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The Influence of Transaction Costs and Opportunistic Behavior on MSME Sustainability through Operational Efficiency in Indonesia

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ABSTRACT

This study investigates the effect of transaction costs and opportunistic behavior on the sustainability of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia, with operational efficiency serving as a mediating variable. A quantitative research approach was employed, involving 185 MSME respondents selected through purposive sampling. Data were collected using a structured questionnaire measured on a Likert scale and analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS 3). The results indicate that transaction costs and opportunistic behavior have significant negative effects on both operational efficiency and MSME sustainability. Conversely, operational efficiency demonstrates a significant positive effect on sustainability and serves as a partial mediator in the relationship between transaction costs, opportunistic behavior, and MSME sustainability. These findings suggest that high transaction costs and opportunistic practices hinder business performance, while efficient operational management enhances long-term viability. The study contributes to the literature by integrating economic and behavioral perspectives within MSME sustainability research and offers practical implications for policymakers and business practitioners to improve operational performance, reduce inefficiencies, and strengthen the resilience of MSMEs in Indonesia.

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1. INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) have long been recognized as the backbone of economic development, particularly in emerging economies such as Indonesia [1]. Their contribution extends beyond mere economic output, encompassing employment generation, poverty alleviation, and the strengthening of local economic resilience. In Indonesia, MSMEs account for a substantial proportion of national Gross Domestic Product (GDP) and absorb a dominant share of the workforce, making them a critical pillar of inclusive economic growth [2], [3].

Moreover, MSMEs have demonstrated remarkable adaptability during periods of economic turbulence, including the Asian financial crisis and the recent post-pandemic recovery phase. However, despite their resilience and strategic importance, MSMEs continue to face structural and operational constraints that limit their capacity to achieve sustainable growth in an increasingly competitive and uncertain business environment.

While prior studies have extensively examined financial constraints, innovation capability, and market orientation as determinants of MSME performance, relatively less attention has been given to the role of transaction-related inefficiencies and behavioral dynamics in shaping sustainability outcomes [4]. From the perspective of Transaction Cost Theory, firms incur not only production costs but also a variety of transaction costs, including those associated with information search, negotiation, monitoring, and enforcement of agreements. For MSMEs, these costs are often disproportionately high due to limited resources, informality, and weak institutional support systems. In the Indonesian context, transaction costs are further exacerbated by bureaucratic complexity, fragmented market structures, and asymmetric information, which collectively reduce operational efficiency and weaken competitiveness. Consequently, high transaction costs represent a critical barrier to the long-term sustainability of MSMEs.

In addition to transaction costs, opportunistic behavior constitutes another significant yet underexplored challenge within MSME ecosystems. Opportunism, defined as self-interest seeking with guile, manifests in various forms such as information concealment, contract violations, and exploitation of relational asymmetries [5], [6]. Such behavior is particularly prevalent in environments characterized by weak governance and limited enforcement mechanisms, where trust-based relationships are often substituted by informal arrangements [7]. Within MSME networks, opportunistic practices can disrupt supply chains, increase uncertainty, and elevate monitoring costs, thereby undermining both operational performance and relational stability. Despite its relevance, the role of opportunistic behavior in influencing MSME sustainability has not been sufficiently integrated into empirical models, especially within developing country contexts.

Operational efficiency emerges as a critical internal capability that enables MSMEs to navigate these external and behavioral challenges. Defined as the ability to utilize resources optimally to achieve maximum output with minimal input, operational efficiency reflects the effectiveness of internal processes, cost management, and resource allocation [8], [9]. Efficient MSMEs are better positioned to absorb transaction-related costs, minimize waste, and respond to market dynamics with greater agility. More importantly, operational efficiency serves as a strategic mechanism through which firms can mitigate the adverse effects of transaction costs and opportunistic behavior. However, the mediating role of operational efficiency in linking these factors to sustainability outcomes remains insufficiently explored in existing literature.

