“The effects of adaptive management and ambidextrous leadership on sustainable business performance: Evidence from Indonesia’s telecommunications”

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THE EFFECTS OF ADAPTIVE MANAGEMENT AND AMBIDEXTROUS LEADERSHIP ON SUSTAINABLE BUSINESS PERFORMANCE: EVIDENCE FROM INDONESIA'S TELECOMMUNICATIONS

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Abstract

This study examines the effects of adaptive management and ambidextrous leadership on sustainable business performance. It addresses a growing managerial challenge: sustaining organizational performance amid technological disruption, intensifying competition, and structural transformation in emerging markets. The survey targeted senior and middle managers who are directly involved in strategic and operational decision-making, ensuring the relevance of responses to leadership and performance outcomes. Data were collected from 208 managerial-level respondents in Indonesian telecommunications companies between January and March 2025. The study applies partial least squares structural equation modeling (PLS-SEM) to test the proposed research model. The results indicate that both adaptive management and ambidextrous leadership have positive and significant effects on sustainable business performance. However, ambidextrous leadership demonstrates a stronger effect ($\beta = 0.637$, $t = 6.384$) than adaptive management ($\beta = 0.285$, $t = 2.512$), with the model explaining 64.2% of the variance in sustainable business performance. These findings provide empirical evidence that leadership ambidexterity plays a dominant role in sustaining business performance in turbulent and dynamic environments. The study contributes to the literature by extending ambidexterity and adaptive management perspectives within the context of the telecommunications industry in an emerging market and offers practical insights for managers seeking to enhance sustainable business performance through adaptive and balanced leadership practices.

Keywords adaptation, ambidexterity, leadership, sustainability, performance, telecommunications

JEL Classification L96, M12, O32

INTRODUCTION

The telecommunications industry plays a critical role in supporting digital transformation, economic development, and social connectivity. In emerging economies such as Indonesia, telecommunications infrastructure enables digital services, mobile connectivity, and data-driven economic activities across geographically dispersed regions. However, the industry is currently experiencing significant structural changes driven by rapid technological innovation, intensifying competition, and the increasing presence of Over-the-Top (OTT) digital platforms that challenge traditional telecommunications business models (Ramli et al., 2023; World Bank, 2021). While high-capacity networks and advanced services are concentrated in major metropolitan areas, many rural and re-

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mote regions remain underserved (Situmorang et al., 2023). These developments have created a highly dynamic and uncertain competitive environment in which maintaining sustainable business performance has become increasingly difficult.

Organizations operating in technology-intensive sectors must continuously adapt to external changes while simultaneously maintaining operational efficiency and performance stability. Traditional management approaches that emphasize rigid planning and operational control are often insufficient in environments characterized by rapid technological disruption and market volatility (Teece et al., 2018). Consequently, organizations increasingly require adaptive managerial mechanisms that support flexibility, organizational learning, resilience, and strategic responsiveness.

Adaptive management has emerged as an important approach for managing uncertainty and organizational change. Adaptive management emphasizes iterative learning, monitoring, feedback integration, and evidence-based decision-making to improve organizational resilience and long-term competitiveness (Reiman et al., 2015; Haarhaus & Liening, 2020). Prior studies suggest that adaptive management strengthens organizational agility and improves firms' ability to respond effectively to technological and market changes (Gyemang & Emeagwali, 2020; Do et al., 2022).

In addition to adaptive managerial processes, leadership capability is considered essential for sustaining organizational performance in turbulent environments. Organizations increasingly require leaders who can simultaneously encourage innovation and maintain operational discipline. This capability is reflected in the concept of ambidextrous leadership, which refers to leaders' ability to balance exploratory behaviors, such as experimentation and creativity, with exploitative behaviors related to coordination, monitoring, and goal achievement (Zacher & Rosing, 2015). Previous studies indicate that ambidextrous leadership positively influences organizational innovation, employee performance, and organizational resilience (Kafetzopoulos, 2022; Martínez-Climent et al., 2019) and, ultimately, sustainable business outcomes (Alghamdi, 2018; Tsai & Wang, 2017).

Although prior studies have examined adaptive management and ambidextrous leadership separately, limited empirical research has investigated how these two perspectives jointly influence sustainable business performance, particularly in emerging-market contexts. This gap is especially relevant in the telecommunications industry, where firms must balance innovation, regulatory compliance, and large-scale infrastructure investments while maintaining long-term performance.

1. LITERATURE REVIEW

The increasing volatility and complexity of contemporary business environments have intensified scholarly attention on how organizations sustain performance under conditions of technological disruption, competitive pressure, and institutional uncertainty. Recent management research emphasizes that long-term organizational viability depends not only on strategic positioning but also on adaptive managerial processes, leadership capabilities that balance competing demands, and sustainability-oriented performance frameworks (Teece, 2018; Bansal et al., 2025; Dyllick & Muff, 2016; Durán & Aguado, 2022; Sott & Bender, 2025; Clauss et al., 2019).

