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# Supply Chain Management Application in Small and Medium Enterprises

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*Abstract-* **In most emerging markets, small and medium enterprises, (SMEs), lack access to thecredit and liquiditythey require for their dailyworkingcapital needs. Supply chain finance is a broad category of financing with multiple products,and it contributes significantly to global trade finance. This paper utilized several variables, such as changes in liquidity level (quick ratio), changes in debt bias, changes in the cost of goods sold, changes in earnings, and changes in stock returns through the supply chain finance. Employing binary logistic regression, the test results showed that accounts, such as current assets, current debt, long-term debt, net income, cost of goods sold, gross margins, were connected to the agent's opportunistic behavior when the financial health of the company has decreased. In the end, it concluded that SEMs in the management of these accounts was proven by supply chain finance in the preparation of financial statements and good distribution when the financial health of the company has achieved.**

*Keywords: Supply chain finance, current assets, current debt, long-term debt, net income, cost of goods sold, gross margin, financial health*

## 1. Introduction

Supply chain finance has now surpassed traditional trade finance in market revenues. We expect this trend to accelerate over the next three to five years, driven by three waves: deepening of established solutions targeted at suppliers, further integration and sophistication of products for buyers and, ultimately, convergence between buyer and supplier oriented solutions. Our latest article looks at these three waves - and the opportunities each one holds for banks. Basically, the preparation of financial statements is the SEMs company's management. In [1] have proven that accounts receivable, inventory, and sales accounts are subjectively regulated by management in many companies in Greece. Globally, Statement of Auditing Standard (SAS) No. 99 of 2002 has also included the term "nature of the industry" as a condition of management SEMs in determining nominal estimates contained in financial statements. It reflects the preparation of risky financial statements with manipulation by agents. In [2] has proven that SEMs in making financial statements termed "cooking the books" can lead to manipulative behavior.

The paradigm that underlies agency theory is the conflict of interest between agent and principal that stimulates the opportunistic behavior of agents or often called "supply chain finance" [3]. Some studies represent supply chain finance as an agent's reluctance to try more for the principal's benefit and tend to be opportunistic for his own interests [4-10]. As [11] found evidence that if there was an incentive conflict between the principal and the agent, the supply chain finance by the agent was to attempt to underreport. It means that the SEMs of agents in preparing financial statements tends to trigger supply chain finance by agents that manifest a loss for the principal.

Supply chain finance is the impact of a conflict of interest between an agent and a principal [12]. Differences in interests between agents and principals have been proven to trigger manipulative behavior in the form of delays in recording ownership of shares and dividend payments, as well as high agency costs [13]. Meanwhile, high funding towards agents is also caused by high principal demands on their profits [14]. Both studies indicate that supply chain finance is a consequence of conflicts of interest between principals and agents.

This paper aimed to prove whether the SEMs of agents in the preparation of financial statements could stimulate supply chain finance. More specifically, SEMs by agents is represented in the management of company liquidity [7], long-term debt management [15], cost of goods sold management [16], earnings management [5; 17], and management of executive share ownership [13; 18]. Meanwhile, the author set supply chain finance as the dependent variable, which was proxied by indicators of financial statement manipulation (M - Score) [19-22]. The M-Score calculation model has been trusted by many researchers as a detector of financial statement manipulation.

## 2. Literature Review and Hypothesis
### 2.1. Finance supply chain

Buyers and suppliers in a supply chain have competing financial interests. The buyer wants to pay as late as possible and the supplier wants to be paid as early as possible. Supply chain finance has emerged to bridge these conflicting interests, providing a range of financing and risk mitigation solutions designed to optimise working capital and liquidity in domestic and international supply chains. Some products are provided directly to the suppliers, others via buyers. Measurement of financial statement manipulation is obtained from the calculation of the M-Score model, as in the study [23-28]. This model combines eight ratios, such as Days Sales in Receivables Index (DSRI), Gross Margin Index (GMI), Asset Quality Index (AQI), Sales Growth Index (SGI), Depreciation Index (DEPI), Sales and General Administration Expenses Index (DEPI) SGAI), Leverage Index (LVGI), and Total Accrual to Total Assets (TATA). Financial statements are indicated to be manipulative if M-Score> -2.22, while M-Score <-2.22 indicates the financial statements are assumed to be free from manipulation. Formula 1 was the M-Score calculation used in this paper.