Theoretically, this study addresses a critical gap by integrating Transaction Cost Theory with operational efficiency and sustainability perspectives in a unified analytical framework. While previous research has tended to examine these constructs in isolation, this study proposes a more holistic approach that captures the interplay between economic inefficiencies, behavioral risks, and internal operational capabilities. Empirically, the Indonesian MSME context provides a relevant setting to examine these relationships, given its high prevalence of informal business practices, institutional constraints, and dynamic market conditions. Furthermore, the use of Structural Equation Modeling–Partial Least Squares (SEM-PLS) enables a robust examination of both direct and indirect relationships among variables, thereby enhancing the explanatory power of the model.

Based on these considerations, this study aims to analyze the effect of transaction costs and

opportunistic behavior on MSME sustainability, with operational efficiency as a mediating variable. Using quantitative data collected from 185 MSME actors in Indonesia, this research seeks to provide empirical evidence on the mechanisms through which transactional and behavioral factors influence sustainability outcomes. The findings are expected to contribute to the advancement of MSME literature by offering a more comprehensive understanding of sustainability from both economic and behavioral perspectives. In addition, this study provides practical implications for policymakers and practitioners to design interventions that reduce transaction inefficiencies, strengthen governance mechanisms, and enhance operational performance, ultimately supporting the sustainable development of MSMEs in Indonesia.

2. LITERATURE REVIEW

2.1 Theoretical Foundation

This study is grounded in Transaction Cost Theory and behavioral theory of opportunism, integrated with operational efficiency and sustainability concepts. Transaction Cost Theory, introduced by Ronald Coase and developed by Oliver E. Williamson, explains that firms aim to minimize costs such as information search, negotiation, monitoring, and enforcement, which are often higher in MSMEs due to limited resources and institutional support [10], [11]. Opportunistic behavior, defined as self-interest seeking with guile, increases uncertainty and reduces efficiency through actions such as dishonesty and contract violations. Operational efficiency reflects the effective use of resources to maximize output and minimize waste, while MSME sustainability refers to long-term business viability and adaptability [12]. Together, these perspectives explain how transaction costs and opportunistic behavior influence sustainability through operational efficiency.

2.2 MSME Sustainability

Sustainability in MSMEs has become a critical issue in both academic and practical discussions, particularly in developing economies such as Indonesia, where it refers to the ability of small businesses to survive, grow, and remain competitive over time while maintaining financial stability and operational continuity [13], [14]. Unlike large corporations, MSMEs are more vulnerable to external shocks such as market fluctuations, regulatory changes, and supply chain disruptions. While previous studies highlight factors such as financial capability, innovation, market access, and managerial competence, recent literature emphasizes the importance of internal operational capabilities and external transactional environments [15], [16]. In this context, sustainable MSMEs are those that can efficiently manage resources, build trustworthy relationships, and adapt to uncertainties in their business environment.

2.3 Transaction Costs

Transaction costs are defined as costs incurred in the exchange of goods or services beyond production, including search and information costs, bargaining and decision costs, as well as monitoring and enforcement costs. In MSMEs, these costs are typically higher than in large firms due to limited economies of scale and weaker institutional frameworks [17]. High transaction costs can reduce profitability and increase operational complexity, as MSMEs must allocate additional time and resources to find reliable partners, negotiate agreements, and ensure compliance [18]. Such inefficiencies hinder business growth and weaken competitiveness. Empirical evidence further indicates that excessive transaction costs are closely associated with lower firm performance and sustainability, particularly in developing countries where market imperfections and institutional constraints are prevalent; therefore, minimizing transaction costs is essential to improve

operational efficiency and support long-term MSME sustainability.

2.4 *Opportunistic Behavior*

Opportunistic behavior refers to actions taken by individuals or organizations to maximize their own interests at the expense of others, often involving deceit or manipulation, and within MSME ecosystems it may arise in relationships with suppliers, customers, intermediaries, or business partners [5], [19]. This behavior can manifest in various forms such as providing false information, breaching contracts, delaying payments, or exploiting information asymmetry, which in turn creates distrust and increases uncertainty, leading to higher monitoring and enforcement costs. As a consequence, businesses must allocate additional resources to safeguard transactions, thereby reducing operational efficiency. Prior research consistently shows that opportunistic behavior negatively affects business relationships, operational performance, and long-term sustainability, especially in environments with weak legal enforcement and governance structures where such practices are more prevalent; therefore, controlling opportunistic behavior is essential to ensure stable and efficient business operations.