One stream of research highlights the role of adaptive management in enabling organizations to respond effectively to environmental uncertainty. Adaptive management is commonly conceptualized as a learning-oriented managerial approach that integrates experimentation, monitoring, and feedback mechanisms into decision-making processes (Qi et al., 2019; Salafsky et al., 2002; West et al., 2016; Välikangas, 2010). Rather than relying on static strategic planning, organizations adopting adaptive management continuously adjust strategies and operational practices in response to changing environmental conditions. Such approaches allow firms to develop dynamic capabilities that support resilience, innovation, and long-term competitiveness (Eisenhardt & Martin,

2000; Teece, 2016; Durán & Aguado, 2022; Sott & Bender, 2025). Empirical studies across various industries indicate that adaptive managerial practices enhance organizational agility and improve performance outcomes by enabling firms to anticipate disruption and respond more effectively to technological and market changes (Gyemang & Emeagwali, 2020; Haarhaus & Liening, 2020; P. Nguyen & T. Nguyen, 2024; Amin et al., 2023; Saah et al., 2024). Studies conducted in emerging-market contexts further demonstrate that adaptive management strengthens organizational learning and resilience under conditions of institutional volatility and resource constraints (Karman & Savanevičienė, 2021; Do et al., 2022). Accordingly, the dimensions of adaptive management examined in this study include the development of structured learning mechanisms, the ability to anticipate and respond to disruption, improvements in competitive performance, and alignment with internal capabilities. These dimensions are primarily derived from the adaptive management framework proposed by Reiman et al. (2015) and complemented by insights on business resilience from Gyemang and Emeagwali (2020).

At the same time, leadership research increasingly emphasizes the importance of leaders' ability to manage competing organizational demands. Organizations must simultaneously pursue exploration, such as innovation, experimentation, and opportunity discovery; and exploitation, which focuses on efficiency, coordination, and reliability. The concept of ambidextrous leadership addresses this challenge by proposing that effective leaders combine opening behaviors that encourage creativity and experimentation with closing behaviors that provide structure, monitoring, and goal orientation (Zacher & Rosing, 2015; Rosing & Zacher, 2023). Empirical studies demonstrate that ambidextrous leadership positively influences employee innovation, knowledge sharing, and organizational performance across diverse contexts (Martínez-Climent et al., 2019; Kafetzopoulos, 2022; Guo et al., 2020; Liu, 2024; Oluwafemi et al., 2020). Leadership balance is particularly critical in dynamic environments such as the COVID-19 pandemic, where organizations must innovate while maintaining operational stability (Atiku & Randa, 2021; Jain & Tripathi, 2023; Clauss et al., 2019). Balancing flexibility and stability often generates internal tensions, resistance to change, and coordination difficulties, particularly in organizations characterized by entrenched routines and hierarchical structures (Abdullah et al., 2023; Rosing & Zacher, 2023). Without alignment among senior leadership, incentive systems, and organizational culture, efforts to promote ambidexterity may weaken strategic coherence and diminish performance effectiveness (Piwowar-Sulej & Iqbal, 2023; Xi et al., 2025). In this study, ambidextrous leadership is operationalized through dimensions that emphasize senior team integration, the articulation of shared vision and value-oriented goals, and the use of incentive mechanisms to support both exploratory and exploitative behaviors. Consistent with prior research, ambidextrous leadership is conceptualized as leadership that combines opening behaviors to encourage innovation with closing behaviors to ensure discipline and execution (Zacher & Rosing, 2015; Klonek et al., 2023).

The growing emphasis on sustainability further extends the discussion of organizational performance beyond traditional financial outcomes. Sustainable business performance is widely conceptualized as a multidimensional construct encompassing economic, social, and environmental dimensions. Contemporary research highlights that long-term organizational success depends on the ability to create value for multiple stakeholders while ensuring responsible resource management and social accountability (Dyllick & Muff, 2016; Schaltegger et al., 2017; Bansal et al., 2025; Van der Waal & Thijssens, 2020). Studies in technology-intensive industries suggest that sustainability outcomes are influenced not only by technological capabilities but also by managerial processes and leadership behaviors that enable organizations to adapt and innovate over time (Barney et al., 2010; Clauss et al., 2019; Yadav et al., 2022). The literature identifies economic indicators, such as profitability, growth, and market share, as core components of sustainable performance, while highlighting the complementary roles of social and environmental dimensions (Liao, 2022; Ahmad, 2025; Hajar et al., 2022; Andries & Stephan, 2019). Social performance includes employee well-being, stakeholder engagement, and corporate responsibility, whereas environmental performance emphasizes resource efficiency, emissions reduction, and sustainable innovation (Dyllick & Muff, 2016; Li

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et al., 2025). Accordingly, sustainability-oriented organizational cultures encourage practices that enhance resilience and support long-term success in unpredictable market environments. To operationalize sustainable business performance, prior studies highlight several key dimensions. Economic performance is commonly evaluated based on profitability, growth, and market share (Ahmad, 2025). Social performance encompasses employee satisfaction and corporate responsibility (Ahmad, 2025; Hajar et al., 2022), while environmental performance emphasizes sustainability leadership and environmentally responsible practices (Liao, 2022; Hajar et al., 2022).

Despite the growing body of research examining adaptive management and ambidextrous leadership, most studies have investigated these perspectives independently. Adaptive management research primarily focuses on organizational learning and strategic flexibility, while leadership studies emphasize behavioral mechanisms that influence innovation and employee performance. Consequently, limited empirical attention has been given to how adaptive managerial processes and ambidextrous leadership behaviors jointly contribute to sustainable business performance. This limitation is particularly evident in emerging-market contexts and technology-intensive sectors such as telecommunications, where firms must navigate rapid technological change, regulatory complexity, and intense competitive pressure.

Taken together, prior research suggests that organizations operating in turbulent environments require both adaptive managerial processes and leadership capabilities that balance exploration and exploitation. However, empirical evidence regarding the combined effects of adaptive management and ambidextrous leadership on sustainable business performance remains limited, especially in emerging economies. Addressing this research gap, the present study investigates the influence of adaptive management and ambidextrous leadership on sustainable business performance within Indonesia's telecommunications industry.