## Formula 1. M- Score Calculation

M-Score = -4,84 + 0,920 DSRI + 0,528 GMI + 0,404 AQI

+ 0,892 SGI + 0,115DEPI - 0,172 SGAI -

0,327 LVGI + 4,697 TATA

Notes:

DSRI = (Net Receivable/ Sales t) ÷ (Net Receivable t-1/ Sales t-1)

GMI = (Sales t-1 - COGs t-1)/ Sales t-1) ÷ (Sales t - COGs t)/Sales t)

AQI = (TA t - (CA t + PPE t)/ TAt) ÷ (TA t - 1 - (CA t-1 + PPE t-1)/ TA t-1

SGI = Sales t ÷ Sales t-1

DEPI = {Deprec t-1 / (PPE t-1 + Deprec t-1) ÷ (Deprec t / (PPE t + Deprec t)

SGAI = (SG&A expense t / Sales t) ÷ (SG&A expense t -1 / Sales t-1)

LVGI = (CL t + LTD t) / TA t } ÷ (CL t-1 + LTD t-1) / TA t-1}

TATA = (Net Income from continuing operation − Cash Flow operation) ÷ Total assets

## 2.2. Opportunistic Behavior in the Management of Corporate Liquidity

The inability of agents to communicate financial tensions raises the risk of violations of the law in solving problems [29]. Financial tension is very risky to decrease the financial performance of the agents because it is connected to the company's liquidity [30]. Further, it is explained that poor liquidity results in a decrease in the profits of the stakeholders. From a systemic risk perspective, liquidity management is an essential factor in maintaining the company's financial stability [28]. Meanwhile, [31] stated that manipulating the recording of company assets is a habit carried out by agents so that the company's liquidity seems stable.

From an accounting perspective, the most effective calculation for assessing company liquidity is with a quick ratio (QR) [32]. This ratio illustrates the ability of lancer-highly liquid assets (CA) to bear its current debt (CL). Good liquidity is represented by changes in CA values, which are directly proportional to changes in CL values. The author identifies the opportunistic behavior of agents in managing liquidity by calculating changes in the quick ratio (ΔQR). Formula 2 shows the calculation of ΔQR by dividing between changes in current assets (CA) per year and changes in current liabilities (CL) per year. The logic developed is that the irregularities in the management of company liquidity by agents can occur when changes in CA values are inversely proportional to changes in CL values. Thus, if ΔQR negatively influences the manipulation of financial statements (MS), then it indicates that supply chain finance has occurred by the agent in preparing the financial statements. Referring to that explanation, the author formulated the hypothesis (H1): "Changes in the quick ratio (ΔQR) have a significant negative effect on supply chain finance in the preparation of corporate financial statements."

## Formula 2. Calculation of Quick Ratio Change (ΔQR)

$$\Delta QR = (CA\ t − CA\ t\text{-}1)/(CL\ t − CL\ t\text{-}1)$$

Note: t (current year), t-1 (previous year)

## 2.3. Opportunistic Behavior in Long-Term Debt Management

In most countries, the income tax system allows a reduction in taxes based on loan interest [33] Meanwhile, longer debt maturities and higher leverage occur in countries with high tax protection [34]. One impact is that many companies are implementing "debt bias" by regulating profits as much as possible to take on more long-term debt [35]. It means an increase in long-term debt can be categorized as a debt bias if it is only used to reduce income tax.

Debt bias (DB) is interpreted as an effort to increase long-term debt (LTD) to reduce income tax, which manifests in increasing net income (NI). It means that the change in LTD value is directly proportional to the change in NI value. The agent's opportunistic behavior in managing long-term debt based on changes in debt bias (ΔDB) was identified by the author. Formula 3 shows the calculation of ΔDB by dividing between changes in LTD per year and NI per year. If the value of ΔDB has a positive effect on the manipulation of financial statements (MS), then it indicates that supply chain finance has occurred by the agent. Thus, the author formulated the hypothesis (H2): "Changes in debt bias (ΔDB) have a significant positive effect on supply chain finance in the preparation of corporate financial statements." Formula 3. Calculation of Change in Debt Bias

$$\Delta DB = (LTD\ t − LTD\ t\text{-}1)/(NI\ t − NI\ t\text{-}1)$$

Note: t (current year), t-1 (previous year)

