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Impact of Whistleblowing System Implementation Level on Company's Operational Efficiency in Indonesia Consumer Goods Sector: Mediating Role of Fraud Prevention

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Abstract

Indonesia faces significant issues with fraud across various business sectors, including consumer goods, which negatively impacts operational efficiency. This highlights the need for effective fraud prevention methods to mitigate these effects. This study uses panel data regression analysis, based on annual reports and financial statements from 2019 to 2023, to examine how the implementation level of whistleblowing systems affects operational efficiency, with fraud prevention as a mediating variable, in consumer goods companies listed on the Indonesia Stock Exchange (IDX). The findings indicate that a higher level of whistleblowing system implementation significantly enhances operational efficiency. However, fraud prevention does not mediate this relationship, as the analysis shows insignificant results regarding the impact of whistleblowing systems on fraud prevention and the effect of fraud prevention on operational efficiency. This suggests that while whistleblowing systems directly improve operational efficiency, their role in fraud prevention does not significantly influence this improvement. This research contributes to the literature by demonstrating the direct positive impact of whistleblowing systems on operational efficiency in the Indonesian consumer goods sector. It also offers practical recommendations for companies to enhance their whistleblowing systems to boost operational efficiency. Additionally, the study calls for future research to explore alternative mechanisms through which whistleblowing systems impact operational efficiency beyond fraud prevention and to investigate other methods for assessing whistleblowing system implementation and fraud incidence to reduce bias.

Keywords: Consumer Goods Companies; Fraud Prevention; Indonesia Stock Exchange; Operational Efficiency; Whistleblowing Systems

A. INTRODUCTION

Indonesia struggles with a high incidence of fraud, ranking third in the Asia-Pacific region, according to ACFE (2024). In 2023 alone, Indonesia reported 791 fraud cases with potential losses totaling IDR 28.4 trillion, per Indonesia Corruption Watch (Anandya and Ramadhana, 2024). The country also scored 34 out of 100 on the Corruption Perception Index, placing 115th out of 180 countries, indicating inadequate anti-fraud measures (Transparency International, 2023). Occupational fraud, involving the misuse of company resources for personal gain, is a critical issue within organizations (Holtfreter, 2005). The manufacturing industry, a significant contributor to Indonesia's GDP (BPS-Statistics Indonesia, 2024), is especially vulnerable to fraud (ACFE, 2024). The consumer goods industry is at risk within this sector due to sales pressures and supply chain complexities, leading to frequent sales report falsifications and stock manipulations (Ernst & Young, 2016; Robinson & Williams, 2015).

Fraud results in substantial financial losses, reduced productivity, lower stock valuations, and long-term operational inefficiencies (Brzić et al., 2021; Duan et al., 2024; Omar et al., 2016; Wu et al., 2022; Zahra et al., 2007). To counteract these effects, companies should implement fraud prevention strategies such as improving internal controls, conducting regular audits, adopting automated transaction technologies, and establishing effective whistleblowing systems. Whistleblowing systems have proven effective in detecting and preventing fraud, with about 40% of fraud cases being identified through these systems. Effective implementation of whistleblowing systems not only aids in fraud detection but also benefits companies with lower equity costs (Wan Sallha and Md Salleh, 2016) and higher profitability (Stubben and Welch, 2020). Despite these benefits, the specific impact of whistleblowing systems on operational efficiency remains underexplored. This research aims to investigate the effect of whistleblowing system implementation on operational efficiency in consumer goods

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companies listed on the Indonesia Stock Exchange, with fraud prevention as a mediating factor. The goal is to provide insights into optimizing whistleblowing systems to enhance operational efficiency in the consumer goods sector.

