

Determinants of asset misappropriation in small and medium enterprises: Evidence from Malaysia

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Abstract: This paper investigates the factors that contribute to the occurrence of asset misappropriation in small and medium enterprises (SMEs) in Malaysia. For a theoretical basis, the fraud hexagon model, which includes pressure, opportunity, rationalisation, capability, ego, and collusion elements, is adopted to guide the study. For the analysis, 306 valid responses from individuals working in diverse SME sectors in Malaysia were obtained via a self-administered questionnaire. Based on the objectives and to test the hypotheses, this research used a quantitative approach. Correlation analysis was utilised to examine the relationship among the independent variables. In addition, multiple regressions were conducted to answer the research questions of this study. The findings show that opportunity, rationalisation, and collusion have a significant relationship with the occurrences of asset misappropriation in Malaysian SMEs, whereby collusion makes the strongest and most significantly unique contribution to explain the occurrences of asset misappropriation. Thus, the study concluded that opportunity, rationalisation, and collusion are indeed significant factors that influence the occurrence of asset misappropriation. This study provides insights for Malaysian SME business owners regarding the minimum monthly salary policy, which should be revisited and reconsidered.

Keywords: Asset misappropriation, Fraud hexagon, Malaysia, Occupational fraud, SMEs.

1 | INTRODUCTION

Fraudulent activity and misconduct continue to plague the economy, endangering both macro- and micro-economic prospects. One of the most serious problems in the business world is frequently considered to be fraud (Skousen & Wright, 2006). As trade and technology increase, they spread over the world like wildfire. Academics, researchers, and professionals are becoming increasingly concerned about the efficacy of corporate governance, government regulatory mechanisms, and the role of corporate and individual ethics considering the sharp rise in fraud cases in rapidly expanding economies in recent decades (Gupta & Gupta, 2015).

The Association of Accredited Fraud Examiners (ACFE) defines 'fraud' as "knowing misrepresentation of the truth or concealment of a material fact to induce another to act to his or her detriment" on its official website, drawing on Black's Law Dictionary. In actuality, the term is used more broadly to refer to any misbehavior, acts of dishonesty, or unethical behavior that qualify as economic crimes. Fraud has far-reaching consequences that can be both financial and non-financial (Koomson, Owusu, Bekoe, & Oquaye, 2020). According to the ACFE's National Survey, businesses lose about USD 3.6 billion annually to fraud—roughly 5% of their total revenue (ACFE, 2022). In addition, individuals, organizations, and nations must deal with non-financial fallout such as diminished public morality, harm to innocent victims' minds and spirits, loss of faith in the stock market and its procedures, and diminished confidence in impacted organizations (Koomson et al., 2020).

"The use of one's occupation for personal enrichment through the deliberate misuse or misapplication of the employing organization's resources or assets" is how the ACFE defines occupational fraud and abuse (ACFE, 2022). The ACFE states that financial statement fraud, asset misappropriation, and corruption are the three main areas under which occupational fraud falls (ACFE, 1996). The study's emphasis on asset misappropriation was selected since it has grown to be a significant global concern. The term "scheme in which an employee steals or misuses the employing organization's resources" (ACFE, 2022) refers to the following: "theft of company cash, false billing schemes, or inflated expense reports." Stated differently, it is a plan wherein a worker pilfers or abuses the company's assets.

Asset misappropriation ranks top among Professional frauds worldwide, ahead of financial statement fraud and corruption, according to the ACFE's Global Study on professional Fraud and Abuse Reports, which covers the years 2012 through 2022. According to the reports, the percentage of instances remained stable from 2012 to 2022, hovering around 80%. The greatest percentage of cases was recorded in 2018, at 89% (ACFE, 2022). Moreover, according to PricewaterhouseCoopers' (PwC) Global Economic Crime and Fraud Survey, among the top three fraudulent activities reported across all industries from 2014 to 2020 is asset misappropriation. According to PwC (2020), the data for 2014 shows 69%, 64% in 2016, 45% in 2018, and 31% in 2020. Asset misappropriation ranks among the top three fraud cases according to PwC Malaysia's (2020) research, which indicates that it contributed 22% in 2018 and 16% in 2020. According to the assessment, fraudsters may have been inside or external, and in certain cases, there may have been coordination (PwC, 2020).

Asset misappropriation accounts for the largest percentage of occupational fraud cases, according to statistics from the ACFE and PwC studies, and the majority of fraudsters are employees of the organization. The category of asset misappropriation among lower-level, middle-level, and senior management personnel in Small and Medium Enterprises (SMEs) in Malaysia is thus the subject of this study. Because fraud is so harmful, especially to small organizations, SMEs were the study's target audience. Because it results in greater financial and organizational harm than embezzlement in larger firms, employee theft is upsetting for small enterprises (ACFE, 2020). According to the ACFE (2012), small enterprises had the greatest median loss at USD147,000, while larger organizations saw a loss of USD 140,000. Furthermore, according to ACFE (2018), occupational fraud costs small enterprises almost twice as much for each scheme. Small enterprises experienced the biggest median loss in 2018 and 2020—USD 200,000 and

USD 150,000, respectively—while larger organizations experienced the lowest—USD 132,000 and USD 140,000, respectively (ACFE, 2018, 2020).

