

THE ROLE OF DYNAMIC CAPABILITY IN IMPROVING SUSTAINABLE PERFORMANCE: MEDIATION OF ENVIRONMENTAL SOCIAL GOVERNANCE (ESG) STRATEGY IN PALM OIL COMPANIES IN MEDAN

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Abstract

This study investigates the role of dynamic capabilities, specifically absorptive capability and adaptive capability, in enhancing sustainable performance, with Environmental, Social, and Governance (ESG) strategy as a mediating variable. Using an empirical approach, data were collected from 100 employees of palm oil companies operating in Medan, Indonesia, through a full sampling method. Data analysis was conducted using SPSS for descriptive statistics and SmartPLS for Partial Least Squares Structural Equation Modeling (PLS-SEM). The results confirm the significance of all five hypothesized relationships, indicating that both absorptive capability and adaptive capability have a positive effect on sustainable performance, with ESG strategy serving as a mediating variable. Among the two capabilities, adaptive capability has the strongest direct and indirect influence, while absorptive capability shows the weakest effect. These findings provide empirical support for the dynamic capability framework and confirm the validity and reliability of the measurement instruments used. This study contributes to the literature on sustainable business practices in emerging markets, particularly within resource-based industries. Additionally, it offers practical implications for corporate managers, policymakers, and stakeholders by highlighting the strategic value of enhancing dynamic capabilities to drive ESG integration and long-term sustainable performance.

Keywords: *Absorptive Capability, Adaptive Capability, ESG Strategy, Palm Oil Companies, Sustainable Performance.*

INTRODUCTION

In the last decade, the concept of Sustainability Performance (SP) has become a major focus for corporations worldwide (Rahi et al., 2023). SP not only evaluates financial success but also incorporates environmental and social impacts of business operations. This approach ensures companies do not merely chase short-term profits but also prioritize long-term ecological and social balance. SP involves strategies that balance economic, environmental, and social sustainability within corporate frameworks. These three pillars must be managed simultaneously to achieve true sustainability. Corporations are increasingly pressured to reduce carbon emissions and manage resources more efficiently (Bag et al., 2020). Across different countries, SP implementation varies according to local priorities and challenges. In Canada, SP focuses on renewable energy development and energy-efficient practices across industrial and household sectors. Meanwhile, China promotes smart and green urban development to enhance urban living standards (Iqbal et al., 2020). In Indonesia, SP initiatives emphasize biodiversity conservation and public health, reflecting its status as the world's largest archipelagic country. The palm oil industry in Indonesia plays a significant role in advancing sustainable development. Many palm oil corporations strive to obtain RSPO certification to align with global standards of sustainable production (Makhloufi et al., 2024).

Table 1 Composition of CPO Production in Indonesia

Province	Percentage (%)	Province	Percentage (%)
Riau	20	West Sulawesi	1
Central Kalimantan	17	Central Sulawesi	1
North Sumatra	13	Papua	1
South Sumatra	9	North Kalimantan	1
East Kalimantan	9	Southeast Sulawesi	0
West Kalimantan	7	South Sulawesi	0
Jambi	6	West Papua	0
South Kalimantan	3	West Java	0
West Sumatra	3	Banten	0
Bengkulu	2	Riau Islands	0
Aceh	2	Maluku	0
Bangka Belitung	2	Gorontalo	0
Lampung	1		

Source: Indonesian Central Bureau of Statistics (BPS), Palm Oil Industry

Sustainability certification, such as RSPO, is designed to ensure that palm oil production adheres to environmental and social standards (Jespersen et al., 2024). RSPO includes various stakeholders such as producers, NGOs, consumers, and governments. The goal is to promote the use of sustainable palm oil through credible global standards (Majid et al., 2021). Palm oil remains the leading certified vegetable oil, far ahead of others like soybean or sunflower oil. However, most vegetable oils still lack sustainability certifications, which indicates a gap in global agricultural practices. This situation emphasizes the need for expanded certification across multiple commodities.

