

Reducing unethical behavior in SMEs using fraud triangle theory and anti-fraud technology: A case study from Medan City

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Received Aug. 6, 2025

Revised Dec. 14, 2025

Accepted Dec. 23, 2025

Online Dec. 30, 2025

Abstract

SMEs are vulnerable to fraudulent behavior from their employees. This research aims to analyze fraud risk factors and integrate anti-fraud information technology as a moderating variable to formulate fraud prevention strategies for SMEs. The study was conducted on SMEs in Medan City, specifically in the coffee shop sector, by distributing questionnaires to employees. Samples were selected using random sampling, and 161 respondents answered the questions. Data analysis used moderating regression analysis with an interaction test approach. This study reveals that only rationalization has a significant impact on fraud. Additionally, this research reveals an important finding that anti-fraud technology acts as a moderating variable in the relationship between opportunity and rationalization towards fraud. This finding indicates that anti-fraud technology plays a crucial role in fraud prevention. SMEs need to invest in information technology to strengthen internal controls by facilitating real-time tracking of employee activities, thereby creating a perception of oversight that can control rationalization and curb tendencies towards unethical actions.

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Published by ARDA.

Keywords: Fraud triangle, Anti-fraud technology, Unethical behavior

1. Introduction

Unethical behavior within organizations is an important issue that can affect the sustainability and reputation of a business. This phenomenon also often occurs in micro, small, and medium enterprises (MSMEs), especially in the food and beverage sector, which plays a significant role in Indonesia's economy. According to data, MSMEs contribute 61.97% to Indonesia's gross domestic product (GDP) and absorb more than 97% of the workforce [1], [2]. However, despite their significant contribution, many MSMEs face internal challenges, one of which is unethical employee behavior, such as abuse of authority, manipulation of financial data, and asset embezzlement [3].

The fraud triangle theory proposed by [4] explains that the main factors that trigger unethical behavior in employees are pressure, opportunity, and rationalization. The pressure experienced by employees can stem from both the work environment and personal life, with financial pressure or high demands to achieve work targets often being the main drivers of fraud [5]. In the context of food and beverage SMEs in Medan City, this pressure

can stem from the demands of business owners to increase sales, intense business competition, and the unmet financial needs of employees. Besides pressure, opportunity also becomes a factor that allows unethical behavior to occur. Opportunities arise due to the weak internal oversight or control systems that are typically common characteristics of MSMEs. According to research conducted by [6], 42% of fraud cases occur in organizations with weak internal oversight. In the food and beverage MSME sector, this opportunity is even greater because business owners often do not have adequate recording systems or technology to detect fraud.

The most significant one to avoid is rationalization; those staff members who do wrong things look for justifications. Fraud triangle theory contends that rationalization enables people to excuse themselves as ethical despite indulging in unethical conduct [4]. For instance, an employee may excuse himself by stealing from the company if wages earned are poor and will not be enough for basic necessities. In an effort to combat this problem, the implementation of anti-fraud technology is showing promising potential. This technology has the ability to make SME owners automate the effectiveness of monitoring, detect exceptions, and minimize the risk of fraud. Studies conducted by [7], [8] established that the adoption of anti-fraud technology can minimize the risk of fraud up to a maximum of 40% using an automated monitoring system and real-time data analysis. Its effectiveness in the context of SMEs, however, also needs to be studied with particular emphasis on its impact on fraud-influencing factors like pressure, opportunity, and rationalization.

Medan City, as one of the economic centers in Indonesia, is not immune to this issue as well. There are over 80.000 SMEs that are running businesses or small business activities [9]. With many conditions among SMEs, this research is needed to determine the reason why there is unethical employee behavior, and how anti-fraud technology can be employed as a moderating variable. This research tries to examine the role of pressure, opportunity, and rationalization toward unethical employee conduct in Medan City's food and beverage SMEs, as well as the function of anti-fraud technology as a moderator variable in the relationship. The results of the research will be expected to build towards the framework of an efficient system of supervision in the SMEs sector, along with establishing the importance of local governments in making policies in support of honest business practice.