Occupational fraud, also known as employee fraud, can have a significant impact on a small businesses ability to pay current employees, hire new staff, invest in new facilities, and buy necessary goods and services (Kennedy, 2018). Consequently, it has a negative impact on sales, general operations, output efficiency, and work productivity (Payne & Gainey, 2004). Because they lack the resources and experience of larger organizations, small businesses are more vulnerable to employee theft. Their inability to create extensive anti-fraud processes also necessitates a greater degree of employee confidence. The resources required to prevent and recover against fraud are typically unavailable to these small organizations (ACFE, 2018; Hess & Cottrell Jr, 2016; Trigg, 2020).

Like many rising countries, Malaysia is highly dependent on SMEs, and their failure could have a negative impact on the economy as a whole (Sow, Basiruddin, Rasid, & Husin, 2018). Therefore, by relating asset misappropriation to occupational fraud in the context of SMEs, this work adds to and expands upon previous research in the field. It is intended that this study would help SMEs' management identify the contributing variables to employee asset misappropriation.

2 | LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1| Asset Misappropriation

Fraud occurs on every continent and in every economic sector. Fraud is a broad category of unlawful crimes, including intentional deceit or misrepresentation (Bhasin, 2013). Fraud can be committed against individuals or organisations, but fraud against organisations has received the most attention in the fraud debate because of the devastating consequences it can have. Fraud continues to be a serious issue for most businesses, as it has a detrimental impact on their growth and jeopardizes their profitability, reputation, and legitimacy, which then has a ripple effect on the economy (Koomson et al., 2020).

Employees who are in a position to hide their criminal activity frequently commit asset misappropriation, which frequently involves small and less significant amounts (Yusrianti, Ghozali, & Yuyetta, 2020). It is a type of fraud in which someone steals or misuses an organisation's assets to benefit the wrongdoers. Individuals who perpetrate asset misappropriation crimes could be workers, clients, or vendors of the victim organisation, or they could be strangers. Acts of asset theft, concealment, and conversion must be present when misappropriation of assets occurs (Albrecht, Albrecht, & Albrecht, 2008; Koomson et al., 2020). Based on the Fraud Tree, in the ACFE (2022), asset misappropriation schemes are divided into two categories: cash and non-cash. Misappropriation of cash has three categories: theft of cash on hand, theft of cash receipts, and fraudulent disbursements. Fraudulent disbursements involve billing schemes, payroll schemes, expense reimbursement schemes, check and payment tampering, and register disbursement. Non-cash misappropriation involves misappropriation of inventory and all other assets.

Asset misappropriation is chosen as the focus of this study since it has become a major issue all over the world. The ACFE Reports for the years 2012 to 2022 have found that the median loss by asset misappropriation amounts to more than USD100,000. The ACFE (2014) shows the highest median loss of USD130,000 from asset misappropriation cases. The ACFE (2022) states that even though the median loss is the least costly compared to corruption and financial statement fraud, it reported the highest percentage of cases at 86%.

2.2| Small and Medium Enterprises (SMEs)

An SME is typically defined by four factors: capital (or investment), assets, annual sales (or revenue), and the number of employees (National Entrepreneur and SME Development Council NESDC (2020)). A uniform definition for SMEs has been in existence in Malaysia since 2005, according to NESDC (2020), with the most recent amendment going into effect in 2014. SMEs in the manufacturing industry are defined as companies with fewer than 200 full-time employees or a sales turnover of no more than 50 million Malaysian Ringgit (MYR). SMEs are defined as businesses with a sales turnover of no more than MYR20 million or fewer than 75 full-time employees for services and other sectors.

Globally, SMEs make a substantial contribution to economic activity. Together, they contribute significantly to job generation, making up between 60% and 70% of all employment in most countries. Furthermore, SMEs represent 99% of all enterprises in the Organization for Economic Cooperation and Development (OECD) region, making them a key source of value creation (Sandberg, Schreyer, & Ramalho, 2020). Given that SMEs make up 98.5% of all business establishments and contributed 38.9% of Malaysia's GDP in 2019, accounting for 907,065 commercial enterprises and 48.4% of the labor force, the significance of SMEs to the nation's economic growth is also evident (NESDC, 2020).

2.3 |Fraud Hexagon Model Factors

The fraud hexagon model is an extension of the S.C.O.R.E model (S: stimulus/pressure, C: capability, O: opportunity, R: rationalization, E: ego; also known as fraud pentagon theory) introduced by Vousinas (2019) with the addition of the collusion element. Vousinas (2019) argued that the existing fraud model used to investigate the reasons that motivate people to commit fraud needs to be updated due to recent related advancements and the growing number of fraud cases. Each of the elements in the fraud hexagon model is explained in the following sections, and hypotheses are developed accordingly.

2.3.1| Pressure

Pressure exists when an individual suffers from a variety of financial or non-financial constraints and is confronted with non-shareable circumstances that force him or her to participate in dishonest behavior (Cressey, 1950; Rahmawati & Kassim, 2020). Such individuals are compelled to take all measures necessary to get out of their predicament, including engaging in fraudulent behavior, because the pressures are not transferable (Koomson et al., 2020). Organisations may experience pressures that cascade down to employees and cause them to have extremely high expectations and targets from their work, therefore putting each individual under a great deal of pressure (Lokanan, 2015). In addition, employees may be under pressure from circumstances outside of the workplace, such as personal matters, family, and friends, leading them to engage in thieving activities. Indebtedness and unanticipated medical expenditures, as well as drug and other forms of addiction, are all examples of financial difficulties (Trigg, 2020). The findings from prior studies have shown that there is a positive relationship between pressure and asset misappropriation (i.e., (Kazemian, Said, Hady Nia, & Vaklifard, 2019; Koomson et al., 2020; Owusu, Koomson, Alipoe, & Kani, 2022; Utami,

Rakhmayani, Imtichana, & Hajar, 2021; Yusrianti et al., 2020)). Therefore, the first hypothesis in this study is as follows:

H1: Pressure (i.e., financial and non-financial) has a positive relationship with the occurrence of asset misappropriation.