Table 2 Sustainable Certification of Vegetable Oils

Types of Vegetable Oils	Do Not Have Sustainable Certification	Sustainable Certified	Sub Total
Palm Oil	56.6	18.9	75.5
Soybean	61.3	0	61.3
Rapeseed	27.9	0	27.9
Sunflower	22.1	0	22.1
Palm Kernel	4.5	4.2	8.7
Beans	6.5	0	6.5
Cotton	5.2	0	5.2
Coconut	3.6	0	3.6
Olive	2.8	0	2.8
Total	190.52	23.08	213.6

Source: Indonesian Central Bureau of Statistics (BPS), Palm Oil Industry

To measure SP, this research adopts the Dynamic Capability (DC) theory introduced by Teece, Pisano, and Shuen (1997). DC refers to a firm's ability to integrate, build, and reconfigure internal and external competences in response to rapidly changing environments. Two key components of DC are Absorptive Capability (ABC) and Adaptive Capability (ADC). ABC enhances a firm's ability to innovate, adopt eco-friendly technologies, and manage waste effectively (Kazancoglu et al., 2022). Meanwhile, ADC enables firms to comply swiftly with regulations and supports sustainable product and process innovation (Yang et al., 2023). Together, ABC and ADC form a dynamic framework for corporate sustainability transformation.

LITERATURE REVIEW

Dynamic Capability (DC)

Dynamic Capability (DC) theory, introduced by Teece, Pisano, and Shuen (1997), emphasizes a firm's ability to adapt, integrate, and reconfigure internal and external competencies in response to rapid environmental changes. It focuses on strategic actions for innovation and renewal, rather than simply maintaining routine operations. DC is comprised of three core components: sensing opportunities and threats, seizing them through innovation and resource allocation, and reconfiguring resources to maintain competitiveness. Sensing includes market monitoring and competitor analysis, while seizing involves decision-making and innovation execution. Reconfiguring demands organizational restructuring and core competence revitalization (Teece et al., 1997). These dynamic capabilities are essential for long-term competitiveness in unstable business environments. They differ from operational capabilities which focus more on efficiency than adaptability (Herold et al., 2023).

In this research, DC provides the theoretical foundation to understand how Absorptive Capability (ABC) and Adaptive Capability (ADC) influence Sustainability Performance (SP). ABC refers to the firm's ability to acquire and apply external knowledge, while ADC emphasizes rapid adaptation and internal resource adjustment. These capabilities support innovation, strategic flexibility, and environmental responsiveness. Firms equipped with strong DCs are better prepared to address environmental and social changes effectively. DC helps companies sustain performance by building resilience and proactive responsiveness (Chirumalla et al., 2023). Understanding the mechanics of DC thus enables a clearer pathway for achieving outstanding and sustainable performance. The framework of this study builds upon Teece's (2023) conceptual model linking macro-environmental sensing to competitive advantage (Bari et al., 2022).

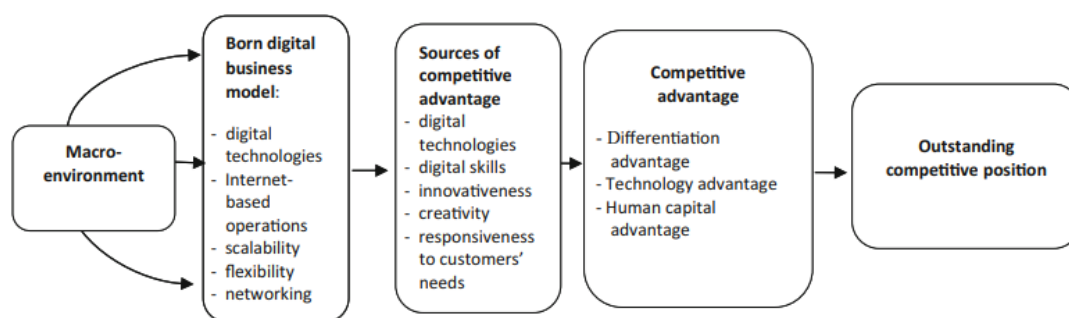


Figure 1 Conceptual Framework
(Source: Teece, 2023)

Absorptive Capability (ABC)

Absorptive Capability (ABC) is the firm's competence in identifying, assimilating, transforming, and applying external knowledge for commercial purposes. It enables organizations to innovate, adapt, and gain competitive advantage in dynamic markets (Cuellar et al., 2024). The ABC process begins with knowledge acquisition, followed by assimilation through internal analysis and integration. This knowledge is then transformed to create new insights and innovations, and finally exploited in operations or product development. These steps allow firms to respond effectively to environmental shifts and emerging trends. ABC thus serves as a critical mechanism for learning and innovation. Proper management of ABC strengthens firms' agility and knowledge-based competitiveness (Putz & Werner, 2024).

ABC is essential for fostering innovation, improving efficiency, and enhancing responsiveness to change. It helps companies develop new offerings, lower operational costs, and maintain relevance amid rapid industry shifts. To strengthen ABC, firms must invest in R&D, develop human resources, and enhance IT infrastructure. Skilled personnel are needed to process and apply knowledge effectively, while IT systems support knowledge distribution and storage. A strong ABC directly contributes to improved sustainability performance by leveraging external knowledge for strategic gains. This study identifies ABC as a dynamic capability essential to sustainable corporate transformation (Bedoya et al., 2023). Building and sustaining ABC is therefore a strategic priority for companies seeking long-term success (Hoessler & Carbon, 2024).