## 2.4. Opportunistic Behavior in the Management of Cost of Goods Sold

Previous research has proven that SEMs ctivity is connected to the manipulation of sales and inventory accounts, which manifests in increasing gross margin [4; 36]. More specific, [37] explained that the agent's opportunistic behavior is interpreted by shifting the Cost of Goods Sold (COGS) into operational costs, such as costs of research and development (R&D) or sales costs, general and administration (SG&A) to increase the gross margin (GM) value. Referring to that explanation, the author would identify the supply chain finance in the management of the Cost of Goods Sold by calculating the change (OGCOGS) per year. Formula 4 shows the calculation of OGCOGS by dividing between changes in the value of R&D or SG&A per year and changes in GM values per year. If OGCOGS has a positive effect on the manipulation of financial statements (MS), then it indicates that there has been a supply chain finance by the agent. Thus, the authors formulated the hypothesis (H3): "Changes in Cost of Goods Sold (OGCOGS) have a significant positive effect on supply chain finance in the preparation of corporate financial statements." Formula 4. Calculation of Change in Cost of Goods Sold (ΔCOGS)

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$\Delta COGS= (R\&D\ t + SG\&A\ t)-(R\&D\ t\text{-}1 + SG\&A\ t\text{-}1)/(GM\ t - GM\ t\text{-}1)$

Note: t (current year), t-1 (previous year)

## 2.5. Opportunistic behavior in earnings management

In determining earnings targets, the principal refers to the comparison between cost and benefit [21]. It means that earnings targets are consequences received by agents, while rewards are consequences for principals. Setting higher profit targets actually result in agents manipulating earnings earned by the principal [8]. Furthermore, the study showed an increase in earnings had a significant effect on increasing profitability and assets. Referring to the research, the author identifies opportunistic behavior by agents by calculating earnings changes ($\Delta ET$) periodically. Formula 5 shows the $\Delta ET$ calculation by dividing the change in net income (NI) from the change in total assets (TA). If the change has a significant positive effect on the manipulation of financial statements (MS), then it indicates that supply chain finance has occurred by the agent. Thus, the author formulated hypothesis (H4): "Changes in earnings ($\Delta ET$) affect significantly positive on supply chain finance in the preparation of corporate financial statements". Formula 5. Calculation of Earning Change ($\Delta ET$)

$\Delta ET =(NI\ t - NI\ t\text{-}1)/(TA\ t - TA\ t\text{-}1)$

Note: t (current year), t-1 (previous year)

## 2.6. Opportunistic Behavior in Executive Share Ownership

When agents have the interests of shares in a company, their interests can affect the company's financial performance [37]. Although ownership of an agent's share will reduce agency costs, it will actually encourage the behavior of maximizing wealth among agents [38]. In [39] also explained that the manipulation that occurs in the financial statements is influenced by the ownership of the agent's shares. Under the excuse of increasing company value, agents can maximize wealth by increasing their stock dividends. It is because dividend payments are positively related to firm value [19].

On the other hand, agents can also delay dividend payments by delaying share ownership. Referring to that explanation, the author would identify the agent's opportunistic behavior in managing share ownership by calculating the change in share profit ($\Delta PS$) per year. Formula 6 shows the calculation of $\Delta PS$ by dividing between changes in the value of dividends paid (DEV) per year and changes in management share ownership (MO) per year. If $\Delta PS$ has a significant positive effect on the manipulation of financial statements (MS), then it indicates that supply chain finance has occurred by the agent. Thus, the author formulated a hypothesis (H5): "Changes in share profits ($\Delta PS$) have a significant positive effect on supply chain finance in the preparation of corporate financial statements." Formula 6. Calculation of Changes in Stock Profits ($\Delta PS$)

$\Delta PS =(DEV\ t - DEV\ t\text{-}1)/(MO\ t - MO\ t\text{-}1)$

Note: t (current year), t-1 (previous year)

