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## Ambidextrous leadership and innovation performance in MSMEs: balancing exploration and exploitation

Dina Noval Madurani<sup>\*1</sup>, Muhammad Karisma Alam<sup>1</sup>, Nadya Kariza<sup>1</sup>

<sup>1</sup>Universitas Terbuka

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### ABSTRACT

While crucial for the survival and growth of Micro, Small, and Medium Enterprises (MSMEs), innovation drivers such as ambidextrous leadership remain relatively understudied in this context, particularly concerning the distinct roles of opening (OBL) and closing (CBL) leadership behaviors. This study aims to examine the distinct influences of closing behavior leadership (CBL) and opening behavior leadership (OBL) on innovation performance within Indonesian MSMEs. Employing a quantitative, cross-sectional survey design, data were collected from 115 employees across various Indonesian MSMEs, characterized predominantly by young workers, half of whom hold diploma or bachelor's degrees. Data were analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM). Findings reveal that both CBL ( $\beta = 0.174$ ,  $p = 0.018$ ) and OBL ( $\beta = 0.509$ ,  $p < 0.001$ ) significantly and positively influence innovation performance, with OBL demonstrating a substantially stronger impact. This research validates the applicability of ambidextrous leadership theory in the vital MSMEs sector and provides practical insights for MSME leaders, suggesting that while both structuring and creativity-enhancing behaviors are beneficial, fostering opening behaviors appears particularly crucial for maximizing innovation outcomes. However, the study's cross-sectional design and the concentration of respondents primarily located in Java Island limit the generalizability of its findings, indicating the need for future studies involving longitudinal approaches and more geographically diverse samples.



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### Corresponding Author:

Dina Noval Madurani,

Universitas Terbuka

Email: [dina.noval@ecampus.ut.ac.id](mailto:dina.noval@ecampus.ut.ac.id)

## Introduction

Micro, Small, and Medium Enterprises (MSMEs) in Indonesia play a crucial role in supporting national economic growth and employment. However, these enterprises often face substantial internal challenges in managing innovation effectively and sustainably. While external factors such as government support and environmental regulations have been recognized as key enablers of sustainable innovation (Achmad et al., 2023; Hamdani et al., 2024), the success of innovation within MSMEs ultimately hinges on their internal managerial capabilities. The ability of leaders to guide teams, make adaptive decisions, and balance competing priorities determines whether innovation efforts can be effectively implemented and sustained in a dynamic and resource-constrained environment.

Innovation within MSMEs often takes the form of product, service, or process improvements that align with broader goals of sustainability. For instance, the adoption of locally sourced and eco-friendly materials can

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reduce environmental impact (Harsanto et al., 2023). Similarly, studies in the Indonesian Batik industry show that focusing on input efficiency and strengthening innovation ecosystems is more relevant for MSME development than rigid waste management practices (Rahmat et al., 2024). These examples highlight that beyond external incentives, effective internal leadership and management approaches are vital to translating innovation aspirations into practical outcomes.

In this regard, ambidextrous leadership provides an important theoretical lens to understand how MSME leaders can balance two critical aspects of innovation: exploration and exploitation. Ambidextrous leaders demonstrate *opening behaviors* that foster creativity, experimentation, and idea generation, alongside *closing behaviors* that emphasize structure, discipline, and implementation (Zacher & Wilden, 2014; Alghamdi, 2018). Opening behaviors help generate new ideas, while closing behaviors enable the realization and commercialization of these ideas (Mascareño et al., 2021). Balancing both behaviors is therefore essential, although its implementation can be highly context-dependent, influenced by time, team dynamics, and organizational culture (Klonek et al., 2020; Duc et al., 2020).

Positioning research on ambidextrous leadership within the Indonesian MSME context is particularly meaningful. Indonesia's socio-economic environment—characterized by collectivist culture, relational management styles, and strong community networks—has shown a unique potential to support ambidexterity and innovation performance (Jaidi et al., 2022). Nonetheless, how MSME leaders in Indonesia specifically apply opening and closing behaviors to enhance innovation performance remains insufficiently understood (Jaidi et al., 2020).

