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GREEN SUPPLY CHAIN MANAGEMENT AS DRIVERS OF SUSTAINABLE PERFORMANCE: A STUDY OF SMES IN EAST JAVA

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Abstract

This research used a survey technique to investigate the beneficial impact of green supply chain management methods on the economic performance of SMEs in East Java. The study examines the exemplary leaders and managers of MSMEs. We conduct sampling using the purposive sampling approach. The structural equation modeling (SEM) method is used as the data analysis tool. The study results indicate that green buying positively influences investment recovery and improves the performance of SMEs. Likewise, Eco-Design demonstrates a positive influence on investment recovery, hence augmenting its effect on the performance of SMEs. Moreover, investment recovery improves the performance of SMEs by maximizing asset usage and operational efficiency. This study underscores the beneficial effects of green buying and eco-design on the economic performance of SMEs, demonstrating their potential to provide higher investment returns and improved operational efficiency. Investment recovery serves as a mediating variable between sustainable practices and corporate results, highlighting the possibility for development and success in this domain.

Keywords: *Green Purchasing, Eco-Design, Investment Recovery, SME's Performance*

1. INTRODUCTION

Business stakeholders such as consumers, communities, and governments are now starting to pay attention to environmental sustainability issues. Companies are also required to develop environmentally friendly programs in their processes and produce green products (Chiou et al., 2011; Tseng et al., 2022; Wang et al., 2022; Yung et al., 2011). The use of conventional processes in business activities generally has an impact on environmental sustainability. Production waste combustion gases, air pollution, use of hazardous materials, and increased production waste can all contribute to environmental damage (Zhang et al., 2022). This can certainly cause challenges to business sustainability and uncertainty. Implementing practices that emphasize environmental aspects in business processes is essential in winning market competition and ultimately has an impact on economic performance (Novitasari et al., 2023). Companies can excel over their competitors if they are able to create specific, durable differentiating factors that can later improve performance. Performance achievement is certainly very necessary for all companies, especially MSMEs (Solikahan & Mohammad, 2019).

MSMEs play a central role in improving the Indonesian economy (Rinaldi et al., 2022). MSMEs are able to contribute up to 40% to a country's national income (GDP) while also contributing to creating new jobs and economic development globally (Félix, 2022). MSMEs have strong resilience in driving the economy, even in extreme conditions (Aisjah & Prabandari, 2021). It is impossible to separate MSMEs' success in surviving and adapting to crisis situations from their capital structure model, which still relies 73% on personal capital (Niode, 2009). The ability of

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MSMEs to adapt to environmental changes makes them productive business units and contributes to the macro and micro economies in Indonesia (Surachman et al., 2024; Tumiwa & Nagy, 2021). MSMEs also play an important role in absorbing up to 97% of Indonesia's total workforce. In line with this, the number of MSMEs in Indonesia also increased significantly, reaching 64.2 million business units in the first quarter of 2021, according to the Ministry of Cooperatives and Small and Medium Enterprises (Kemenkop UKM, 2021). The increase in the aggregate number of MSME units also occurred from 2020 to 2023.

Table 1. MSME Actors and Growth in 2020-2023

Year	Number of MSME	Percentage
2020	59.260.000	0%
2021	61.650.000	4,0%
2022	62.922.617	2,1%
2023	66.194.057	2,0%

Source: Researcher, 2023

Although MSMEs have a central role in the Indonesian economy, the use and implementation of business practices that adopt the concept of environmental sustainability have not received special attention (Kumar et al., 2019; Shetty & Bhat, 2022). In fact, in running a business, MSMEs should pay attention to the aspects of people, planet, and profit (Gahlot et al., 2023; Surachman et al., 2024). The human aspect emphasizes the welfare and involvement of stakeholders. Meanwhile, the planet aspect emphasizes the concept of environmental sustainability and natural resource conservation, while the profit aspect emphasizes financial sustainability and business growth. According to Duong (2022); Le et al. (2022); Peng et al. (2022), these aspects are important to consider. Sustainable business based on the environment is currently very crucial because environmental damage can pose challenges, threats, and uncertainties to the sustainability of the business itself (Menguc & Ozanne, 2005). Extreme climate change, increasing temperatures, and scarcity of natural resources are indicators of environmental damage that can have a negative impact on the sustainability of a business (Kapitsa, 2020), to ensure a business remains sustainable, business actors must comprehend the concept of sustainable business practices. The Triple Bottom Line Theory explains this business concept, highlighting the environmental aspect as a key factor in operating a sustainable business (Elkington, 2018).