1.1. Fraud triangle elements and unethical behavior

Unethical behavior by the employees of MSME is a major threat that affects financial performance as well as operational stability. Some of these practices vary from forgery of accounting records to embezzlement of assets and abuse of power [10], [11]. Empirical analyses of the causes of these unethical practices have emerged as an important topic of study in the accounting and management fields. Based on the traditional fraud triangle, [4] established the fraud diamond theory, which places its focus on capability as a necessary element in addition to pressure, opportunity, and rationalization. These elements interact to create environments under which unethical action is feasible. The theory serves as a foundation for numerous studies that seek to investigate the motives of fraudulent actions in various organizational environments, including SMEs.

Pressure, which is frequently mentioned to be one of the major drivers in instances of illegal behavior such as tampering with information or misuse of power, is exacerbated when individuals perceive genuine channels for need satisfaction as out of reach. Pressure may come from so many different sources, including fiscal pressure, stringent performance standards, or being compelled to meet particular targets [5]. In MSMEs, such pressure can be due to a need to increase sales figures, contain rising operating costs, or respond to individual employees' personal financial requirements.

Opportunities, further, usually entice employees to engage in dishonesty. Opportunities, in terms of situations or conditions under which staff members can commit fraud without getting caught, are likely to occur as a result of poor monitoring or poor internal control procedures. The need for sound internal controls and a sound ethical organizational culture to prevent fraud is emphasized by [12], [13], [14]. Research [15] indicates that there needs to be access or a perceived lack of access in order for fraudulent activity to occur. In MSMEs, such opportunities

can arise due to poor segregation of duties, poor technological infrastructure, and poor awareness among owners about the significance of strong monitoring systems.

Studies by [16], [17] reveal that poor internal controls and poor ethical awareness are prime drivers of unethical actions among MSME employees. This is a reflection of the susceptibility of the MSME industry to fraud because of straightforward monitoring procedures, limited resources, and inadequate ethical staff training. In the same manner, the need to upgrade internal controls to help eliminate fraud opportunities is also prioritized. Likewise, [3] established the fact that institutions lacking proper oversight mechanisms are more vulnerable to fraud compared to companies having stringent control measures. This is especially applicable in MSMEs, where opportunities for fraud are rampant because segregation of duties is lacking, and there is over-dependence on manual accounting methods of recording. ACFE further advocates for employees being offered anti-fraud training so as to enhance awareness and comfort with fraud risk.

Lastly, rationalization is the ethical rationalization used by people to justify their unethical behavior. Fraud perpetrators justify their actions as harmless or acceptable [4]. For example, workers will rationalize taking company money in small amounts by feeling that they deserve more pay. Rationalization is key because, through it, people can feel fine with doing something that contradicts adopted norms and codes of ethics. The predicted hypothesis is thus:

H1: Fraud triangle components are good predictors of unethical activity.

H1a: Pressure is a very strong predictor of unethical activity.

H1b: Opportunity is a very strong predictor of unethical activity.

H1c: Rationalization is a very strong predictor of unethical activity.

1.2. Anti-fraud technology and fraud

Anti-fraud technology is now a requirement for fraud detection and prevention in the majority of industries, including SMEs. Positive solutions are typically software employing data analysis, auto transaction monitoring systems, and AI to identify irregularities in business or financial procedures. Research by [3], [18] indicates that such solutions enable real-time monitoring and thus reduce the risks of fraud due to poor human monitoring. In SME food and beverages, where transactions and financial recording are less advanced, such technologies can be utilized to increase transparency.

Researchers [19] specifically examine the use of anti-fraud technology in MSMEs. According to their research, technologies such as digital cash register systems can promote transparency in everyday transactions and therefore prevent fraud. These technologies also make it easier for MSME owners to track financial transactions, which can make it easier to spot potential anomalies. However, [19] also finds it necessary to train employees in a way that they effectively employ these anti-fraud technologies.

