasonable. Still, if it is continued for a long time, it will cause an increase in operating cash flow from unsustainable operations, which has the potential for fraud (Schilit et al., 2018). The third trick is purchasing inventory that is lower than the previous period. A red flag occurs when management purchases inventory that is lower than the previous period. This method is unnatural, but the impact caused is to instantly increase operating cash flow in that period (Deo & Liu, 2016; Schilit et al., 2018).

### 1.3. Cash flow operation to current liability ratio and fraudulent financial statement (Hypothesis – H1)

Misclassification usually occurs when a loan from a bank is recognized as income by a company (Schilit et al., 2018). They carry out an inflow in operating cash flow so that operating cash flow increases. Current debt provides an excellent opportunity for management to manipulate because it is free from performance checks (Stevanovic et al., 2013). Management can also use other means of recognizing customer advances as an inflow to operating cash flows (Stevanovic et al., 2013). Revenue manipulation is received in advance as income increases the company's revenue and cash flow (Deo & Liu, 2016).

It is necessary to perform a research using a comparison between cash flow operations to current liabilities to detect fraudulent financial statements (Bhandari & Iyer, 2013; Krylov, 2018; Fahlevi & Marlinah, 2019). Based on a prior study, it can be stated that cash flow operations to current liabilities can forecast fraudulent financial statements. Therefore, the hypothesis developed is:

*H<sub>1</sub>: Cash flow operations to current liabilities affect the fraudulent financial statement.*

### 1.4. Operating cash flow ratio and fraudulent financial statement (Hypothesis – H2)

Policies to create counterfeit income can increase operating cash flow (Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018). However, this view assumes that there is a possibility that investors and auditors will not monitor the operating cash flow section so that management can freely create false income without worrying that investors and auditors will find out. In addition, the creation of false

income will not affect the accruals section so that it cannot be detected by investors and auditors (Stevanovic et al., 2013).

False income can leave a trail that creates an anomaly in the cash flow section (Deo & Liu, 2016). Then there are research findings that the Operating Cash Flow Ratio can predict strange things in income (Peasnell et al., 2000; Krylov, 2018). Operating cash flow ratios can impact fraud (Francis & Eason, 2012; Bhandari & Iyer, 2013; Dugan & Taylor, 2019; Lennox & Yu, 2019; Sayidah et al., 2020). So, based on the existing literature, the operating cash flow ratio can predict financial statement fraud. Therefore, the hypothesis developed is:

*H<sub>2</sub>: Operating cash flow ratio affects the fraudulent financial statement.*

### 1.5. The ratio of change in receivable to cash flow operation and fraudulent financial statement (Hypothesis – H3)

Accounts receivable is often played to increase operating cash flow or increase company profitability (Molina & Preve, 2009). A sudden increase or decrease in receivables can be a red flag for fraud (Dimitrijevic, 2015; Krylov, 2018; Schilit, 2010; Schilit et al., 2018). Management can increase the company's operating cash flow without being noticed by auditors and investors by creating false receivables (Stevanovic et al., 2013). One way to write off bad debts is working capital, improving operating cash flow performance (Deo & Liu, 2016). Another opinion, that the comparison of operating cash flows and receivables affects financial statement fraud (Al-Attar & Maali, 2017; Barth et al., 2001; Ebaid, 2011a, 2011b; Francis & Eason, 2012; Lennox & Yu, 2019; Luo, 2008). So, based on previous research, it can be stated that change in receivable to cash flow operations can predict fraudulent financial statements. Therefore, the hypothesis developed is:

*H<sub>3</sub>: The ratio of receivables to cash flow operation affects the fraudulent financial statement.*

### 1.6. Free cash flow and fraudulent financial statement (Hypothesis – H4)

WorldCom is a company that popularizes manipulation by deliberately recognizing expenses as assets (Dimitrijevic, 2015; Krylov, 2018; Schilit, 2010; Schilit et al., 2018). Expenses are capitalized into capital expenditure (Schilit et al., 2018), making the free cash flow equation is operating cash less capital expenditures to detect fraud. Management usually uses capital expenditure as a container for storing operating expenses (Stevanovic et al., 2013). Capital expenditure is one of the accounts in investment cash flow that investors and auditors rarely look at to provide an opportunity for management to save its expenses (Schilit et al., 2018). Free cash flow is as a red flag for management to carry out discretionary accruals (Bukit & Iskandar, 2009; Zakaria et al., 2013). Based on prior study,

it can be argued that free cash flow impacts fraudulent financial statements. Therefore, the hypothesis developed is:

*H<sub>4</sub>: Free cash flow affects the fraudulent financial statement.*

### 1.7. Cash flow operation to total liability ratio and fraudulent financial statement (Hypothesis – H5)

Liability becomes a place for management to manipulate because it is an unsustainable operation (Stevanovic et al., 2013). By utilizing liabilities, management can quickly improve the performance of operating cash flows (Schilit et al., 2018; Stevanovic et al., 2013). Therefore, recommend this ratio comparison as a fraud detection tool (Schilit et al., 2018; Stevanovic et al., 2013). Several studies state that this ratio significantly affects fraud on operating cash flow. Based on a prior study, the statement could be expressed that the cash flow operation to liability ratio impacts fraud reports (Al-Attar & Maali, 2017; Ebaid, 2011a, 2011b; Francis & Eason, 2012; Luo, 2008). Therefore, the hypotheses developed as follows:

*H<sub>5</sub>: The ratio of cash flow operations to total liability affects Fraudulent Financial Statement.*

### 1.8. Days payable outstanding and fraudulent financial statement (Hypothesis – H6)

Days Payable Outstanding and Fraudulent Financial Statements (Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018). The policy of often delaying the payment of liabilities can add new income and debt to increase its operating cash flow, but this is inappropriate because it can create false profits by hiding its debts. That red flag arises when companies take longer to pay their obligations (Wayo, 2012). The previously mentioned tricks take advantage of the current opportunities because investors and auditors do not monitor unsustainable operations (Stevanovic et al., 2013). That day payable outstanding can predict fraud (Ahmadi et al., 2020). So, based on this argument, days payable outstanding impact fraudulent financial statements. Therefore, the hypotheses developed are:

*H<sub>6</sub>: Days payable outstanding has an effect on Fraudulent Financial Statement.*

### 1.9. Change in inventory to cash flow operation ratio and fraudulent financial statement (Hypothesis – H7)

Companies buy inventory is something that companies usually do. Inventory is used to increase the company's revenue. However, if the company suddenly reduces its inventory purchases, this could be a sign of fraud. When the company purchases less inventory than in previous years, the company can save on operating cash flow outflow to quickly increase operating cash flow (Schilit et al., 2018). This is called fraud because it is included in unsustainable

operations (Schilit et al., 2018). The manipulation carried out by utilizing less inventory can be predicted with problems that arise in operating cash flow (Dimitrijevic, 2015). Management can deliberately capitalize the wrong inventory to increase net income and improve operating cash flow performance (Deo & Liu, 2016). So, based on the above argument, the ratio of change in inventory to cash flow operations impacts financial statement fraud. Therefore, the hypotheses developed are:

*H<sub>7</sub>: The ratio of change in inventory to cash flow operations affects Fraudulent Financial Statements.*

## 2. Research method

### 2.1. Sample and data

This research was conducted on the mining industry in Indonesia, Malaysia, China, and Japan. The mining industry was chosen because it was the industry that suffered the most considerable losses due to fraud (ACFE, 2020a). Meanwhile, Indonesia, Malaysia, China, and Japan are selected because these four countries have mining companies included in the list of the world's largest mining companies (PwC, 2019). In addition, based on the ACFE survey in the Asia Pacific region, it was stated that the four countries had a high number of fraud cases (ACFE, 2020b).

The sampling technique used was purposive sampling. Several categories of companies that are sampled are (1) mining companies that carry out mining upstream or downstream, (2) consistently reporting financial statements during the 2010–2019 period, and (3) provide the accounts needed in the research. Data sources come from the Indonesia Stock Exchange, the China and Hong Kong Stock Exchanges, the Malaysia Stock Exchange, the Tokyo Stock Exchange, and each company's websites.

### 2.2. Definitions and measurement variables

#### 2.2.1. F-Score

The F-Score is employed to assign whether a firm sample is indicated to have committed fraud or not (Dechow et al., 2011, 2012). The model was developed and improved based on the Beneish M-Score model (Dechow et al., 2011). Furthermore, the model was, in this research, developed with an earnings management approach (Dechow et al., 2012). The F-Score model used is as follows:

$$F = \text{Accrual quality} + \text{Financial performance.}$$

Accrual Quality is calculated by RSST accrual, namely WC + NCO + FIN divided by average total assets. Meanwhile, financial performance is computed to have a basis the ratio of changes in receivables, inventory, cash sales, and profit.

#### 2.2.2. M-Score

M-Score is a model to predict companies that are indicated to commit fraud and non-fraud (Beneish, 1999).



This model consists of eight financial ratios: DSRI, GMI, AQI, SGI, DEPI, SGAI, LVGI and TATA. If the calculation result is more excellent than (-2.22), then the company is indicated to have committed fraud (Beneish, 1999). The following is to measure the M-Score:

$$M = -4840 + 0.920XDSRI + 0.528XGMI + 0.0404XAQI + 0.892XSGI + 0.115XDEPI - 0.172XSGAI + 4.679XTATA - 0.327XLVGI,$$

where:

*DSRI* = The ratio of receivables per level of sales in year *t* compared to the year (*t* - 1) (Adu-Gyamfi, 2020; Beneish, 1999; Talab et al., 2018).