To address this gap, this study investigates the distinct effects of opening behavior leadership (OBL) and closing behavior leadership (CBL) on the innovation performance of Indonesian MSMEs. By analyzing these two dimensions independently, the study aims to evaluate the applicability of ambidextrous leadership theory in this unique context and provide nuanced insights into which leadership behaviors are most influential in driving innovation.

Accordingly, this study seeks to answer the following research questions (1) How does opening behavior leadership (OBL) influence innovation performance among Indonesian MSMEs? (2) How does closing behavior leadership (CBL) influence innovation performance among Indonesian MSMEs? (3) Which of these two leadership behaviors, OBL or CBL plays more dominant role in enhancing innovation performance?

### **The importance of innovation on MSMEs**

Innovation performance is a crucial factor for SMEs to survive and thrive in a dynamic business landscape, enabling them to create added value and effectively respond to market changes. This innovation performance encompasses a broad spectrum of activities, ranging from the adaptation of existing products or services (incremental innovation) to the development of new solutions (Pullen et al., 2009). Various studies have confirmed that the success of innovation in SMEs depends on a complex interplay of internal capabilities, such as entrepreneurial orientation (Zhai et al., 2018), organizational characteristics (Pullen et al., 2009), and the utilization of information technology capabilities (Lyver & Lu, 2018; Homayoun et al., 2024), as well as the ability to adapt to the external environment.

### **Ambidextrous Leadership as a Theoretical Framework**

While external factors and other internal capabilities are important, the ability of SMEs to effectively execute innovation heavily relies on internal managerial capabilities. Ambidextrous Leadership Theory provides a relevant conceptual framework for understanding how leaders can manage the inherent tension between exploration activities (searching for new opportunities) and exploitation activities (optimizing current operations) to foster innovation (Klonek et al., 2020; Rosing et al., 2011). This theory posits that effective leaders must dynamically balance these two orientations, as both have been shown to significantly influence subordinate activities and result in higher levels of innovation (Alghamdi, 2018; Zacher et al., 2016).

Specifically, this theory is manifested through two complementary sets of behaviors (Rosing et al., 2011; Zacher & Rosing, 2015). First, opening behaviors refer to leader actions that encourage divergent thinking, experimentation, and employee autonomy, which are essential for facilitating exploration and the generation of new ideas (Zacher & Wilden, 2014; Mascareño et al., 2021). Second, closing behaviors encompass leader actions focused on efficiency, goal setting, and enforcing standards, which are necessary for exploitation and the effective implementation of ideas (Gerlach et al., 2020; Mascareño et al., 2021). Studies indicate that opening behaviors positively predict employee exploratory behaviors, while closing behaviors predict exploitative behaviors (Alghamdi, 2018; Zacher et al., 2016), and the highest innovation is often achieved when both behaviors are utilized in a balanced or interactive manner (Mascareño et al., 2021; Zacher et al., 2016; Duc et al., 2020).

## Literature Synthesis and Research Gaps

Although this theoretical foundation is robust, almost all empirical research on ambidextrous leadership has focused on large-scale organizations (Rosing et al., 2011; Zacher et al., 2016; Gerlach et al., 2020). There remains a significant gap in understanding how opening and closing behaviors separately contribute to innovation performance within the context of Micro, Small, and Medium Enterprises (MSMEs), particularly in developing countries like Indonesia. The MSME context is markedly different, as most of them face resource limitations, flat organizational structures, and often an overlap between ownership and management (Jaidi et al., 2020). Leaders of these MSMEs encounter unique pressures to adapt quickly (driving opening) while maintaining strict operational efficiency (driving closing). Understanding this dynamic is crucial, especially given that previous studies have indicated the Indonesian socio-economic context may uniquely support ambidextrous performance (Jaidi et al., 2022).

## Hypothesis Development

Based on the theoretical foundation of ambidextrous leadership and the identified research gap, this study proposes two main hypotheses regarding the separate effects of opening and closing behaviors on innovation performance in the context of MSMEs (see figure 1).

Theoretically, opening behaviors are a primary driver of exploratory activities (Zacher et al., 2016). By encouraging experimentation, autonomy, and divergent thinking, leaders directly create a psychological environment conducive for employees to generate new and creative ideas (Mascareño et al., 2021). In the context of MSMEs, which require rapid adaptation and high flexibility, the role of leaders in stimulating this exploration is crucial for generating innovative solutions (Jaidi et al., 2022). Therefore, we hypothesize that H1: Opening behavior leadership positively and significantly affects innovation performance in MSMEs.