The application of the GSCM concept can also increase efficiency and reduce long-term operating costs (Le et al., 2024). For example, by optimizing delivery routes and minimizing travel distances, MSMEs can reduce fuel consumption and greenhouse gas emissions, as well as save on transportation costs. In addition, the implementation of GSCM can improve MSMEs' reputation and competitiveness (Abdallah & Al-Ghwayeen, 2020; Surachman et al., 2024). Consumers are becoming more conscious of the environmental impact of the products they purchase, leading them to select environmentally responsible products (Anjaningrum et al., 2024; Daddi et al., 2021; Suryadi et al., 2021). MSMEs can gain a competitive advantage by attracting customers through GSCM implementation.

2. LITERATURE REVIEW AND METHOD

Green purchasing, which includes consumer behavior in choosing environmentally friendly products or services, can have a positive impact on MSMEs. Firstly, by increasing demand for green products, MSMEs that adopt green practices can attract more consumers, increase sales, and in turn, increase revenue (Tantan & Akdağ, 2023). Green practices can reduce long-term production costs by improving energy efficiency and using more sustainable raw materials. Several



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studies have highlighted the positive correlation between green purchasing and MSME performance. For example, research Bestari & Butarbutar (2021) found that MSMEs that implement environmental practices have a better chance of long-term growth and sustainability. Likewise, research Nsikan et al. (2023); Suryadi et al. (2018) shows that consumers tend to prefer MSME products that are environmentally friendly, which in turn positively affects their economic performance. However, the resources and capabilities of MSMEs in adopting green practices also need to be considered. Factors such as the cost of capital, access to green technology, and understanding of the long-term benefits of green investments can affect MSMEs' ability to respond to market demand for environmentally friendly products. Therefore, the government and related institutions must support and educate MSMEs to enhance their awareness and capacity to adopt green practices.

H1: Green purchasing has a significant impact on MSMEs' economic performance.

(Ali et al. (2022) provide evidence that investing in green practices enhances the performance of MSMEs. The research indicated that MSMEs prioritizing green innovation often experience superior revenue growth and enhanced ROI compared to those that do not use green practices. Nande & Vhankate (2023) emphasized that sustainable practices can assist MSMEs in reducing long-term operational expenses via resource efficiency, thereby expediting the investment recovery process. Nonetheless, it is crucial to recognize that investments in sustainable practices may incur elevated initial expenses. Consequently, MSMEs may require sufficient access to financial resources and institutional assistance to surmount this obstacle. Assistance from the government, financial institutions, and non-governmental organizations can be crucial in enabling sustained recovery investments for MSMEs.

H2: Green Purchase significantly influences MSMEs' investment decisions.

Eco-design plays a crucial role in the recovery investments of MSMEs (Al-Maathidi & Al-Shammari, 2023; Mishra et al., 2019). Eco design encompasses the incorporation of environmental principles throughout the complete product life cycle, starting from the planning phase and extending to the final disposal stage. Investing in eco-design can enhance investment recovery for MSMEs by minimizing the use of hazardous raw materials and boosting resource efficiency. Implementing eco-design strategies has the potential to lower production costs over time, thereby enhancing the speed of return on investment. Moreover, ecologically designed products frequently draw in environmentally conscious consumers, resulting in increased sales and a faster return on investment. Asamoah et al. (2023) demonstrates that eco-design can help MSMEs improve their financial sustainability by reducing production costs and expanding market share. Moreover, MSMEs implementing eco-design are capable of producing superior-quality products that command higher selling prices, thereby enhancing overall performance.

H3: Eco-Design significantly influences on investment recovery of MSME's.

Eco-design may improve the reputation and brand image of MSMEs as environmentally responsible enterprises. This can facilitate the establishment of enduring connections with consumers, suppliers, and other business partners (Handrito et al., 2024.; Li & Sarkis, 2022). Ultimately, eco-design may stimulate innovation in MSMEs, promoting the creation of more efficient and sustainable goods and processes. Eco-design may enhance the environmental and economic efficacy of MSMEs. The use of eco-design yields concrete advantages for MSMEs in terms of resource efficiency, manufacturing costs, and market share.