2.3.2 | Opportunity

The frequency of workplace fraud is mostly attributable to the chances generated by poor control systems, which allow employees to conduct fraud (Koomson et al., 2020). An inefficient control or governance structure creates an opportunity for a person to perpetrate corporate fraud. This is referred to as an internal control vulnerability in the realm of accounting (Yusrianti et al., 2020). When individuals believe that the internal control mechanisms are inadequate and their wrongful activity will not be detected, the likelihood of asset misappropriation increases (Vousinas, 2019). Koomson et al. (2020) argued that the extent to which individuals will misappropriate assets highly depends on their perception of the organisation's internal control strength. Kazemian et al. (2019), Yusrianti et al. (2020) and Utami et al. (2021) showed a positive relationship between opportunity and asset misappropriation. In addition, Said, Alam, Karim, and Johari (2018) and Owusu et al. (2022) posited that opportunity has a positive relationship with employee fraud. Thus, the study hypothesizes that:

H2: Opportunity has a positive relationship with the occurrence of asset misappropriation.

2.3.3 | Rationalisation

The term 'rationalisation' refers to an act of justifying deception or fraud, which aids the fraudsters to escape the consequences of their actions (Said et al., 2018; Vousinas, 2019). Because many fraudsters consider themselves to be honest, normal people rather than criminals, they must create a rationale to justify their actions. Individuals involved in fraudulent acts, particularly those involved in the misappropriation of assets, may justify their conduct by claiming that they are required to do so or that they are not causing any harm to anyone else (Koomson et al., 2020; Said et al., 2018; Vousinas, 2019). Examining the determinants of asset misappropriation in Indonesia using the fraud hexagon theory, Wahyulistyo (2023) stated that rationalisation does not contribute to misappropriation. Using organisational culture as a proxy for rationalisation, Ariffin, Hasnan, Ali, and Harymawan (2023) posited that it influences asset misappropriation incidences in Malaysian public organisations. Based on the recent finding using a Malaysian sample, the study hypothesizes that:

H3: Rationalisation has a positive relationship with the occurrence of asset misappropriation.

2.3.4 | Capability

Asset misappropriation commonly occurs when the culprit is in a position that gives him or her the permitted access to the resources and is intelligent enough to exploit the internal control of a company (Koomson et al., 2020). There are six elements that permit individuals to commit misappropriation of assets: significant position or function, intelligence, ego or high confidence, the ability to compel others to cooperate, being consistent and successful in cheating, and the ability to manage stress very well (Rustiarini, Nurkholis, & Andayani, 2019; Wolfe & Hermanson, 2004). Based on past research, capability is a factor in the occurrence of asset misappropriation (Kazemian et al., 2019; Koomson et al., 2020; Utami et al., 2021). Utami et al. (2021) argued that employees' ability to find and argue weak points in the organisational policies will increase their tendency to misappropriate assets and come up with alibis that favor their personal interests. Based on this argument, the study hypothesizes that:

H4: Capability has a positive relationship with the occurrence of asset misappropriation.

2.3.5 | Ego

Wolfe and Hermanson (2004) explained that a person with capability "has a strong ego and great confidence that he will not be detected, or the person believes that he could easily talk himself out of trouble if caught." Abdullahi and Mansor (2015) added that such confidence or arrogance increases the likelihood of individuals engaging in fraud. Pamungkas, Ghozali, Achmad, Khaddafi, and Hidayah (2018), as cited in Horwath (2011), said that "arrogance is an attitude of superiority over the rights owned and feels that internal control or company policy does not apply to him." Ego is commonly directed at a person who possesses a high position in an organisation. Prior studies have found that there is a positive association between ego and accounting fraud (Pamungkas et al., 2018); corporate fraud (Christian, Basri, & Arafah, 2019); fraudulent financial reporting (Putriyanti & Cahyati, 2020); and asset misappropriation (Koomson et al., 2020). Hence, the fifth hypothesis is as follows:

H5: Ego has a positive relationship with the occurrence of asset misappropriation.

2.3.6 | Collusion

The term 'collusion' refers to a deceptive agreement or compact between two or more people for one party to file an action against the other for some ill goal, such as defrauding a third person of his or her rights (Vousinas, 2019). In other words, it is a deceitful technique in which two or more individuals collaborate to accomplish a purpose that benefits only themselves. Utami et al. (2021) argued that experience and knowledge tend to increase the risk of collusion and, thus, the likelihood of fraud. Naturally, collusion is illegal as it goes to great lengths for personal advantage, and a greater degree of collusion influences the probability of fraud (Achmad, Ghozali, & Pamungkas, 2022; Aviantara, 2021). Involuntary collusion can also occur because of fraud spreading within an organisation, and fraudsters taking advantage of others' positions and exploiting innocent people (Vousinas, 2019). Based on the ACFE (2022), more than half of the fraud cases are due to two or more perpetrators. In addition, the median loss of these fraud cases is six times higher than fraud cases with only one perpetrator (i.e., USD57,000 due to one perpetrator; USD145,000 due to two perpetrators; and USD219,000 due to three or more perpetrators). Based on the above-mentioned findings, the sixth hypothesis of the study is as follows:

H6: Collusion has a positive relationship with the occurrence of asset misappropriation.

