

The Impact of Green Supply Chain Practices, Risk Management, and Ethical Leadership on Corporate Performance: The Moderating Role of Governance

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ARTICLE INFO

Received: 30 Dec 2024

Revised: 12 Feb 2025

Accepted: 26 Feb 2025

ABSTRACT

In response to growing environmental concerns, market volatility, and increased stakeholder demand for transparency, organizations are increasingly compelled to adopt sustainable and ethically driven management practices. This study explores the impact of green supply chain practices, risk management, and ethical leadership on corporate performance, with corporate governance examined as a moderating variable. Utilizing a qualitative literature review approach, the research synthesizes findings from peer-reviewed academic journals, international standards, and empirical studies published between 2015 and 2024. The analysis reveals that green supply chain practices contribute to improved operational efficiency, resource optimization, and brand reputation. Risk management is shown to enhance organizational resilience by identifying vulnerabilities and enabling proactive strategies to minimize disruption and ensure continuity. Ethical leadership, meanwhile, fosters a values-based organizational culture that improves employee commitment, stakeholder trust, and strategic alignment. However, the influence of these factors on performance is significantly shaped by the quality of corporate governance mechanisms in place. Strong governance structures—characterized by accountability, transparency, and strategic oversight—amplify the positive effects of sustainability and ethics-driven practices on firm outcomes. Despite the growing body of research in this domain, studies in developing economies, particularly within Southeast Asia, remain limited. This study addresses that gap by offering a holistic conceptual framework and highlighting the need for integrated approaches that align environmental responsibility, risk preparedness, ethical conduct, and governance to drive long-term corporate performance. The findings contribute to both theory and practice, offering strategic insights for scholars, managers, and policymakers.

Keywords: Green Supply Chain, Risk Management, Ethical Leadership, Corporate Governance, Firm Performance

INTRODUCTION

Climate change and environmental degradation are among the most pressing challenges faced globally today. The industrial world is under increasing pressure to respond to environmental issues. These challenges range from global warming and waste management to stricter environmental regulations and growing consumer demand for eco-friendly products (Amaranti et al., 2017). Environmental pollution poses a significant threat that, if left unaddressed, could lead to the extinction of various species. Several growing sectors contribute to the declining quality of the global environment, including industrial processes, transportation, waste, agricultural products, power generation, land use, biogas combustion, fossil fuels, housing, tourism, and others.

Rapid and dynamic change has become a normal reality for many companies across service and industrial sectors. This dynamic environment creates significant challenges for businesses in achieving their strategic objectives (Cabernard et al., 2022; Gellert, 2019). Disruptions in the supply chain can result in severe financial losses, as evidenced in the past decade by Boeing, Cisco, and Pfizer, which each reported losses exceeding USD 2 billion due to supply chain failures (Luthra & Mangla, 2018; Yadav, 2020). Another critical example is the automotive industry,

where supply chain failures can lead to losses exceeding USD 100 million per day (Mathivathanan, 2018; Sharma et al., 2019; Vanalle et al., 2017). According to Li et al. (2020) and Luthra et al. (2018), the complexity and uncertainty of today's business climate—coupled with increasingly intricate supply chains—create both internal (operational) and external (disruption-related) risks that elevate the potential for failure.

Several researchers (Andiappan et al., 2021; Hafezalkotob, 2019; Teixeira, 2020; Zou et al., 2021) have found that implementing green supply chain practices positively affects company performance. However, findings are not always consistent. For instance, Chanchaichujit (2020) reported a negative relationship between green supply chain management and firm performance based on a survey of 109 supply and purchasing managers in Germany. Similarly, Khorasani (2018), Nazam et al. (2020), and Wong et al. (2020) found that green supply chains had no significant impact on performance improvement.

Another critical factor in enhancing company performance is effective risk management. There is strong belief that risk management provides companies with the tools needed to balance the inherent conflict between seizing opportunities and preventing losses, accidents, and disasters (Yan, 2021). According to Saeidi et al. (2021) and Tasmin (2020), risk management has become an increasingly important element in supply chain management projects. Its goal is to minimize disruption, reduce its impact on operations, and accelerate recovery to normal conditions (Iswajuni et al., 2018). Indonesia, represented by the National Standardization Agency (BSN, 2018), is an active member of ISO Technical Committee (TC) 262 on Risk Management. BSN has adopted ISO 31000:2009 as SNI ISO 9001:2011, and in February 2018, updated the national standard to ISO 31000:2018.

In addition to risk management, ethical leadership plays a pivotal role in achieving organizational goals. According to Franczukowska et al. (2021), Julmi et al. (2022), Özsungur (2019), Roque et al. (2020), and Xue et al. (2021), major barriers to adopting green supply chain initiatives include attitudinal and perceptual constraints, information limitations, technical challenges, resource constraints, and weak strategic orientation. Studies by Adnan (2020), de Ruiter (2019), Hassan (2019), Karsten (2019), and Metwally (2019) further explore the application of green supply chain practices across sectors and how these practices influence supply chain initiatives and performance.

To resolve inconsistencies in the literature, this study introduces corporate governance as a moderating variable that influences the relationships among green supply chain management, risk management, ethical leadership, and firm performance. Although prior research has explored the relationship between corporate governance and firm performance (e.g., Brogi & Lagasio, 2022; Paniagua, 2018), results remain inconsistent. These studies show that good governance tends to correlate positively and significantly with financial performance.