Whistleblowing

A whistleblowing system is a mechanism that allows for the anonymous reporting of fraud or ethical violations within an organization, aiming to initiate corrective actions (Argento, 2024; Ceva & Bocchiola, 2020; Putra et al., 2022). Originating in the United States in 1863, these systems gained international prominence with the U.N. Convention Against Corruption (UNCAC) in 2003, which Indonesia ratified through Law No. 7 of 2006 (Republic of Indonesia Cabinet Secretariat, 2016). While Indonesian regulations, such as OJK Circular Letter No. 16/SEOJK.04/2021, encourage the inclusion of whistleblowing systems in annual reports; they do not mandate implementation. According to a report by the Komite Nasional Kebijakan Governance (KNKG) (2008), effective whistleblowing systems involve structural, operational, and maintenance aspects, including company commitment, protection policies, anonymous reporting mechanisms, and monitoring program effectiveness (KNKG, 2008). Companies with well-implemented whistleblowing systems benefit from lower equity costs, higher profitability, reduced fraud cases, and mitigated negative impacts of fraud (Abdelghaffar Saleh et al., 2024; Maulida & Bayunitri, 2021; Putra et al., 2022; Sudjono, 2023; Stubben & Welch, 2020; Wan Sallha & Md Salleh, 2016).

Fraud and Fraud Prevention

Fraud is an intentional crime designed to gain benefits by illegally acquiring others' property or money (Chen, 2020). In business, occupational fraud is the misuse of organizational assets or resources for personal gain (Holtfreter, 2005). The Association of Certified Fraud Examiners (ACFE) identifies three types of occupational fraud: corruption, asset misappropriation, and financial statement fraud. Corruption involves the misuse of influence for personal benefit, asset misappropriation includes theft or misuse of company assets, and financial statement fraud involves intentional misstatements in financial reports. Fraud prevention involves identifying and managing fraudulent activities (Rodrigues et al., 2022) and strategies to prevent and control fraud (Putra et al., 2022). Effective strategies include evaluating company conditions, enhancing internal controls, implementing whistleblowing systems, improving auditing standards (Dewi & Ariandi, 2017), developing data monitoring or automated transaction technologies (ACFE, 2024), and providing employee fraud awareness training (Tarjo et al., 2022). The goal of fraud prevention is to mitigate its negative impacts, which include decreased productivity (Brzić et al., 2021), reduced stock market value (Zahra et al., 2007), reputational damage (Wu et al., 2022), and financial losses (Omar et al., 2016). Recent research also indicates that fraud adversely affects long-term operational efficiency by disrupting daily business operations (Duan et al., 2024).

Operational Efficiency

Operational efficiency measures how well a company uses resources to produce output with minimal input costs (Derouiche et al., 2021; Gill et al., 2014; Stubben & Welch, 2020). It is crucial for shaping competitive strategies and guiding business decisions on sales forecasts, production volumes, and pricing (Handoyo et al., 2023). Operational efficiency can be assessed using various methods: parametric approaches like Stochastic Frontier Analysis (SFA), nonparametric techniques such as Data Envelopment Analysis (DEA), and integrated methods like Stochastic Nonparametric Envelopment of Data (StoNED) (Lee & Johnson, 2014). To enhance operational efficiency, companies should identify and address bottlenecks, eliminate non-value-added activities and waste, optimize supply chain management, integrate automation and technology, and implement continuous improvement programs (Lee & Johnson, 2014; Raval et al., 2020).

Consumer Goods Sector

The consumer goods sector comprises companies that produce finished products for individual consumers and households. This sector is characterized by low profit margins, a wide variety of products, high demand for availability, a need for constant innovation, and significant marketing investments (Diehl & Spinler, 2013; Stewart & Niero, 2018). The supply chain in this sector is complex, involving numerous third parties such as vendors, suppliers, manufacturers, distributors, and service providers (Deloitte, 2014). This complexity increases the risk of theft, financial fraud through system record manipulation, and illegal product resale or black-market activity

(Deloitte, 2014; Robinson & Williams, 2015). Consequently, robust fraud prevention measures are essential to mitigate these risks and protect the company's operations.

Hypotheses Development

Previous research has examined the role of whistleblowing systems in preventing fraud. (Maulida & Bayunitri, 2021) found that effective implementation of such systems led to a 54.3% reduction in fraud. (Handajani et al., 2023) noted that poor implementation limits their effectiveness, while (Putra et al., 2022) demonstrated that better implementation correlates with reduced fraud. (Sudjono, 2023; Saleh et al., 2024) also, high levels of whistleblowing system implementation decrease fraud cases and address broader corporate wrongdoing. Thus, it is hypothesized that H1: The whistleblowing system implementation level positively impacts fraud prevention.