*GMI* = The gross margin ratio in the year (*t* - 1) to gross margin in year *t* (Beneish, 1999; Talab et al., 2018).

*AQI* = A ratio that indicates the proportion of raise efforts to defer expenses. When the *AQI* is more than 1, the firm can raise its complications in the deferred expenses (Beneish, 1999; Talab et al., 2018).

*SGI* = Revenue growth in one year than the previous year's income (Beneish, 1999; Talab et al., 2018).

*DEPI* = Ratio that shows the rate of depreciation. If this number is more than 1, then the depreciation rate of tangible assets has slowed, increasing the possibility that the company has revised the asset's estimated useful life upward or adopted a new method of increasing revenue (Beneish, 1999).

*SGAI* = Ratio showing marketing and sales expenses. This ratio compares sales to the previous year's sales (Beneish, 1999; Talab et al., 2018).

*LVGI* = Ratio that represents the proportion of liability. The comparison of total liability to total assets is measured by the leverage index (Beneish, 1999; Nobanee et al., 2020; Talab et al., 2018).

*TATA* = Ratio that shows the volume of revenue generated from accruals and not from a cash basis. The measurement is profit from operating activities minus operating cash flow per total asset (Hugo, 2019; Tarjo & Herawati, 2015).

### 2.2.3. Cash flow operation to current liability

This cash flow operation to current liability ratio has been used by several researchers (Abelingga et al., 2021; Deo & Liu, 2016; Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018; Schmidgall et al., 1993; Stevanovic et al., 2013). In addition, this ratio is used to predict fraud in the current liabilities section. The following is to measure the Cash flow operation to current liability:

$$\text{Cash flow operation to current liability} = \frac{\text{Cash flow operation}}{\text{Current liabilities}}$$

### 2.2.4. Operating cash flow ratio

Several researchers has use operating cash flow ratio (Abelingga et al., 2021; Deo & Liu, 2016; Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018; Schmidgall et al., 1993; Stevanovic et al., 2013). This ratio is used to predict management making false income. The following is to measure the Operating Cash Flow Ratio:

$$\text{Operating cash flow ratio} = \frac{\text{Cash flow operation}}{\text{Sales}}$$

### 2.2.5. Change in receivable to cash flow operation

The Change in Receivable to Cash flow operation ratio has been used by several researchers (Deo & Liu, 2016; Molina & Preve, 2009; Schilit et al., 2018; Stevanovic et al., 2013). This ratio is used to predict false receivables and receivable anomalies. The following is to measure Change in Receivable to Cash flow operation:

$$\text{Change in receivable to cash flow operation} = \frac{\Delta \text{Receivable}}{\text{Cash flow operation}}$$

### 2.2.6. Free cash flow (FCF)

The *FCF* ratio has been used in a study (Schilit et al., 2018). This ratio is used to predict management that intentionally miscapitalizes expenses into assets. Here's how to measure *FCF*:

$$FCF = LN(\text{Cash Flow Operation} - \text{Capital Expenditures})$$

### 2.2.7. Cash flow operation to total liability

This cash flow operation to total liability ratio has been used by several researchers (Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018). The ratio used to predict manipulation in liability accounts to impact the company's operating cash flows. Therefore, it is to measure the cash flow operation to total liability as follows:

$$\text{Cash flow operation to total liability} = \frac{\text{Cash flow operation}}{\text{Total liabilities}}$$

### 2.2.8. Days payable outstanding (DPO)

The *DPO* ratio has been used by several researchers (Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018). For example, this ratio is used to predict how long the company will pay off debt. Here's how to measure *DPO*:

$$DPO = \frac{\text{Account payable}}{\text{Cost of goods sold}} \times 365;$$

$$DPOG = \frac{DPO_t - DPO_{t-1}}{DPO_{t-1}}$$

### 2.2.9. Change in inventory to cash flow operation

This change in inventory to cash flow operation ratio has been used by several researchers (Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018). This ratio is used to predict sudden and deliberate declines in inventory by management. The following is to measure Change in Inventory to Cash flow operation:

$$\text{Change in inventory to cash flow operation} = \frac{\Delta \text{Inventory}}{\text{Cash flow operation}}$$

### 2.3. Model specification

This study uses multiple linear regression analysis to test all hypotheses. The models and variables developed in this study are different from previous studies. Previous studies only suggested using cash flow shenanigans ratios, but there was no follow-up, so research on this theme is still rare. In addition, previous studies rarely use the F-score and M-score as a proxy for financial statement fraud. Previous studies only used one proxy and dummy values (1 and 0) which were not the actual values of the model. Based on the explanation above, this research has a novelty not owned by previous research.