Most of the existing studies are based in developed countries or specific industries such as manufacturing. In contrast, research on green supply chains, risk management, and ethical leadership in developing countries—especially in Southeast Asia—is still limited. Moreover, industry-specific contexts such as agribusiness or services are rarely addressed in relation to these variables.

This research fills that gap by integrating green supply chain management, risk management, and ethical leadership as independent variables—an approach that remains rare in the literature. It also introduces governance as a moderating variable and adopts a holistic approach to firm performance, including sustainability dimensions. Furthermore, the research focuses on a developing country context, an underexplored yet increasingly relevant domain in global business literature.

Research Identification

This study is grounded in real-world phenomena and informed by relevant literature. In recent years, global challenges such as climate change, economic volatility, and increased awareness of good governance have pushed manufacturing firms to adopt sustainable business practices. As a hub of industrial activity in Indonesia, the MM 2100 Industrial Estate presents a dynamic setting where companies are strategically shifting to improve performance through sustainability-focused approaches.

Scope of the Study

This research focuses exclusively on manufacturing companies located in the MM 2100 Industrial Estate. It relies on primary data and measurements derived from indicators outlined in the appendices of this dissertation. Furthermore, the study draws predominantly on global references, which may not fully capture the unique contextual variables in Indonesia, such as local regulations and market structures. These differences may affect the applicability of theoretical frameworks in the Indonesian context and the comparability of findings with those from other countries. Follow-up research will be necessary to further refine these theories within the specific characteristics of Indonesian manufacturing, while incorporating local factors that influence the implementation of green supply chain management, risk management, and ethical leadership.

Research Questions

This research seeks to explore the relationships among green supply chain practices, risk management, ethical leadership, and corporate governance in enhancing firm performance. The questions guiding this study are:

1. How does Green Supply Chain Management influence Firm Performance?
2. How does Risk Management influence Firm Performance?
3. How does Ethical Leadership influence Firm Performance?
4. What is the moderating role of Corporate Governance in the relationship between Green Supply Chain Management and Firm Performance?
5. What is the moderating role of Corporate Governance in the relationship between Risk Management and Firm Performance?
6. What is the moderating role of Corporate Governance in the relationship between Ethical Leadership and Firm Performance?

Research Objectives

The objectives of this study are to contribute both to academic theory and managerial practice by offering new insights into the integration of sustainability strategy, risk management, ethical leadership, and governance in improving firm performance. Specifically, the study aims to:

1. Analyze the effect of Green Supply Chain Management on Firm Performance.
2. Analyze the effect of Risk Management on Firm Performance.
3. Analyze the effect of Ethical Leadership on Firm Performance.
4. Examine the moderating role of Corporate Governance in the relationship between Green Supply Chain Management and Firm Performance.
5. Examine the moderating role of Corporate Governance in the relationship between Risk Management and Firm Performance.
6. Examine the moderating role of Corporate Governance in the relationship between Ethical Leadership and Firm Performance.

Research Contributions

The anticipated contributions of this study are as follows:

1. Enriching academic literature on Green Supply Chain Management, Risk Management, Ethical Leadership, Corporate Performance, and Governance, especially within the context of developing economies.
2. Enhancing understanding of supply chain performance by exploring its intersection with risk and ethical leadership, which has been underrepresented in existing studies.
3. Providing practical insights for managers on the role of green supply chains and risk mitigation strategies in maintaining business continuity amid environmental turbulence.

Supporting businesses in evaluating and improving their supply chain performance, thereby enabling more informed decision-making to sustain or improve overall firm performance.

Theoretical basis

Agency Theory

Study (Jensen, M. C, 1993) describes the agency relationship as a relationship between the owner of the company (*principal*) and the agent, with the delegation of decision-making authority to the agent. In an agency relationship, there may be a conflict of interest between the principal and the agent. Shareholders demand increased profitability and dividends for the company, while managers are agents who are motivated to maximize the fulfillment of economic needs. And psychological. On base connection agency And principal, management is encouraged to carry out earnings management in presenting financial reports. To That, Wrong one way that can used for monitor contractual issues between management and investors and limiting opportunistic management behavior is through the implementation of GCG.

Stakeholder Theory

Study (Freeman, RE, 1984) concluded that the true purpose of the company is For fulfil need stakeholders, that is which is influenced by the decisions taken by the company. Research (Gray, R., *et al* , 1995) said that the survival of a company depends on the support of *stakeholders* , and this support must be sought so that the company must seek this support. The stronger the stakeholders, the more companies try to adapt. *Stakeholder theory* is important in this study because the theory is related to stakeholders. Which concerned with company; they Which will affected and influenced by company activities, such as management accountability to *stakeholders* in the form of CSR activities and company financial performance.

Supporting Theory

Theory of The Green Supply Chain

Draft This describe approach new in management organization which is factor important For reach success in modern and dynamic markets (Sherehiy , B., & Karwowski, W., 2014); (Yusuf, YY, *et al* , 2014). Indeed , organizations moment This must concentrate on creating dexterity (Shin, H *et al* , 2015). Agility chain supply identified as factor strategic so that effective For continuity life company (Sukati, I., *et al* , 2012); (Liu, H. *et al* , 2013); (Yusuf, YY, *et al* , 2014).