H4: Eco-design has a significant impact on MSMEs' performance.

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Yildiz Çankaya & Sezen (2019) explain that investment recovery positively impacts the growth and business performance of MSMEs. Over time, organizations that can swiftly recoup their investments generally experience greater growth and enhanced financial stability. Additionally, a study Al-Maathidi & Al-Shammari (2023) emphasized that effective investments can enhance the motivation and confidence of MSME owners, subsequently leading to improved overall business performance. It is crucial to acknowledge that external factors, including market conditions, government policies, and access to financial resources, significantly influence the capacity of MSMEs to attain optimal investment recovery. Consequently, the backing of institutions and the availability of sufficient resources are essential for MSMEs to optimize investment recovery and enhance their business performance.

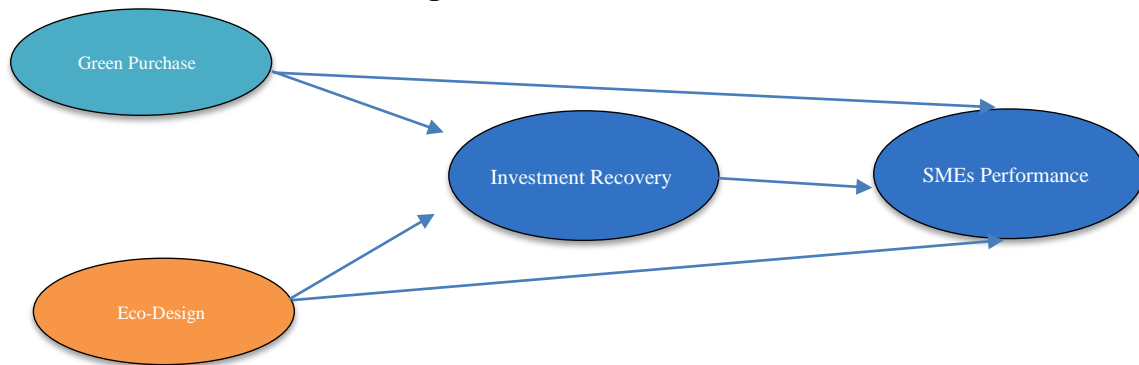
H5: Investment recovery has a significant impact on performance of MSMEs

Greater business scale enables MSMEs to access additional investment resources, increasing their chances of accelerating investment recovery and ultimately improving business performance. Research by Asamoah et al. (2023) elucidates that investment recovery may serve as a connection between the implementation of Green Supply Chain Management (GSCM) and company success. Successful MSMEs that allocate resources for product innovation typically attain superior investment recovery, hence enhancing their business performance. Magnano et al. (2024) conducted a study that highlighted the potential role of investment recovery as a mediating variable in the relationship between investment in sustainable practices and corporate success. Research indicates that MSMEs investing resources in green practices are likely to realize superior investment recovery, hence enhancing overall business performance.

H6: Investment recovery influences the impact of Green Purchase on MSME Performance.

H7: Investment recovery modulates the impact of Eco-design on MSME performance.

Figure 1. Research Framework



Source: Researcher, 2024

This investigation seeks to gather empirical data and formulate a theoretical framework regarding the impact of green purchasing and eco-design on the performance of MSMEs. This study employs an explanatory research methodology in conjunction with a survey approach, taking into account the research challenges and objectives. Explanatory research seeks to investigate the causal relationships between variables that elucidate a specific phenomenon (Bougie & Sekaran, 2019). We articulate operational variables as dimensions, indicators, and data scales to enhance measurement in data collection. The participants in this study included leaders and managers from MSMEs located in East Java, Indonesia. We employed the purposive sampling method to identify top managers and operational managers with a minimum of one year of experience. A minimum of 30 research samples is required. This corresponds with the viewpoint of Roscoe (1975), as cited in Bougie & Sekaran (2019), indicating that a sample size greater than 30 (five to ten times the number of research items) leads to a total of 100. Consequently, the sampling method employed is



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purposive sampling. To achieve valid and reliable research outcomes, it is essential to present respondents with a set of specific criteria:

1. Have run an MSME business for at least a year
2. Have implemented an environmentally friendly business concept
3. Have a supply chain

A questionnaire serves as the instrument to gather the necessary data and information for analysis. This study employs analysis techniques such as instrument validity testing, instrument reliability testing, and hypothesis testing, which includes causality testing and inner model testing. We use the structural equality model (SEM) approach as a data analysis technique.