The predictor variables are the cash flow operation to current liability ratio, operating cash flow ratio, change in receivable to cash flow operation, free cash flow, cash flow operation to total liability, days payable outstanding, and change in inventory to cash flow operation. This study's financial statement fraud was measured using the F-Score Score (Dechow et al., 2011, 2012) and M-Score (Beneish, 1999). Several studies have proven that the Beneish M-score and F-score are the best proxies for measuring fraud (Dechow et al., 2012; Hugo, 2019; Repousis, 2016; Tarjo & Herawati, 2015). The research hypothesis was tested using multiple linear regression. The following model is used in this study:

$$F_{it} = \beta_0 + \beta_1 CFOCL + \beta_2 OCFR + \beta_3 CRCFO + \beta_4 FCF + \beta_5 CFOTL + \beta_6 DPO + \beta_7 CICFO + \varepsilon;$$

$$M_{it} = \beta_0 + \beta_1 CFOCL + \beta_2 OCFR + \beta_3 CRCFO + \beta_4 FCF + \beta_5 CFOTL + \beta_6 DPO + \beta_7 CICFO + \varepsilon.$$

where:  $F_{it}$  = ratio *F-Score*,  $M_{it}$  = ratio *M-Score*,  $\beta_0$  = constant,  $\beta_1 - \beta_7$  = coefficient, *CFOCL* = ratio cash flow operation to current liability, *OCFR* = ratio Operating Cash Flow Ratio, *CRCFO* = ratio change in receivable to cash flow operation, *FCF* = ratio free cash flow, *CFOTL* = ratio cash flow operation to total liability, *DPO* = ratio days payable outstanding, *CICFO* = ratio change in inventory to cash flow operation, and  $\varepsilon$  = error.

## 3. Result and discussion

### 3.1. Descriptive statistics

The following Table 1 is a summary of descriptive statistical tests.

Table 1. Descriptive statistics

Variable	N	Minimum	Maximum	Mean	Standard Deviation
<i>F-Score</i>	470	-84.170	102.244	1.135	8.611
<i>M-Score</i>	470	-24.355	31.640	-1.062	3.737
<i>CFOCL</i>	470	-1.293	11.302	0.557	1.142
<i>OCFR</i>	470	-1.339	9.793	0.199	0.513
<i>CRCFO</i>	470	-19.060	121.836	1.160	8.732
<i>FCF</i>	470	17.554	28.616	24.049	1.897
<i>CFOTL</i>	470	-1.201	5.402	0.277	0.637
<i>DPO</i>	470	-0.932	9.119	0.145	0.835
<i>CICFO</i>	470	-86.650	159.684	0.573	9.866

### 3.2. Classical assumptions

The test results in Tables 2 and 3 show that all research data meet the classical assumptions (Ghozali, 2018), so researchers can use them to test hypotheses. In more detail, the normality test showed the Kolmogorov-Smirnov value > 0.05. Furthermore, heteroscedasticity test, each test (*F-Score* and *M-Score*) has a significance value > 0.05. The multicollinearity test showed that the VIF and tolerance values met the classical assumptions. Finally, the autocorrelation test shows the Durbin-Watson value that each model also meets the specified conditions.

### 3.3. Hypothesis testing

The results of hypothesis testing will be tested on two proxies for financial statement fraud, namely *F-Score* and *M-Score* (Table 2 and 3). The predictor variables were *CFOCL*, *OCFR*, *CRCFO*, *FCF*, *CFOTL*, *DPO*, and *CICFO*. The results of the *F-Score* test, the variables *CRCFO*, *DPO*, and *CICFO*, can be used as it. The significance value of *CRCFO*, *DPO*, and *CICFO* each with a value 0.003; 0.001; and 0.007 (Table 2). These results can answer hypotheses 3, 6, and 7.

Another result is shown in the test using the *M-Score* as a proxy for financial statement fraud. The results showed that the predictor variable *CFOCL*, *OCFR*, *FCF*, *CFOTL*, *DPO*, and *CICFO* can predict financial statement fraud. This is shown from the significance of *CFOCL*, *OCFR*, *FCF*, *CFOTL*, *DPO*, and *CIFCO* in with a value 0.017; 0.032; 0.091; 0.000; 0.004; and 0.061 (Table 3). This result proves that it can answer hypotheses 1, 2, 4, 5, 6, and 7.