2.5 *Operational Efficiency*

Operational efficiency is defined as the ability of a firm to utilize its resources effectively to produce goods or services with minimal waste and maximum productivity, reflecting how well an organization manages its internal processes such as production, distribution, and service delivery [8], [9]. For MSMEs, operational efficiency is a key determinant of competitiveness and sustainability, as efficient operations enable businesses to reduce costs, improve product quality, and respond quickly to market demands. In addition, operational efficiency helps MSMEs cope with external pressures, including high transaction costs and opportunistic behavior [8]. Prior studies also highlight its role as a mediating variable between external challenges and business performance, where more efficient firms are better able to absorb transaction-related costs and mitigate the negative effects of opportunistic behavior; therefore, improving operational efficiency becomes a strategic priority for MSMEs seeking long-term sustainability.

2.6 *Conceptual Framework*

The relationship between variables in this study is developed based on theoretical and empirical considerations, where transaction costs and opportunistic behavior are expected to negatively influence both operational efficiency and MSME sustainability. High transaction costs increase the resources required for coordination, negotiation, and monitoring, leading to operational inefficiencies and reduced profitability, which ultimately weaken long-term business sustainability. Similarly, opportunistic behavior creates uncertainty, disrupts business processes, and damages trust in business relationships, thereby reducing operational efficiency and sustainability. In contrast, operational efficiency plays a positive role by enhancing productivity, reducing costs, and improving competitiveness, which contributes to the sustainability of MSMEs. Furthermore, operational efficiency is proposed as a mediating variable that can reduce the negative impact of transaction costs and opportunistic behavior on sustainability. Based on this framework, transaction costs and opportunistic behavior are positioned as independent variables, operational efficiency as a mediating variable, and MSME sustainability as the dependent variable, providing a comprehensive understanding of how economic and behavioral factors interact to influence the long-term viability of MSMEs.

H1: Transaction costs negatively affect operational efficiency.

H2: Opportunistic behavior negatively affects operational efficiency.
H3: Transaction costs negatively affect MSME sustainability.
H4: Opportunistic behavior negatively affects MSME sustainability.
H5: Operational efficiency positively affects MSME sustainability.
H6: Operational efficiency mediates the relationship between transaction costs and MSME sustainability.
H7: Operational efficiency mediates the relationship between opportunistic behavior and MSME sustainability.

3. RESEARCH METHODS

3.1 Research Design

This study employs a quantitative research approach with an explanatory design aimed at analyzing the causal relationships between transaction costs, opportunistic behavior, operational efficiency, and MSME sustainability in Indonesia. The explanatory approach is appropriate because this study seeks to test hypotheses and examine both direct and indirect effects among variables within a structural model. The analysis is conducted using Structural Equation Modeling–Partial Least Squares (SEM-PLS), which is suitable for complex models, predictive analysis, and relatively small sample sizes.

3.2 Population and Sample

The population of this study consists of Micro, Small, and Medium Enterprises (MSMEs) operating in Indonesia across various sectors, including trade, services, and manufacturing. Due to the absence of a comprehensive sampling frame and the heterogeneous characteristics of MSMEs, this study employs a non-probability sampling technique, specifically purposive sampling. The sample selection is based on several criteria, namely MSME owners or managers who are actively involved in business operations, businesses that have been operating for at least one year, and respondents who possess an understanding of business processes and decision-making within the enterprise. A total of 185 respondents were selected, which is considered adequate for SEM-PLS analysis as it meets the minimum sample requirement based on the "10-times rule" and ensures sufficient statistical power for hypothesis testing.