Based on the theoretical arguments presented above, organizations operating in dynamic and uncertain environments require adaptive managerial processes and leadership capabilities that support both flexibility and operational effectiveness. Adaptive management enables organizations to respond effectively to environmental uncertainty through continuous learning and evidence-based decision-making, while ambidextrous leadership facilitates the balance between exploratory and exploitative activities necessary for sustainable organizational performance.

Therefore, this study aims to examine the effects of adaptive management and ambidextrous leadership on sustainable business performance within Indonesia's telecommunications industry. Specifically, the study investigates the comparative influence of adaptive management and ambidextrous leadership on sustainable business performance and evaluates the relative dominance of opening and closing leadership behaviors in dynamic business environments.

Hypotheses are as follows:

H1: Adaptive management has a positive effect on sustainable business performance.

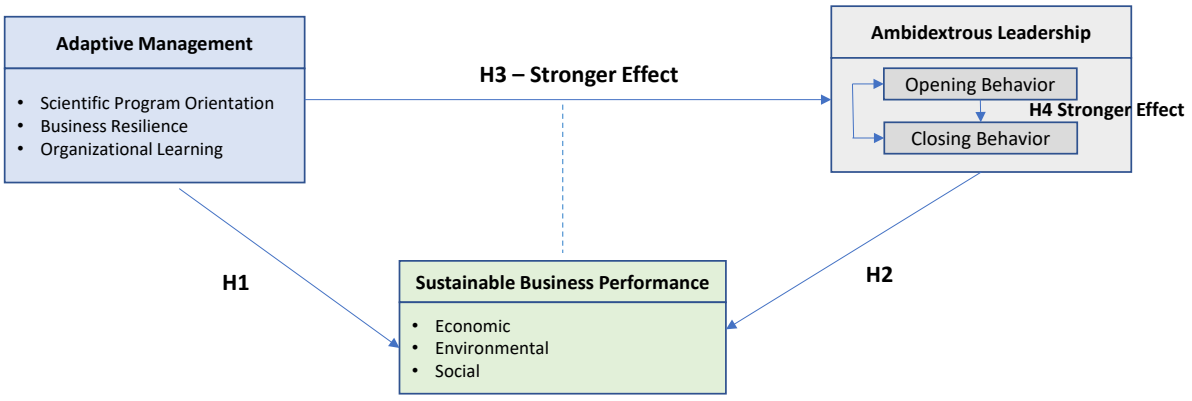

Figure 1. Research model

H2: Ambidextrous leadership has a positive effect on sustainable business performance.

H3: Ambidextrous leadership exerts a stronger influence on sustainable business performance than adaptive management.

H4: Closing leadership behaviors exert a stronger positive effect on sustainable business performance than opening leadership behaviors.

Figure 1 displays the research model developed for this study.

2. METHODOLOGY

2.1. Research design and procedure

This study employed a quantitative, cross-sectional research design to examine the effects of adaptive management and ambidextrous leadership on sustainable business performance in the Indonesian telecommunications industry. A survey-based approach was selected because it enables systematic data collection from a large number of organizational decision-makers and supports the statistical generalization of findings (Hair et al., 2021).

The research procedure followed a structured sequence:

1) identification of the research population;

2) development and validation of the survey instrument;

3) data collection; and

4) data analysis using partial least squares structural equation modeling (PLS-SEM).

This systematic approach ensured methodological rigor, consistency, and replicability throughout the research process.

PLS-SEM was chosen due to its suitability for predictive research models, robustness in handling complex constructs, and effectiveness with relatively small-to-moderate sample sizes and non-normal data distributions (Chin, 1998; Hair et al., 2021). Data analysis was conducted using SmartPLS version 3.0.

2.2. Population, sample, and data collection

The research population comprised management-level personnel from licensed telecommunications companies operating in Indonesia. According to official data published by the Indonesian Internet Service Providers Association (APJII, 2023), the population consisted of 1016 firms, including 920 Internet service providers (ISPs) and network access providers (NAPs), 65 network operators, and 31 tower infrastructure providers.

Data were collected from 208 managerial-level respondents, with one respondent representing each firm. Respondents were drawn from senior and middle management positions, such as directors, division heads, and senior managers who are directly involved in strategic decision-making and operational management. Following data screening, cleaning, and validation, all 208 questionnaires were deemed usable for analysis.

The final sample size exceeds the minimum requirement for PLS-SEM based on the ten-times rule. The sample size also satisfies recent recommendations for PLS-SEM studies emphasizing statistical power and model complexity (Hair et al., 2021). As the construct with the largest number of indicators consisted of 14 items, the minimum required sample size was 140 respondents. This criterion was satisfactorily met.

To ensure proportional representation across industry subsectors, a stratified random sampling technique was employed. Stratified sampling was selected to reduce sampling bias and enhance representativeness by dividing the population into homogeneous strata and randomly selecting respondents from each subgroup (Kerlinger & Lee, 2008). The use of managerial respondents was considered appropriate, as adaptive management practices, ambidextrous leadership behaviors, and sustainability-oriented performance outcomes are primarily formulated and implemented at the managerial level. This sampling approach enhances the relevance, reliability, and representativeness of the data for organizational-level analysis within the Indonesian telecommunications industry.

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Primary data were collected through a structured online questionnaire administered between January and March 2025. This period was selected to capture recent organizational practices following post-pandemic digital transformation initiatives within the telecommunications sector.