Adaptive Capability (ADC)

Adaptive Capability (ADC) refers to a corporation's ability to respond and adjust to external environmental changes quickly and effectively. It emphasizes organizational agility and flexibility in navigating shifts in markets, technology, and regulations (Weidner, Nakata & Zhu, 2019). ADC includes the capability to detect changes, interpret their implications, and revise strategies accordingly. By monitoring the environment effectively, firms can identify

early signs of disruption and proactively prepare responses. Corporations also need to analyze external information critically to make informed strategic decisions. Managers must interpret data insights thoroughly to ensure the organization adapts accurately and in time. This ensures business continuity and prepares the firm to act on emerging opportunities.

ADC also involves executing change effectively by realigning organizational structures and business processes. It includes introducing new products, diversifying markets, and adopting technologies to keep pace with environmental shifts (Hansson & Abrantes, 2023). Organizational learning is crucial, allowing firms to reflect on past experiences and improve future responses. Companies with a strong learning culture can adjust more efficiently to change. A robust ADC offers competitive advantage as it enhances responsiveness and resilience. This ability enables firms to stay relevant and outperform competitors in fast-evolving markets. In this study, ADC acts as a dynamic capability influencing Sustainable Performance (SP) by enabling strategic flexibility (Kuo, 2024). It empowers corporations to adapt and sustain superior performance amidst continuous change.

Sustainable Performance (SP)

Sustainable Performance (SP) integrates economic, environmental, and social dimensions to evaluate long-term corporate success. Unlike traditional performance models, SP emphasizes corporate responsibility toward society and the environment alongside financial profitability (Fosso et al., 2024). Economically, SP focuses on profitability and growth while ensuring efficient resource use, cost reduction, and long-term value creation. It emphasizes responsible profit generation through innovative products and effective operations (Kamble et al., 2020). Environmentally, SP encourages practices such as reducing emissions, using renewable energy, and effective waste management. Companies with strong environmental focus aim to minimize ecological footprints. This creates environmentally sustainable operations aligned with modern stakeholder expectations.

Socially, SP involves fair treatment of employees, safe work environments, respect for human rights, and positive community contributions. Corporations benefit from increased trust and loyalty from stakeholders by embracing SP principles (Kamble et al., 2020). Implementing SP also helps manage risks linked to environmental and social regulations. This can reduce legal liabilities and enhance the company's reputation as a responsible organization. In this research, SP serves as a mediating variable that connects Absorptive and Adaptive Capabilities to performance outcomes (Iqbal et al., 2020). It allows firms to align strategic and operational shifts with long-term sustainability objectives. SP not only supports long-term profitability but also creates shared value for all stakeholders.

Environmental, Social, and Governance (ESG Strategy)

ESG Strategy involves incorporating environmental, social, and governance factors into a company's core business strategy. This approach has gained prominence as firms and investors recognize the impact of non-financial factors on long-term performance (Fang, Nie & Shen, 2023). The environmental component includes efforts to minimize carbon emissions, manage waste, use energy efficiently, and protect natural resources. Companies that prioritize the environment commit to sustainable and eco-friendly operations. The social aspect addresses employee welfare, diversity, workplace safety, and community engagement. It ensures companies provide social value and maintain positive stakeholder relationships. The governance aspect ensures transparency, ethical leadership, and effective risk management. Governance includes strong leadership, anti-corruption policies, shareholder rights protection, and accountability frameworks. An effective ESG strategy enhances a firm's reputation and stakeholder trust. It also mitigates risks from regulatory changes and environmental pressures. ESG helps firms stay resilient and competitive in shifting external conditions. Over time, ESG practices contribute to increased profitability and operational sustainability (Fang, Nie & Shen, 2023). Firms that adopt ESG strategies are often better positioned to seize future growth opportunities. This strategic integration makes ESG a critical tool for long-term success and corporate responsibility.

METHOD

This study employed a quantitative approach using a survey method by distributing questionnaires developed based on the research variables. The questionnaire utilized a 5-point Likert scale to measure the level of respondents' agreement with each statement. The research is cross-sectional in nature, meaning it was conducted at a single point in time to capture the current phenomenon. The population consists of 20 palm oil companies headquartered in Medan, each represented by five respondents from managerial positions. A total of 100 respondents were involved, selected through a full sampling method due to the limited number of companies, allowing comprehensive data

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collection from the entire population. An ordinal scale was used to capture respondent perceptions more specifically and systematically. This measurement approach ensures clearer insights into the variables under investigation.