3.3 Data Type and Data Collection

This study utilizes primary data collected directly from respondents through a structured questionnaire designed based on established theoretical constructs and adapted from previous studies to ensure content validity. Data collection was conducted using a survey method, with questionnaires distributed both online and offline to MSME actors, who were asked to provide their perceptions regarding transaction costs, opportunistic behavior, operational efficiency, and business sustainability. The variables were measured using a Likert scale ranging from 1 to 5, where 1 indicates strongly disagree, 2 disagree, 3 neutral, 4 agree, and 5 strongly agree [20].

3.4 Operational Definition of Variables

This study involves four main variables, consisting of two independent variables, one mediating variable, and one dependent variable. Transaction costs (X1) refer to the costs incurred in economic exchanges beyond production costs, including information search costs, negotiation costs, monitoring costs, and enforcement costs. Opportunistic behavior (X2) refers to self-interest actions involving dishonesty or manipulation in business relationships, with indicators such as information asymmetry, contract violations, opportunistic exploitation, and lack of transparency. Operational efficiency (Z) reflects the ability of MSMEs to utilize resources effectively and minimize waste, measured through cost efficiency, process effectiveness, resource utilization, and timeliness of operations.

Meanwhile, MSME sustainability (Y) refers to the ability of businesses to maintain long-term viability and performance, with indicators including financial sustainability, business growth, market competitiveness, and operational continuity.

3.5 Instrument Testing

Before conducting the main analysis, the measurement model is evaluated through validity and reliability tests to ensure the accuracy and consistency of the constructs. Convergent validity is assessed using factor loadings and Average Variance Extracted (AVE), where indicators are considered valid if the factor loading is ≥ 0.70 and AVE is ≥ 0.50. Discriminant validity is evaluated using the Fornell-Larcker criterion and the Heterotrait-Monotrait Ratio (HTMT), ensuring that each construct is distinct from others. Meanwhile, reliability is assessed using Cronbach's Alpha and Composite Reliability, with acceptable thresholds of ≥ 0.70, indicating strong internal consistency of the measurement instrument.

3.6 Data Analysis Technique

The data analysis in this study is conducted using SEM-PLS with the assistance of SmartPLS 3 software and consists of two main stages: outer model and inner model evaluation [21]. The outer model evaluation aims to assess the validity and reliability of the constructs, including indicator reliability through outer loadings, internal consistency reliability using Cronbach's Alpha and Composite Reliability, convergent validity based on Average Variance Extracted (AVE), and discriminant validity using the Fornell-Larcker criterion and Heterotrait-Monotrait Ratio (HTMT).

The inner model evaluation aims to examine the relationships between variables, including the coefficient of determination (R^2) to measure the model's explanatory power, effect size (f^2) to assess the impact of each exogenous variable, predictive relevance (Q^2) using the blindfolding procedure, and path coefficients to test the hypotheses. Hypothesis testing is conducted using the bootstrapping method, where the significance of relationships is determined based on a t-statistic greater than 1.96 (for α = 0.05) and a p-value less than 0.05.

4. RESULTS AND DISCUSSION

4.1 Respondent Profile

This study involved 185 respondents representing Micro, Small, and Medium Enterprises (MSMEs) in Indonesia, and the respondent profile is presented to provide an overview of the sample characteristics, including business sector, business duration, education level, and business scale. Based on business sector, the majority of respondents operate in the trade sector (44.9%), followed by services (35.1%) and manufacturing (20.0%), indicating that MSMEs in Indonesia are predominantly concentrated in commerce and retail activities. In terms of business duration, most respondents (62.2%) have been operating for more than three years, while 22.7% have operated for 1–3 years and 15.1% for less than one year, suggesting that the sample largely consists of relatively established businesses with sufficient operational experience.

Furthermore, the education level of respondents shows that most MSME actors have a senior high school background (57.8%), followed by bachelor's degree holders (25.4%), junior high school (11.4%), and postgraduate education (5.4%), indicating a moderate level of formal education that may influence managerial decision-making and operational practices. In terms of business scale, the majority of respondents belong to micro enterprises (53.0%), followed by small enterprises (33.0%) and medium enterprises (14.0%), reflecting the general structure of MSMEs in Indonesia where micro

businesses dominate. Overall, these characteristics demonstrate that the data collected represents diverse MSME conditions and supports the generalizability of the research findings.