2.3. Respondent characteristics

To provide a clearer overview of the sample, the demographic and organizational characteristics of respondents are summarized in Table 1. The respondents consisted of 208 managerial-level professionals from telecommunications firms in Indonesia, including directors, division heads, senior managers, and managers who are directly involved in strategic and operational decision-making. The sample represents various subsectors within the telecommunications industry, including Internet service providers, network operators, and tower infrastructure companies.

2.4. Measurement instrument

The questionnaire consisted of two sections. The first section captured respondents' demographic and organizational characteristics, including managerial position, years of experience, firm size, and subsector classification. The second section measured the study constructs using previously validated measurement scales adapted to the telecommunications context.

Adaptive management was operationalized using three dimensions: scientific program orientation, business resilience, and organizational learning. These dimensions were adapted from the frameworks proposed by Reiman et al. (2015) and Gyemang and Emeagwali (2020), which emphasize learning-based decision-making, resilience under uncertainty, and systematic performance improvement.

Ambidextrous leadership was measured using two behavioral dimensions: opening leadership behaviors (e.g., encouraging creativity and experimentation) and closing leadership behaviors (e.g., monitoring, control, and corrective action). The measurement items were adapted from established scales developed by Zacher and Rosing (2015) and Klonek et al. (2023).

Sustainable business performance was assessed using a multidimensional approach encompassing economic, social, and environmental performance indicators. Measurement items were adapted from prior sustainability performance research (Ahmad, 2025; Hajar et al., 2022; Liao, 2022).

All items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5

Table 1. Respondent characteristics

Characteristic	Category	Frequency	Percentage (%)
Position Level	Director / Executive	28	13.5
	Division Head / General Manager	64	30.8
	Senior Manager	72	34.6
	Manager	44	21.1
	Total	208	100
Years of Managerial Experience	< 5 years	36	17.3
	5–10 years	79	38.0
	11–15 years	56	26.9
	> 15 years	37	17.8
	Total	208	100
Company Type	Internet Service Providers (ISP)	118	56.7
	Network Operators	56	26.9
	Tower Infrastructure Providers	34	16.4
	Total	208	100
Company Size (Employees)	< 100	42	20.2
	100–500	89	42.8
	501–1000	46	22.1
	> 1000	31	14.9
	Total	208	100

Table 2. Measurement constructs and indicators

Construct	Dimension	Number of Items	Source
Adaptive Management	Scientific Program Orientation	5	Reiman et al. (2015)
	Business Resilience	4	Gyemang and Emeagwali (2020)
	Organizational Learning	3	Reiman et al. (2015)
Ambidextrous Leadership	Opening Behavior	7	Zacher and Rosing (2015)
	Closing Behavior	7	Zacher and Rosing (2015)
Sustainable Business Performance	Economic	3	Ahmad (2025)
	Environmental	1	Liao (2022)
	Social	2	Hajar et al. (2022)

(strongly agree). Prior to the main survey, a pilot test involving 20 respondents was conducted to assess clarity, reliability, and content validity. Minor wording revisions were made based on the pilot feedback. A detailed list of operational variables and measurement items is provided in Appendix A and the summary of measurement constructs and indicators is presented in Table 2.

2.5. Ethical considerations

This study adhered to standard ethical principles for research involving human participants. All respondents were informed about the study's objectives, the voluntary nature of participation, and their right to withdraw at any time without consequence. Anonymity and confidentiality were strictly maintained, and no personally identifiable information was collected. Informed consent was obtained from all participants prior to questionnaire completion.

The data collected were generated exclusively for this research and have not been used in any prior publications. The survey was conducted independently and solely for academic purposes.

2.6. Data analysis

Data analysis was performed using partial least squares structural equation modeling (PLS-SEM). Following established guidelines (Hair et al., 2021), the analysis proceeded in two stages: assessment of the measurement model and evaluation of the structural model. Reliability and validity tests were conducted to confirm the adequacy of the measurement instruments, followed by hypothesis testing using bootstrapping procedures to assess the significance of the structural relationships.

3. RESULTS

3.1. Measurement model assessments

The measurement model was evaluated to assess convergent validity and internal consistency reliability. The results indicate that both convergent validity and internal consistency were satisfactorily established. All measurement indicators exhibited factor loadings exceeding the minimum threshold of 0.50, Average Variance Extracted (AVE) values for all constructs were above 0.50, and Composite Reliability (CR) values exceeded the recommended threshold of 0.70, demonstrating adequate internal consistency reliability. The detailed results of the convergent validity assessment are reported in Table 3.

The measurement (outer) model specifies the relationship between latent constructs and their corresponding observed indicators. All indicator loadings exceeded the minimum threshold of 0.5. Furthermore, all *t*-values obtained through bootstrapping were greater than 1.98, indicating statistically significant indicator loadings. The structural model with path coefficients is illustrated in Figure 2.

3.2. Discriminant validity

Discriminant validity was assessed using the heterotrait–monotrait ratio (HTMT) criterion. According to Hair et al. (2021), HTMT values should be below the recommended threshold of 0.85 to indicate adequate discriminant validity. As presented in Table 4, all HTMT values are below this threshold, indicating that the constructs are empirically distinct from each other. Therefore, the measurement model demonstrates satisfactory discriminant validity.