On the other hand, innovation does not stop at idea generation but also demands effective implementation and execution, which falls within the domain of exploitation activities (Duc et al., 2020; Gerlach et al., 2020). Closing behaviors, such as setting clear goals, monitoring work progress, and ensuring efficiency, provide the necessary structure and focus to transform raw ideas into implementable and valuable products or processes (Mascareño et al., 2021). Although MSMEs are known for their flexibility, they often operate with very limited resources; therefore, leaders' closing behaviors become essential to ensure that innovation efforts do not deviate, resources are allocated efficiently, and concrete results (innovation performance) are indeed achieved. Thus, we also hypothesize that:

H2: Closing behavior leadership positively and significantly affects innovation performance in MSMEs.

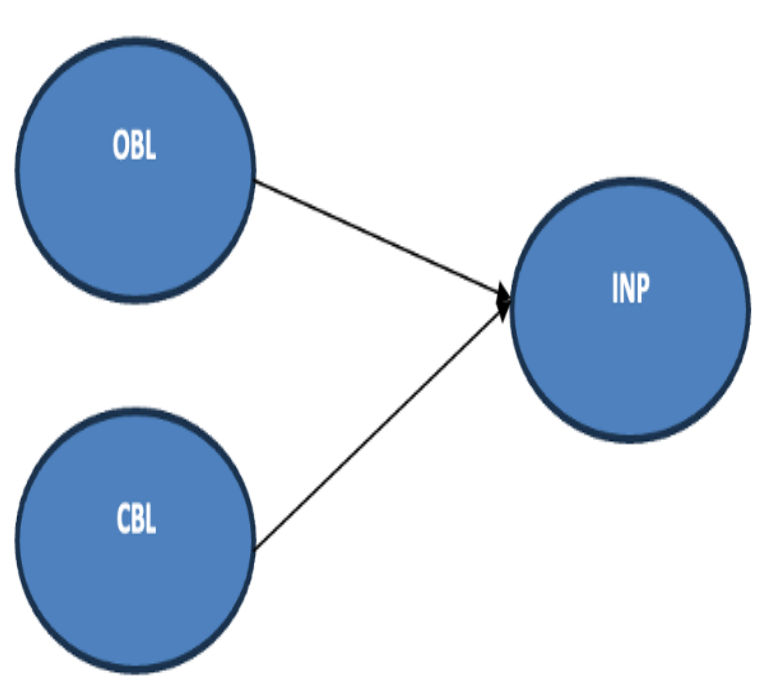


Figure 1. Empirical Research Model

## Method

### Research Design

This study adopts a quantitative research design with a cross-sectional survey approach to examine the relationship among key organizational variables. The primary objective is to examine the associative relationships between ambidextrous leadership strategies—specifically closing behavior leadership (CBL) and opening behavior leadership (OBL)—and innovation performance within the context of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. This design enables the collection of data from a single time point to investigate the proposed relationships between the key constructs.

### Participants and Sampling

The participants in this study consisted of employees working in various MSMEs geographically dispersed across Indonesia. A total of 115 employees completed the questionnaire. The demographic profile includes age range, gender, educational background, work experience, and business location. The sampling procedure followed a non-probability approach, based on accessibility and voluntary participation, which is considered appropriate for exploratory organizational studies involving MSMEs. A summary of respondent characteristics is presented in Table 1. The demographic profile indicates a predominantly young workforce, mostly aged between 17 and 25 years, with about half holding a diploma or bachelor's degree, followed by those with senior high school education. Most respondents have 1–3 years of work experience, and the sample is largely concentrated in Java.

Data were gathered using a self-administered questionnaire adapted from established literature to measure three constructs: Closing Behavior Leadership, Opening Behavior Leadership, and Innovation Performance. Each construct was measured with several items on a Likert-type scale, where higher scores represented stronger agreement. The items for closing and opening leadership behaviors reflected exploitation-oriented and exploration-oriented leadership practices, respectively, while innovation performance items assessed innovative outcomes at the organizational level. All items were adapted with minor contextual modifications to fit the MSME setting. The data collection procedure was conducted over several weeks, ensuring participant anonymity and voluntary participation.