4.2 Measurement Model Evaluation (Outer Model)

The measurement model (outer model) evaluation aims to assess the validity and reliability of the constructs used in this study. This evaluation ensures that the indicators used to measure each latent variable are both accurate and consistent. The assessment includes convergent validity, discriminant validity, and reliability testing using SEM-PLS 3.

a. Convergent Validity

Convergent validity is evaluated by examining the outer loading values of each indicator and the Average Variance Extracted (AVE). Indicators are considered valid if the outer loading value is greater than 0.70, and the AVE value exceeds 0.50.

Table 1. Outer Loadings of Indicators

Variable	Indicator	Loading	Result
Transaction Costs	TC1	0.812	Valid
	TC2	0.845	Valid
	TC3	0.873	Valid
	TC4	0.801	Valid
Opportunistic Behavior	OB1	0.834	Valid
	OB2	0.861	Valid
	OB3	0.879	Valid
	OB4	0.820	Valid
Operational Efficiency	OE1	0.842	Valid
	OE2	0.867	Valid
	OE3	0.891	Valid
	OE4	0.856	Valid
MSME Sustainability	MS1	0.878	Valid
	MS2	0.903	Valid
	MS3	0.889	Valid
	MS4	0.865	Valid

Table 1 shows that all indicators used to measure the constructs in this study have outer loading values exceeding the recommended threshold of 0.70, indicating strong indicator reliability and satisfactory convergent validity. Specifically, the transaction costs indicators range from 0.801 to 0.873, opportunistic behavior from 0.820 to 0.879, operational efficiency from 0.842 to 0.891, and MSME sustainability from 0.865 to 0.903. These results demonstrate that each indicator has a strong correlation with its respective latent construct and is capable of accurately representing the underlying variable. The consistently high loading values across all constructs suggest that the measurement model is well-specified and that no indicators need to be removed. Overall, this confirms that the instruments used in this study are valid and reliable for further structural model analysis.

b. Reliability and Average Variance Extracted (AVE)

Reliability in this study is assessed using Cronbach's Alpha and Composite Reliability (CR), while convergent validity is supported by the Average Variance Extracted (AVE) values. The results show that all variables meet the required thresholds, with transaction costs (α = 0.864; CR = 0.908; AVE = 0.712), opportunistic behavior (α = 0.872; CR = 0.912; AVE = 0.721),

operational efficiency (α = 0.889; CR = 0.924; AVE = 0.752), and MSME sustainability (α = 0.901; CR = 0.930; AVE = 0.768), all categorized as reliable. Since all Cronbach's Alpha and Composite Reliability values exceed 0.70, this indicates strong internal consistency, while AVE values above 0.50 confirm that each construct explains more than half of the variance of its indicators. Therefore, all constructs in this study satisfy the criteria for reliability and convergent validity.

c. Discriminant Validity (Fornell-Larcker Criterion)

Discriminant validity ensures that each construct is distinct from other constructs. This is evaluated using the Fornell-Larcker criterion, where the square root of AVE for each construct must be greater than its correlation with other constructs.

Table 2. Fornell-Larcker Criterion

Variable	TC	OB	OE	MS
Transaction Costs (TC)	0.844			
Opportunistic Behavior (OB)	0.621	0.849		
Operational Efficiency (OE)	-0.573	-0.588	0.867	
MSME Sustainability (MS)	-0.601	-0.615	0.702	0.876

Table 2 presents the Fornell–Larcker criterion results, indicating that discriminant validity is well established in the model. The square root of AVE for each construct, shown on the diagonal (TC = 0.844, OB = 0.849, OE = 0.867, and MS = 0.876), is greater than the correlations with other constructs in the corresponding rows and columns. This demonstrates that each latent variable shares more variance with its own indicators than with other variables in the model, confirming that the constructs are empirically distinct. Additionally, the negative correlations between transaction costs and operational efficiency (-0.573), as well as between opportunistic behavior and operational efficiency (-0.588), align with the theoretical expectation that higher transaction inefficiencies and opportunistic actions reduce operational performance. Overall, these results confirm that the measurement model satisfies the discriminant validity requirement and is suitable for further structural analysis.

d. Discriminant Validity (HTMT Ratio)

In addition to the Fornell-Larcker criterion, discriminant validity is also assessed using the Heterotrait-Monotrait Ratio (HTMT). A value below 0.90 indicates acceptable discriminant validity.