Table 3 List of companies that are research samples

No	Company	Respondents	No	Company	Respondents
1	PT PP London Sumatra	5	11	PT Perkebunan Milano	5
2	PT Perkebunan Nusantara IV	5	12	PT Tolan tiga indonesia	5
3	Permata Hijau Group	5	13	PT Musim Mas Group	5
4	PT Indra Angkola Group	5	14	PT Buana Sawit Indah	5
5	PT Wilmar Nabati Indonesia	5	15	PT Anglo Eastern Plantations	5
6	PT Sumber Tani Agung Resources Tbk	5	16	PT Megah Pusaka Andalas	5
7	PT Naga Mas Agro Mulia	5	17	PT Bukit Tangga Lima	5
8	PT Perkebunan Nusantara III	5	18	PT Perkebunan Inti Sawit Subur	5
9	PT Asian Agri Group	5	19	PT Tara Bintang Nusa	5
10	PT Socfin Indonesia	5	20	PT Nubika Jaya	5
		Number of companies			20
		Number of respondents for each company			5
		Number of respondents			100

Source: North Sumatra Central Statistics Agency Palm oil corporation headquartered in Medan City

Data collection was conducted online using Google Forms to save time and cost while adapting to respondents' availability. The data obtained are primary data collected directly from selected palm oil companies in Medan. The questionnaire format was chosen for its ability to deliver consistent questions and simplify data processing. The use of a digital platform facilitated real-time and accurate data management. All respondents answered independently based on the provided scale options. The collected data were analyzed using statistical methods with the assistance of SMART-PLS software. This technique helped examine the relationships among variables and draw relevant conclusions regarding the factors influencing sustainable performance in the palm oil sector.

RESULTS AND DISCUSSION

Respondent Demographic Profile

The demographic profile of the 100 respondents participating in this research provides valuable insight into the workforce involved in corporate sustainability efforts, particularly ESG (Environmental, Social, and Governance) strategy implementation. The gender distribution is relatively balanced, with 51% male and 49% female respondents. Education levels are equally split between Bachelor's (S1) and Master's (S2) degree holders, indicating a well-educated group with potential for in-depth understanding of the research topics. Most respondents fall within the productive age group of 35–44 years (61%), followed by 25–34 years (29%), and 45–54 years (10%). In terms of work experience, 37% of respondents have 7–10 years of experience, while 28% have 4–6 years, 21% have 1–3 years, and only 10% have more than 10 years. The respondents primarily occupy managerial (64%) and supervisory (35%) positions, with just 1% working as staff. All respondents are permanent employees, work predominantly in headquarters (99%), and are directly involved in ESG strategy implementation (100%).

Table 4 Respondent Demographic Profile Summary

Characteristic	Category	Frequency	Percentage
Gender	Male	51	51%

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	Female	49	49%
Education	Bachelor (S1)	50	50%
	Master (S2)	50	50%
Age	25–34 years	29	29%
	35–44 years	61	61%
	45–54 years	10	10%
Work Experience	1–3 years	21	21%
	4–6 years	28	28%
	7–10 years	37	37%
	>10 years	10	10%
Position	Manager	64	64%
	Supervisor	35	35%
	Staff	1	1%
Employment Status	Permanent	100	100%
Office/Plant Location	Head Office	99	99%
	Plantation	1	1%
ESG Involvement	Involved	100	100%

This demographic composition illustrates a highly experienced, educated, and strategically positioned respondent group directly contributing to ESG initiatives. The dominance of managers and supervisors ensures the insights gathered reflect organizational decision-making perspectives. The exclusive involvement of permanent employees and ESG-focused staff strengthens the credibility and relevance of the data. The overwhelming concentration of respondents from headquarters suggests a central administrative viewpoint, although the minimal representation from plantations still offers a glimpse into field-level perspectives. Overall, the balanced gender ratio and academic qualifications contribute to a well-rounded and representative dataset for analyzing ESG strategy effectiveness.

Structural Equation Modeling-Partial Least Square (SEM-PLS) Analysis

Data processing in this research was carried out using SmartPLS 3.0 software, with one type of model applied simultaneously. All variables, namely absorptive capability, adaptive capability, ESG strategy, and sustainable performance, were analyzed using a reflective model. In this research, the reflective model was applied to all variables mentioned. The SEM-PLS analysis process was carried out by applying a method that is in accordance with the characteristics of the data used. The research model used can be seen in Figure 2.