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Table 3. Evaluation of convergent validity

Variable	Dimension – Indicator	Loading Factor	t value	Average Variance Extracted (AVE)	Composite Reliability
Adaptive Management	Adaptive → Scientific Program Approach	0.942	57.759	0.519	0.842
	AM1 ← situational awareness plan	0.805	22.977		
	AM2 ← sense-making	0.598	6.695		
	AM3 ← continuous monitoring	0.763	17.490		
	AM4 ← data-based decision making	0.716	13.074		
	AM5 ← coordination	0.704	8.865		
	Adaptive → Business Resilience	0.922	43.753	0.595	0.797
	AM6 ← financial health	0.712	13.440		
	AM7 ← operational resilience	0.708	12.715		
	AM8 ← organizational agility	0.692	8.341		
	AM9 ← crisis management	0.703	11.646		
	Adaptive → Organizational Learning	0.838	21.665	0.566	0.796
	AM10 ← learning	0.685	11.159		
	AM11 ← proactive hazard solution	0.792	16.985		
	AM12 ← effective incident response	0.777	14.426		
Ambidextrous Leadership	Ambidextrous → Opening behavior drives exploration	0.949	73.938	0.559	0.855
	AL1 ← provide alternative solution	0.706	9.934		
	AL2 ← support new idea	0.660	9.725		
	AL3 ← take a risk	0.708	13.060		
	AL4 ← independent action	0.645	9.608		
	AL5 ← provide motivation	0.650	10.208		
	AL6 ← open communication	0.666	9.820		
	AL7 ← fault tolerance	0.701	12.855		
	Ambidextrous → Closing behavior drives exploitation	0.951	71.512	0.579	0.865
	AL8 ← learning from mistake	0.710	11.392		
	AL9 ← control	0.658	9.198		
	AL10 ← develop rule	0.650	8.789		
	AL11 ← corrective action	0.657	10.699		
	AL12 ← compliance	0.678	9.760		
	AL13 ← focus on accomplishment of task	0.712	12.376		
	AL14 ← reward	0.772	18.696		
Sustainable Business Performance	Performance → Economy	0.878	30.016	0.621	0.831
	Perf1 ← profit	0.744	15.051		
	Perf2 ← growth	0.852	32.817		
	Perf3 ← market share	0.764	16.666		
	Performance → Environmental	0.742	14.809	1.000	1.000*
	Perf4 ← environmental sustainability practice	1.000*			
	Performance → Social	0.874	38.129	0.650	0.788
	Perf5 ← employee satisfaction	0.775	15.927		
	Perf6 ← corporate social responsibility	0.837	28.130		

Note: * Following prior sustainability research, environmental performance was measured using a single-item indicator (Liao, 2022).

Table 4. Discriminant validity

Construct	Adaptive Management	Ambidextrous Leadership	Sustainable Business Performance
Adaptive Management			
Ambidextrous Leadership	0.54		
Sustainable Business Performance	0.61	0.67	

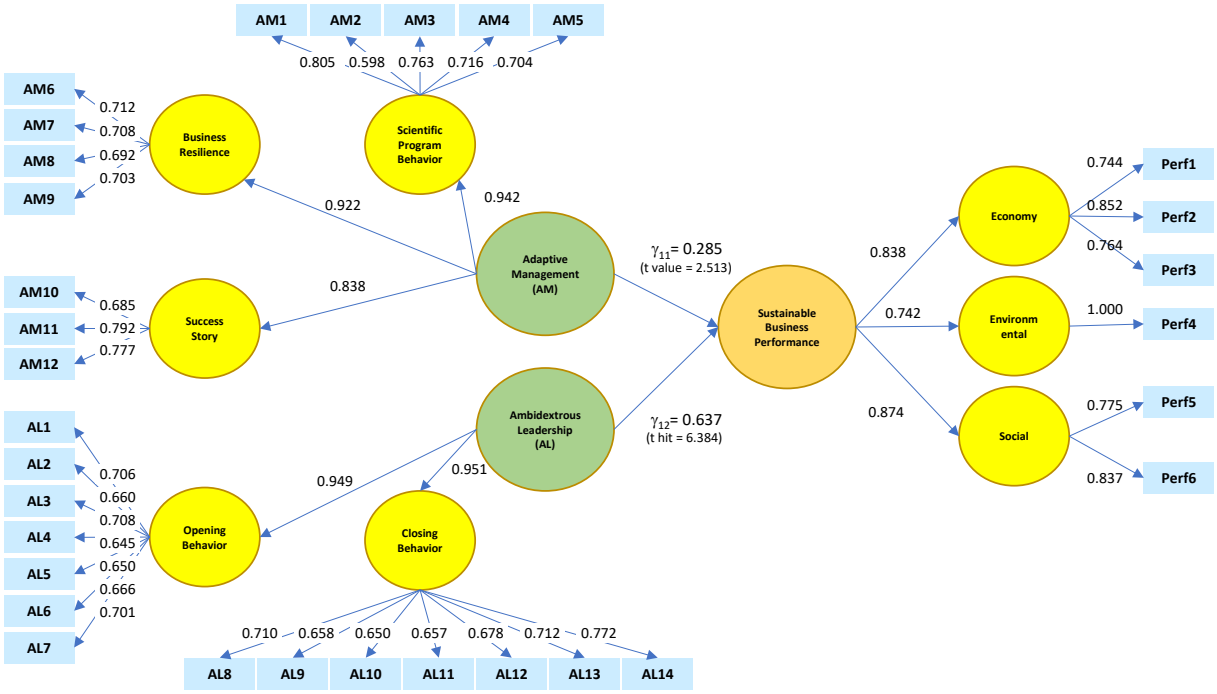

Figure 2. Structural model path coefficients

3.3. Structural model

The structural model was evaluated using the coefficient of determination (R^2) and the Goodness-of-Fit (GoF) index. According to Hair et al. (2021), an R^2 value above 0.50 indicates substantial explanatory power in PLS-SEM models. As presented in Table 5, the R^2 value for sustainable business performance was 0.642, indicating that adaptive management and ambidextrous leadership jointly explain 64.2% of the variance in sustainable business performance. The GoF index value of 0.422 and 0.438 indicates a strong overall model fit. These results indicate that both adaptive management (β = 0.285, t = 2.512) and ambidextrous leadership (β = 0.637, t = 6.384) have significant positive effects on sustainable business performance.