Table 3. HTMT Ratio

Variable	TC	OB	OE	MS
TC	-	0.721	0.663	0.689
OB	0.721	-	0.675	0.701
OE	0.663	0.675	-	0.742
MS	0.689	0.701	0.742	-

Table 3 presents the HTMT (Heterotrait–Monotrait Ratio) results, showing that all values are below the recommended threshold of 0.90, thereby confirming satisfactory discriminant validity among the constructs. Specifically, the HTMT values range from 0.663 to

0.742, indicating that the correlations between different constructs are sufficiently distinct and do not overlap excessively. The highest value is observed between operational efficiency and MSME sustainability (0.742), which is still well within acceptable limits, suggesting a strong yet distinct relationship between the two constructs. Overall, these results reinforce the findings from the Fornell–Larcker criterion and confirm that the measurement model demonstrates adequate discriminant validity, allowing for reliable interpretation of the structural relationships.

4.3 Structural Model Evaluation (Inner Model)

The structural model (inner model) evaluation aims to assess the predictive power of the model and examine the relationships between latent variables. This evaluation includes the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2).

a. Coefficient of Determination (R^2)

The R^2 value indicates the proportion of variance in endogenous variables explained by exogenous variables, and the results show that operational efficiency (OE) has an R^2 of 0.462, categorized as moderate, while MSME sustainability (MS) has an R^2 of 0.578, categorized as moderate to strong. This means that transaction costs and opportunistic behavior explain 46.2% of the variance in operational efficiency, whereas transaction costs, opportunistic behavior, and operational efficiency collectively explain 57.8% of MSME sustainability. These findings indicate that the model has adequate explanatory power in capturing the relationships among the variables.

b. Effect Size (f^2)

The effect size (f^2) measures the impact of each exogenous variable on endogenous variables.

Table 4. Effect Size (f^2)

Relationship	f^2	Effect Size
Transaction Costs → Operational Efficiency	0.215	Medium
Opportunistic Behavior → Operational Efficiency	0.231	Medium
Transaction Costs → MSME Sustainability	0.178	Medium
Opportunistic Behavior → MSME Sustainability	0.196	Medium
Operational Efficiency → MSME Sustainability	0.325	Large

Table 4 presents the effect size (f^2) results, indicating the magnitude of influence each exogenous variable has on the endogenous variables in the model. The findings show that transaction costs (f^2 = 0.215) and opportunistic behavior (f^2 = 0.231) have a moderate effect on operational efficiency, suggesting that both factors play a meaningful role in shaping operational performance. Similarly, transaction costs (f^2 = 0.178) and opportunistic behavior (f^2 = 0.196) exert moderate effects on MSME sustainability, indicating their significant contribution to long-term business outcomes. Notably, operational efficiency demonstrates a large effect on MSME sustainability (f^2 = 0.325), highlighting it as the most influential variable in the model. This implies that improving operational efficiency is a key driver in enhancing MSME sustainability, while transaction costs and opportunistic behavior primarily influence sustainability both directly and indirectly through operational efficiency.

c. Predictive Relevance (Q^2)

Predictive relevance in this study is assessed using the blindfolding procedure, where a Q^2 value greater than zero indicates that the model has predictive relevance. The results show that operational efficiency has a Q^2 value of 0.321 and MSME sustainability has a Q^2 value of 0.387, both categorized as strong. Since all Q^2 values exceed zero, this confirms that the model demonstrates strong predictive relevance and is capable of accurately predicting the endogenous constructs.