Preventing fraud is crucial for mitigating negative impacts on companies. (Duan et al., 2024) companies facing high fraud risks experience long-term operational inefficiencies due to disruptions and resource allocation issues. (Derouiche et al., 2021) support this by indicating that strong risk management, including fraud prevention, enhances operational efficiency. Hence, it is hypothesized that H2: Fraud prevention positively impacts the company's operational efficiency.

While research on whistleblowing systems and fraud prevention is extensive, their impact on operational efficiency is less explored. Studies by (Maulida & Bayunitri, 2021; Putra et al., 2022; Sudjono; 2023; Saleh et al., 2024) suggest that high implementation levels of whistleblowing systems reduce fraud, with broader benefits expected. As (Duan et al., 2024) indicate, timely corrective action against fraud can enhance operational efficiency. Therefore, it is hypothesized that H3: There is a positive impact of the whistleblowing system implementation level on the company's operational efficiency.

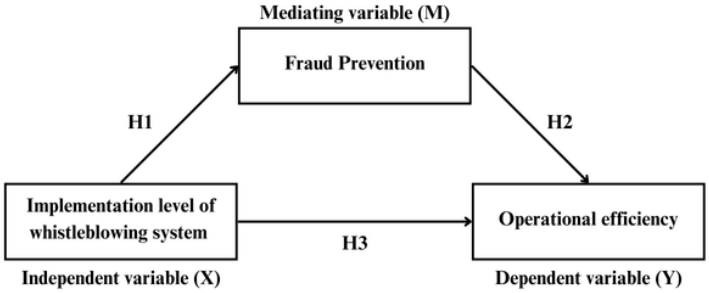

Figure 1. Conceptual Framework
Source: Adopted from (Handajani et al., 2023; Derouiche et al., 2021)

B. RESEARCH METHODS

This research focuses on consumer goods companies listed on the Indonesia Stock Exchange (IDX), investigating how the implementation level of whistleblowing systems impacts operational efficiency, with fraud prevention as a mediating variable. The study follows a comprehensive design, from problem identification to drawing conclusions and making recommendations. Initially, the researcher identified the problem by assessing the state of fraud in Indonesia. A literature review of credible sources followed this to pinpoint gaps in existing research. These gaps informed the research questions exploring the relationships between whistleblowing systems, fraud prevention, and operational efficiency. Hypotheses were then developed based on the literature review findings. The research employs a quantitative approach, using secondary data from published annual reports and financial statements from 2019 to 2023. Panel data regression analysis is applied to examine the relationships among variables. Finally, the study summarises key findings and offers recommendations for consumer goods companies and future research.

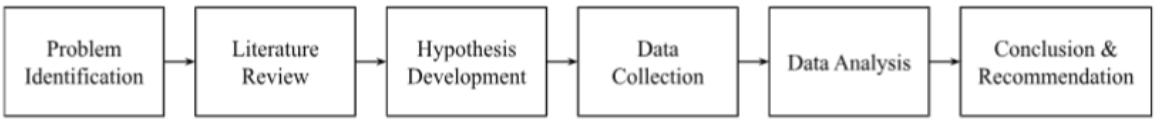

Figure 2. Research Design
Source: Research data, 2024

Data Collection

The research targets Indonesian-listed companies in the consumer goods sector. To determine the sample, a purposive sampling design was used, selecting companies based on three criteria: 1) they must have published annual reports for the years 2019 to 2023; 2) they must have reported the implementation of a whistleblowing system in these annual reports; and 3) they must have disclosed the number of cases reported through the whistleblowing system in their annual reports for the same period. After applying these criteria, the final sample for this study includes 16 companies.