Enterprise Risk Management Theory

Risk management has emerged as an important factor in management decisions and control. (Ritchie, B. and Brindley, C., 2007), is widely applied in various fields such as economics, insurance, and manufacturing, among others. While the word risk applies to events that uncertain, possible danger or damage, or consequence other Which No wanted (Harland, C. *et al* , 2003), Which can expressed through probability, management show action or activity organized For control incident This. So, risk management can be understood as a structured process to minimize or mitigate the effects of risk (Wang, H., and Hsu, F., 2009.) or a proactive decision-making process that aims to minimize the consequences of negative events. in time front, with identify potential risk, analyze it and plan response Which required For monitoring And control (Zafiroopoulos, L *et al* , 2005); (Mabrouki, C. *et al* , 2014).

Ethical Leadership Theory

The conceptualization of ethical leadership is associated with (Brown, ME *et al* , 2005), Which define it as "demonstration behavior Which in accordance in a way normative through action personal And connection interpersonal, And promotion of such behavior to followers through two-way communication, reinforcement, and decision making". These authors advance consideration, honesty, trustworthiness, and interactional justice as key attributes of ethical leadership. These traits in leaders' behavior are the reasons for their moral appeal to their followers. This idea is reinforced by the application of social learning theory (Bandura, A., 1977), according to which individuals learn not only by experience but also by observation or "vicariousness". Vicarious learning very in harmony with consequence behavior Which observed (Bandura, A., 1977). Leader is model role behavior in

organization based on their hierarchical status and authority. They can use this legitimate authority to regulate follower behavior by using rewards and punishments (Brown, ME *et al* , 2005). (Brown, ME *et al* , 2005) conceptualization of ethical leadership is based on the social learning perspective to authenticate modeling role positive leader from behavior Which in accordance normatively in the work environment.

Stewardship Theory

(Shleifer, A., and R. Vishny R. , 1997) defines governance company as method in where Supplier finance For company convincing self they Alone For get return investment they . In a tone Which The same , (LaPorta *et al* , 2002) referring to on order manage company as " a set of mechanism by which foreign investors protect self they from takeover by manager And holder share controller ". Definition the reflect perspective narrow governance company based on orientation holder share or holder share , Which become base thinking model theory governance agency company , where holder share as principal delegate role to manager as agent , Where There is distribution risk between entities and conflicts latent interests (Eisenhardt, KM, 1989).

Company performance

Flapper *et al* . (1996) stated that performance is something that is very important for an organization: the success and sustainability of an organization depends on its performance. According to Flapper, performance can be defined as the way an organization carries out its goals.

Measurement objectives performance is For Motivate behavior that leads to on improvement sustainable in satisfaction customer, flexibility , and productivity . In the context of development product , more interpretation specific from draft performance has presented by Ulrich and Eppinger (1995). Five dimensions related to with the benefits achieved by (product) new) can used For evaluate performance effort development product (adapted) from Ulrich & Eppinger, 1995, pp . 2–3).

Study Previous

Research conducted by Tooranlo *et al* . (2018), argues that *The agility of the green supply chain* as an operational capability in responding quickly to uncertain and volatile markers not only improves company performance, but also leads to reduced costs and increased professional capabilities. The results of the study indicate that the factors of supplier and customer relationships, performance, marketing and process integration have the most importance as factors influencing the green agility of the supply chain and the factors of IT and Intellectual Capital have the lowest relative importance in evaluating the indicators of green supply chain agility. Therefore, this company can achieve an agile green supply chain by supporting information integration through collaborative planning and sharing key information.

Research by Almeida *et al* (2019) shows that *Enterprise Architecture Models* (EA) and EA tools can help reduce the complexity of the ISO 31000 standard and improve communication between stakeholders.

Ahmad *et al*'s (2019) research shows that the occurrence of unethical behavior plays a stronger role than ethical behavior in shaping employee well-being. This finding provides support for the perspective of the conservation of resources theory (*The Conservation of Resources Theoretical*) by reiterating the importance of resource loss over resource gain in shaping employee well-being.

Young, Stephen B (2009) concludes that the US perspective on corporate governance is rational in relation to the objective requirements of finance companies and that, as capital markets become larger and more liquid worldwide, corporate governance regimes will essentially resemble the US model. Although cultural variations on the US pattern are consistent with the corporate governance objective of limiting abuse of power in private companies.

Hypothesis

Green Supply Chain Impacts Company Performance

According to (Migdadi, 2019; Zou *et al* ., 2021) Researchers have developed the concept of supply chain management into a more effective concept that is more concerned with the environment. Green supply chain is one of the processes that can be effective in considering environmental issues (Anvari, 2021; Hafezalkotob, 2019; Jazairy, 2020; Lähdeaho

et al., 2020) and its practices in all work processes in every company, so that the concept of green supply chain has emerged with the acceleration of government regulations and rules to be achieved (Habib *et al.*, 2020; Rebs *et al.*, 2018). Green supply chains are intended to reduce environmental risks and negative environmental impacts while increasing ecological efficiency (Irani *et al.*, 2017; Jazairy, 2020; Masudin *et al.*, 2018) and eliminating environmental waste in organizations (Chanchaichujit, 2020; Irani *et al.*, 2017; Nazam *et al.*, 2020). The hypotheses built based on these explanations are as follows:

H1: The influence of green supply chain influence on Company Performance

Risk Management Affects Company Performance

Risk management has become a fundamental concern in today's global environment. Risk management is the process by which an association identifies future threats and analyzes them to examine alternatives to the threat or reduce the threat. The implementation of risk management requires leadership and commitment from top management, as well as active involvement from all members of the organization. This relationship reinforces the relevance and importance of risk (Gjerdrum and Peter, 2011). To be applied to different risks and activities, the approach proposed in the standard is basically intended to be generic and rational (Lalonde and Boiral, 2012). The hypothesis built on this explanation is as follows:

H2: Risk Management has an effect on Company Performance

Ethical Leadership Affects Company Performance

The conceptualization of ethical leadership is associated with Brown *et al.* (2005, p. 120), who define it as "the demonstration of normatively appropriate behavior through personal actions and interpersonal relationships, and the promotion of such behavior to followers through two-way communication, reinforcement, and decision making". Some researchers advance consideration, honesty, trust, and interactional justice as key attributes of ethical leadership. Ethical leaders are fair, caring, trustworthy, helpful and supportive (Chughtai *et al.*, 2015; Kalshoven and Boon, 2012; Miao *et al.*, 2013; Wilson and McCalman, 2017) and can provide sources of emotional and interpersonal support that are valued by employees. The hypotheses built based on these explanations are as follows:

H3: Ethical Leadership influence on Company Performance

Governance Moderates Green Supply Chain and Firm Performance

The role of good governance practices became more important after the collapse of companies such as WorldCom and Enron in the US, as well as Chengdu Hongguang and Yinguangxia in China (Fu, 2010). There is a perception that the lack of good governance practices contributed to the failure of these companies. Good governance practices can generally improve company performance (Bhagat & Bolton, 2019; Brogi & Lagasio, 2022; Naciti, 2019; Paniagua, 2018; Uyar *et al.*, 2021). More specifically, well-governed companies have better operating performance because good governance reduces the control rights granted by shareholders and creditors (Shleifer and Vishny, 1994). The hypotheses built based on this explanation are as follows:

H4: Governance Moderates Green Supply Chain and Firm Performance

Governance Moderates Risk Management and Corporate Performance

Stulz (2008) suggests that risk management due to neglect of corporate governance can be caused by: risk events are often unrelated to strategy, risk definitions are often poorly expressed and therefore not fully understood, organizations are not always able to develop intelligent responses to risk, or boards of directors do not consider corporate governance in detailing risk responses. Stulz (2008) notes that risk management systems can be damaged and corporate governance can become ineffective in the following cases: failure to use an appropriate risk matrix, failure by lower-level managers to communicate risk to top management, or failure to monitor risk and manage risk. Krause and Tse (2016) examine the relationship between risk management and firm value. They conclude that more effective risk management practices replace corporate governance to reduce cash flow volatility, improve financial performance, and increase firm value. The hypotheses built based on these explanations are as follows:

H5: Governance Moderates Risk Management and Firm Performance

Governance Moderates Ethical Leadership and Corporate Performance

Mayer's (1997) study examined the interconnection between governance and trust. Trust was identified by Wang and Chen (2004) as one of the four pillars of corporate governance. Building a climate of trust is essential for effective governance (Ghillyer, 2008, p. 85). Child and Rodrigues' (2004) study revealed that policies, which can help improve employee trust, strengthen governance. The organization's distinctive trust system and its competence to replicating and exploiting trust relationships is responsible for improving governance policies and overall competitive advantage (Rodgers, 2009). Skinner and Spira (2003) illustrate the complexity of the relationship between trust and control in the context of governance by studying the internal audit technique of self-assessment control. Based on the above arguments the following hypothesis is proposed:

H6: Governance Moderates Ethical Leadership and Company Performance

METHODS

This type of research is empirical research with hypothesis testing, namely testing the influence of green supply chains, risk management, and ethical leadership on company performance with governance as a moderating variable. The research data is primary data sourced from the respondent level in manufacturing companies at the *Middle Manager*, *Supervisor*, *Production Staff*, *Warehouse Staff*, *Quality Control Staff* levels in large industrial areas such as the MM 2100 Cibitung Industrial Area.

Population and Research Sample

The population in this study is manufacturing companies. Based on data from the MM 2100 Cibitung industrial area, there are 153 companies. This study will distribute questionnaires to 60 companies where each company will be taken as many as 2-3 respondents, namely *Middle Managers*, *Supervisors*, *Production Staff*, *Warehouse Staff*, *Quality Control Staff*, who work at the MM 2100 Industrial Area Manufacturing Company.

Development of Measurement Instruments and Scales

This study uses primary data with a survey method using an online questionnaire built based on theoretical and empirical studies relevant to the research variables. The online questionnaire uses a 4-point Likert scales interval scale (Chomeya, 2010; Feldmen *et al.*, 2013) to make it easier for respondents to answer questions, and the answers to the statements given by respondents are; Strongly Disagree (STS), Disagree (TS), Agree (S), and Strongly Agree (SS).

1. Materials and Methods

Descriptive Statistical Analysis

Descriptive statistics deals with the collection and summarization of data and presenting the results of the summary. Statistical data that can be obtained from survey results, and other observations with data that is still raw, random and not well organized. The data must be summarized well and orderly, both in the form of tables and graphs, can be used as a basis for decision making.

Partial Least Square (PLS) Analysis

This study uses the *Partial Least Square (PLS) analysis method* to measure the direct and indirect influence of governance variables, *intellectual capital* and company performance. This study selects using PLS because each variable, both dependent and independent, is a formative constructed latent variable that has measurement indicators.