Table 1. Demographic Profile of Respondents (N=115)

Characteristic	Category	Frequency	Percentage (%)
<b>Age:</b>	17 – 25 years	74	63%
	26 – 40 years	34	30%
	>40 years	7	7%
	Total	115	100%
<b>Gender:</b>	Male	33	71%
	Female	82	29%
Total		115	100%
<b>Education background:</b>	Junior High School	2	2%
	Senior High School	50	43%
	Vocational Secondary School	2	2%
	Diploma/bachelor's degree	57	50%
	Master's degree	4	3%
Total		115	100%
<b>Years of experience:</b>	<1 years	36	31%
	1 – 3 years	61	53%
	4 – 6 years	12	10%
	>6 years	6	5%
Total		115	100%
<b>Business location:</b>	Sumatera	6	5%
	Java	73	63%
	DKI Jakarta	20	17%
	Jabodetabek	11	10%
	Sulawesi	3	3%
	Bali	2	2%
Total		115	100%

The demographic profile of the respondents indicates a predominantly young workforce, with the majority aged between 17 and 25 years. Referring to the respondent's educational background, the data indicate that most participants have completed a Diploma (D3) or Bachelor's (S1) degree, followed by a considerable proportion

whose highest level of education is senior high school. The data also reveal that most participants have between 1 – 3 years of work experience, and the research sample is predominantly composed of participants located in Java.

Data for this study were gathered using a self-administered questionnaire, with items adapted from established literature to measure the three primary constructs: Closing Behavior Leadership, Opening Behavior Leadership, and Innovation Performance. Closing Behavior Leadership items assessed leadership behaviors focused on process control, standardization, and strict supervision, reflecting exploitation activities. Opening Behavior Leadership items, conversely, assessed behaviors related to fostering creativity, encouraging experimentation, and supporting new ideas, reflecting exploration activities. The dependent variable, Innovation Performance, was measured by items assessing the innovative outcomes of the organization. All items were measured using a Likert-type scale. The data collection procedure was conducted over several weeks, ensuring participant anonymity and voluntary participation.

### Data Analysis

Data analysis employed Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS software. This method was chosen for its suitability in examining associative relationships and predictive power among constructs in relatively small samples. The analysis was conducted in two stages. First, the measurement model (outer model) was evaluated for validity and reliability. Convergent validity was verified through outer loadings exceeding 0.7 and Average Variance Extracted (AVE) values above 0.5. Construct reliability was established with Cronbach's Alpha and Composite Reliability (CR) values above 0.7, while discriminant validity was confirmed using the Fornell-Larcker criterion and HTMT ratio ( $<0.85$ ). Next, the structural model (inner model) was analyzed to test the hypotheses. The model's explanatory power was determined by the  $R^2$  value of the innovation performance construct. Significance testing used bootstrapping, with path coefficients considered significant if  $p < 0.05$  and  $t > 1.96$ .

In addition, a power adequacy check indicated that the sample size was sufficient to detect medium effects, meeting general recommendations for PLS-SEM. To address the risk of common method bias (CMB), procedural precautions such as anonymity and item randomization were applied during data collection. Statistical inspection using a single-factor test also confirmed that no single factor dominated the variance.

Finally, it is acknowledged that this methodology carries limitations: the cross-sectional design restricts causal inference, and the concentration of respondents in Java limits the generalizability of findings to MSMEs across other Indonesian regions.

### Results and Discussions

Data processing was conducted using the SEM-PLS method with the assistance of the Smart PLS 3.0 application. Data processing was divided into three measurement stages: the measurement model, the structural model, and hypothesis testing. The measurement model evaluates the relationship between latent (unobserved) variables and their indicators (observed), using criteria such as validity and reliability. The validity of indicators as measures of a variable is assessed by convergent validity, which relies on the outer loading values of each indicator. Values over 0.50 are deemed acceptable in the initial stages of model development (new research) as they satisfy convergent validity. Although values  $>0.70$  are preferred, values between 0.5 and 0.7 remain acceptable as long as the overall construct validity and reliability are met (Cheung et al., 2024). Based on the data processing evident from the Outer Loadings values, one indicator (OBL) was removed due to an outer loading value  $<0.50$ . The remaining loading values appear to be above the recommended threshold, indicating that the model has good convergent validity (see Table 2). Subsequently, instrument reliability was assessed using Cronbach's Alpha and Composite Reliability, with values  $>0.7$ . The data processing results showed that all variable items had values  $>0.7$  (see Table 3), which means that all constructs can be declared reliable and internally consistent.