## 3. Method

The author used secondary data, namely the financial statements of manufacturing companies released by the Indonesia Stock Exchange (IDX) - www.idx.co.id. Meanwhile, the population was all manufacturing companies listed on the IDX for the period 2015 - 2017. Sampling employed a purposive sampling method, which is sampling with specific criteria [14]. The sample criteria considered by the author included companies listed on the IDX successively during the observation year, companies provided financial information using the rupiah currency, and companies had the required data and information. Based on these criteria, there were 66 companies selected as samples, with three years of observation (2015-2017). Thus, the observations were made on 198 financial statement data.
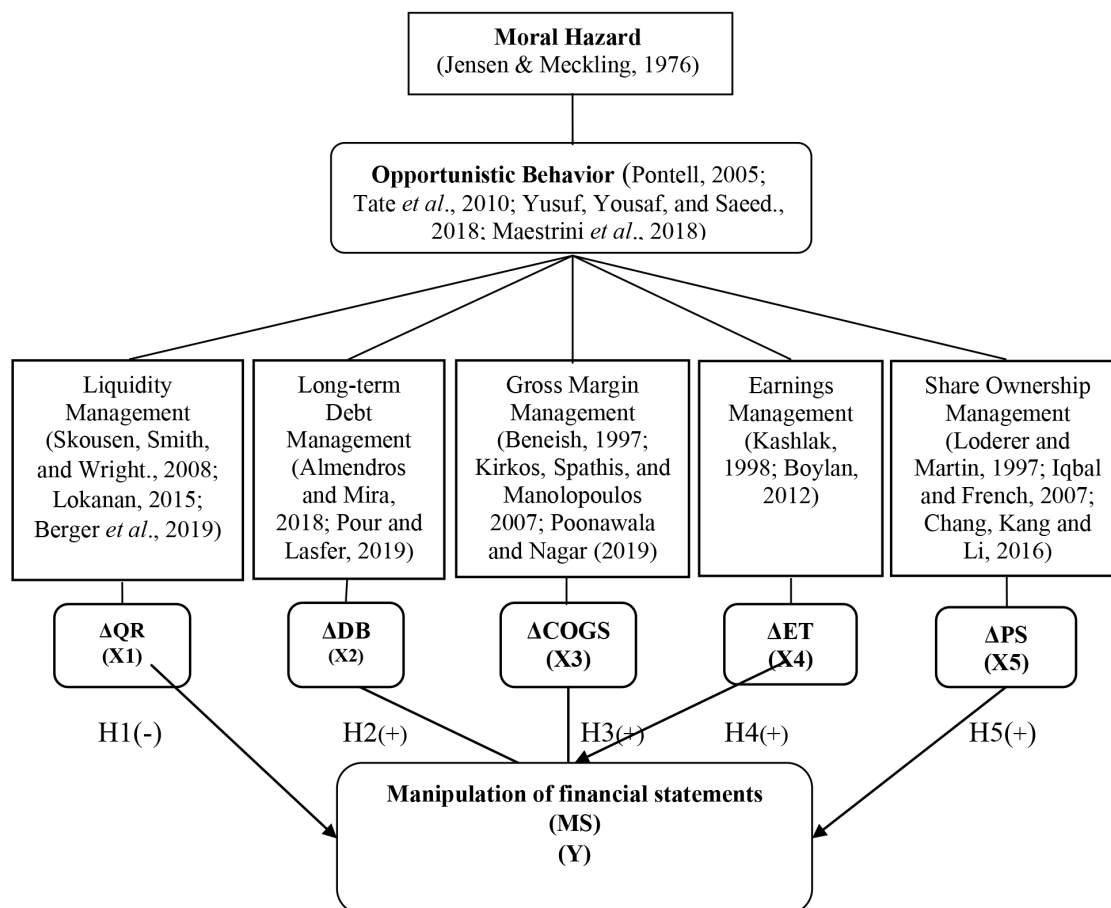
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**Figure 1.** Conceptual Framework

The dependent variable was the manipulation of financial statements (MS), which was calculated by the M-Score model. The independent variables used were changes in the quick ratio (ΔQR), changes in debt bias (ΔDB), changes in Cost of Goods Sold (OGCOGS), changes in earnings (ΔET), and changes in stock returns (ΔPS). An overview of the operational definitions of variables is explained in Table 1.