3. RESULTS AND DISCUSSION

This study aims to analyze the factors that can encourage the implementation of Green Supply Chain Management. Through a better understanding of these factors, it is expected that appropriate strategies and policies can be developed to encourage the implementation of Green Supply Chain Management in MSMEs. The characteristics of the respondents are further described in the following table 2:

Table 2. Respondent Characteristics

Respondent Identity	Description	Total	Percentage
Gender	Male	71	47%
	Female	79	53%
Total		150	100%
Age	18 th s/d 27 th	27	18%
	> 27 th s/d 37 th	36	24%
	> 37 th s/d 47 th	54	37%
	> 47 th s/d 57 th	29	19%
	>57 th	4	3%
Total		150	100%
Education Level	Elementary School	6	4%
	Junior High School	13	9%
	High School	19	13%
	Bachelor/Diploma	95	63%
	Other	17	11%
Total		150	100%
Profits/Month	< Rp 10.000.000,-	121	81%
	> Rp 10.000.000 - Rp 30.000.000	24	16%
	> Rp 30.000.000,- s/d Rp 70.000.000,-	4	2%
	> Rp 70.000.000,- s/d Rp 150.000.000,-	1	1%
Total		150	100%

This study involved 150 respondents, with the majority being female, accounting for 53% or 79 people, while males made up 47% or 71 people. Based on age groups, most respondents were in the 37-47 age range, comprising 36% or 54 people. The 27-37 age group made up 24% or 36 people, while the 47-57 age group accounted for 19% or 29 people. Additionally, the 17-27 age group represented 18% or 27 people, and the group over 57 years old constituted 4% or 4 people. In terms of education level, the majority of respondents had completed a bachelor's degree,

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accounting for 63% or 95 people. Respondents with a high school diploma made up 13% or 19 people, while those with a junior high school education constituted 11% or 13 people. Respondents with an elementary school education were recorded at 4% or 6 people, and the remaining 11% or 17 people fell into other categories.

Study aims to analyze the factors that can encourage the implementation of green supply chain management. Through a better understanding of these factors, it is expected that appropriate strategies and policies can be developed to encourage the implementation of green supply chain management in MSMEs in East Java, Indonesia.

3.1 Hypothesis Testing Results

The direct and indirect influence hypothesis testing will be accepted if the p value is less than 5% significant.

Tabel 3. Direct Effect

	Original Sample (O)	T Statistics (O/STDEV)	P Values	Result
Green Purchasing -> Investment Recovery	0,345	4,826	0,000	Accepted
Green Purchasing -> SME's Performance	0,374	2,682	0,008	Accepted
Eco - Design -> Investment Recovery	0,405	4,841	0,000	Accepted
Eco - Design -> SME's Performance	0,154	1,147	0,252	Rejected
Investment Recovery -> SME's Performance	0,371	2,496	0,013	Accepted

Source: Data processed, 2024

- a. The results of the study show that green purchasing on investment recovery is significant at the 5% level (p value 0.000 < 0.05) and the T statistics value is 4.826 > 1.96. The original sample estimate value, 0.345, indicates a positive relationship between green purchasing and investment recovery. Therefore, the higher the value of green purchasing, the higher the value of investment recovery. Thus, the H1 hypothesis in this study, which states that green purchasing has an effect on investment recovery, is **accepted**.
- b. The results of the study show that green purchasing on SME's performance is significant at the 5% level (p value 0.008 < 0.05) and the T statistics value is 2.682 > 1.96. The original sample estimate value is positive (0.374), indicating that the direction of the relationship between green purchasing and SME's performance is positive. So, the higher the value of green purchasing, the higher the value of SME's performance. Thus, the hypothesis H2 in this study, which states that green purchasing has an effect on SME's performance, is **accepted**.
- c. The study's results show that Eco-Design on Investment Recovery is significant at the 5% level (p value 0.000 < 0.05) and the T statistics value is 4.841 > 1.96. The original sample estimate value is positive, which is 0.405, indicating that the direction of the relationship between Eco-Design and Investment Recovery is propitious. Therefore, the higher the value of green purchasing, the higher the value of investment recovery. Therefore, this study **accepts** hypothesis H3, which asserts that Eco-Design influences Investment Recovery.
- d. The results of the study show that Eco-Design on SME's Performance is significant at the 5% level (p value 0.252 > 0.05) and the T statistics value is 1.147 < 1.96. The original sample estimate value is positive (0.374), indicating that the direction of the relationship between Eco-Design and SME's Performance is positive. so that the higher the Eco-Design value, the higher the SME's Performance value. Thus, the H4 hypothesis in this study, which states that Eco-Design has an effect on SME's Performance, is **rejected**.