Regarding rationalization, [20], [21] have determined in their research that anti-fraud technology will also diminish the level at which employees rationalize unethical behavior. With open books and connected systems, employees will not be able to rationalize misconduct because they will know their actions are tracked and documented. This means that not only can technology function as a prevention mechanism, but also as an element to sway employees' ethical concerns. Thus, the following hypothesis is developed:

H2: The implementation of anti-fraud technology is inversely related to unethical behavior.

1.3. Anti-fraud technology as a moderator

As a moderating variable, anti-fraud technology not only denies the capability for fraud but also affects pressure and rationalization, lessening their functions in unethical conduct. For example, an electronic cashiering system, coupled with data analysis, can automatically log every transaction, hence reducing the holes available for employees to embezzle funds. An analysis by [8] demonstrates that the use of anti-fraud technology in MSMEs

has the potential to reduce fraud risk by 40% through increased efficiency and improved monitoring. It would mean that the technology has the capability to stop the vulnerabilities that employees might exploit to commit unethical behavior. Fraud detection systems, which are AI and machine learning based, provide fraud scores that indicate the level of risk involved in a transaction.

In addition, anti-fraud technology helps establish an open and transparent organizational culture that de-prioritizes pressure and rationalization that could drive employees to engage in unethical behaviors. Technology also reminds individuals that each action is under observation, thus ensuring compliance with set rules [7], [22]. At the same time, the technology-driven transparency can ease employees from either emotional or financial pressure as they perceive that they work in a better-organized and fairer system. Anti-fraud technology is thus not only employed as a prevention tool but also as a reservoir for positive organizational behavioral changes.

Past studies also examined the interplay between pressure, opportunity, justification, and technology. For instance, [10], [23] established that economic pressure and work targets are highly likely to be the primary offenders of unethical behavior, particularly when lacking adequate monitoring. However, with the presence of anti-fraud technology, that pressure can be managed better through transparency in work processes and real-time monitoring. This study shows that technology can be a significant moderator in reducing the impact of pressure on unethical behavior. Thus, the proposed hypothesis is as follows:

H3: Anti-fraud technology acts as a moderator in the relationship between fraud triangle elements and unethical behavior.

H3a: Anti-fraud technology acts as a moderator in the relationship between pressure and unethical behavior.

H3b: Anti-fraud technology acts as a moderator in the relationship between opportunity and unethical behavior.

H3c: Anti-fraud technology acts as a moderator in the relationship between rationalization and unethical behavior.

2. Research method

This research uses a quantitative method with a survey approach to examine the influence of pressure, opportunity, and rationalization on the unethical behavior of MSME coffee shop employees in Medan City, as well as to study the role of anti-fraud technology as a moderating variable. The quantitative method was chosen because it can provide measurable, objective, and generalizable results [24]. The survey approach is used to collect primary data directly from respondents through questionnaires that are structured based on the research variable indicators. The population in this study consists of employees of MSME coffee shops in Medan City, totaling 295. The questionnaire was distributed to employees of UMKM coffee shops with specific criteria, such as involvement in operational activities, including financial management, transactions, and inventory storage.

Data collection was conducted using a structured questionnaire designed based on the indicators of each research variable. The questionnaire uses a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree," to measure the levels of pressure, opportunity, rationalization, anti-fraud technology, and unethical behavior. This research instrument adapts measurement tools that have been tested in previous studies, such as the pressure, opportunity, rationalization, and unethical behavior from a study by [25], while anti-fraud technology from a study by [26]. Before the questionnaire was used, validity and reliability tests were conducted to ensure that the instrument used could provide accurate and consistent results [27]. The validity of the instrument was tested using the product-moment correlation, while its reliability was analyzed using Cronbach's alpha. A question item is considered valid if the calculated r value is greater than the table r value, in a two-tailed test with a significance level of 0.05. Furthermore, an instrument is considered reliable if the Cronbach's alpha value exceeds 0.6.