**Table 1.** Definition of Variable Operations

| No | Variables | Type | Abbreviation | Measurement |
|----|-----------|------|--------------|-------------|
| 1 | Manipulation of financial statements | Dependent | MS | It used indicators of manipulation of financial statements, which were calculated employing the M-Score model. They were dummy variables, M-Score > -2.22, manipulative, notation (0), M-Score <-2.22, no manipulative notation (1) **(Formula 1).** |
| 2 | Changes in liquidity levels | Independent | ΔQR | It divided the change in current assets (CA) per year against changes in current debt (CL) per year **(Formula 2).** |
| 3 | Change in debt bias | Independent | ΔDB | It divided the change in long-term debt (LTP) per year against changes in net income (NI) per year **(Formula 3).** |

| 4 | Change in cost of goods sold | Independent | ΔCOGS | It divided the changes in R&D and SG&A costs per year against changes in the value of gross margin per year **(Formula 4).** |
| 5 | Changes in earnings | Independent | ΔET | It divided the change in net income (NI) from the change in total assets (TA) **(Formula 5).** |
| 6 | Changes in stock returns | Independent | ΔPS | It divided the changes in dividends (DVD) per year to changes in management share ownership (MO) per year **(Formula 6).** |

Hypothesis testing utilized a binary logistic regression model, which positioned the MS variable as a dummy variable. Hosmer and Lemeshow's of fit-test were used to assess the overall model, whether the whole model was feasible, which referred to the Likelihood-L value. Pseudo R square was employed to evaluate whether the independent variables in this study could explain the dependent variable. The analysis process was carried out by testing the overall data for three years (2015-2017) and annually. Formula 7 was a regression equation for testing hypotheses.

$$MS_i = \alpha - \beta_1 \Delta QR_i + \beta_2 \Delta DB_i + \beta_4 \Delta COGS_i + \beta_5 \Delta ET_i + \beta_5 \Delta PS_i + \mu \ldots\ldots\ldots\ldots.1$$

$$MS_{i(t)} = \alpha - \beta_1 \Delta QR_{i(t)} + \beta_2 \Delta DB_{i(t)} + \beta_4 \Delta COGS_{i(t)} + \beta_5 \Delta ET_{i(t)} + \beta_5 \Delta PS_{i(t)} + \mu \ldots..2$$

Note:

MS : M-Score - Indicators of manipulation of financial statements (dummy variable, M-Score > -2.22, manipulative, notation (0), M-Score <-2.22, no manipulative notation (1).

ΔQR` : Quick ratio change.
ΔDB : Change in debt bias.
ΔCOGS : Changes to Cost of Goods Sold.
ΔET : Changes in earnings.
ΔPS : Changes in stock returns.
α : Constant.
β : Coefficient.
i : Company of- i.
t : Year of- t.

## 4. Analysis Results

Table 2 presents the results of hypothesis testing with logistic regression models in this study. Unfortunately, the results of the Hosmer and Lemeshow test in all samples showed a significance value of chi-square of 0.035, below the significance of 5%, so the model used was unable to predict the value of the observations. The annual test indicated that the ΔQR variable was consistently negative and statistically significant. Meanwhile, the ΔDB and OGCOGS variables statistically revealed significance values that were not consistent, so they could not be used as reference results. The other variables statistically exposed insignificant results in all tests. The results of this test indicated that the hypothesis (H1) was accepted. Still, the author believed that these results were not robust due to problems in the prediction value of chi-square in testing the entire sample. In the next step, the authors conducted an "additional analysis" using the indicator of corporate financial health (ZS) as a moderating variable. The author wanted to ascertain whether adding the ZS variable could improve the model used, specifically in the acquisition of predictive value (Sig. Chi-square) in the observations. The author suspected that the poor financial health of the company (ZS) was a trigger for the opportunistic behavior of agents, which manifested in the manipulation of financial statements.