Although recent PLS-SEM literature suggests that model fit should primarily be assessed using predictive indicators, the GoF index is reported to provide an overall descriptive measure of model adequacy.

In addition to testing the direct effects, a comparative analysis of standardized path coefficients indicates that ambidextrous leadership (β = 0.637) exerts a substantially stronger influence on sustainable business performance than adaptive management (β = 0.285), providing support for H3. Furthermore, within the ambidextrous leadership construct, closing leadership behaviors demonstrate higher factor loadings and stronger explanatory power than opening behaviors, supporting H4.

3.4. Hypothesis testing

Hypothesis testing was conducted using a bootstrapping procedure with 5,000 resamples. The results are presented in Table 6.

Adaptive management has a positive and statistically significant effect on sustainable business performance (β = 0.285; t = 2.512). Ambidextrous leadership also demonstrates a positive and sta-

Table 5. Evaluation of R-squared value and GoF

Variable	R-Square	Communality	Goodness of Fit (GoF) Index
Adaptive Management	–	0.306	0.422
Ambidextrous Leadership	–	0.310	0.438
Sustainable Business Performance	0.642	0.287	

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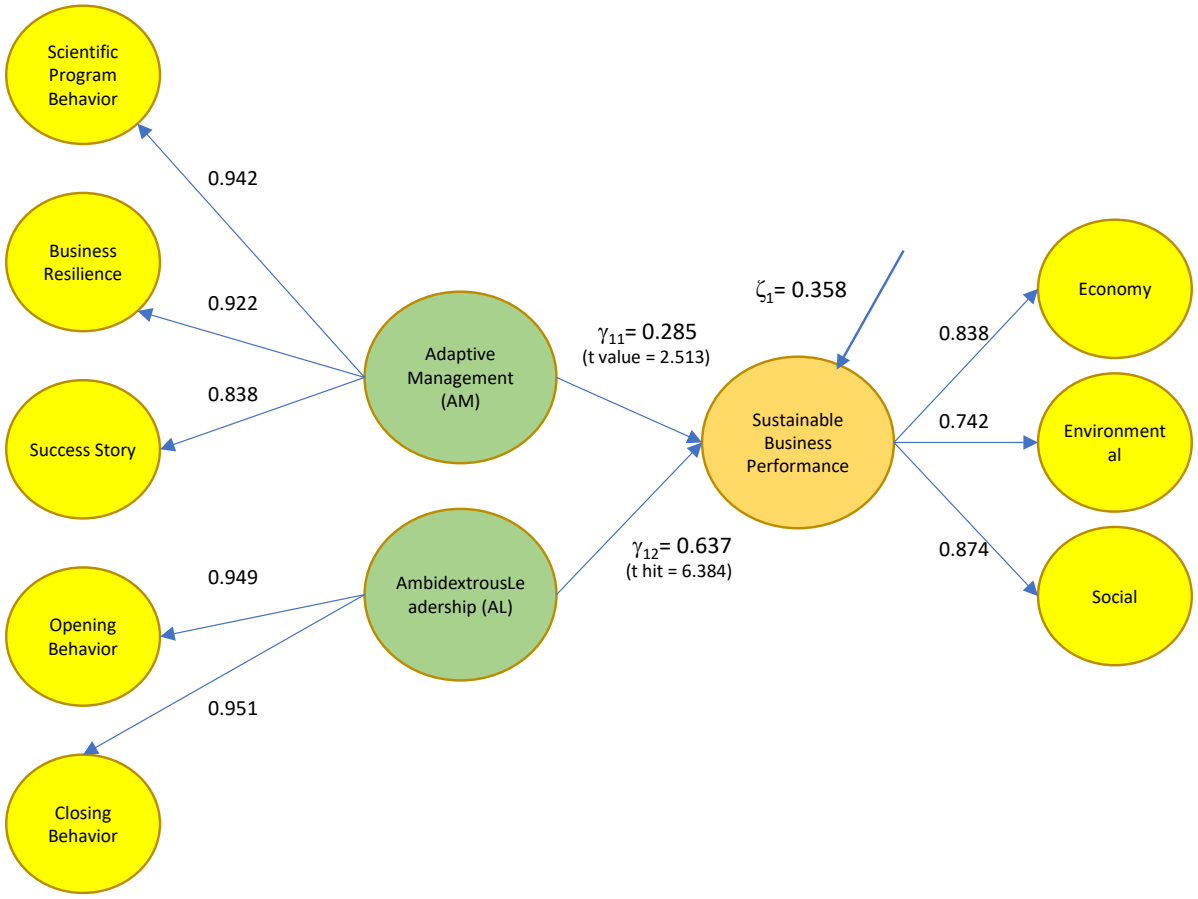

Figure 3. Research findings

Table 6. Hypothesis testing

Hypothesis	Path Coefficients (γ_{ij})	SE (γ_{ij})	t- value	R^2	Conclusion
Adaptive Management → Sustainable Business Performance	0.285	0.113	2.512	0.158	Significant
Ambidextrous Leadership → Sustainable Business Performance	0.637	0.100	6.384	0.483	Significant

tistically significant effect on sustainable business performance (β = 0.637; t = 6.384). Among the two predictors, ambidextrous leadership exhibits a stronger standardized path coefficient. According to Hair et al. (2021), an R^2 value of 0.642 indicates substantial explanatory power, suggesting that the proposed model provides strong predictive capability for sustainable business performance.