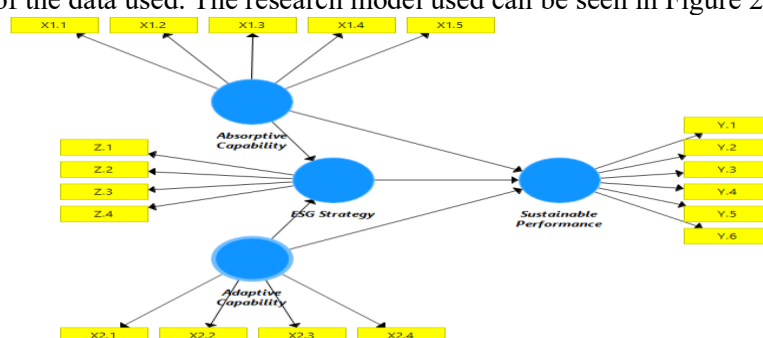


Figure 2 PLS-SEM Statistical Model

Outer Model Evaluation (Measurement Model)

To meet the validity requirements, each variable indicator must have an outer loading value of more than 0.7. The outer loading values in each indicator in the construct are presented in Table 5 and Figure 3. In this construct, each indicator is analyzed based on the specified outer loading value. The validation process is carried out by ensuring that the outer loading value meets the specified limits. Further information regarding these values can be seen in the tables and figures provided.

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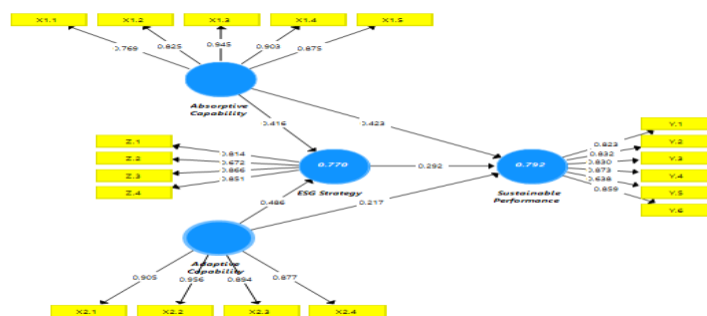


Figure 3 PLS-SEM Measurement Model

Based on the results of construct reliability and validity analysis, all variables demonstrated good internal consistency, with Cronbach's alpha values exceeding 0.7. The highest Cronbach's alpha was recorded for ADC (0.929), while the lowest was for ESG Strategy (0.817). Similarly, rho_A values were high, with ADC reaching 0.932, indicating strong reliability. Composite reliability values for all four variables were also above 0.7, with ADC achieving the highest at 0.950. Construct validity, measured through Average Variance Extracted (AVE), showed values above the 0.5 threshold for all variables—ADC again scoring the highest (0.825) and ESG Strategy the lowest (0.647), yet still acceptable. These results confirm that the research instrument meets the required standards of reliability and convergent validity for further analysis.

Table 5 Construct Reliability and Validity

Variabel	Cronbach's Alpha	rho_Alpha	Composite Reliability	Average Variance Extracted (AVE)
Absorptive capability	0.915	0.923	0.937	0.749
Adaptive Capability	0.929	0.932	0.950	0.825
ESG Strategy	0.817	0.838	0.879	0.647
Sustainable Performance	0.896	0.907	0.921	0.661

Table 6. presents the results of the Fornell-Larcker discriminant validity test, which confirms that discriminant validity is achieved, as the square root of AVE for each construct is greater than its correlations with other constructs. For example, ABC has a diagonal value of 0.865, exceeding its correlations with ADC (0.889), ESG Strategy (0.849), and SP (0.863). Similarly, SP's AVE value of 0.813 is higher than its correlations with other constructs. This indicates that each construct more strongly measures its own variable than others within the model. Furthermore, all outer loading values exceed 0.7, and all AVE values are above the recommended threshold of 0.5, confirming that the model meets the required discriminant and convergent validity for further analysis.

Table 6 Discriminant Validity with Fornell & Larcker Approach

Variabel	Absorptive capability	Adaptive Capability	ESG Strategy	Sustainable Performance
Absorptive capability	0.865			
Adaptive Capability	0.889	0.908		
ESG Strategy	0.849	0.857	0.804	
Sustainable Performance	0.863	0.843	0.837	0.813

Collinearity evaluation is carried out in testing the presence or absence of correlation or strong correlation between SP (Y) indicators (Beldiq et al., 2020). Based on Beldiq et al., (2020), the tolerance value should be more than 0.2, while the VIF value should be less than 5. In table 5.16, it can be seen that the organizational performance indicators do not experience collinearity problems. All VIF values found are below 5. This information is presented in more detail in table 7.