Table 1. Sample Data

No.	Name of Company	Code
1.	PT Akasha Wira International Tbk.	ADES
2.	PT FKS Food Sejahtera Tbk	AISA
3.	PT Chitose Internasional Tbk.	CINT
4.	PT Garudafood Putra Putri Jaya Tbk.	GOOD
5.	PT H.M. Sampoerna Tbk.	HMSP
6.	PT Hartadinata Abadi Tbk.	HRTA
7.	P.T. Indonesian Tobacco Tbk.	HRTA
8.	PT Kimia Farma Tbk.	KAEF
9.	PT Kino Indonesia Tbk.	KINO
10.	PT Merck Tbk.	MERK
11.	PT Phapros Tbk.	PEHA
12.	PT Palma Serasih Tbk.	PSGO
13.	PT Nippon Indosari Corpindo Tbk.	ROTI
14.	PT Industri Jamu dan Farmasi Sido Muncul Tbk.	SIDO
15.	PT Sekar Laut Tbk.	SKLT
16.	PT Wismilak Inti Makmur Tbk.	WIIM

Source: Research data, 2024

Variables and Measurements

This research utilizes four types of variables: dependent, independent, mediating, and control variables. The dependent variable is the company's operational efficiency (EFFICIENCY), measured using Data Envelopment Analysis (DEA). DEA employs sales revenue as the output variable and three input variables: 1) cost of goods sold (COGS); 2) net property, plant, and equipment (PP&E); and 3) selling, general, and administrative costs (SG&A) (Cheng et al., 2018; Derouiche et al., 2021). The independent variable is the whistleblowing system implementation level (WBS), represented by the total number of disclosed items related to the whistleblowing system in the company's annual report. Each identified item is scored as 1, with a maximum possible score of 10 (KNKG, 2008; G. Lee & Fargher, 2013; Rani et al., 2022).

Table 2. Item Disclosure For Whistleblowing System

No.	Disclosure Item	Description
1.	Statement of company's commitment	There is a statement of commitment to implement the whistleblowing system from the company.
2.	Whistleblower protection	The company has a whistleblower protection policy to give protection against behavior that is harmful to the whistleblower.
3.	Fraud management unit	The company has an independent unit to investigate the report, or it can also be managed by a committee such as the Board of Commissioners or Internal Audit.
4.	Media to report	The company has reporting media for both internal and external, such as hotline, email, or any other forms.
5.	Anonymous Reporting	The company has guaranteed the confidentiality of the whistleblower's report.
6.	Reporting mechanism	The company states the procedures for submitting the fraud reports, the investigation process, and the update for whistleblowers regarding the report.
7.	Investigation	The company stated there would be a further investigation or follow-up into the reported fraud.
8.	Whistleblowing effectiveness	The company conducts reviews to ensure the effectiveness of

No.	Disclosure Item	Description
		implementing the whistleblowing system and states its results by the number of frauds received in a year.
9.	Scope of fraud	The company stated the types of fraud that can be reported.
10.	Training and Education	The company has training and education regarding ethics and corporate culture training to encourage honesty and openness.

Source: Research Data, 2024

In this research, fraud prevention is the mediating variable, measured by the number of fraud cases (FRAUD) reported through the whistleblowing system, as stated in the annual report. If a company reports no cases, it is recorded as 0 (Handajani et al., 2023; Sudjono, 2023). Additionally, control variables are used to account for potential confounding effects. For hypothesis 1, the control variables include the natural logarithm of total assets (Firm Size), the number of directors (Board Size), and the natural logarithm of the company's age (AGE) (Cheng et al., 2018; Ewelt-Knauer et al., 2015; Stubben & Welch, 2020). For hypotheses 2 and 3, the control variables are the natural logarithm of total assets (Firm Size), the natural logarithm of the company's age (AGE), and the ratio of the company's revenue to the total revenue of listed companies in the same subsector for that year (MARKET) (Cheng et al., 2018; Demerjian et al., 2013; Derouiche et al., 2021).