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- e. The study's results show that investment recovery on SME's performance is significant at the 5% level (p value $0.013 < 0.05$), and the T statistics value is $2.496 > 1.96$. The original sample estimate value is positive (0.371), indicating that the direction of the relationship between investment recovery and SME's performance is positive. Therefore, the higher the value of green purchasing, the higher the value of SME's performance. Therefore, we **accept** the H5 hypothesis in this study, which asserts that investment recovery influences SME's performance.

2. Indirect Effect

It was found that there is a statistically significant link (p value < 0.05) between Green Purchasing and SME Performance through Investment Recovery. There is also a statistically significant link (p value < 0.05) between Eco-Design and SME Performance through Investment Recovery.

Tabel 4. Indirect Effect

	Original Sample (O)	T Statistics (O/STDEV)	P Values	Result
Green Purchasing -> Investment Recovery -> SME's Performance	0,128	2,166	0,031	Mediated
Eco - Design -> Investment Recovery -> SME's Performance	0,151	2,080	0,038	Mediated

Source: Data processed, 2024

Investment recovery demonstrates the indirect impact of green purchasing on the performance of small and medium enterprises (SMEs). Mediation is proven to be positive and significant, with a p -value of 0.031 (< 0.05), meaning it has a significant effect. Green purchasing directly impacts Pro-SME's performance. This indicates that there is partial mediation in this study. Partial mediation means that by involving the mediator variable, directly or indirectly, the independent variable affects the dependent variable. This study shows that the relationship between green purchasing and investment recovery has a direct effect on SME's performance, while green purchasing has an indirect effect on SME's performance. A p -value of 0.038 (< 0.05) shows that the indirect relationship between Eco-Design and SME's performance through investment recovery is positive and significant. This indicates that eco-design has a significant impact. Meanwhile, Eco-Design's direct influence does not affect Pro-SME's performance. This demonstrates that there is perfect mediation in this study. When we add the mediator or mediation variable to an equation, the independent variable has no effect on the dependent variable, resulting in perfect mediation. This study demonstrates that the relationship between Eco-Design and SME's performance does not directly affect it, but the Eco-Design variable has an indirect effect on SME's performance through investment recovery.

3.2 Discussion

Green purchasing, also known as "green" or "sustainable," is a practice where organizations purchase environmentally friendly products and services. The study's findings explain that green purchasing impacts a SME's performance. Green purchasing has a positive and significant effect on the company performance variable; the better the implementation of green purchasing, the better the company performance achieved (Kusuma et al., 2024). We select environmentally friendly products, reduce the use of hazardous materials, and support suppliers who implement sustainable practices. This indicates that the more consumers consider purchasing environmentally friendly products, the better the economic performance of small and medium

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enterprises (SMEs). Research shows that green purchasing has a positive effect on the economic SME's performance. Bestari & Butarbutar (2021) found in their study that MSMEs implementing environmentally friendly practices have better opportunities for growth and sustainability. Nsikan et al. (2023) also showed that consumers prefer environmentally friendly MSME products, which improves the economic SME's performance.

Consumer behavior in selecting environmentally friendly products or services is known as green purchase, whereas asset recovery or resource recovery is another term for investment recovery. The study's findings explain that green purchasing is impacted by investment recovery. Green purchasing helps MSMEs maximize returns on investment by reducing operating costs, increasing the residual value of assets, increasing sales, operational efficiency, regulatory compliance, and improving the company's image. This environmentally friendly purchasing practice not only supports sustainability but also increases the value of the assets and capital invested by MSMEs. Investment recovery in SMEs refers to the strategies and practices used by small and medium businesses to maximize returns on the assets and capital they have invested. (Yildiz Çankaya & Sezen, 2019) research aligns with this study, demonstrating that investment recovery positively impacts the growth and performance of SME businesses.