Table 7 Collinearity evaluation (VIF)

Variabel	VIF	Variabel	VIF
X1.1	1.956	Y.1	2.748

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X1.2	2.428	Y.2	2.809
X1.3	4.593	Y.3	2.394
X1.4	3.833	Y.4	3.217
X1.5	3.213	Y.5	1.843
X2.1	3.793	Y.6	3.117
X2.2	4.713	Z.1	1.672
X2.3	3.201	Z.2	1.390
X2.4	2.703	Z.3	2.320
		Z.4	2.170

The outer weight evaluation showed that all indicators had non-significant p-values (above 0.05). However, following Beldiq et al. (2017), indicators with outer loadings > 0.5 can still be retained. Since all outer loadings exceeded 0.5, all indicators were kept for further analysis, as summarized in Table 8.

Table 8 Outer loading evaluation

Variable	Outer loading	Variable	Outer loading
X1.1	0.769	Y.1	0.823
X1.2	0.825	Y.2	0.832
X1.3	0.945	Y.3	0.830
X1.4	0.903	Y.4	0.873
X1.5	0.875	Y.5	0.638
X2.1	0.905	Y.6	0.859
X2.2	0.956	Z.1	0.814
X2.3	0.894	Z.2	0.672
X2.4	0.877	Z.3	0.866
		Z.4	0.851

Inner Model Evaluation (Structural Model)

This section presents the results of the significance test (bootstrapping), which assesses how well each measurement item represents its variable. The analysis revealed that ABC (X1) significantly influences ESG strategy (Z) and Sustainable Performance (Y) with coefficients of 0.416 ($p = 0.009$) and 0.423 ($p = 0.002$), respectively. ADC (X2) also showed a significant positive effect on ESG strategy (Z) with a coefficient of 0.486 ($p = 0.002$) and on SP (Y) with 0.217 ($p = 0.041$). Additionally, ESG strategy (Z) significantly affects SP (Y) with a coefficient of 0.292 ($p = 0.020$).

Table 9 Path Coefficient Test and Significance of Direct Effect

Variabel	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Absorptive capability → ESG Strategy	0.416	0.439	0.158	2.642	0.009
Absorptive capability → Sustainable Performance	0.423	0.440	0.134	3.159	0.002
Adaptive Capability → ESG Strategy	0.486	0.465	0.155	3.134	0.002
Adaptive Capability → Sustainable Performance	0.217	0.201	0.106	2.052	0.041
ESG Strategy → Sustainable Performance	0.292	0.291	0.125	2.341	0.020

Based on the analysis presented in the table, the R square value for the ESG strategy variable is 0.770, indicating that 77% of the variability in ESG strategy can be explained by the independent variables in the model. The adjusted R square value for ESG strategy is 0.765, reflecting a refined model fit by accounting for the number of predictors. Meanwhile, the R square value for Sustainable Performance (SP) is 0.792, meaning that 79.2% of the variation in SP is explained by the model, with an adjusted R square of 0.786. This demonstrates that the model has strong explanatory power for the relationships among the studied variables.

Table 10 R-Square

Variabel	R Square	R Square Adjusted
ESG Strategy	0.770	0.765
Sustainable Performance	0.792	0.786

Based on the analysis in Table 11, the structural model's goodness of fit was assessed using the predictive relevance (Q^2) value. The Q^2 for the ESG strategy variable is 0.755, indicating a strong predictive ability of the model for this construct. Similarly, the Q^2 value for Sustainable Performance (SP) is also 0.755, meaning that over 50% of the variation in SP can be predicted by the model. These positive Q^2 values confirm that the model demonstrates good predictive relevance in explaining the relationships among variables, supporting its overall structural fit.

Table 11 Q-square

Variabel	RMSE	MAE	Q^2_{predict}
ESG Strategy	0.511	0.368	0.755
Sustainable Performance	0.511	0.358	0.755

The f-square values are categorized into three levels: 0.02 (small), 0.15 (moderate), and 0.35 (large) effects (Beldiq et al., 2021). The analysis shows that ABC (X1) has a moderate effect on ESG strategy (Z) with an f-square of 0.157, suggesting its important but partial role in supporting ESG implementation. ABC also has a moderate influence on Sustainable Performance (SP) with an f-square of 0.155, indicating a meaningful contribution without being dominant. ADC (X2) demonstrates the strongest impact on ESG strategy with an f-square of 0.215, highlighting the value of adaptive capabilities in forming effective ESG strategies. However, its influence on SP is low (f-square = 0.039), implying limited direct contribution without support from other variables. Finally, ESG strategy (Z) has a small effect on SP with an f-square of 0.094, suggesting the need for better ESG integration and support from both absorptive and adaptive capabilities to significantly enhance sustainable performance.