The data obtained from the questionnaire will be analyzed using the moderated regression analysis with an interaction test approach to test the role of anti-fraud technology as a moderating variable. Before conducting

regression analysis, the data will undergo several classical assumption tests, such as the normality test, multicollinearity test, and heteroscedasticity test, to ensure that the analysis model used is valid and appropriate [28]. With this approach, the research is expected to identify significant relationships between independent, moderating, and dependent variables.

3. Results and discussion

After data collection through the distribution of questionnaires, the number of respondents who filled out the questionnaire and were used in the analysis of this study was 161. Then, data quality and classical assumption testing were conducted to ensure that the obtained data met the eligibility criteria for hypothesis testing. Based on the results of data quality tests, including validity and reliability testing, it was found that all calculated r values for each instrument were greater than the r table value, and all Cronbach's alpha values exceeded the minimum threshold of 0.60. Thus, all the questionnaire instruments used in this study are declared valid and reliable. The first assumption tested is the normality of the data using the Kolmogorov-Smirnov test. The test results show that the Kolmogorov-Smirnov value is greater than 0.05; thus, it can be concluded that the data in this study are normally distributed. Further assumption tests include heteroscedasticity and multicollinearity. The results of the Breusch-Pagan test show a significance value greater than 0.05, while the variance inflation factor (VIF) values for all variables are below 10, as shown in Table 1. Therefore, it can be concluded that the data in this study are homogeneous and there is no significant correlation between the independent variables.

Table 1. Result of the variance inflation factor

Variable	VIF
Pressure	1.105
Opportunity	1.430
Rationalization	1.287
Anti-fraud technology	1.351

Because the data in this study have met the necessary assumptions, the analysis continues with hypothesis testing. Several previous studies, as stated by [15], [25], [29], indicate that the factors of pressure, opportunity, and rationalization influence unethical behavior. In addition, anti-fraud technology can also play a role in mitigating unethical behavior. Pressure drives individuals to meet their needs, making pressure the primary factor that can lead someone to consider unethical behavior [30], [31]. Meanwhile, opportunity creates a gap for individuals to engage in unethical behavior, especially if the individual has a high level of rationalization to justify their actions.

On the other hand, anti-fraud technology serves to close the gaps that allow unethical behavior to occur [8], [32], [33], because entities with weak internal controls, especially those not equipped with anti-fraud technology, tend to have less effective financial management systems [34]. The more advanced a technology is, the greater its ability to reduce the likelihood of unethical behavior. However, the results of this study show different findings as presented in Table 2, where only rationalization has an impact on unethical behavior, while pressure, opportunity, and anti-fraud technology do not show a significant influence on such behavior. These findings are in line with the study by [35] states that individual who commit unethical behavior always tend to justify their actions.

Table 2. Result of regression

Variable	Sign	t test	p value
Pressure	+	1.179	0.243
Opportunity	-	1.521	0.134
Rationalization	+	2.243	0.029

Variable	Sign	t test	p value
Anti-fraud technology	-	0.020	0.984
F-Value	2.019		
R2	0.126		

Notes: ^aDependent variable: Fraud

Therefore, employees' propensity to engage in unethical behavior will increase if there are rationalization processes that support such actions. Conversely, without rationalization, employees tend to avoid unethical behavior even if factors like pressure and opportunity are present. Perpetrators of unethical actions generally engage in a process of self-justification for their unethical behavior. Thus, before engaging in unethical behavior, fraud perpetrators first construct a form of rationalization that is considered morally acceptable, making them feel safer and giving them the courage to carry out the unethical behavior [36].