Model Measurement (Outer Model)

The *outer model* is also often called (*outer relation* or *measurement model*) which defines how each indicator block relates to its latent variables.

Convergent Validity Test

Convergent validity in SEM PLS is used as one of the evaluations for the measurement model (*outer model*).

Convergent validity is a type of validity that is related to the principle that the measurer of a construct must have a high correlation so that it is used to measure the magnitude of the correlation between latent variables and manifest variables in the reflexive measurement model.

Discriminant Validity Test

One of the evaluations to measure the measurement model (*outer model*) is discriminant validity. Since discriminant validity is related to the principle that different construct measures should not be highly correlated, the discriminant validity of the reflexive measurement model can be calculated based on the *cross loading value* of the manifest variable against each latent variable.

Reliability Test

Reliability Test on SEM-PLS model is used as one of the evaluations for measurement model (*outer model*). Latent variable can be said to have good reliability if the *composite reliability value* greater than 0.6 and can be strengthened by a *Cronbach's alpha value* greater than 0.7 (Sarwono and Narimawati, 2015).

Structural Measurement (*Inner Model*)

The structural model (*inner model*) is a structural model to predict causal relationships between latent variables. Through the bootstrapping process by looking at the *path coefficient* to predict the existence of a causal relationship.

R-Squared (R²) Test

The R-squared (R²) test is a test conducted to measure the level of *Goodness of Fit* of a structural model. The R-squared (R²) value is used to measure how much influence a particular independent latent variable has on the dependent latent variable.

Hypothesis Testing

The proposed hypothesis testing is done by testing the *inner model structural model* by looking at the R-square value which is a *goodness-fit model test* . In addition, by looking at the *path coefficients* which show the parameter coefficients and the significance value of the t statistic.

Respondent Description Based on Position

For the general description of respondents obtained from the demographic information section data contained in the research questionnaire. The following composition of respondents based on position in this study can be seen in Table 4.1.

Table 1 Classification of Respondents Based on Position

Information	Number of people)	%
<i>Middle Manager</i>	25	16.3%
<i>Supervisor</i>	22	14.4%
Production Staff	45	29.4%
Warehouse Staff	30	19.6%
<i>Quality Control Staff</i>	31	20.3%
Total	153	100%

The table above shows that the respondents in this study were 25 *middle managers* with a percentage value of 16.3%. As many as 22 supervisors with a percentage value of 14.4%. As many as 45 production staff with a percentage value of 29.4%. As many as 30 warehouse staff with a percentage value of 19.6%. While the remaining 31 *quality control staff* with a percentage value of 20.3%. Thus the largest number of respondents were production staff.

Outer Model Test (Measurement Model)

Several criteria in using data analysis techniques with SmartPLS to assess *the outer model*, namely the *convergent validity test*, the *discriminant validity test*, and the *composite reliability test*.

Convergent Validity Test

Convergent validity checks can be seen from the constructs on *the loading factor values* of each indicator. The *loading factor limit* used for confirmatory research is 0.7. Meanwhile, the *loading factor limit* used for explanatory research is 0.6 and the *loading factor limit* used for production research is 0.5 (Wiyarni & Bunyamin, 2021).

Table 2 Convergent Validity Test Results (Green Supply Chain and Risk Management)

Indicator	Chain Green Supply	Indicator	Management Risk
RPH 1	0.859	MR 1	0.841
RPH 2	0.883	MR 2	0.841
RPH 3	0.868	MR 3	0.873
RPH 4	0.854	MR 4	0.860
RPH 5	0.862	MR 5	0.798
RPH 6	0.847	MR 6	0.862
RPH 7	0.834	MR 7	0.854

Source: Processed data, SmartPLS 4.0 2025

Table 3 Results of Convergent Validity Test (Ethical Leadership and Governance)

Indicator	Leadership Ethical	Indicator	Governance
TO 1	0.899	Kindergarten 1	0.877
TO 2	0.853	Kindergarten 2	0.857
THE 3RD	0.878	Kindergarten 3	0.844
TO 4	0.874	Kindergarten 4	0.873
TO 5	0.862	Kindergarten 5	0.854

Source: Processed data, SmartPLS 4.0 2025

Table 4 Convergent Validity Test Results (Company Performance)

Indicator	Company performance
KP 1	0.890
KP 2	0.945
KP 3	0.901
KP 4	0.862
KP 5	0.891
KP 6	0.856

Source : Processed data , SmartPLS 4.0 2025

Table 5 Results of Convergent Validity Test (TK x RPH, TK x MR, TK x KE)

Indicator	Kindergarten x RPH	Indicator	Kindergarten x MR	Indicator	Kindergarten x KE
Kindergarten x RPH	1,000	Kindergarten x MR	1,000	Kindergarten x KE	1,000

Source : Processed data , SmartPLS 4.0 2025

Based on tables 2, 3, 4, and 5, all indicators show *loading factor values* > 0.70. This shows that all indicators have met the requirements of *convergent* and valid validity.

Discriminant Validity Test

Discriminant validity is assessed based on the *cross loading* value for each variable must be greater than 0.7. The correlation value between variables in the model can also be compared with the square root of AVE for each variable (Widajantie & Dewi, 2020).