The outcomes from the hypothesis testing are visually represented in Figure 3.

4. DISCUSSION

This study examined the influence of adaptive management and ambidextrous leadership on sustainable business performance in Indonesia's telecommunications industry. The results demonstrate that both adaptive management and ambidextrous leadership significantly contribute to sustainable business performance, although ambidextrous leadership appears to exert a stronger influence. These findings provide important insights into how organizations sustain performance in dynamic and technology-intensive environments.

First, the results indicate that adaptive management positively influences sustainable business performance. This finding is consistent with prior research emphasizing the importance of learning-oriented managerial processes in environments characterized by uncertainty and technological disruption. For instance, Reiman et al. (2015) argue that adaptive management enhances orga-

nizational resilience through continuous monitoring, feedback mechanisms, and iterative decision-making. Similarly, Gyemang and Emeagwali (2020) found that adaptive managerial practices improve organizational agility and competitive performance in the telecommunications industry. The findings regarding adaptive management support prior research emphasizing the importance of learning-oriented processes, continuous monitoring, and data-driven decision-making in dynamic environments (Wilke et al., 2019; Pellissier, 2011; Reiman et al., 2015). Consistent with Sundaramoorthy et al. (2022), the findings indicate that adaptive management is most effective when structured, science-based planning mechanisms are complemented by flexible and timely responses to environmental change. The present study supports these arguments by demonstrating that adaptive management enables firms to respond more effectively to changing market conditions, technological developments, and regulatory challenges. In the Indonesian telecommunications context, such adaptive processes appear particularly valuable due to rapid digital transformation and evolving industry structures.

Second, the findings reveal that ambidextrous leadership has a stronger effect on sustainable business performance than adaptive management. This result aligns with prior studies suggesting that leadership behaviors play a central role in translating organizational processes into performance outcomes. Zacher and Rosing (2015) emphasize that ambidextrous leadership enables organizations to simultaneously pursue exploration and exploitation, thereby fostering innovation while maintaining operational efficiency. This finding also aligns with previous studies suggesting that leadership capabilities enabling the simultaneous pursuit of exploration and exploitation are critical for sustaining performance under conditions of uncertainty (Al-Eida, 2020; Kafetzopoulos, 2022; Zacher & Rosing, 2015). Moreover, the inclusion of business resilience as a core component of adaptive management reinforces earlier research highlighting resilience as a critical organizational capability in volatile and technology-intensive environments (Gyemang & Emeagwali, 2020). Empirical research by Kafetzopoulos (2022) and Martínez-Climent et al. (2019) similarly shows that leadership balance between creativity and control enhances organizational performance and resilience. The stronger influence of ambidextrous leadership observed in this study suggests that leadership behaviors may act as a critical mechanism through which adaptive strategies are implemented and operationalized within organizations.

An additional insight emerges from the relative dominance of closing leadership behaviors over opening behaviors. This observation is consistent with prior findings emphasizing the importance of formal coordination and compliance mechanisms in emerging economies (Al-Khawaldeh & Saleh, 2020). While ambidextrous leadership theory highlights the importance of balancing exploration and exploitation, the results indicate that control-oriented leadership behaviors, such as monitoring performance, enforcing rules, and implementing corrective actions appear to exert a stronger influence on sustainable business performance in the Indonesian telecommunications context. This finding partially contrasts with studies conducted in developed economies, where exploratory leadership behaviors often play a dominant role in promoting innovation (Oluwafemi et al., 2020; Guo et al., 2020). One possible explanation is that organizations operating in emerging markets face higher levels of institutional volatility, regulatory complexity, and infrastructure constraints. Under such conditions, structured leadership practices may be particularly important for maintaining operational stability and ensuring consistent performance outcomes.

Furthermore, the results highlight the complementary relationship between adaptive management and ambidextrous leadership. While adaptive management provides the procedural and analytical mechanisms necessary for organizational learning and environmental responsiveness, leadership behaviors shape the implementation of these processes within the organization. This finding supports the argument of Clauss et al. (2019) that organizational performance in turbulent environments depends on the interaction between managerial systems and leadership capabilities. In the telecommunications sector, where technological change, regulatory policies, and competitive pressures continuously reshape industry dynamics, both adaptive managerial processes and balanced leadership practices appear essential for sustaining long-term performance.

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Overall, the findings contribute to the literature in several ways. First, they extend existing research on ambidextrous leadership by demonstrating that the relative importance of exploratory and exploitative leadership behaviors may vary across institutional contexts. Second, the results provide empirical support for the role of adaptive management in enhancing sustainable business performance in technology-intensive industries. Finally, by integrating adaptive management and ambidextrous leadership within a single empirical model, this study offers a more comprehensive explanation of how organizations sustain performance under conditions of rapid environmental change.

This study contributes to the management and leadership literature in three ways. First, it extends adaptive management research by demonstrating its direct influence on sustainable business performance in a technology-intensive industry. Second, the findings provide empirical evidence supporting the importance of ambidextrous leadership in emerging-market contexts, where balancing exploration and exploitation is critical for organizational resilience. Third, by integrating adaptive management and ambidextrous leadership within a single empirical model, the study offers a more comprehensive framework for understanding how organizations sustain performance in dynamic and uncertain environments.