After conducting the measurement model analysis, the next step is to perform the structural model analysis. The structural model describes the relationships between latent constructs based on the R-Square ( $R^2$ ) value. The data processing results show that the R-Square value for Innovation Performance indicates the extent to which the variation is explained by the Closing Behavior Leadership and Opening Behavior Leadership constructs. If the R-Square value is between 0.3 and 0.67, the model has a moderate to strong influence (see table 4). From the data processing results, the latent constructs of opening behavior leadership and closing behavior leadership have a moderate influence on innovation performance with an R-square value of 0.329 and an adjusted R-square value of 0.317 (see table 3).

Table 2. Outer loading

	Opening Behavior Leadership	Closing Behavior Leadership	Innovation Performance
OBL1	0.665		
OBL2	0.645		
OBL3	0.694		
OBL4	0.579		
OBL5	0.620		
OBL6	0.442		
OBL7	0.660		
CBL1		0.664	
CBL2		0.589	
CBL3		0.765	
CBL4		0.576	
CBL5		0.565	
CBL6		0.764	
CBL7		0.681	
INP1			0.646
INP2			0.762
INP3			0.585
INP4			0.615
INP5			0.696
INP6			0.650
INP7			0.692
INP8			0.674
INP9			0.622

Table 3. Composite reliability and Cronbach's alpha for construct reliability test

Variable	Composite Reliability	Cronbach's Alpha	Description
Opening Behavior Leadership	0.811	0.729	Reliable
Closing Behavior Leadership	0.844	0.804	Reliable
Innovation Performance	0.875	0.839	Reliable

Table 4. R-Square

Variable	R-Square	R-Square Adjusted
Innovation Performance	0.329	0.317

Testing hypotheses based on the Path Coefficient processing results is the third step in the measuring procedure with smart PLS. It is evident from the path analysis that direct effect is the basis for the assumptions (see figure 2). According to the research paradigm, the direct effect in this study refers to the direct effect of opening behavior leadership on innovation performance, and the direct effect of closing behavior leadership on innovation performance (see table 4). From the result in table 4, indicate that the direct influence of opening behavior leadership on innovation performance has a t-statistic of  $6.283 > 1.96$ , and a p-value of  $0.000 < 0.05$ . Consequently, it may be inferred that opening behavior leadership exerts a substantial direct impact on innovation performance. This result indicates that opening behavior leadership has a positive and highly significant influence on Innovation Performance. This means that the higher the ambidextrous leadership behavior oriented toward opening behavior, such as encouraging creativity, providing freedom to experiment, and supporting new ideas, the higher the innovation performance of MSMEs.

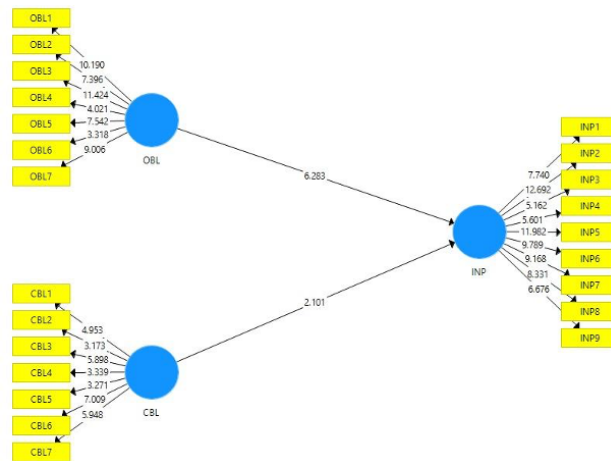


Figure 2. Path Coefficient Analysis

This outcome is consistent with the research conducted by Zacher and Wilden (2020), which demonstrates that open leader behavior significantly enhances performance in organizations that require creativity and new solutions. Leaders who promote independence and freedom of thought enable subordinates to cultivate innovative ideas pertinent to market demands and shifts in the business landscape. Lopez and Esteves (2023) also did a study that showed how important a leader's openness is for creativity, innovation, and sharing knowledge in a company. This openness lets ideas flow freely and lets people work together, which makes the organization more inventive in the long run.