**Table 2.** Variable in Equation

|  | Predicted Sign | All | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| *ΔQR* | - | -5.212* (0.990) | -6.217** (2.683) | -8.629* (2.522) | -2.868*** (1.428) |
| *ΔDB* | + | 11.802* (2.967) | 5.719 (3.728) | 20.329* (7.456) | 20.398* (7.261) |
| *ΔCOGS* | + | 5.870* (1.217) | 6.600** (2.844) | 25.154*** (13.822) | 13.406 (8.286) |
| *ΔET* | + | 0.231 (0.322) | -1.776 (4.405) | 0.458 (0.473) | 34.650** (16.230) |
| *ΔPS* | + | 0.170 (0.241) | 1.439 (1.077) | -0.066 (0.518) | 0.818 (1.311) |

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| | | | | |
|---|---|---|---|---|
| Constant | -0.706 (0.262) | -0.785 (0.549) | -1.465 (0.743) | -1.048 (0.524) |
| -2Log likelihood | 158.224 | 52.031 | 33.488 | 51.325 |
| R-square ($R^2$) | 0.590 | 0.598 | 0.779 | 0.606 |
| Sig. Chi-Square | 0.035 | 0.836 | 0.813 | 0.970 |
| N | 198 | 66 | 66 | 66 |

Dependent Variable: MS

Note: This table presents the correlation coefficient number (β), while the number between parentheses is the standard error. The *, **, and *** signs indicate significance at the levels of 1%, 5%, and 10%.

The author identified the company's financial health condition by using the Altman Z-Score model [3]. This model has been universally accepted for assessing company survival and bankruptcy [2; 23]. This model was calculated by combining several ratios, including working capital to total assets (WC), retained earnings to total assets (RE), earnings before interest and tax to total assets (IT), market value equity to book value of total debt (MV), and sales to total assets (SA) [3; ]. (A; Ravisankar *et al.*, 2011). Furthermore, Altman (1968) determined the Z-Score range of 1.81 - 2.99 as a threshold for the financial health of a company that can still be tolerated. Meanwhile, a score > 2.99 indicates that the company is in a healthy financial condition, and a score of <1.81 shows poor financial health. Formula 8 displayed the Z-score calculation. Formula 8. Altman Z-Score calculation

$ZS = 0.012WC + 0.014\,RE + 0.033\,IT + 0.006\,MV + 0.999\,SA$

Notes:
WC = Working capital ÷ Total assets
RE = Retained earnings ÷ Total assets
IT = Earnings before interest and tax ÷ Total assets
MV = Market value equity ÷ book value of total debt
SA = Sales ÷ Total assets

The financial health variable (ZS) employed in this paper was measured from the change (increase or decrease) in the Z-Score per year. This variable functioned as a dummy variable. If there was a decrease, it was given a notation (0), while if there was an increase in score, it was given a notation (1). It was hoped that this variable could improve the predicted value (chi-square). The author suspected that the poor financial health of the company (ZS) was a trigger for the opportunistic behavior of agents, which manifested in the manipulation of financial statements. It indicated that the ZS variable had a significant negative effect on supply chain finance in the preparation of financial statements. The logistic regression equation using the ZS moderation variable is contained in Formula 9, while the test model is in Figure 2. Formula 9. Logistic Regression Equation with moderation variables (ZS)

$MS_i = \alpha - \beta_1\Delta QR_i + \beta_2\Delta DB_i + \beta_4\Delta COGS_i + \beta_5\Delta ET_i + \beta_5\Delta PS_i - \beta_6 ZS + \mu \ldots\ldots 1$

$MS_{i(t)} = \alpha - \beta_1\Delta QR_{i(t)} + \beta_2\Delta DB_{i(t)} + \beta_4\Delta COGS_{i(t)} + \beta_5\Delta ET_{i(t)} + \beta_5\Delta PS_{i(t)} - \beta_6 ZS + \mu \ldots\ldots 2$

Note:
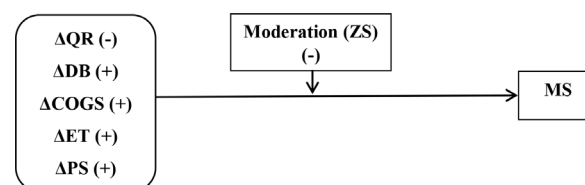ZS : Z-Score – indicator of corporate financial health (Dummy variable, 0: Decrease, 1: increase (1).