Table 3. Result of moderating regression analysis

Variable	Sign	t test	p value
Pressure*anti-fraud technology	+	1.130	0.263
Opportunity*anti-fraud technology	-	2.063	0.044
Rationalization*anti-fraud technology	+	2.001	0.050

Notes: ^aDependent variable: Fraud

The next hypothesis test was conducted to analyze the moderating effect of anti-fraud technology on the relationship between pressure, opportunity, rationalization, and unethical behavior. The study conducted by [37] states that information technology plays a role in reducing the likelihood of unethical behavior. The results of this study, as shown in Table 3, confirm this argument by demonstrating that anti-fraud technology moderates the influence of opportunity and rationalization on unethical behavior. Therefore, strong internal controls need to be supported by advanced information technology, such as anti-fraud technology, even though in this study, that technology does not moderate the relationship between pressure and unethical behavior.

4. Discussion

The results of this study reveal that only rationalization affects unethical behavior. The higher the level of rationalization, the greater the likelihood that individuals will engage in unethical activities. In fraud psychology, rationalization is a crucial element, as it reflects the cognitive justification mechanisms used by individuals to legitimize unethical actions [38]. Even without pressure and opportunity, an employee can still engage in unethical behavior if the individual has lost their sense of guilt and no longer experiences moral conflict within themselves. On the other hand, employees who have pressure and an incentive to commit fraud but lack justification as a reason to commit the act are likely to have fear or moral limits preventing them from committing unethical actions. Furthermore, employees might seek alternative methods of meeting their needs, e.g., seeking alternative jobs, cutting costs, or asking for help.

This research also showed that anti-fraud technology decreases the opportunity-rationalization-unethical behavior relationship. Technology can, therefore, reduce the likelihood of individuals engaging in unethical acts through increased control, accountability, and transparency, speeding up fraud reporting procedures, making audits easier [39], [40], and allowing external stakeholders, like clients, to interact with business owners and provide information related to small and medium enterprise employees' activities. Anti-fraud technology may also foster a more transparent and accountable organizational environment [41]. In addition, information technology can also record all employee activities, making them think twice before committing fraud [42]. The relationship between the fraud triangle and unethical behavior, moderated by anti-fraud technology, can be represented in Figure 1.