3 | RESEARCH DESIGN

Following Koomson et al. (2020), this research adopted a quantitative approach on the grounds of the essence of its objectives and to test the hypotheses of the study. Quantitative data are numerical data that are typically acquired via structured questions (Sekaran & Bougie, 2016).

Therefore, this study used the survey strategy, in which information was requested from the respondents to explain the research's constructs and analyse the relationships between the different constructs. A survey is a method of gathering data from or about individuals to describe, compare, or explain their knowledge, attitude, and behavior (Sekaran & Bougie, 2016). In business research, the survey strategy is popular because it allows the researcher to obtain quantitative and qualitative data on a wide range of topics. In fact, surveys are frequently used in exploratory and descriptive research to gather information about people, events, or situations (Sekaran & Bougie, 2016). This study seeks to answer the question, "What are the determinants of asset misappropriation?" and hence, the survey method is deemed most appropriate.

3.1 | Sample Formation

All individuals employed in SMEs in Malaysia, regardless of the industry, constitute the population for this research. However, the respondent group excluded people who have resigned and those who have just started working. This is because the study measured asset misappropriation that is currently occurring at the workplace. It would therefore not be acceptable to respond based on experience or potential prospects. This study used the Krejcie and Morgan (1970) method to determine sample size, which generated a total sample size of 382 based on a total population of 75,000. However, the final sample is based on 306 valid responses.

There are two primary sampling designs: probability sampling and non-probability sampling. Probability sampling is used to determine which elements in the population have a known, non-zero chance or probability of being chosen as sample subjects. Meanwhile, the elements in non-probability sampling do not have a known or predetermined probability of being chosen as subjects (Sekaran & Bougie, 2016). In probability sampling, it can be either unrestricted (simple random sampling) or restricted (complex probability sampling) in nature (Sekaran & Bougie, 2016). This study employed probability sampling and adopted simple random sampling, in which each element of the population had an equal probability of being chosen as a subject (Sekaran & Bougie, 2016).

3.2 | Data Collection

To conduct the analysis, the study relied entirely on primary data sources. The data were gathered from original sources and analysed to provide answers to the research problem. To extract information from respondents, a questionnaire was utilised as a major data collection instrument for the study. Generally, a questionnaire is used to collect significant amounts of quantitative data. The questionnaire has been electronically distributed to respondents through email and WhatsApp messages. While the questionnaire method is typically less expensive and time-consuming than interviews and observations, it poses a significantly greater risk of non-response and non-response error (Sekaran & Bougie, 2016).

3.3 | Questionnaire Design

The questionnaire comprises three main sections, i.e., Sections A, B, and C. Section A comprised five sequential questions that sought information on the gender, age, years of work experience, type of industry that respondents have worked in, and the number of full-time employees in the current organisation. Sections B and C required respondents to indicate their levels of agreement with each of the questions on a seven-point Likert scale. Section B questioned the occurrences of asset misappropriation, while Section C was about the six fraud hexagon model factors, i.e., pressure, opportunity, rationalisation, capability, ego, and collusion. The questionnaire was adapted from Koomson et al. (2020). However, the four items under 'collusion' as an independent variable were adapted from Sitorus and Scott (2008). The questionnaire that was used to collect data for this study is presented in Appendix 1.

3.4 | Data Analysis Technique

The Statistical Package for Social Sciences (SPSS) was used to analyze the data that was gathered. For Section A, descriptive statistics constitute the first analysis. Gender, age, years of work experience, industry type, and number of full-time employees were among the factors examined. The normality test was applied in the second analysis to examine the symmetry of the scores and the creation of a bell-shaped curve. The values of skewness and kurtosis for each variable can be used to determine normality, or the histograms of scores can be examined (Pallant, 2016).

Third, the validity and reliability of the data were examined. Whether an instrument measures what it is intended to measure is referred to as its validity (Field, 2013). Finding out whether an instrument can be consistently understood in many contexts is the goal of a reliability test (Field, 2013). The Cronbach's Alpha coefficient is one of the most popular measures of internal consistency. So, the items in Section B, which had the dependent variable of asset theft incidents, and Section C, which had the independent variables of the factors affecting asset theft in Malaysian small and medium-sized businesses, were tested for validity and consistency in SPSS.

Fourth, correlation analysis was used to analyse the data. Correlation analysis is used to explain the direction and strength of a linear relationship between two variables. Multiple regression analysis, which is a collection of methods for analyzing the connection between several independent variables or predictors and a single dependent continuous variable, was the last analysis method. A range of research issues can be answered using multiple regression, which also assesses how effectively a group of factors can predict a specific result (Pallant, 2016).