Analysis Technique

To analyze the relationship between each variable, the researcher uses the cross-section and time-series data that observed 16 listed consumer goods companies in the Indonesia Stock Exchange that already implemented the whistleblowing system during 2019 - 2023; thus, the data panel regression will be used. The model of regression analysis is as follows:

1) $FRAUD_{it} = \beta 1_i + \beta 2WBS_{it} + \beta 3FSIZE_{it} + \beta 4AGE_{it} + \beta 5BSIZE_{it} + u_{it}$

2) $EFFICIENCY_{it} = \beta 1_i + \beta 2WBS_{it} + \beta 3FRAUD_{it} + \beta 4FSIZE_{it} + \beta 5AGE_{it} + \beta 6MARKET_{it} + u_{it}$

C. RESULTS AND DISCUSSION

Data Envelopment Analysis

This research uses the Data Envelopment Analysis (DEA) model to determine operational efficiency scores using DEAP 2.1 software. The output-oriented Variable Returns to Scale (VRS) model is utilized, as it evaluates firms based on their ability to increase outputs while maintaining or reducing inputs, assuming that changes in input levels have a proportional effect on output levels (Derouiche et al., 2021). The resulting operational efficiency scores are presented below.

Table 3. Operational Efficiency Scores

Company	Year				
	2019	2020	2021	2022	2023
ADES	0.950	1.000	1.000	1.000	1.000
AISA	0.655	0.604	0.615	0.658	0.726
CINT	1.000	1.000	1.000	1.000	1.000
GOOD	0.828	0.812	0.811	0.829	0.838
HMSP	1.000	1.000	1.000	1.000	1.000
HRTA	1.000	1.000	1.000	1.000	1.000
ITIC	1.000	1.000	1.000	1.000	1.000
KAEF	0.770	0.785	0.824	0.861	0.712
KINO	0.879	0.872	0.813	0.727	0.786
MERK	1.000	1.000	1.000	1.000	1.000
PEHA	1.000	1.000	0.903	0.996	1.000
PSGO	0.723	0.896	1.000	1.000	0.986
ROTI	1.000	1.000	0.949	0.952	0.961
SIDO	1.000	1.000	1.000	1.000	1.000
SKLT	0.870	0.874	0.826	0.764	0.838
WIIM	0.862	1.000	1.000	1.000	1.000

Source: Research Data, 2024

Panel Data Regression Analysis

Data from 16 consumer goods companies in Indonesia selected for this research were collected and analyzed using STATA 17.0 software. The results of the descriptive statistics are summarized and presented below.

Table 4. Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
WBS	80	4	10	8.21	1.420
FRAUD	80	0	4.22	0.7286	1.17546
EFFICIENCY	80	0.6	1	0.9219	0.11101
FSIZE	80	12.96	17.83	14.8332	1.21638
AGE	80	2.40	4.70	3.6033	0.53502
BSIZE	80	2	9	4.56	1.764
MARKET	80	0.000697	1	0.1215504	0.2524018

Source: Research Data, 2024

Based on the descriptive statistics, companies, on average, report 8 out of 10 aspects of whistleblowing system implementation in their annual reports. This indicates a relatively high level of implementation. The following summarizes the total number of disclosure items found in the annual reports of the sample companies for 2019-2023.

Table 5. Total Disclosure Items of Whistleblowing System

Items of whistleblowing systems	Total
Statement of company's commitment	27
Whistleblower protection	72
Fraud management unit	80
Media to report	79
Anonymous Reporting	74
Reporting mechanism	58
Investigation	73
Whistleblowing effectiveness	80
Scope of fraud	72
Training and Education	42

Source: Research Data, 2024

This study measures fraud prevention (FRAUD) using the natural logarithm of the number of fraud cases reported in the companies' annual reports. The range of reported fraud cases spans from 0 (indicating no reported fraud) to a maximum of 4.22. The average value is 0.7286, suggesting that the fraud reported through the whistleblowing system is relatively low. For operational efficiency, measured using DEA (Data Envelopment Analysis), the scores range from a minimum of 0.6 to a maximum of 1, with an average score of 0.9219. Although this score indicates that the companies are not fully efficient (with 1 representing full efficiency), the results are still relatively high. To determine the appropriate regression model, the researcher conducted model selection tests, including the Chow test, Hausman test, and Lagrange multiplier test, all at an alpha level of 0.05. The results indicate that the random effects model is the most suitable for this study's regression analysis (Baltagi, 2021) (see Table 6).