Table 12 Effect Size (f^2)

Variabel	$f\text{-square}$
X1 → Z	0,157
X1 → Y	0,155
X2 → Z	0,215
X2 → Y	0,039
Z → Y	0,094

One of the criteria for assessing the goodness of fit (GoF) is the standardized root mean square residual (SRMR). A model is considered to have acceptable fit if $SRMR < 0.10$, and a perfect fit if $SRMR < 0.08$, while values > 0.10 indicate poor fit and the need for model improvement (Beldiq et al., 2024; Al Mazroui, 2024). In this study, the SRMR value is 0.070, indicating that the model demonstrates a good fit (perfect fit) with the empirical data, as shown in Table 13.

Table 13 GoF Test Based on SRMR

	Saturated model	Estimated model
SRMR	0.070	0.070
d_{ULS}	0.933	0.933
d_{G}	0.794	0.794
Chi-Square	411.990	411.990
NFI	0.791	0.791

Discussion

The study tested five hypotheses, all of which were supported by the data. The findings showed that Absorptive Capability (ABC) had a positive and significant effect on both ESG Strategy and Sustainable Performance (SP). This

implies that corporations with strong ABC are more capable of integrating sustainability trends into their strategies and achieving better performance outcomes. The findings align with the Dynamic Capability (DC) theory, emphasizing how knowledge absorption enhances innovation and operational efficiency. Respondents' backgrounds primarily managerial-level employees with high education and work experience strengthened the results, indicating their readiness to implement ESG effectively. These insights reinforce previous studies confirming the link between ABC and ESG outcomes.

Adaptive Capability (ADC) also showed a significant and positive impact on ESG Strategy and SP. Organizations with high adaptability are better positioned to navigate environmental changes and integrate sustainability into their operations. This was consistent with the DC theory that highlights the importance of organizational agility in achieving long-term performance. Most respondents held strategic roles with significant tenure, indicating they possessed the adaptive skills needed to support ESG implementation. Their educational background and age range (mostly 35–44 years old) further validated their competence. These factors combined to demonstrate ADC's role in enabling sustainable growth in palm oil companies.

Finally, ESG Strategy significantly influenced Sustainable Performance, suggesting that well-implemented ESG practices can lead to long-term value creation, risk reduction, and improved operational outcomes. This relationship was reinforced by respondent profiles mainly permanent employees involved in ESG, working at headquarters, and highly educated. The findings are consistent with earlier studies that recognized ESG integration as a driver of sustainable success. The study thus highlights the interconnectedness of ABC, ADC, and ESG Strategy in shaping corporate sustainability outcomes. Altogether, these results offer strong empirical support for applying the DC framework in the palm oil industry context.

CONCLUSION

This study analyzes the influence of Absorptive Capability (ABC) and Adaptive Capability (ADC) on Sustainable Performance (SP), with ESG strategy as a mediating variable, in palm oil corporations in Medan using the PLS-SEM method. The results indicate that both ABC and ADC significantly affect SP through ESG strategy, with ADC showing the strongest impact on ESG but the weakest direct effect on SP, highlighting the crucial role of ESG as a mediator. Theoretically, this research extends the application of Dynamic Capability theory within the Indonesian palm oil industry. Practically, it emphasizes the importance of strengthening ESG strategies to enhance corporate readiness in facing sustainability challenges. The findings are also relevant for policymakers in designing regulations or incentives that promote corporate environmental responsibility, social sustainability, and industry competitiveness. Thus, the study contributes not only to academic knowledge and managerial practices but also to the development of a more sustainable industrial sector in Indonesia.