These results prove that all of the predictive variables tested can predict financial statement fraud. The *F-Score* is appropriate for predicting financial statement fraud using the *CRCFO*, *DPO*, and *CICFO* ratios. Meanwhile, the *M-Score* is appropriate for predicting financial statement

fraud using the *CFOCL*, *OCFR*, *FCF*, *CFOTL*, *DPO*, and *CICFO* ratio. Brief result tests are resummed in Table 2 as follows:

Table 2. The result of hypothesis testing for the dependent variable *F-Score*

Variable	Heteroskedasitas	Sig	VIF	Tolerance
<i>CFOCL</i>	0.309	0.514	3.247	0.308
<i>OCFR</i>	0.982	0.315	1.439	0.695
<i>CRCFO</i>	0.729	0.003*	1.062	0.941
<i>FCF</i>	0.840	0.355	1.341	0.746
<i>CFOTL</i>	0.337	0.364	2.812	0.356
<i>DPO</i>	0.201	0.001*	1.277	0.783
<i>CICFO</i>	0.865	0.007*	1.044	0.958
Kolmogorov-Smirnov	0.200			
<i>F</i>	4.393			
<i>p</i> -value	0.000			
Durbin-Watson	1.744			

Note: where: sig \* = 0.01, \*\* = 0.05, and \*\*\*0.1.

Table 3. The result of hypothesis testing for the dependent variable *M-Score*

Variabel	Heteroskedasitas	Siginifikan	VIF	Tolerance
<i>CFOCL</i>	0.465	0.017**	3.247	0.308
<i>OCFR</i>	0.341	0.032**	1.439	0.695
<i>CRCFO</i>	0.417	0.260	1.062	0.941
<i>FCF</i>	0.404	0.091***	1.341	0.746
<i>CFOTL</i>	0.408	0.000*	2.812	0.356
<i>DPO</i>	0.729	0.004*	1.277	0.783
<i>CICFO</i>	0.515	0.061***	1.044	0.958
Kolmogorov-Smirnov	0.200			
<i>F</i>	33.443			
<i>p</i> -value	0.000			
Durbin-Watson	1.790			

Note: where: sig \* = 0.01, \*\* = 0.05, and \*\*\*0.1.

## 4. Discussions

### 4.1. Testing result of cash flow operation to current liability ratio and fraudulent financial statement

The test results show that the cash flow operation to current liability ratio can predict financial statement fraud. This is evidenced by the test results in the *M-Score* section, that the ratio of Cash flow operation to short term liability has a significance value of 0.017. It means that the cash flow operation to current liability ratio affects financial statement fraud. Therefore, the first hypothesis is supported by data.

The results align with the prior study, which states that cash flow operations to current liability can predict financial statement fraud (Bhandari & Iyer, 2013; Deo & Liu, 2016; Dimitrijevic, 2015; Fahlevi & Marlinah, 2019; Krylov, 2018; Schilit et al., 2018; Stevanovic et al., 2013). This study provides new evidence regarding the ratio of cash flow operations to current liability. The update lies in the empirical results because previous research is still an opinion.

Management has the opportunity to manipulate cash flow when investors and auditors do not focus on cash flow (Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018). Management took advantage of this opportunity to shift the inflow of current liabilities such as bank loans into operating cash flows which should have been inflows from financing cash flows. It is supported by research results, which states that management can take advantage of the unearned income account as an operating cash flow inflow (Deo & Liu, 2016; Stevanovic et al., 2013).

Misclassification of current liabilities as income arises because of an opportunity. This opportunity is in the form of weak monitoring of unsustainable operations. In addition, motivation for bonuses, good performance, and pursuing targets can be the driving force to do so. Management can sometimes use this trick to cover up the company's targets. The trick is to take advantage of bank loans and recognize them as income, but this trick creates a trial (Schilit et al., 2018). The trace is in the form of an overstate on operating cash flow because the income is not from the original income made by the company.

When viewed from the changes that occur in current liabilities and juxtaposed with operating cash flows, it shows that many companies have increased current liabilities in one period and impact increasing operating cash flows. On the other hand, in the next period, current liabilities decreased drastically but operating cash flow did not change much. This is a sign that there is manipulation that occurs in operating cash flows using current liabilities. This causes the Cash flow operation to current liability ratio to significantly affect the Fraudulent Financial Statement.

### 4.2. Operating cash flow ratio test results and fraudulent financial statements

The test results show that the Operating Cash Flow Ratio can predict financial statement fraud. This is evidenced by the test results on the *M-Score* section, that the ratio of Operating Cash Flow Ratio has a significance value of 0.032. It means the Operating Cash Flow Ratio, has an effect on financial statement fraud. So, the second hypothesis is supported by data.