Ecodesign is an effort to create sustainable products that consider environmental aspects. The study's results indicate that the application of eco-design principles, which often require significant initial investment in adopting new technologies, employee training, and changes in production processes, has no effect on the performance of SMEs. These costs can be a burden for SMEs with limited resources, reducing the potential for short-term performance improvements. High implementation costs often exceed SMEs' financial capabilities, and many SMEs still lack knowledge or awareness of the long-term benefits of eco-design. Green product innovation does not have a significant effect on sustainability performance. This is due to SMEs' lack of awareness and concern for environmental sustainability (Polas et al., 2023). Eco-design focuses on waste reduction, the use of more environmentally friendly materials, and resource efficiency. In the SME business environment, investing in eco-design can have a beneficial effect on investment returns by reducing the use of hazardous raw materials and increasing resource efficiency. The results of the study explain that eco-design has an effect on investment recovery. Eco Design has a positive and significant effect on the company performance variable; the better the implementation, the better the company performance achieved (Kusuma et al., 2024).

SMEs particularly demonstrate this by striving to optimize the returns on their invested assets and capital. Eco-design, with a focus on more environmentally friendly raw materials, waste reduction, and resource efficiency, opens up the potential for long-term cost savings and increased value of owned assets. Investment recovery, also known as asset recovery or resource recovery, is the process of regaining the value of unused or expired assets. The study's findings demonstrate that investment recovery impacts a SME's performance. By optimizing the use of assets, SMEs can reduce waste and increase operational efficiency, which in turn can increase their productivity and economic performance. This study is in line with Yildiz Çankaya & Sezen (2019) research, which shows that investment recovery has a positive effect on the growth and performance of SME businesses. The study's findings indicate that investment recovery mediates the influence of green purchasing on the performance of small and medium-sized enterprises (SMEs). Investment recovery mediates the influence of green purchasing on SME performance, highlighting how green purchasing practices boost SMEs' economic performance by increasing their return on investment in assets and capital expenditures.

The use of green purchasing has a significant impact on a company's performance, with improved execution resulting in better outcomes. We achieve this by selecting eco-friendly products, reducing the use of harmful substances, and supporting suppliers who implement sustainable practices. Research by Yildiz Çankaya & Sezen (2019) indicates that investment

recovery may moderate the association between firm size and SME success. More substantial firm sizes provide SMEs with better access to investment resources, thereby increasing their likelihood of accelerated investment recovery and eventually improving their business performance. The study's findings demonstrate that eco-design influences SME performance by facilitating investment recovery. Investment recovery facilitates the connection between the adoption of environmentally sustainable practices and corporate success. Their research demonstrates that SMEs investing resources in green practices generally attain superior investment recovery, thereby enhancing overall business performance (Magnano et al., 2024). By using Eco-Design, SMEs may enhance resource use, thereby creating opportunities for additional investment in company expansion or increased production capacity, ultimately leading to improved overall business performance. Consequently, investment recovery serves as an intermediary between eco-design and the economic performance of SMEs.

4. CONCLUSION

The study findings indicate that green buying substantially and favorably enhances the economic performance of SMEs by augmenting investment returns on assets and capital. The use of eco-friendly items, minimization of hazardous chemicals, and endorsement of suppliers adopting sustainable methods exemplify this. Furthermore, eco-design enhances the economic performance of SMEs by facilitating investment recovery, since investments in sustainable practices provide avenues for company expansion and augmented production capacity. Despite the substantial initial expenditure required for Eco-Design, the use of more sustainable raw materials and enhanced resource efficiency may provide long-term cost savings and augmented asset value. The study indicates that investment recovery positively influences the economic performance of SMEs by enhancing asset usage and operational efficiency and, therefore, augmenting total company productivity and performance. Consequently, both green buying and eco-design may improve the economic performance of SMEs by augmenting returns on assets and capital, with investment recovery serving as a mediator linking investment in sustainable practices to overall company success.

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