REFERENCES

- Bag, Subrata, et al. "Big data analytics as an operational excellence approach to enhance sustainable supply chain performance." *Resources, Conservation and Recycling*, vol. 153, 2020, p. 104559. <https://doi.org/10.1016/j.resconrec.2019.104559>.
- Bari, Nasir, et al. "Dynamic capabilities to achieve corporate sustainability: a roadmap to sustained competitive advantage." *Sustainability*, vol. 14, no. 3, 2022, p. 1531. <https://doi.org/10.3390/su14031531>.
- Bedoya-Villa, Mario, et al. "The effects of dynamic absorptive capacity on innovation strategy: Evidence from SMEs in a technological context." *Mathematics*, vol. 11, no. 10, 2023, p. 2366. <https://doi.org/10.3390/math11102366>.
- Chirumalla, Koteswar, et al. "Moving from servitization to digital servitization: Identifying the required dynamic capabilities and related microfoundations to facilitate the transition." *Journal of Business Research*, vol. 158, 2023, p. 113668. <https://doi.org/10.1016/j.jbusres.2023.113668>.
- Cuéllar, Sandra, et al. "Convergence between absorptive capacity and knowledge appropriation: A new methodology Mapping the hidden links." *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 10, no. 1, 2024, p. 100170. <https://doi.org/10.3390/joitmc100100170>.

- Fang, Min, et al. "Can enterprise digitization improve ESG performance?" *Economic Modelling*, vol. 118, 2023, p. 106101. <https://doi.org/10.1016/j.econmod.2023.106101>.
- Hansson, Christoffer, and Bruno F. Abrantes. "Strategic Adaption (Capabilities) and the Responsiveness to COVID-19's Business Environmental Threats." *Essentials on Dynamic Capabilities for a Contemporary World: Recent Advances and Case Studies*, Springer Nature Switzerland, 2023, pp. 1–23. https://doi.org/10.1007/978-3-031-20482-6_1.
- Herold, Sabine, et al. "Dynamic capabilities for digital procurement transformation: a systematic literature review." *International Journal of Physical Distribution & Logistics Management*, vol. 53, no. 4, 2023, pp. 424–447. <https://doi.org/10.1108/IJPDLM-09-2022-0461>.
- Hoessler, Sebastian, and Claus-Christian Carbon. "Digital transformation in incumbent companies: a qualitative study on exploration and exploitation activities in innovation." *Journal of Innovation and Entrepreneurship*, vol. 13, no. 1, 2024, p. 46. <https://doi.org/10.1186/s13731-023-00319-0>.
- Iqbal, Qamar, et al. "A moderated-mediation analysis of psychological empowerment: Sustainable leadership and sustainable performance." *Journal of Cleaner Production*, vol. 262, 2020, p. 121429. <https://doi.org/10.1016/j.jclepro.2020.121429>.
- Kamble, Sachin S., et al. "Achieving sustainable performance in a data-driven agriculture supply chain: A review for research and applications." *International Journal of Production Economics*, vol. 219, 2020, pp. 179–194. <https://doi.org/10.1016/j.ijpe.2019.05.022>.
- Kazancoglu, Yigit, et al. "Role of flexibility, agility and responsiveness for sustainable supply chain resilience during COVID-19." *Journal of Cleaner Production*, vol. 362, 2022, p. 132431. <https://doi.org/10.1016/j.jclepro.2022.132431>.
- Kuo, Su-Yen. "Improving innovation performance through learning capability and adaptive capability: The moderating role of big data analytics." *Knowledge Management Research & Practice*, vol. 22, no. 4, 2024, pp. 364–376. <https://doi.org/10.1080/14778238.2024.1817125>.
- Makhloufi, Latifa, et al. "Mediation-moderation model of green absorptive capacity and green entrepreneurship orientation for corporate environmental performance." *Management of Environmental Quality: An International Journal*, vol. 35, no. 1, 2024, pp. 139–157. <https://doi.org/10.1108/MEQ-06-2023-0356>.
- Pütz, Laura, and Annette Werner. "Absorptive capacity in family firms: a systematic literature review." *Review of Managerial Science*, vol. 18, no. 2, 2024, pp. 577–632. <https://doi.org/10.1007/s11846-023-00457-1>.
- Rahi, Abdul Farhan, et al. "Corporate sustainability and financial performance: A hybrid literature review." *Corporate Social Responsibility and Environmental Management*, vol. 31, no. 2, 2024, pp. 801–815. <https://doi.org/10.1002/csr.2445>.
- Teece, David J. "The evolution of the dynamic capabilities framework." *Artificiality and Sustainability in Entrepreneurship*, Springer, 2023, p. 113. https://doi.org/10.1007/978-3-030-45579-0_10.
- Weidner, Kristin L., et al. "Sustainable Innovation: An Adaptive Capabilities Approach to Understanding its Antecedents and Consequences: An Abstract." *Finding New Ways to Engage and Satisfy Global Customers*, Springer International Publishing, 2019, p. 103.
- Yang, Min, et al. "Leadership, capability and performance: A study among private higher education institutions in Indonesia." *Heliyon*, vol. 9, no. 1, 2023, e12983. <https://doi.org/10.1016/j.heliyon.2023.e12983>.