The results be in accordance with prior study (Bhandari & Iyer, 2013; Deo & Liu, 2016; Dimitrijevic, 2015; Dugan & Taylor, 2019; Francis & Eason, 2012; Lennox & Yu, 2019; Peasnell et al., 2000; Schilit et al., 2018; Stevanovic et al., 2013). This proves there is a big hole for fraudulent revenue detection. However, opportunities arise because

guardianship only focuses on the accrual part. False income must be covered by management, especially in the accrual section (Stevanovic et al., 2013). So that the guardianship that checks the accrual section will not find the fake income. But fraudulent income will leave an imprint on the cash flow side (Deo & Liu, 2016; Dimitrijevic, 2015; Lennox & Yu, 2019; Peasnell et al., 2000).

Making false income has an effect on increasing income and profits on the income statement. Even though management covers false income in the profit and loss section, it is different from operating cash flow, where operating cash flow will only record income in cash inflows. In contrast, fake income does not generate cash inflows. If the increase in revenue is not commensurate with the increase in operating cash flow, this becomes a red flag. This red flag can be detected using the Operating Cash Flow Ratio.

Based on the data used in this study, the company experienced revenue growth but on the other hand, operating cash flow showed a downward trend. This indicates the presence of false income on the revenue account. In addition, red flags were seen when income increased from the previous period, but cash flow remained unchanged. Other evidence is shown in descriptive statistics. It can be seen that the average company experiences a slight change in operating cash flow which is shown a small value. This is evidence that explains that the Operating Cash Flow Ratio significantly affects the Fraudulent Financial Statement.

#### 4.3. Test result of change in receivable to cash flow operation ratio and fraudulent financial statement

The test results show that the Change in Receivable to Cash flow operation ratio can predict financial statement fraud. This is evidenced by the test results in the F-Score section, that the ratio of change in receivables to cash flow operations has a significance value of 0.003. It means that the ratio of change in receivables to cash flow operations affects financial statement fraud. So, the third hypothesis is supported by data.

The results were align with the findings that the comparison between receivables and operating cash flows can predict financial statement fraud (Al-Attar & Maali, 2017; Barth et al., 2001; Ebaid, 2011a, 2011b; Francis & Eason, 2012; Lennox & Yu, 2019; Luo, 2008). The results of this study prove that the Change in Receivable to Cash flow operation ratio can be used to detect fraud. This finding is evidence of the novelty of this research because previous research was only in the form of theories and arguments (Dimitrijevic, 2015; Krylov, 2018; Schilit, 2010; Schilit et al., 2018).

Opportunities arise when guardianship only focuses on detecting fake receivables in the accrual section (Stevanovic et al., 2013). Like fake income, even fake receivables can only be detected in the cash flow section (Dimitrijevic, 2015; Krylov, 2018; Schilit, 2010; Schilit et al., 2018). In addition, receivables, terrible debts can be

hidden in working capital, thereby increasing operating cash flow (Deo & Liu, 2016).

Counterfeit receivables and fake income have almost the same characteristics; namely, they have no cash inflow (Schilit et al., 2018). False receivables are created to be used to increase profitability. False receivables will lead to a buildup of receivables. This accumulation of receivables creates a trace of operating cash flow (Schilit et al., 2018). This buildup of receivables creates a trace of the operating cash flow. The more accumulated receivables will cause the worse operating cash flow. This is also shown by several companies used as research samples that in the following year, receivables suddenly decreased drastically. Still, there was no significant change in operating cash flow because even though receivables were reduced, the incoming cash remained small (Schilit et al., 2018). These red flags can be detected by looking at changes in receivables and their effect on operating cash flows. So that by using the ratio Change in Receivable to Cash flow operations can predict the existence of fake receivables or anomalies in receivables.

The data indicate that receivables often fluctuate, can go up and down even until there is a change to a negative value. It is proof that receivables can be played to increase profitability. On the other hand, when compared to operating cash flow, when receivables increase, operating cash flow decreases and vice versa. In addition, there are also cases where receivables increase but operating cash flow does not change much. If you look at the descriptive statistics, it can be seen that there is a big gap between the maximum and minimum values and has a high mean value. This proves that there is manipulation on receivables and operating cash flow. This evidence causes the Change in Receivable to Cash flow operation ratio to affect the Fraudulent Financial Statement significantly.

#### 4.4. Free cash flow test results and fraudulent financial statement

The test results show that FCF can predict financial statement fraud. This is evidenced by the test results on the M-Score section, that FCF has a level significance in 0.091. It means that FCF has an effect on financial statement fraud. So, the fourth hypothesis is supported by data.

These results align with previous studies (Bukit & Iskandar, 2009; Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018; Stevanovic et al., 2013; Zakaria et al., 2013). The results of this study are different from previous empirical research. The novelty lies in the formula used. The FCF formula is based on the financial shenanigans book, so it is different from the formula that applies in general. This result also provides evidence that the FCF ratio in cash flow shenanigans can be used to detect fraudulent financial statements.