4 | RESULTS AND DISCUSSION

4.1 | Descriptive Statistics

Table 1 shows the results of the descriptive statistics with a total sample of 306. For gender, there are 12 missing values of 3.9%, and therefore, the valid $n = 294$. Female respondents are 22.9% higher than male respondents (female: 59.5%; male: 36.6%). The results for age also show 12 missing values from the total respondents and a valid $n=294$, the same as for gender. The respondents in the survey are mostly young adults, as age "30 and below" records the highest percentage at 55.2%; while age "36-40" shows the lowest percentage at 6.2%. In terms of years of work experience, there are 13 missing values of 4.9%, and the valid $n=293$. The results show respondents who have worked for less than three years have the highest percentage at 39.9%, while respondents who have worked for 5-6 years experience have the lowest percentage at 10.1%. This indicates that the majority of the respondents lack work experience.

The type of industry shows that there are 13 missing values of 4.2% from the total sample. Services reported the highest percentage at 44.4%,

while printing and education both showed the lowest percentage at 0.7%. Retailing comes in second with 20.3%, then others at 9.5%, agriculture at 8.5%, manufacturing at 4.9%, food & beverage at 2.6%, construction at 2%, health & medicine at 1.3%, and mining & quarrying at 1%. The results show that respondents work in a wide range of industries across the country, indicating that the study sample is a fair representation of the population of SME workers in Malaysia.

Finally, for the number of full-time employees, two criteria indicate the organisation is an SME: the number of employees and sales turnover (NESDC, 2020). This study focuses on the number of employees because it helps the respondents easily understand and answer the questions. There are 31 missing values of 10.1%, and valid $n=276$. A total of 36.6% is the highest percentage for the number of employees “from 30 to less than 75,” and the number of employees “from 5 to less than 75” is the lowest percentage at 2.9%. The percentage of employees “from 5 to less than 30” and “less than 5” differs only by 0.3%, which is 20.6% and 20.9%, respectively, while the number of employees “from 75 to 200” is 8.8%. These results also show that 45.4% of the respondents are from medium-sized enterprises (number of full-time employees “from 30 to less than 75” and “from 75 to less than 200”).

Table 1: Descriptive statistics

Measure	Item	Frequency	Percentage
Gender	Male	112	36.6
	Female	182	59.5
	Missing	12	3.9
Age (Years)	30 and below	169	55.2
	31-35	82	26.8
	36-40	19	6.2
	41 and above	24	7.8
	Missing	12	3.9
Years of Work Experience	Less than 3 years	122	39.9
	3-4 years	79	25.8
	5-6 years	31	10.1
	More than 6 years	61	19.9
	Missing	13	4.2
Type of Industry	Services	136	44.4
	Manufacturing	15	4.9
	Agriculture	26	8.5
	Construction	6	2.0
	Mining & Quarrying	3	1.0
	Retail	62	20.3
	Food & Beverage	8	2.6
	Health & Medicine	4	1.3
	Printing	2	.7
	Education	2	.7
	Others	29	9.5
	Missing	13	4.2
Number of Full-Time Employees	75<200	27	8.8
	30<75	112	36.6
	5<75	9	2.9
	5<30	63	20.6
	<5	64	20.9
	Missing	31	10.1

4.2 | Validity Test

To test whether the instrument measures what it sets out to measure, a validity test is carried out (Field, 2013). Due to the fact that distribution of the scores for all the variables is not normal, the study used Spearman Rank Order Correlation (Spearman’s rho) for the validity test. Since all the items are significant at $p<.01$, therefore, all the questions are valid. When the result shows all the variables are not normally distributed, the data are transformed. This entails utilising multiple algorithms and square roots to numerically transform the scores until the distribution appears more normal (Pallant, 2016). Table 2 presents the normality test, and the results show that the distribution of the scores for all the variables is not normal as the p -value of all the variables is greater than .05.

Table 2: Test of normality

Variable	Kolmogorov-Smirnov ^a		
	Statistic	Df	Sig.
Asset Misappropriation	0.204	306	<0.001
Pressure	0.104	306	<0.001
Opportunity	0.109	306	<0.001
Rationalisation	0.089	306	<0.001
Capability	0.096	306	<0.001
Ego	0.129	306	<0.001
Collusion	0.452	306	<0.001

a. Lilliefors Significance Correction

4.3 | Reliability Test

One of the most commonly used indicators of internal consistency is Cronbach's Alpha coefficient. Ideally, Cronbach's Alpha coefficient of a scale should be above 0.7 (Pallant, 2016). Referring to Table 3, the occurrences of asset misappropriation have good internal consistency, with Cronbach's Alpha coefficient at 0.896. Cronbach's Alpha coefficient for all independent variables also shows good internal consistency, whereby the highest is reported by collusion at 0.952 and the lowest is reported by rationalisation at 0.761.

Table 3: Reliability test

Variable	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Asset Misappropriation	0.896	0.908	10
Pressure	0.877	0.877	9
Opportunity	0.878	0.894	10
Rationalisation	0.761	0.752	10
Capability	0.813	0.832	6
Ego	0.876	0.884	8
Collusion	0.952	0.953	4

4.4 | Correlation Analysis

To investigate the strength of a relationship between two continuous variables, the study used Pearson correlation, or Spearman's correlation. This reveals the strength and direction of the relationships (positive or negative). When one variable increases, the other increases as well, resulting in a positive correlation, while when one variable increases, the other decreases, resulting in a negative correlation (Pallant, 2016). Pearson correlation coefficient (r) is used for correlation analysis, and it takes on values from -1 to $+1$ (Pallant, 2016). However, according to Field (2013), Spearman's Rank-Order Correlation (Spearman's ρ) should be used when the data are not normally distributed. Spearman's ρ is a statistical method for analysing ordinal or ranked data that is especially beneficial when the data does not match the Pearson correlation criteria (Pallant, 2016). The interpretation of correlation coefficient is based on Hinkle, Wiersma, and Jurs (1998). Range and types of correlation coefficient values are: .00 to .30 [little (+ve/-ve) correlation]; .30 to .50 [low (+ve/-ve) correlation]; .50 to .70 [moderate (+ve/-ve) correlation]; .70 to .90 [high (+ve/-ve) correlation]; and .90 to 1.00 [very high (+ve/-ve) correlation].