Table 6 Results of Discriminant Validity Test

Indicator	Chain Green Supply	Management Risk	Leadership Ethical	Company performance	Governance	Kindergarten x RPH	Kindergarten x MR	Kindergarten x KE
RPH 1	0.859	0.549	0.540	0.278	0.542	0.432	0.430	0.381
RPH 2	0.883	0.662	0.680	0.376	0.677	0.605	0.501	0.486
RPH 3	0.868	0.650	0.632	0.376	0.652	0.583	0.505	0.451
RPH 4	0.854	0.722	0.702	0.286	0.690	0.721	0.554	0.514
RPH 5	0.862	0.594	0.632	0.274	0.598	0.521	0.493	0.511
RPH 6	0.847	0.742	0.709	0.338	0.718	0.742	0.646	0.605
RPH7	0.834	0.671	0.684	0.313	0.652	0.663	0.551	0.530
MR 1	0.680	0.841	0.714	0.420	0.690	0.593	0.612	0.552
MR 2	0.658	0.841	0.738	0.556	0.732	0.550	0.566	0.458
MR 3	0.558	0.873	0.756	0.668	0.763	0.473	0.690	0.552
MR 4	0.703	0.860	0.771	0.408	0.749	0.607	0.750	0.599
MR 5	0.722	0.798	0.740	0.275	0.662	0.733	0.647	0.576
MR 6	0.703	0.862	0.731	0.426	0.770	0.623	0.772	0.598
MR 7	0.622	0.854	0.733	0.440	0.731	0.557	0.768	0.632
TO 1	0.786	0.780	0.899	0.474	0.793	0.644	0.633	0.714
TO 2	0.627	0.771	0.853	0.363	0.630	0.630	0.574	0.652
THE 3RD	0.695	0.726	0.878	0.349	0.663	0.501	0.559	0.630

Indicator	Chain Green Supply	Management Risk	Leadership Ethical	Company performance	Governance	Kindergarten RPH	Kindergarten x MR	Kindergarten x KE
TO 4	0.642	0.765	0.874	0.414	0.729	0.610	0.669	0.687
TO 5	0.585	0.758	0.862	0.469	0.644	0.465	0.517	0.533
KP 1	0.232	0.418	0.327	0.890	0.526	0.015	0.165	0.062
KP 2	0.451	0.596	0.542	0.945	0.691	0.286	0.380	0.322
KP 3	0.252	0.376	0.298	0.901	0.489	0.019	0.105	0.013
KP 4	0.444	0.614	0.522	0.862	0.716	0.282	0.474	0.316
KP 5	0.254	0.418	0.379	0.891	0.528	0.090	0.211	0.184
KP 6	0.332	0.551	0.438	0.856	0.651	0.216	0.422	0.263
Kindergarten 1	0.738	0.817	0.751	0.456	0.877	0.657	0.736	0.628
Kindergarten 2	0.544	0.739	0.664	0.546	0.857	0.572	0.744	0.633
Kindergarten 3	0.604	0.649	0.634	0.602	0.844	0.564	0.635	0.577
Kindergarten 4	0.697	0.782	0.722	0.765	0.873	0.612	0.619	0.555
Kindergarten 5	0.684	0.734	0.657	0.480	0.854	0.598	0.664	0.548
Kindergarten x RPH	0.714	0.674	0.653	0.185	0.680	1,000	0.791	0.792
Kindergarten x MR	0.614	0.804	0.676	0.348	0.781	0.791	1,000	0.861
Kindergarten x KE	0.580	0.659	0.735	0.233	0.695	0.792	0.861	1,000

Source: Processed data, SmartPLS 4.0 2025

Based on table 4.6, each variable in this study shows a *cross loading value* greater than 0.70 and has a higher AVE square root value than the correlation between variables. Based on the results of this test, it can be concluded that all variables meet the *rule of thumb criteria* for *discriminant validity*.

Composite Reliability Test

Composite reliability test is conducted to prove the accuracy, consistency and precision of the instrument in measuring the construct. The *composite reliability value* must be greater than 0.7 for *confirmatory research* and a value of 0.6-0.7 is still acceptable for exploratory research (Widajantie & Dewi, 2020).

Composite Reliability Test Results

Variables	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
Chain Green Supply	0.941	0.947	0.951	0.737

Management Risk	0.936	0.963	0.947	0.718
Leadership Ethical	0.922	0.932	0.941	0.763
Company performance	0.948	0.955	0.959	0.794
Governance	0.914	0.938	0.935	0.741

Source: Processed data, SmartPLS 4.0 2025

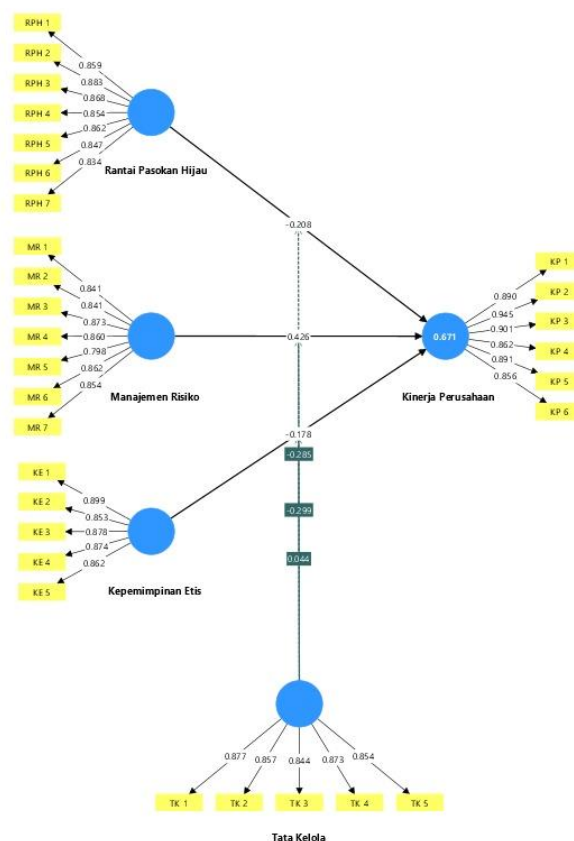
Based on table 7, it is obtained that *the composite reliability* for the green supply chain variable is 0.951, risk management is 0.947, ethical leadership is 0.941, company performance is 0.959, and corporate governance is 0.935. The results of this *composite reliability test* show that each variable has a value above 0.70, indicating that all constructs meet the criteria for good reliability. Furthermore, the evaluation using *Cronbach's alpha* shows a value for the green supply chain of 0.941, risk management is 0.936, ethical leadership is 0.922, company performance is 0.948, and governance is 0.914. With a *Cronbach's alpha value* above 0.50, it can be concluded that all constructs still meet the criteria for good reliability.