CONCLUSION

This study aimed to examine the effects of adaptive management and ambidextrous leadership on sustainable business performance in Indonesia's telecommunications industry.

The results indicate that both adaptive management and ambidextrous leadership have significant positive effects on sustainable business performance. However, ambidextrous leadership demonstrates a stronger influence, suggesting that leadership behaviors play a critical role in translating adaptive managerial processes into organizational outcomes. In particular, closing leadership behaviors related to monitoring, control, and corrective actions contribute more strongly to sustainable performance than exploratory leadership behaviors.

These findings suggest that telecommunications firms operating in dynamic environments can enhance sustainable business performance by integrating adaptive managerial practices with ambidextrous leadership capabilities.

Despite its contributions, this study has several limitations. The paper uses cross-sectional survey data, which limits causal interpretation. In addition, the sample focuses exclusively on the Indonesian telecommunications industry, which may limit generalizability to other sectors or regions. Future research may employ longitudinal designs or comparative cross-country studies to further examine the relationship between adaptive management, ambidextrous leadership, and sustainable business performance.

Subsequent studies may examine mediating or moderating mechanisms, such as dynamic capabilities, innovation intensity, or organizational culture to further explain how adaptive management and ambidextrous leadership interact over time. Longitudinal or panel data designs would be particularly valuable for capturing sustainability dynamics across different stages of organizational development. Additionally, comparative and multi-country studies, especially within the ASEAN region, could enhance the generalizability of findings.

AUTHOR CONTRIBUTIONS

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APPENDIX A

Table A1. Operationalization of variables

No	Variable	Dimension	Questionnaire Item	Code	Source
1	Adaptive Management	Program Work Approach (Scientific Program)	The company prepares a systematic monitoring plan for work programs	MA01	Reiman et al. (2015)
			The company clearly defines the scope and development of work programs	MA02	Reiman et al. (2015)
			The company continuously monitors the implementation of work programs	MA03	Reiman et al. (2015)
			Management uses data and evidence for decision-making	MA04	Reiman et al. (2015), Salafsky et al. (2002)
			Management evaluates the efficiency and effectiveness of work programs	MA05	Reiman et al. (2015)
		Practical Approach (Business Resilience)	Management appreciates small wins in daily work activities	MA06	Gyemang and Emeagwali (2020)
			Management identifies and utilizes opportunities in daily operational activities	MA07	Gyemang and Emeagwali (2020)
			Management flexibly adjusts priorities according to changing conditions	MA08	Gyemang and Emeagwali (2020), Teece (2018)
			Management builds positive working relationships among employees	MA09	Gyemang and Emeagwali (2020)
		Success Story (Learning from Experience)	Management understands organizational systems and the complexity of relationships within the firm	MA10	Reiman et al. (2015), West et al. (2016)
			Management observes problems carefully and implements appropriate solutions	MA11	Reiman et al. (2015)
			Management learns from previous programs to improve efficiency and effectiveness	MA12	Reiman et al. (2015), Salafsky et al. (2002)
2	Ambidextrous Leadership	Opening Behavior	The leader allows employees to explore alternative ways to complete tasks	AL01	Zacher and Rosing (2015)
			The leader supports employees in trying new ideas	AL02	Zacher and Rosing (2015)
			The leader encourages employees to take calculated risks	AL03	Zacher and Rosing (2015)
			The leader allows employees to think and act independently	AL04	Zacher and Rosing (2015)
			The leader provides space for employees to express opinions and ideas	AL06	Zacher and Rosing (2015)
			The leader tolerates mistakes as part of the learning process	AL07	Zacher and Rosing (2015)
		Closing Behaviors	The leader encourages learning from mistakes to improve performance	AL08	Zacher and Rosing (2015), Klonek et al. (2023)
			The leader monitors and controls the achievement of periodic goals	AL09	Zacher and Rosing (2015), Klonek et al. (2023)
			The leader establishes clear rules and procedures	AL10	Zacher and Rosing (2015), Klonek et al. (2023)
			The leader takes corrective actions when deviations occur	AL11	Zacher and Rosing (2015), Klonek et al. (2023)
			The leader enforces compliance with organizational rules	AL12	Zacher and Rosing (2015), Klonek et al. (2023)
			The leader gives special attention to ensuring task completion	AL13	Zacher and Rosing (2015), Klonek et al. (2023)
			The leader applies sanctions for violations of rules and procedures	AL14	Zacher and Rosing (2015), Klonek et al. (2023)

Table A1 (cont.). Operationalization of variables

No	Variable	Dimension	Questionnaire Item	Code	Source
3	Sustainable Business Performance	Economic Performance	Over the past three years, the company's profit growth has exceeded that of competitors	FP01	Ahmad (2025)
			Over the past three years, the organization has maintained a strong competitive position and market share	FP02	Ahmad (2025)
			The organization achieves consistent revenue and profit growth	FP03	Ahmad (2025)
		Environmental Performance	Over the past three years, the organization has implemented environmentally sustainable practices	FP04	Liao (2022), Hajar et al. (2022)
		Social Performance	Over the past three years, the organization has prioritized employee satisfaction and well-being	FP05	Ahmad (2025), Hajar et al. (2022)
			Over the past three years, the organization has actively contributed to social responsibility initiatives	FP06	Ahmad (2025), Hajar et al. (2022)

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