The results in Table 4 reveal that pressure has a significantly small positive correlation with opportunity ($r=.246$) and capability ($r=.295$). In addition, pressure has a significantly low positive correlation with rationalisation ($r=.394$) and ego ($r=.396$). Opportunity has a significantly small positive correlation with rationalisation ($r=.286$), and a significantly low positive correlation with both capability ($r=.458$) and ego ($r=.362$). Rationalisation shows a significantly low positive correlation with capability ($r=.353$) and ego ($r=.373$). These inter-correlations signify that opportunity and capability may exert pressure on individuals to rationalise their wrongful acts, which somehow increases their ego to commit fraud.

In addition, ego is positively and significantly correlated with rationalisation ($r=.373$) and capability ($r=.307$), suggesting that an individual's capability significantly influences his/her ego to rationalise wrongdoings. Interestingly, collusion shows an insignificantly negative correlation with opportunity ($r=-.215$) and ego ($r=-.219$). This indicates that those who collude in committing misappropriation of assets at the workplace are not influenced by the opportunity available or by their ego. Importantly, all the correlations explained above are significant at the 1% level.

Table 4: Spearman's rho correlation

Variable	Pressure	Opportunity	Rationalization	Capability	Ego	Collusion
Pressure	1	0.246**	0.394**	0.295**	0.396**	-0.092
Opportunity		1	0.286**	0.458**	0.362**	-0.215**
Rationalisation			1	0.353**	0.373**	0.043
Capability				1	0.307**	-0.075
Ego					1	-0.219**
Collusion						1

Note: ** Denotes Correlation is Significant at the 1% Level (2-Tailed).

4.5 | Multivariate Analysis

Regression techniques can be used on a data set in which the independent variables are associated to varied degrees with one another and with the dependent variable. When independent variables are associated, regression techniques can be utilised. They are beneficial in both experimental and observational, or survey research. Because of this, regression techniques' adaptability is especially helpful for researchers working on real-life or very tough issues that can't be boiled down to simple orthogonal designs in the (Tabachnick & Fidell, 2013). Multiple regression is a bivariate regression extension in which numerous independent variables are merged instead of just one to predict a dependent variable value for each subject (Tabachnick & Fidell, 2013). The data in this study showed that it is not normally distributed, and hence, multiple regression using bootstrapping method was deemed appropriate (Field, 2013).

The Variance Inflation Factor (VIF) statistical test was used in this study to determine the existence of multicollinearity problems between the independent variables. If the value of VIF is above 10, it indicates that multicollinearity exists (Pallant, 2016). Referring to Table 5, the result shows that the values of VIF for the independent variables range from 1.091 to 1.474. Therefore, this does not violate the multicollinearity assumption.

The model of regression analysis examined the determinants of asset misappropriation in SMEs in Malaysia, comprising six independent variables, i.e., pressure, opportunity, rationalisation, capability, ego, and collusion. Table 5 shows the adjusted R square value of 0.213, which reveals that the predictors explain 21.3% of the variance in the occurrences of asset misappropriation with $F=14.797$, $p<.001$.

Table 5: Regression analysis

Variable	B	SE	p value	95% CI	VIF	Model
(Constant)	2.451	0.408	<0.001	1.711, 3.319	-	
Pressure	-0.018	0.033	0.615	-0.085, 0.050	1.384	
Opportunity	-0.248	0.092	0.003	-0.436, -0.050	1.474	
Rationalisation	0.129	0.045	0.003	0.040, 0.213	1.398	
Capability	0.050	0.064	0.434	-0.070, 0.177	1.405	
Ego	-0.608	0.063	0.272	-0.200, 0.038	1.467	
Collusion	0.314	0.087	<0.001	0.159, 0.517	1.091	
R						0.478
R Square						0.229
Adjusted R Square						0.213
SE of the Estimation						0.883
Regression df						6
Residual df						299
F						14.797
p Value						0.001
Note: CI Stands for Confidence Interval.						

The findings reveal that collusion ($B=.314$, $p<.001$) has a positive relationship, making it the strongest and most significantly unique contribution to explain the occurrences of asset misappropriation. This result supports past research, whereby collusion has a positive relationship with fraudulent activities. [Martins, Maragno, Knupp, and Norba \(2019\)](#) revealed that corruption is perpetrated not just by persons with affective or friendship relationships but also by people with working relationships, which can make it difficult for law enforcement authorities to discover suspicious links between criminals. The result is also consistent with [Aviantara \(2021\)](#), who found that collusion negatively affects fraudulent financial reporting. The result is also in tandem with [Sitorus and Scott \(2008\)](#), who indicated that collusion could have a significant and direct impact on the commission of fraud. In addition, the result concurs with the findings of [Horne, Venter, and Lochner \(2018\)](#) that collusion between employees of companies requesting tenders and employees of the bidding company is rampant, which leads to bid manipulation and information leakage. Based on this evidence, H6 is accepted.