**Figure 2.** The testing model with moderation variables (ZS)

### 4.1. Additional Analysis Results

Table 3 shows the Significance Value of chi-square for all tests above 5% significance so that the model used could predict all observations. The coefficient of determination (R2) in testing the entire sample was 0.820, which means the influence between variables was getting stronger. Meanwhile, the coefficient value (β) of the variable RQR was -4.660 and statistically significant. It means that changes in the quick ratio had a significant negative effect on the manipulation of financial statements (MS). Variables ΔDB and ΔCOGS, each had coefficient values (β) of 15,402 and 5,241, which were statistically significant. The corporate financial health variable (ZS) obtained a coefficient value (β) of -4,223 and statistically significant. It indicates that this variable strengthened the influence of the ΔQR, ΔDB, and ΔCOGS variables on the MS variable. On the other hand, the ΔET and ΔPS variables were not statistically significant, which means that the two variables could not explain the variable manipulation of financial statements (MS).

Overall test results in Table 3 presented consistent results on each independent variable. Variables of ΔQR, ΔDB, and ΔCOGS consistently revealed coefficient values (β) in accordance with the prediction set. Also, the ZS variable had managed to moderate the three variables, so that it had a more substantial effect. In other words, SEMs in the recording of current asset accounts, current debt, long-term debt, net income, cost of goods sold, and gross margins caused a hazard by agents when the financial health of the company decreased. The detailed test results are illustrated in Table 3, while the interpretation of the results is in Table 4.

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**Table 3.** Variables in Equation Include Moderating Variable (ZS)

| | Predicted Sign | All | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| $\Delta QR$ | - | -4.660* (1.209) | -6.448** (2.538) | -7.483** (3.762) | -3.556*** (1.913) |
| $\Delta DB$ | + | 15.402* (4.214) | 11.491*** (6.786) | 35.189** (17.479) | 33.875** (15.892) |
| $\Delta COGS$ | + | 5.241* (1.413) | 6.934** (2.754) | 45.892*** (25.711) | 26.361*** (14.884) |
| $\Delta ET$ | + | 0.169 (0.622) | -0.306 (8.894) | -0.612 (1.162) | 81.545** (35.839) |
| $\Delta PS$ | + | 0.276 (0.418) | 0.615 (1.745) | -1.602 (1.068) | 5.770 (5.135) |
| ZS | - | -4.223* (0.640) | -4.838* (1.344) | -5.251** (2.155) | -6.084* (2.034) |
| Constant | | 0.986 (0.436) | 1.618 (1.127) | 0.046 (0.390) | 0.194 (0.898) |
| -2Log likelihood | | 85.176 | 25.162 | 18.492 | 22.473 |
| R-square ($R^2$) | | 0.820 | 0.845 | 0.892 | 0.864 |
| Sig. Chi-Square | | 0.560 | 0.880 | 0.899 | 0.973 |
| N | | 198 | 66 | 66 | 66 |

Dependent Variable: MS

Note: This table displays the correlation coefficient number ($\beta$), while the number between parentheses is the standard error. The *, **, and *** signs indicate significance at the levels of 1%, 5%, and 10%.

## 5. Discussion

Every company tries to meet the demand of the product with proper supply in a timely manner by using effective resources. Some of the important goals of supply chain management are:

- People work together at different levels of the supply chain to maximize resource efficiency, build standardized processes, eliminate duplicate effort, and minimize inventory levels.
- Minimizing supply chain costs is essential, especially when there is economic uncertainty in capital retention.
- Efficient and inexpensive costs are essential, but supply chain managers need to focus on creating value for their customers.
- The best way to meet customers' expectations is on a regular basis.
- Increases customer expectations by creating a variety of products, customizing goods, off-season inventory and fast delivery.
- To meet consumer expectations, merchants must use inventory as a common resource and use order management technology to supply it from the relevant unit in the supply chain.

Finally, supply chain management aims to contribute to a company's financial success. In addition to all of the above, the goal is to guide supply chain companies to improve differentiation, increase sales, and penetrate new markets, as well as manage competitive profits and shareholder value. In general, the opportunistic behavior of management in preparing financial statements is always associated with the problem of manipulation of financial statements or often called "fraud" [15; 25; 26; 30]. Meanwhile, various studies have proven that the M-Score calculation model can detect manipulations in the company's financial statements [2; 4; 5; 6; 16]. Using this model, the author innovates several accounts in financial statements that are connected with conflicts of interest between agents and principals. Some of the accounts are current assets, current debt, long-term debt, net income, cost of goods sold, and gross margin. The results of the analysis in this study indicated that the SEMs in the management of these accounts would stimulate supply chain finance when the condition of the company's financial health decreased.