RESULTS

Inner Model Test (Structural Model)

The measurement of the inner model shows the strength of the estimation between latent variables or constructs (Ghozali & Latan, 2015: 78-80). The inner model is evaluated by looking at the percentage of explained variance, namely by looking at the R-Square value.

Figure 4.1 1Model Test Results



Source: Processed data, SmartPLS 4.0 2025

R-Square or Determinant Coefficient

R^2 values into strong categories with a value of (0.67), moderate with a value of (0.33), and weak with a value of (0.19), the coefficient of determination (R^2) value is used to explain the influence of independent variables on dependent variables (Widajantie & Dewi, 2020).

Table 8 Results of the R-Square Test or Determinant Coefficient

	R-square	R-square adjusted
Company performance	0.671	0.654

Source: Processed data, SmartPLS 4.0 2025

Based on table 8 shows the Adjusted R-Square value for the company performance variable obtained 0.654. These results indicate that green supply chain, risk management, ethical leadership are able to explain the company performance variable by 65.4% and the remaining 34.6% is explained by other variables that are not hypothesized in the model.

Hypothesis Testing (*Bootstrapping*)

In hypothesis testing using the *bootstrapping method*, the t statistic and p-value are used to determine whether the null hypothesis is accepted or rejected. Since the research hypothesis is a one-way hypothesis, if the P-value < 0.05 and t table > 1.976, then the exogenous variable has a major effect on the endogenous variable (Wiyarni & Bunyamin, 2021).

Table 9 Hypothesis Test Results (*Bootstrapping*)

Source: Processed data, SmartPLS 4.0 2025

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Information
Chain Green Supply -> Company Performance	-0.208	-0.216	0.103	2,015	0.044	Accepted
Management Risk -> Company Performance	0.426	0.403	0.178	2,399	0.016	Accepted
Leadership Ethics -> Company Performance	-0.178	-0.152	0.177	1,001	0.317	Rejected
Governance -> Corporate Performance	1,147	1,165	0.137	8,395	0,000	Accepted
Governance x Chain Green Supply -> Company Performance	-0.285	-0.283	0.097	2,927	0.003	Accepted
Governance x Management Risk -> Company Performance	-0.299	-0.289	0.121	2,463	0.014	Accepted
Governance x Leadership Ethics -> Company Performance	0.044	0.027	0.123	0.358	0.721	Rejected

Based on the table showing the results of hypothesis testing in the *path table coefficients* stated that the hypothesis is accepted if the t statistic value > 1.976 or P Value or sig value < 0.05. The following is an analysis of the hypothesis test:

1. Green Supply Chain has an effect on company performance, obtained t statistics of 2.015 > 1.976, significance value of 0.044 < 0.05 and *original sample* -0.208.
2. Risk Management has an effect on company performance, obtained t statistics of 2.399 > 1.976, significance value of 0.016 < 0.05 and *original sample* 0.426.

3. Ethical Leadership does not affect company performance, the t statistic obtained is $1.001 < 1.976$, the significance value is $0.317 > 0.05$ and the original sample is -0.178.
4. Governance has an effect on company performance, obtained t statistics of $8.395 > 1.976$, significance value of $0.000 < 0.05$ and original sample 1.147.
5. Governance moderates green supply chain on company performance, obtained t statistic of $2.927 > 1.976$, significance value of $0.003 < 0.05$ and original sample -0.285.
6. Governance moderates risk management on company performance, obtained t statistics of $2.463 > 1.976$, significance value of $0.014 < 0.05$ and original sample -0.299.

Governance does not moderate ethical leadership on company performance, obtained t statistics of $0.358 < 1.976$, significance value of $0.0721 > 0.05$ and original sample 0.044.

DISCUSSION

The Impact of Green Supply Chain on Company Performance

Research result show that chain supply green influential to performance company with P values are 0.044 and t-statistics of 2,015. The results of the study This in line with research (Andiappan *et al*, 2022; Hafezalkotob, 2019; Teixeira, 2020; Zou *et al.*, 2021). This matter indicates that the better implementation chain supply green in company, then performance company will increase. Chain supply green covers various friendly practice environment, such as use material sustainable raw materials, management more waste good, and efficiency in use source Power nature (Syamil *et al.*, 2023).