Rationalisation ($B=.129$, $p<.05$) also has a positive relationship and makes a significantly unique contribution to the occurrences of asset misappropriation. The result is in line with past research that rationalisation has a positive relationship with asset misappropriation ([Kazemian et al., 2019](#); [Koomson et al., 2020](#); [Yusrianti et al., 2020](#)) and employee fraud ([Owusu et al., 2022](#); [Said et al., 2018](#)). Therefore, H3 is accepted.

The result shows that there is a significantly negative relationship between opportunity and the occurrence of asset misappropriation ($B=-.248$, $p<.05$). This suggests that internal control among the sample SMEs is rather weak, which consequently creates higher chances for employees to commit fraud. [Enofe, Egbe, and America \(2016\)](#) failed to prove that segregation of duties can reduce fraud and argued that it is probably because there is collusion among the workers. The findings of this study are also consistent with [Achmad et al. \(2022\)](#), who posited that ineffective monitoring has no effect on the risk of fraudulent financial reporting. In addition, the result is in line with [Meidijati and Amin \(2022\)](#), who found a negative association between opportunity and fraudulent financial reporting. Based on the results of this study, H2 is rejected.

The other variables, namely pressure, capability, and ego, show no significant relationship with the occurrences of asset misappropriation. Hence, referring to the result, H1, H4, and H5 are rejected. Nonetheless, it is important to note that capability has a positive correlation with the occurrence of asset misappropriation, consistent with the expectations of the study. Meanwhile, contrary to the study's expectations, pressure and ego have negative coefficients with the occurrence of asset misappropriation. The contradictory coefficient value is, however, consistent with prior studies on fraudulent activities by [Aviantara \(2021\)](#) and [Achmad et al. \(2022\)](#), who found that the chief executive officer's arrogance or ego does not affect fraudulent financial reporting.

5 | CONCLUSION

This study investigated the factors that contribute to the occurrence of asset misappropriation in Malaysian SMEs. A total sample of 306 SMEs was analysed using multiple regression tests. Based on the results, collusion is the strongest and most significant factor and has a positive relationship with the occurrence of asset misappropriation. Collusion is a crucial factor in many complicated and costly frauds and financial (white-collar) crimes, as evidenced by massive fraud cases like Enron, WorldCom, and Parmalat. The results suggest that collusion is a crucial factor in the occurrence of fraudulent activities, specifically the misappropriation of assets among SME employees in Malaysia. The second significant factor in a positive relationship is rationalisation. The study finds that employees tend to rationalise their intentions by using excuses such as *"with the amount of responsibility given to me at work, I think that I am underpaid"* and *"despite the company making a lot of money, I find myself in a desperate financial situation at times"* to justify their fraudulent acts. The results of this study further add to the literature that rationalisation is an important factor in fraud occurrences, specifically asset misappropriation among SME employees. This study also reveals that opportunity contributes significantly to the occurrences of asset misappropriation among SME employees; however, the relationship is negative, thus suggesting that SMEs in Malaysia have weak internal control and the chances of employees defrauding their company are high. The negative relationship is probably due to the high collusion among SME employees with internal and external parties. The main value of this paper lies in its disclosure of the effects of the fraud hexagon model factors on the likelihood of asset misappropriation in Malaysian SMEs. However, the study comes with some limitations, such as the time frame for data collection, which took place at the end of 2021, during the COVID-19 pandemic. Thus, many SMEs were affected, and some were forced to shut down. Future research may consider widening the data collection period and the population for a more in-depth comparative study.

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Institutional Review Board Statement:

The Ethical Committee of the Universiti Teknologi MARA, Malaysia has granted approval for this study on 30 June 2021 (Ref. No. REC/o6/2021 (MR/505)).

Transparency:

The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

Competing Interests:

The authors declare that they have no competing interests.

Authors' Contributions:

All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

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Appendix 1: Determinants of asset misappropriation in small and medium enterprise (SMEs): Evidence from Malaysia. Survey Questionnaire

Section A

Demographic Background

The following questions refer to your profile. Please provide the appropriate information by placing a (v) in the box provided to represent your answer.

1. Gender

- Male
 Female

2. Age

- 30 and below
 31 - 35 / 31 - 35
 36 - 40 / 36 - 40
 41 and above

3. Years of work experience

- Less than 3 years
- 3 - 4 years
- 5 - 6 years
- More than 6 years

4. Types of Sectors

- Services
- Manufacturing
- Agriculture
- Construction
- Mining & Quarrying
- Retail
- Food and Beverage
- Health & Medicine
- Printing
- Education
- Tourism
- Others

5. Number of full-time employees

- From 75 to less than 200
- From 30 to less than 75
- From 5 to less than 75
- From 5 to less than 30
- Less than 5

Section B

Misappropriation of Assets

Below are statements that focus on possible uses of assets at your place of work. On a 7-point Likert scale from 1 = rarely up to 7 = often, please indicate how often you are involved in these actions.