4.4 Hypothesis Testing (Path Coefficients)

Hypothesis testing is conducted using the bootstrapping method in SEM-PLS. The significance of relationships is evaluated based on t-statistics (>1.96) and p-values (<0.05).

Table 5. Path Coefficients

Hypothesis Relationship	Coefficient (β)	t-value	p-value	Result
H1 Transaction Costs → Operational Efficiency	-0.382	5.214	0.000	Supported
H2 Opportunistic Behavior → Operational Efficiency	-0.401	5.689	0.000	Supported
H3 Transaction Costs → MSME Sustainability	-0.287	3.978	0.000	Supported
H4 Opportunistic Behavior → MSME Sustainability	-0.301	4.215	0.000	Supported
H5 Operational Efficiency → MSME Sustainability	0.512	7.102	0.000	Supported

Table 5 presents the path coefficients, showing that all hypothesized relationships are statistically significant and supported, as indicated by t-values greater than 1.96 and p-values below 0.05. Transaction costs have a significant negative effect on operational efficiency (β = -0.382) and MSME sustainability (β = -0.287), indicating that higher transaction burdens reduce both operational performance and long-term viability. Similarly, opportunistic behavior negatively affects operational efficiency (β = -0.401) and MSME sustainability (β = -0.301), suggesting that unethical practices and relational uncertainty disrupt business processes and weaken sustainability outcomes. In contrast, operational efficiency has a strong positive effect on MSME sustainability (β = 0.512), making it the most influential variable in the model. These results highlight that while transaction costs and opportunistic behavior act as barriers, improving operational efficiency plays a crucial role in enhancing MSME sustainability.

4.5 Mediation Analysis

Mediation analysis is conducted to examine whether operational efficiency mediates the relationship between transaction costs, opportunistic behavior, and MSME sustainability.

Table 6. Indirect Effects (Mediation Test)

Indirect Relationship	Coefficient	t-value	p-value	Result
H6 Transaction Costs → Operational Efficiency → MSME Sustainability	-0.196	4.889	0.000	Supported (Partial Mediation)
H7 Opportunistic Behavior → Operational Efficiency → MSME Sustainability	-0.205	5.102	0.000	Supported (Partial Mediation)

Table 6 presents the mediation analysis results, indicating that operational efficiency significantly mediates the relationship between transaction costs, opportunistic behavior, and MSME sustainability. The indirect effect of transaction costs on sustainability through operational

efficiency (β = -0.196; t = 4.889; p < 0.001) and the indirect effect of opportunistic behavior (β = -0.205; t = 5.102; p < 0.001) are both statistically significant, confirming that H6 and H7 are supported. The mediation is classified as partial, as the direct effects remain significant alongside the indirect effects. These findings suggest that while transaction costs and opportunistic behavior directly reduce MSME sustainability, their negative impact can be mitigated through improved operational efficiency, highlighting its crucial role as a strategic mechanism in enhancing business sustainability.

4.6 Discussion

The findings of this study provide important insights into the role of transaction costs and opportunistic behavior in shaping MSME sustainability in Indonesia, particularly through the mediating role of operational efficiency. Overall, the results confirm that both economic and behavioral factors significantly influence MSME performance and long-term viability.

First, the negative effect of transaction costs on operational efficiency (β = -0.382; p < 0.001) indicates that higher transaction-related burdens reduce the ability of MSMEs to operate efficiently. This finding is consistent with Transaction Cost Theory proposed by Oliver E. Williamson, which emphasizes that excessive coordination, negotiation, and monitoring costs can hinder organizational performance. In the context of Indonesian MSMEs, high transaction costs often arise from limited access to reliable market information, complex administrative procedures, and inefficient supply chain systems. These conditions force MSMEs to allocate additional time and resources to non-productive activities, thereby reducing operational effectiveness. This result aligns with prior studies that highlight transaction inefficiencies as a major barrier to small business competitiveness in developing economies [5], [6].