The result proves that many companies still practise the tricks used by WorldCom (Somayyeh, 2015). Capital expenditure is an account in the investment cash flow, so guardianship does not detect that part (Dimitrijevic, 2015;

Schilit, 2010; Schilit et al., 2018; Stevanovic et al., 2013). Management took advantage of this opportunity to save the company's expenses so that the company's operating profit and cash flow.

However, red flags appear when capital expenditure decreases (Schilit et al., 2018). A decrease in capital expenditure will be a sign that free cash flow is in bad shape. This is what happened to some companies that often capital expenditure decreased or even reached zero, causing poor free cash flow. This decrease was due to the company wanting to eliminate the existing burden on assets wrongly (Schilit et al., 2018). This is what causes FCF to detect fraudulent financial statements.

#### **4.5. Test result of cash flow operation to total liability ratio and fraudulent financial statement**

The test results show that the cash flow operation to total liability ratio significantly affects the Fraudulent Financial Statement. This is evidenced by the test results in the M-Score section, that the cash flow operation to total liability ratio has a significance value of 0.000. It means that the cash flow operation to total liability ratio affects financial statement fraud. So, the fifth hypothesis is supported by the data.

The results are in line with the findings that the comparison between total liabilities and operating cash flows can detect fraudulent financial statements (Al-Attar & Maali, 2017; Ebaid, 2011a, 2011b; Francis & Eason, 2012; Luo, 2008). The results of this study provide empirical evidence that the cash flow operation to total liability ratio can detect fraud. In addition, these results are an update on previous research, which still considers this ratio only used to assess performance. On the other hand, we prove that the theory developed by previous research can be applied in real terms.

Fraud occurs because of the opportunities that arise in unsustainable operations (Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018). That this unsustainable operation is free from auditor examination. Auditors only focus on sustainable operations (Stevanovic et al., 2013).

This is what management uses to manipulate liabilities to increase operating cash flow. Increasing operating cash flow using liabilities is usually used at critical times. Pressure on the company's targets can be the trigger so that management chooses to increase liabilities with the opportunity. With an increase in liabilities, cash inflows in the operating cash flow section will increase operating cash flows. However, this will leave a trail on operating cash flow. So by using the ratio of cash flow operations to total liability can predict the occurrence of the trick.

The test results show that the increase in liabilities will also increase operating cash flow. The exciting thing is that some companies experience a high increase in liabilities that can turn previously negative operating cash flows into positive ones. In addition, the gap between the maximum and minimum values in descriptive statistics can be a sign of high fluctuations that occur. Some of this evidence causes FCF to have a significant effect on the Fraudulent Financial Statement.

#### **4.6. Days payable outstanding test results and fraudulent financial statement**

The test results show that DPO can predict financial statement fraud. This is evidenced by the test results on the F-Score and M-Score sections, that DPO has a significance value of 0.001 in the F-Score section and 0.004 in the M-Score section. This means that DPO has an effect on financial statement fraud. So, the sixth hypothesis is supported by the data.

These results align with previous studies (Ahmadi et al., 2020; Deo & Liu, 2016; Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018; Wayo, 2012). This ratio is rarely used in research, but we prove that this ratio is effective for detecting fraudulent financial statements. Therefore, the results of this study are an update on previous research.

Opportunities always arise in every unsustainable operation, one of which is a liability (Stevanovic et al., 2013). With the opportunity in this liability account, management deliberately slows down the payment of liabilities and takes advantage of it to get new income and liabilities (Deo & Liu, 2016). Management can also hold liabilities, especially to parties related to the company (Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018).

Debt payments are usually made at maturity. This is because the company will not take the risk to repay the debt as soon as possible. However, these debt payments can increase operating cash flow by delaying these payments. Usually, this happens to companies that have debts to related parties or perhaps to subsidiaries. Many companies have established cooperation with many companies to have good relationships with related companies. This is what is used to delay debt payments. And the results of the study show that DPO can detect fraudulent financial statements. This result also proves that many companies take advantage of debt to related parties to delay debt.

The results, in the descriptive statistics, can be seen that the change in the DPO period is very significant. DPO testing on company data shows that almost all sample companies are always late in paying their liabilities. This does not happen only in one period; even up to 10 years, DPO has increased. This is a warning for auditors and investors to pay attention to increasing DPO. Some of the empirical evidence that has been presented is what causes DPO to have an effect on the Fraudulent Financial Statement.

#### **4.7. Test result of change in inventory to cash flow operation ratio and fraudulent financial statement**

The test results show that the ratio of change in inventory to cash flow operations can predict financial statement fraud. It is evidenced by the test results on the F-Score and M-Score sections, that the ratio of Change in Inventory to Cash flow operations has a significance value of 0.007 in the F-Score section and 0.061 in the M-Score section. It means that the ratio of change in inventory to cash flow operations affects financial statement fraud. So, the seventh hypothesis is supported by the data.