Following the selection of the random effects model, classical assumption tests were performed. Given that the random effects model employs Generalized Least Squares (GLS), which assumes constant variance and no correlation among residuals, only the normality and multicollinearity tests were necessary (Gujarati & Porter, 2009). The normality test results showed p-values of 0.49158 and 0.99793 for each model (see Table 3.5), indicating that the data are normally distributed as the p-values are greater than the alpha level of 0.05 (Gujarati, 2012). The multicollinearity test, using the variance inflation factor (VIF), showed that all variables had VIF values below 10 (see Table 3.6), confirming that multicollinearity is not an issue (Gujarati, 2012).

Table 6. Model Selection Test

	Model 1	Model 2
Chow Test	0.1790	0.0199
Hausman Test	0.0856	0.0874
Lagrange Multiplier Test	0.0000	0.0000

Source: Research Data, 2024

Table 7. Normality test

Normality Test	
Model 1	0.49158
Model 2	0.99793

Source: Research Data, 2024

Table 8. Multicollinearity Test

Model 1		Model 2	
Variable	**VIF**	**Variable**	**VIF**
WBS	1.23	WBS	1.35
BSIZE	1.92	FRAUD	2.33
FSIZE	1.91	FSIZE	2.69
AGE	1.20	AGE	1.21
		MARKET	1.24

Source: Research Data, 2024

The panel data regression analysis was performed after confirming that the data met the classical assumption tests. For the first model, which examines the impact of whistleblowing system implementation (WBS) on fraud prevention (FRAUD), the constant term was found to be -7.270507. This indicates that, theoretically, if all independent variables were zero, the number of fraud cases would decrease by -7.270507. However, the p-value for WBS in the regression analysis was 0.681, significantly higher than the accepted alpha level of 0.05. This suggests that the level of implementation of the whistleblowing system (WBS) does not significantly affect fraud prevention (FRAUD) in the companies studied. Consequently, hypothesis H1 is rejected. This finding contradicts the reported results (Sudjono, 2023; Saleh et al., 2024).

The lack of significance might be explained by (Lee and Fargher, 2013), who found that while a better implementation of the whistleblowing system did not directly reduce fraud cases, it did increase employees' intentions to report misconduct anonymously. This could imply that implementing whistleblowing systems might have other indirect benefits not captured in this study. Regarding the control variables, both Firm Size (FSIZE) and Board Size (BSIZE) have a significant positive impact on fraud prevention, with p-values of 0.009 and 0.001, respectively, which are below the alpha level of 0.05. These results align with (Velte, 2023; Ebaid, 2023) findings. In contrast, the company's age (AGE) did not significantly impact fraud prevention, with a p-value of 0.316, which is higher than the alpha level of 0.05.

Table 9. Regression result for Model 1

FRAUD	Coefficient	Std. err.	z	P>z	[95% conf. interval]	
WBS	.0250167	.0608396	0.41	0.681	-.0942267	.1442602
FSIZE	.3933051	.1509897	2.60	0.009	.0973707	.6892396
AGE	.3583031	.3570467	1.00	0.316	-.3414956	1.058.102
BSIZE	.1465505	.0590044	2.48	0.013	.030904	.262197
cons	-7.270.507	227.506	-3.20	0.001	-1.172.954	-2.811.471

Source: Research Data, 2024

Based on the Chi-square test, the p-value of 0.0002 is significantly lower than the alpha level of 0.05, indicating that the overall model significantly affects the dependent variable, fraud prevention (FRAUD). The R-squared value of 0.5485 suggests that the independent variable, whistleblowing system implementation level (WBS), along with the control variables (company size, board of directors' size, and company age), accounts for 54.85% of the variation in fraud prevention. This leaves 45.15% of the variation unexplained by the model, suggesting that other variables or factors not included in this study may also influence fraud prevention.