No.	Question	1	2	3	4	5	6	7
1	Acquire some resources from your place of work							
2	Do personal work during office time							
3	Violate several policies of the organisation with regard to asset usage							
4	Take monetary or non-monetary loan for personal use							
5	Use office assets for personal reason							
6	Use the internet service at the place of work for personal purpose							
7	Take belongings of the office home for personal use							
8	Utilise the office computer and printer for personal purpose							
9	Make questionable medical claims							
10	Make questionable entertainment claims							

Section C

Determinants of Asset Misappropriation in Small and Medium Enterprises (SMEs) in Malaysia

Pressure: Pressure and the incidences of asset misappropriation

Individuals experience pressure either from within or outside their place of work in several ways. On a 7-point Likert scale from 1 = strongly disagree up to 7 = strongly agree, please rate your level of agreement to each of these pressure indicators.

No.	Question	1	2	3	4	5	6	7
1	My work presents a lot of challenges to me							
2	My work demands that I achieve the key performance indicators (KPI) stipulated by the company							
3	I must carry out different tasks at the same time							
4	Most times I am not able to fulfil the targets given							
5	Tension and frustration are unavoidable to me due to the constant pressure at work							
6	At times I must ensure that my expenditure on necessities is reduced so that my salary is enough till month end							
7	In some instances, I am not able to pay for my family expenses as they are very costly							
8	I am entirely accountable for my family expenditure							
9	With the rising cost of living at present time, it has put a lot of pressure on me							

Opportunity: Strength of internal control and the incidences of asset misappropriation

On a 7- point Likert scale from 1 = strongly disagree up to 7 = strongly agree, please describe your perception of strength of internal controls at your place of work as indicated in each statement below.

No.	Question	1	2	3	4	5	6	7
1	Sufficiently documented transaction has to have the approval of the appropriate senior member							
2	Transaction has to be recorded within the stipulated time frame							
3	Roles and responsibilities are clearly defined							
4	Proper supervision, monitoring and review of work are executed							
5	Policies, procedures and guidelines are documented efficiently and conveyed to employees effectively							
6	All activities are monitored by closed-circuit camera							
7	Every resource is properly recorded and documented							
8	For over usage of the company facilities, such as telephones and internet connections, proper supervision is conducted							
9	It is adequate to have physical controls of asset usage							
10	To prevent employees from taking advantage of medical certificates and other employment incentives, proper supervision is conducted							

Rationalization: Justification of immoral acts and the incidence of asset misappropriation

Below are frequently cited justifiable reasons for individuals' actions at their place of work. On a 7-point Likert scale from 1 = strongly disagree up to 7 = strongly agree, please indicate your level of agreement to each of these justifications.

No.	Question	1	2	3	4	5	6	7
1	With the amount of responsibility given to me at work, I think that I am underpaid							
2	For the family member or loved one in need financially, I believe that I must help them							
3	Despite the company making a lot of money, I find myself in a desperate financial situation at times							
4	With the amount of work I do, I believe my organization owes me money							
5	Although I borrow the office asset, I intend to return it when I am done with it							
6	Using office assets qualifies as a reward for my hard work in the company							
7	It does not affect anyone when I am using office assets for personal purpose							
8	Although I use it for my personal reason, I am using the office asset for a good purpose							
9	Some discretion should be given to me in performing my job							
10	When a customer, a vendor or a colleague delivers a gift, I believe it is a gesture of good service that I have provided							

Capability: Position and ability and the incidences of asset misappropriation

Various traits of people at the place of work set others apart from themselves and may give individuals some advantages. On a 7-point Likert scale from 1 = strongly disagree up to 7 = strongly agree, please rate your level of agreement to each statement below.

No.	Question	1	2	3	4	5	6	7
1	I am able to convince the company staff to agree with my suggestions							
2	I am able to multitask efficiently that renders me superior at the place of work							
3	I am able to solve the problems of customers/clients effectively that make my employers trust me							
4	I have the belief that I am good and that influences several situations in my department							
5	I am able to access the company resources with the position I hold							
6	I am able to deal with stress very well							

Ego: Reputation and the incidences of asset misappropriation

Generic (general) perceptions render an influence on one's actions. Individuals have different regard for standards and what others think of them. On a 7-point Likert scale from 1 = strongly disagree and 7 = strongly agree, please indicate your level of agreement with each statement.

No.	Question	1	2	3	4	5	6	7
1	I am concerned with what other people think of me							
2	What others think of me can validate what I think about myself							
3	<i>I am worried if other people have bad opinion about me</i>							
4	My self-worth will suffer if I commit something immoral							
5	My self-worth depends on whether or not I follow my moral/ethical values							
6	I fail to respect myself if I do not abide by a moral code							
7	Whenever I abide by my moral values, my sense of self-respect gets an uplift							
8	I lose my self-respect if I do something I know is wrong							

Collusion: Collusion and the incidences of asset misappropriation

Collusion is defined as an act of doing something illegal agreed between two or more people in which one party agrees to deceive the other person for some bad goal, such as defrauding a third party's right. The statements below describe possible misappropriation of assets in collusion in the place of work. On a 7-point Likert scale from 1 = rarely up to 7 = often, please indicate how often you engage in these actions.

No.	Question	1	2	3	4	5	6	7
1	To perform the act of fraud, I conspire with the suppliers							
2	To perform the act of fraud, I conspire with the customers							
3	To perform the act of fraud, I conspire with my colleagues							
4	To perform the act of fraud, I conspire with my bosses							

~ End of Questionnaire ~