These results align with previous research (Deo & Liu, 2016; Dimitrijevic, 2015; Schilit, 2010; Schilit et al., 2018). Schilit developed the ratio of change in inventory to cash flow operations based on the phenomenon in the United States (Schilit et al., 2018). However, this ratio has never been tested empirically. Therefore, this study uses this ratio to provide empirical evidence that this ratio can detect fraudulent financial statements. In addition, this finding is a novelty for previous research.

Opportunities arise because purchasing supplies is a common thing for so that guardianship considers it an everyday thing. In addition, the policy to reduce inventory purchases includes unsustainable operations so that they escape guardianship's observation. Guardianship should focus more on the development of inventory purchases made by the company because management can reduce inventory purchases on purpose to improve its operating cash flow performance (Schilit et al., 2018). A decrease in inventory can signify a problem with operating cash flow (Dimitrijevic, 2015). A decrease in inventory purchases will have an impact on decreasing cash outflows to increase operating cash flow. This fluctuation in inventory purchases has become a red flag, and this policy is rarely carried out to enter into unsustainable operations. So, investors should pay attention to inventory movements. This study also proves that using the change in inventory to cash flow operation ratio can predict fraud in inventory purchases.

Based on descriptive statistics proves that inventory has decreased to a negative number. In addition, research data also shows that almost all companies experienced a drastic decline in inventory in a certain period. This can be a warning for investors and auditors to pay more attention to changes in inventory. This study proves that the ratio of change in inventory to cash flow operations has a significant effect on the Fraudulent Financial Statement.

## Conclusions

This study examines the detection of fraudulent financial statements using the cash flow shenanigans approach. The anxiety of this research arises from the effectiveness of detection tools that still use the income statement and statement of the financial position described by previous research. In contrast to previous research, we designed a detection tool that focuses on the accounts in the cash flow statement because cash flow statements are often overlooked from observation. In addition, this study is also in line with previous research, which suggested using the financial shenanigans approach to detect fraudulent financial statements today and can be used and developed in the future.

This study can be concluded that all cash flow shenanigans ratios can predict fraudulent financial statements. These results prove empirically that the red flags in cash flow shenanigans can detect fraudulent financial statements.

In addition, specifically, the ratio of change in receivable to cash flow operations, days payable outstanding, and

change in inventory to cash flow operations is tested using the F-Score. Meanwhile, cash flow operations to current liability, operating cash flow ratio, free cash flow, cash flow operations to total liability, days payable outstanding, and change in inventory to cash flow operations were tested using the M-Score.

The theoretical implication of this research is to add new literature on tools to detect fraud in financial statements. In addition, this study provides empirical evidence regarding detection using financial shenanigans. The managerial implication of this research is that managers are more sensitive to the potential for fraud in the cash flow section. In addition, managers can devise methods to prevent this potential, and if fraud persists, managers can easily detect it.

The research limitation is that it does not use companies that have committed fraud. This happens because information about companies that commit fraud is difficult to find, and there has been no official release about companies that have committed fraud. The second limitation is that this research still focuses on the operating cash flow section, even though it indirectly involves a liability account which is still part of the financing cash flow section and the capital expenditures account, which is part of the investment cash flow but does not directly use investment cash flows or financing.

For further research is to use company data that has been proven to commit financial fraud following official releases from each stock exchange authority or other regulators. The use of companies that commit fraud will make research results more authentic and accurate. In addition, further research is expected to use ratios involving investment cash flows and financing cash flows.

## Acknowledgements

We express our deepest gratitude for the financial support from the Chancellor of Universitas Trunojoyo Madura (UTM) and the Chair of Research institutions and community service of UTM, who have provided funds in this research "Excellent Research Contract" Scheme with Contract Number Numbers: 2285/UN46.3.1/PN/2019 May 7, 2019.

## Funding

This work was supported by the Chancellor of Universitas Trunojoyo Madura (UTM) based on the "Excellent Research Contract" with Contract Number: 2285/ UN46.3.1/ PN/2019 May 7 2019.

## Author contributions

Tarjo Tarjo and Eklamsia Sakti compiled the study and were responsible for the design and development of the data analysis. Tarjo Tarjo, Eklamsia Sakti, Prasetyono Prasetyono, Otniel Safkaur, and Pujiono were responsible for data collection and analysis. Tarjo Tarjo, Prasetyono Prasetyono, Otniel Safkaur, and Pujiono were responsible for data interpretation.

Yusarina Mat-Isa did the editing and proofreading paper. Tarjo Tarjo wrote the first draft of the article.

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