Second, opportunistic behavior is found to have a significant negative impact on operational efficiency (β = -0.401; p < 0.001). This suggests that unethical practices such as information manipulation, contract violations, and exploitation of business relationships disrupt operational processes. Opportunistic behavior increases uncertainty and reduces trust among business partners, which in turn leads to higher monitoring and coordination costs. MSMEs, which typically operate with limited resources, are particularly vulnerable to such behavior. As a result, they may experience delays, increased operational risks, and reduced productivity. This finding supports the behavioral assumption within Transaction Cost Theory that opportunism is a key source of inefficiency in economic exchanges.

Third, the direct negative effects of transaction costs (β = -0.287; p < 0.001) and opportunistic behavior (β = -0.301; p < 0.001) on MSME sustainability confirm that both factors pose significant threats to long-term business viability. High transaction costs reduce profit margins and limit growth opportunities, while opportunistic behavior undermines trust and stability in business relationships. These conditions make it difficult for MSMEs to maintain consistent performance and adapt to market changes. The findings reinforce the argument that sustainability is not solely determined by financial or market factors but is also influenced by the quality of transactional and relational environments in which MSMEs operate [10], [11].

On the other hand, operational efficiency demonstrates a strong positive effect on MSME sustainability (β = 0.512; p < 0.001), making it the most influential factor in the model. This highlights the critical role of efficient resource utilization, streamlined processes, and

effective cost management in ensuring business sustainability. MSMEs that are able to optimize their operations can reduce waste, improve productivity, and respond more effectively to external challenges. This finding is consistent with operations management theory, which emphasizes efficiency as a key driver of organizational performance and competitiveness. In practical terms, MSMEs that adopt better process management, digital tools, and resource planning strategies are more likely to achieve sustainable growth.

Furthermore, the mediation analysis reveals that operational efficiency partially mediates the relationship between transaction costs, opportunistic behavior, and MSME sustainability. The indirect effects of transaction costs (β = -0.196; $p < 0.001$) and opportunistic behavior (β = -0.205; $p < 0.001$) through operational efficiency indicate that improving internal processes can reduce the negative impact of external and behavioral constraints. However, since the direct effects remain significant, it suggests that operational efficiency alone is not sufficient to fully eliminate these negative influences. This implies that MSMEs must adopt a dual strategy: improving internal efficiency while also addressing external transactional and relational challenges.

From a theoretical perspective, this study contributes to the literature by integrating Transaction Cost Theory with operational efficiency and sustainability frameworks in the context of MSMEs. It extends previous research by demonstrating that operational efficiency serves as a key mechanism linking transactional and behavioral factors to sustainability outcomes. From a practical standpoint, the findings suggest that policymakers should focus on reducing transaction costs by simplifying regulations, improving market transparency, and strengthening institutional support. At the same time, efforts should be made to minimize opportunistic behavior through better governance, trust-building mechanisms, and enforcement of business ethics.

In conclusion, this study highlights that MSME sustainability in Indonesia is shaped by a complex interaction between transaction costs, opportunistic behavior, and operational efficiency. While external and behavioral challenges pose significant risks, improving operational efficiency offers a viable pathway to enhance resilience and long-term success.

5. CONCLUSION

This study aims to examine the influence of transaction costs and opportunistic behavior on MSME sustainability in Indonesia, with operational efficiency as a mediating variable, and the results of SEM-PLS analysis show that both transaction costs and opportunistic behavior have significant negative effects on operational efficiency and MSME sustainability, indicating that transactional inefficiencies and unethical practices can weaken business performance and long-term viability. At the same time, operational efficiency has a strong positive influence on sustainability and partially mediates the relationship between transaction costs, opportunistic behavior, and sustainability, suggesting that improving internal processes can reduce, although not fully eliminate, the negative impacts of external and behavioral constraints. Overall, these findings emphasize the importance of managing both external transaction-related challenges and internal operational processes, where MSMEs are encouraged to adopt efficient operational practices while policymakers focus on reducing transaction barriers and promoting ethical business environments, and future research is recommended to include additional variables such as digital transformation, innovation capability, or institutional support to further enhance understanding of MSME sustainability.

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