Table 10. Chi-square and R-square test for Model 1

Model 1	
Chi-square test	0.0002
R-square test	0.5485

Source: Research Data, 2024

In the panel data regression analysis for Model 2, which examines the impact of whistleblowing system implementation level and fraud prevention on the company's operational efficiency, the constant value of 0.7044299 suggests that if all independent variables are zero, the company's operational efficiency (EFFICIENCY) will increase by 70.44%. However, the p-value for fraud prevention (FRAUD) is 0.806, higher than the accepted alpha level of 0.05. This indicates that the number of reported fraud cases does not significantly impact the company's operational efficiency, leading to the rejection of hypothesis H2. This result contradicts the findings of Duan et al. (2024). Free and Murphy (2015) suggest that if the scale of fraud is relatively small and manageable, it may not significantly disrupt operational efficiency.

Conversely, the p-value for the whistleblowing system implementation level (WBS) is 0.0106, significantly lower than the alpha level of 0.05. This result indicates that the whistleblowing system's implementation level significantly impacts the company's operational efficiency. Specifically, the coefficient of 0.0195946 implies that for every increase in the whistleblowing system implementation level, the company's operational efficiency increases by 1.95%. Thus, hypothesis H3 is accepted. Regarding the control variables, FSIZE (company size), AGE (company age), and MARKET (market share) do not show a significant impact on operational efficiency, with p-values of 0.611, 0.242, and 0.310, respectively, all exceeding the alpha level of 0.05.

Table 11. Regression result for Model 2

EFFICIENCY	Coefficient	Std. err.	z	P>z	[95% conf. interval]	
WBS	.0195946	.0076246	2.57	0.010	.0046505	.0345386
FRAUD	-.0034201	.0138982	-0.25	0.806	-.03066	.0238198
FSIZE	-.0108303	.0212701	-0.51	0.611	-.0525189	.0308583
AGE	.0571777	.0488631	1.17	0.242	-.0385923	.1529477
MARKET	.112695	.1109808	1.02	0.310	-.1048234	.3302134
_cons	.7044299	.3197381	2.20	0.028	.0777548	1.331.105

Source: Research Data, 2024

In the panel data regression analysis for Model 2, the Chi-square test reveals a p-value of 0.0382, below the alpha level of 0.05. This indicates that the model significantly affects the company's operational efficiency (EFFICIENCY). The R-squared value of 0.0551 shows that the independent variable (whistleblowing system implementation level), the mediating variable (fraud prevention), and the control variables (company size, company age, and market share) collectively explain only 5.51% of the variability in operational efficiency. This suggests that the remaining 94.49% of the variability in operational efficiency is influenced by other factors not captured by the model in this research.

Table 12. Chi-square and R-square test for Model 2

Model 2	
Chi-square test	0.082
R-square test	0.0551

Source: Research Data, 2024

CONCLUSION

Based on the analysis results, several key findings provide insights into the relationship between whistleblowing system implementation, fraud prevention, and operational efficiency in consumer goods sector companies listed on the Indonesia Stock Exchange. Firstly, the study found that the implementation level of the whistleblowing system does not significantly impact fraud prevention. Despite having more disclosed aspects in their annual reports, this does not necessarily lead to reduced fraud cases within the company. This suggests that merely having a comprehensive whistleblowing system in place may not effectively prevent fraud. Secondly, the results indicate that fraud prevention does not significantly affect the company's operational efficiency, even when accounting for control variables such as company size, age, and market share. This implies that the number of fraud cases reported does not significantly disrupt the company's operational processes. On the other hand, the implementation level of the whistleblowing system was found to have a significant positive impact on operational efficiency. Companies with a higher level of whistleblowing system implementation tend to exhibit better operational efficiency, suggesting that a well-implemented system can enhance efficiency by improving transparency and internal processes.

Based on these findings, it is recommended that consumer goods sector companies focus on improving their whistleblowing systems by increasing transparency, enhancing reporting mechanisms, and ensuring effective integration into their operations. Additionally, the study found that fraud prevention does not mediate the relationship between whistleblowing system implementation and operational efficiency. Future research should explore alternative mechanisms or variables to explain this relationship better. Researchers could benefit from using primary data, such as employee questionnaires and detailed records of fraud cases, to understand whistleblowing system effectiveness better. Further investigations could include qualitative studies or longitudinal research to capture changes over time and provide deeper insights into the dynamics between whistleblowing systems, fraud prevention, and operational efficiency.

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