The Influence of Risk Management on Company Performance

Based on results research, management risk own influence on performance company with P values of 0.016 and t-statistics of 2,399. The results of the study This in line with research (Amanor & Tetteh, 2022; Ghazieh & Chebana, 2021; Loska & Higa, 2020). This matter shows that companies that have system management good risk will more capably face uncertainty and optimizing performance. Management risk help company in identify, measure, and control various risks that can occur hinder achievement objective business (Thian, 2021). Approach proactive in management risk allow company for anticipate and respond problem like risk financial, operational, compliance and reputation with faster and more effective. System management good risk help company avoid loss big that can happen Because unpreparedness for adapt self with change in environment business (Radiansyah *et al*, 2023).

The Influence of Ethical Leadership on Company Performance

Research result show that leadership ethical No influential to performance company, with P values of 0.317 and t-statistics of 1.001. The results of the study This in line with research (Lameck, 2022; McKimm & McLean, 2020; Moon & Kahlor, 2022). This indicates that although leadership ethical own role important in organization, its influence to performance company No significant in study This.

Governance Moderates Green Supply Chain on Firm Performance

Research result show that governance to moderate influence chain supply green to performance company, with P value of 0.003 and t- statistic of 2,927. This means that the better governance, increasingly strong connection between chain supply green and performance company. Good governance ensure that the chain strategy supply green run in a way consistent and transparent (Syamil *et al*, 2023). Companies that have strong governance more capable enter element sustainability to in the decision they made make. This thing produce balance between interest environmental, economic, and social (Adrai & Perkasa, 2024).

Governance Moderates Risk Management on Corporate Performance

This result confirms that the existence of good governance capable strengthen connection between management risk and performance company. Company with strong governance tend more tough in face uncertainty Because they can be more systematic in identify, assess, and manage risks faced (Judijanto *et al.*, 2025).

Governance Moderates Ethical Leadership on Corporate Performance

This result show that governance No capable strengthen connection between leadership ethics and performance

company. This indicates that although company have good governance, things the No as well as immediately increase impact leadership ethical to performance company.

CONCLUSION

The purpose of this study is to analyze the influence of green supply chains, risk management, and ethical leadership on company performance and to examine the role of governance in strengthening or weakening green supply chains, corporate risk management and ethical leadership on company performance in the MM 2100 Industrial Area. Based on the results and discussions described, it can be concluded that:

1. Green Supply Chain affects company performance.
2. Risk Management affects company performance.
3. Ethical Leadership has no effect on company performance.
4. Governance moderates green supply chain on firm performance.
5. Governance moderates risk management on company performance.

Governance does not moderate ethical leadership on firm performance.

Acknowledgment

I would like to express my deepest gratitude to all those who contributed to the completion of this research on "The Impact of Green Supply Chain Practices, Risk Management, and Ethical Leadership on Corporate Performance: The Moderating Role of Governance." I am especially grateful to the scholars and industry experts whose insights helped shape the direction of this study. Their valuable guidance has significantly enriched the research, highlighting the critical role of sustainable practices, effective risk management strategies, and ethical leadership in enhancing corporate performance. I also appreciate the support and resources provided by my academic institution and colleagues, which made this study possible. Lastly, I would like to acknowledge the importance of governance as a moderating factor, which emerged as a crucial element in driving the positive impact of these practices on organizational outcomes.

Ethical considerations

Ethical considerations in the context of "The Impact of Green Supply Chain Practices, Risk Management, and Ethical Leadership on Corporate Performance: The Moderating Role of Governance" emphasize the responsibility of businesses to integrate sustainable practices that not only enhance their performance but also contribute positively to society and the environment. Green supply chain practices demand transparency and accountability in sourcing materials, minimizing environmental impact, and ensuring that products are produced with respect for human rights. Risk management strategies must be ethically aligned, ensuring that potential negative outcomes are identified and mitigated without exploiting vulnerable communities or the environment. Ethical leadership plays a pivotal role in fostering a corporate culture that prioritizes ethical decision-making, responsible innovation, and long-term value creation over short-term profits. Moreover, governance structures must be robust and effective, ensuring that ethical practices are upheld throughout the organization and that corporate actions align with broader societal values, thus enhancing corporate performance while ensuring compliance with ethical standards and sustainability goals.

Conflict of Interest

The authors declare no conflicts of interest concerning the research presented in this study on the impact of green supply chain practices, risk management, and ethical leadership on corporate performance, with a particular focus on the moderating role of governance. The research was conducted impartially, and all data used in this study were gathered from publicly available sources without any external influence from stakeholders or organizations that could benefit financially or otherwise from the results. Additionally, there were no personal, professional, or financial relationships that could be perceived to have influenced the outcomes or interpretation of the findings in this paper.

Funding

The funding for this research on The Impact of Green Supply Chain Practices, Risk Management, and Ethical Leadership on Corporate Performance: The Moderating Role of Governance aims to explore the integration of sustainable practices within corporate strategies and their impact on overall business performance. This study will

focus on how green supply chain initiatives, effective risk management strategies, and ethical leadership practices contribute to corporate success while emphasizing the role of governance as a moderating factor. Funding will support the collection and analysis of data from various industries, allowing for a comprehensive understanding of how these factors interact and influence corporate outcomes. Additionally, the research will assess how governance mechanisms can either strengthen or weaken the relationship between sustainability-driven practices and firm performance, offering valuable insights for businesses looking to improve their competitive edge while adhering to ethical and environmental standards.

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