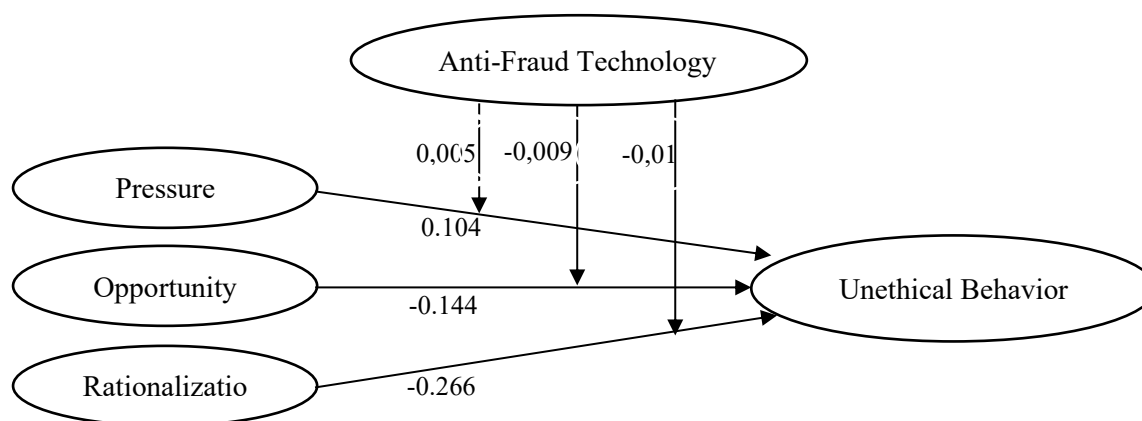


Figure 1. Representation of the moderating effect

The effectiveness of internal control will be even stronger if supported by anti-fraud technology [43]. Regulations and procedures without technological support still have a high potential for unethical activities [18], because in such conditions, direct interaction between the briber and the recipient is still possible, even in situations of long distance. This situation creates opportunities for collusion that can lead to illegal actions. Additionally, many small and medium enterprises in Indonesia have inadequate internal controls, such as the absence of task segregation, where the accounting and cash functions are held by a single employee, unsystematic financial recording, and the lack of cash and inventory inspection mechanisms [11]. However, with the implementation of anti-fraud technology, the potential for employees to engage in unethical behavior can be minimized, as the presence of technology creates a tighter monitoring system, making employees feel more supervised in every activity.

5. Conclusions

Small and medium-sized enterprises are particularly susceptible to unethical conduct by employees. Therefore, investigating fraud risk determinants and incorporating anti-fraud information technology as a moderating factor is critical for crafting effective fraud prevention strategies tailored to SMEs. This study's findings suggest that, among the elements of the fraud triangle, rationalization uniquely exerts a substantial influence on fraudulent activities. The perpetrator of the fraud first builds a form of rationalization to feel safer and gain the courage to engage in such unethical behavior. Furthermore, the research highlights a noteworthy discovery: anti-fraud technology functions as a moderating variable in the correlation between opportunity and rationalization in relation to fraud. SMEs should prioritize mitigating unethical behavior through control rationalization, and opportunity. Then, allocating resources to information technology, such as video surveillance and employee activity monitoring systems, can diminish the likelihood of unethical actions. The deployment of such technologies also aids in managing employee rationalization by fostering a sense of oversight, which can deter inclinations toward actions that contravene organizational ethics. This research acknowledges several limitations that warrant consideration by future investigators. Firstly, the scope of this study is confined to SMEs within the coffee shop industry; subsequent research could broaden its scope by examining alternative business sectors. Secondly, the present study exclusively employs the fraud triangle framework; future analyses could consider incorporating the fraud diamond theory to attain a more holistic understanding. Thirdly, the current research emphasizes the elements of the fraud triangle and information technology, while its overall contribution of these variables is still low, so the future study could explore additional variables that contribute to unethical behavior within SMEs.

Declaration of competing interest

The authors declare that they have no known financial or non-financial competing interests in any material discussed in this paper.

Funding information

No funding was received from any financial organization to conduct this research.

Acknowledgements

The authors express gratitude to the anonymous reviewers for their valuable comments and suggestions. Their encouragement to investigate a wider array of databases and journals has notably enhanced the breadth of this research.

Author contribution

The contribution to the paper is as follows: Nur M. Ridha Tarigan: Fully responsible for the conceptualization of the research ideas and hypotheses. Designed the research methodology and experiments. Wrote the original draft of the manuscript, including the introduction, methodology, results, and discussion sections, with a specific focus on employee behavior as the object of study. Led the process of manuscript revision and editing, and provided significant feedback and revisions to the manuscript draft based on input from other authors and reviewers. Ramadona Simbolon: Contributed to the conceptualization of the research ideas and hypotheses. Participated in the design of the research methodology and experiments. Wrote specific sections of the manuscript, namely the literature review and parts of the discussion, particularly those related to the fraud triangle, in collaboration with the first author. Involved in the analysis and interpretation of data. Created data visualizations (tables) for the manuscript. Assisted in providing significant feedback and revisions to the manuscript draft. Sri Elviani: Carried out the initial drafting and managed the submission process to the journal system. Actively involved in data collection, tabulation, and testing. Actively provided materials and gathered necessary reference sources for the research. Provided minor revision inputs to the manuscript.

Ethical approval statement

Our institution does not require research ethics approval for reporting individual cases or case series.

Declaration of use of AI in the writing process

The author(s) used Mendeley Reference Manager during the preparation of this work to reference. The author(s) reviewed and edited the work as necessary and take(s) full responsibility for the final version.

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