Moreover, research conducted by Rosing, Frese, and Bausch (2020) indicates that ambidextrous leadership styles, which integrate both opening and closing behaviors, enhance innovation performance in small and medium-sized technology enterprises. These results corroborate the findings of this study, which demonstrate that the opening behavior dimension is more instrumental in catalyzing creativity, as it cultivates the environment conducive to exploration and experimentation essential for the generation of new ideas. Thus, the findings of this study add to the evidence that opening behavior leadership is a major factor in how well innovation works. Leadership that encourages creativity, new ideas, and the freedom to try new things can help MSMEs come up with new products, processes, and ways to market them. This behavior is very important for making small firms more competitive in the context of local economic empowerment. These businesses need to be able to adapt to and thrive in a market that is always changing.

Rosing, Frese, and Bausch (2020) conducted an experimental study that demonstrated that an open leader behavior style enhances performance in tasks necessitating creativity. However, in tasks focused on implementation, which require efficiency, quality control, and adherence to processes, this style does not yield a significant positive effect. In the context of MSMEs, which may necessitate additional implementation processes (e.g., normal production, standard operating procedures), an open leadership style may be suboptimal or even lead to dysfunction, since excessive flexibility might impede productivity. Some research suggests that the connection between an opening behavior leadership style and innovation frequently necessitates mediators such as innovation culture, organizational learning, or knowledge sharing for its effects to manifest at the performance level, as evidenced by the findings of Chelliah, Aravindan, & Muthaiyah (2022). In other words, if leaders don't encourage an inventive culture or ways for the organization to learn, the flexibility they provide their employees may not lead to real innovation. This is important for MSMEs, which usually don't have a formal learning culture or system yet.

Table 4. Hypotheses Testing

	Original Sample (O)	T-Statistics (> 1,96)	P-Value (< 0,05)	Description
Opening Behavior Leadership -> Innovation Performance	0,509	6,283	0,000	Significant
Closing Behavior Leadership -> Innovation Performance	0,174	2,101	0,018	Significant

The influence of closing behavior leadership on innovation performance is indicated by a t-statistic of  $2.101 > 1.96$ , and a p-value of  $0.018 < 0.05$ . The results indicate that closing behavior leadership significantly influences innovation performance directly. These findings suggest that closing behavior leadership is characterized by enforcing discipline, overseeing work processes, offering clear guidance, and prioritizing efficiency and quality of outcomes substantially enhancing innovation performance in micro, small, and medium enterprises (MSMEs). This finding is consistent with the notion of ambidextrous leadership posited by Rosing, Frese, and Bausch (2011), which asserts that effective leaders in fostering innovation must possess the ability to both facilitate creative space (opening behavior) and conclude the process with robust control and organizational structure. For creative ideas to be put into action in a way that is efficient, scalable, and in line with the goals of the business, closing behavior is important. So, the right balance between exploration (coming up with new ideas) and exploitation (putting those ideas into action) is quite important for effective innovation.

In the case of MSMEs, closing behavior leadership is highly crucial because most small business owners have few resources and a simple work structure. Leaders who tend to closely assist make the manufacturing process more efficient, cut down on mistakes, and keep the quality of products and services the same. This aligns with the conclusions of Zacher and Rosing (2015), who indicated that leadership behaviors focused on structure, control, and oversight of work progress enhance implementation innovation performance—the organization's capacity to effectively execute new ideas. Additionally, Luu (2017) research demonstrated that leadership focused on work discipline and results monitoring positively impacts process innovation and operational excellence in small enterprises in Southeast Asia. This demonstrates that within the realm of MSMEs, a focus on order and control can enhance the efficacy of executing pre-established innovations.