Financial health condition is a special variable in this study. The results of this study indicated that the manipulation of financial statements was a strategy by agents to increase the value of the company when a decline in the company's financial health occurred. Variable financial health condition is a trigger factor for multidimensional fraud. If financial conditions improve, then it becomes opportunities for agents to manipulate financial statements to increase incentives [35; 37]. If financial conditions persist or worsen, then it manifests into pressure on agents that trigger the manipulation of financial statements so that the company's financial condition appears stable [36]. Besides, the agent can also rationalize his actions to be a truth because he considers

the manipulation of financial statements as a help for the company [30]. Thus, the author believed that the decline in corporate health was behind the manipulative behavior of agents in preparing financial statements.

Detection of manipulative behavior is difficult to express because various motivations can encourage someone to commit fraud and the many ways used to commit fraud [9]. Other research also revealed that efforts to provide remuneration packages for agents and board independence proved ineffective in regulating agents in many companies in the country of Iran [39].

Both studies indicate that fraudulent behavior is more beneficial for agents so that the remuneration package and the independence of the board cannot be used as an effective way to regulate agents. Specifically, this paper provided a clear picture of effective strategies for detecting manipulative behavior by agents. The manipulative agent indicator used several accounts in the financial statements, such as current assets, current debt, long-term debt, net profit, cost of goods sold, and gross margin, which were connected to the financial health condition of the company.

**Table 4.** Interpretation of Testing Results

| Variable | Results | Interpretation |
|---|---|---|
| $\Delta$ET | Hypothesis (H4) was rejected | Changes in earnings are were a benchmark to detect supply chain finance in the preparation of financial statements. Thus, earnings targets, which were suspected of providing pressures for agents, were apparently not proven to trigger supply chain finance by agents in preparing financial statements for manufacturing companies in Indonesia. |
| $\Delta$PS | Hypothesis (H5) was rejected | Agent share ownership was not a benchmark for detecting supply chain finance in the preparation of financial statements. It indicated that efforts to maximize wealth by agents and manipulation of share ownership had not been proven in manufacturing companies in Indonesia. |
| $\Delta$QR | Hypothesis (H1) was accepted | Management of company liquidity by agents was proven to trigger supply chain finance in the preparation of financial statements. These results indicated that the SEMs had manifested as an effort to manipulate current assets and current debt at manufacturing companies in Indonesia. |
| $\Delta$DB | Hypothesis (H2) was accepted | Long-term debt management by agents was proven to trigger supply chain finance in the preparation of financial statements. It indicated that the SEMs had manifested as a debt bias in manufacturing companies in Indonesia. |
| $\Delta$COGS | Hypothesis (H3) was accepted | Management of Cost of goods sold by agents had proven to trigger supply chain finance in the preparation of financial statements. These results indicated that the SEMs of an agent had manifested itself as an effort to manipulate research and development costs or sales, general, and administrative costs to increase the value of gross margins. |
| ZS | Moderation | These results indicated that the condition of the company's financial health was a determinant of the occurrence of supply chain finance agents in the preparation of financial statements. Thus, SEMs opportunistic behavior in managing current assets, current debt, long-term debt, and Cost of goods sold was caused by a decline in the company's financial health. |

# 6. Conclusion and Implication
## 6.1. Conclusion
This paper obtained the results that the SEMs in the preparation of financial statements was a trigger for the occurrence of supply chain finance. Other findings indicated that the unstable financial health condition was one of the factors underlying opportunistic behavior by agents. Conflicts of interest between agents and principals tended to trigger agents' opportunistic behavior in managing current assets, current debt, long-term debt, net income, cost of goods sold, and gross margin. Thus, the author concluded that when the company's financial condition decreased, the SEMs in the management of accounts, such as current assets, current debt, long-term debt, net income, cost of goods sold, and gross margin, was proven to trigger a supply chain finance.

## 6.2. Implication
This paper provided an overview of supply chain finances in the preparation of in-depth company financial statements by utilizing the accounts available therein. The results of the presentation have explained systematically about how opportunistic behavior in accounting records by agents. For an auditor, this paper can provide additional information related to the audit process. In general, this paper is the development of agency theory connected with the discipline of accounting, which is the novelty of this paper. The author recommends that academics conduct research on the manipulation of financial statements that are focused on investment accounts and intangible assets.

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