Research shows that Closing Behavior Leadership has a positive and significant effect on Innovation Performance, but some international studies show that this relationship isn't always positive and stable, especially in small businesses like SMEs that need creativity, flexibility, and improvisation to stay alive in a changing market. Rosing, Frese, and Bausch (2011) say that while closing behavior leadership is important for making sure that ideas are put into action quickly, too much of it without a balance with opening behavior can stifle innovation. Leaders that are too focused on rules, supervision, and efficiency tend to make it harder for people to come up with new ideas. In the case of MSMEs, this can make employees less likely to try new things because they are afraid of failing or breaking rigid rules.

Zacher and Wilden (2020) observed comparable findings, indicating that closing behavior leadership styles have a negative connection with innovative behavior in contexts necessitating significant flexibility. This indicates that when the corporate world changes quickly, SMEs' closing behavior leadership actions (Rosing et al., 2011). Nonetheless, much research, such as Luu (2017), validate that numerous MSMEs executives do not attain this equilibrium, as they prioritize operational control over the promotion of innovation. So, although closing behavior makes things more efficient in the near term, the innovation that comes from it is usually little and doesn't make a big difference in how well the business succeeds.

The findings of this study corroborate the ambidextrous leadership theory (Rosing et al., 2011), which posits that effective innovation necessitates a balance between the freedom to experiment (opening behavior) and the control of execution (close behavior). In MSMEs, leadership that encourages creativity, new ideas, and the freedom to try new things (opening behavior) can lead to new products, processes, and marketing strategies. This behavior is very important for making small firms more competitive in the context of local economic empowerment. These businesses need to be able to adapt and stay in business even when the market changes all the time. And, closing behavior leadership is very important to make sure that innovative results last by making processes more efficient, products better, and workers more disciplined.

However, the convergent validity analysis revealed that several outer loadings were below the ideal threshold, indicating potential weaknesses in the measurement of certain indicators. Although one indicator was removed to maintain the validity of the construct, this suggests that future studies should refine the measurement instruments to better capture the multidimensional aspects of ambidextrous leadership within MSMEs. These measurement issues may slightly weaken the precision of construct interpretation and should be considered when drawing theoretical and practical conclusions.

Furthermore, the markedly stronger effect of OBL compared to CBL on innovation performance may be linked to the contextual characteristics of Indonesian MSMEs. Many MSMEs employ younger workers who tend to be more adaptive, creative, and receptive to exploratory leadership approaches. This demographic composition, coupled with dynamic market conditions, may naturally favor opening behavior leadership, which emphasizes experimentation and idea generation. The imbalance found between OBL and CBL also challenges the traditional ambidextrous leadership theory that underscores equilibrium between the two. Therefore, future research should explore how contextual and demographic factors mediate this imbalance and how such

dynamics shape innovation strategies in emerging-market MSMEs. Methodological limitations, including the cross-sectional design and the concentration of samples in Java, should also be acknowledged as they restrict the generalizability of these findings.

## Conclusions

This study concludes that both opening behavior leadership (OBL) and closing behavior leadership (CBL) positively influence innovation performance among Indonesian MSMEs, with OBL demonstrating a substantially stronger effect. This finding suggests that the conventional notion of “balance” in ambidextrous leadership may not be universally optimal. In the dynamic and resource-constrained environment of MSMEs—characterized by a young and adaptive workforce—emphasizing opening behaviors such as creativity, experimentation, and support for new ideas appears to be more effective than maintaining strict equilibrium with closing behaviors. Theoretically, this result refines ambidextrous leadership theory by highlighting that its effectiveness is context-dependent, where the ideal configuration between exploration and exploitation must adapt to organizational scale, structure, and flexibility.

Practically, these findings offer valuable implications for MSME leaders and policymakers. Leaders are encouraged to foster innovation-oriented environments by promoting creative risk-taking and openness while applying closing behaviors selectively to maintain discipline and process efficiency. Future research should adopt longitudinal or mixed-method approaches to examine causal relationships and changes over time. Additionally, exploring moderating or mediating factors such as organizational culture, digital readiness, or employee engagement, as well as expanding the sample beyond Java Island, would provide a more comprehensive understanding and stronger generalizability of ambidextrous leadership’s role in enhancing innovation performance across diverse MSME contexts.

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