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GREEN SUPPLY CHAIN SYNERGY: HOW INTEGRATION AND RISK MANAGEMENT DRIVE FINANCIAL PERFORMANCE

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ABSTRACT

Companies strive to win the competition to maintain sustainability. This study aims to analyze the effect of supply chain integration on financial performance through green supply chain management and supply chain risk management in manufacturing companies in East Java. This study employs a quantitative approach, utilizing a causal research design, with 90 respondents from manufacturing companies that have implemented environmentally friendly practices. Data analysis was conducted using Partial Least Squares Structural Equation Modeling (SmartPLS 4.0) to examine the relationship between research variables. The results indicate that supply chain integration affects both green supply chain management and supply chain risk management, but it does not directly impact financial performance. Green supply chain management and supply chain risk management have been shown to have a positive effect on financial performance. Manufacturing companies with supply chain integration do not directly influence financial performance; instead, they do so through well-managed green supply chains and by mitigating supply chain risk. The results of the study emphasize the importance of synergy between supply chain integration, green supply chain, and supply chain risk management in building a sustainable and resilient supply chain. The theoretical contribution of this research is to broaden the understanding of the relationship between integration, sustainability, and risk in the context of the manufacturing industry in developing countries. The practical contribution of the research results provides manufacturing managers with guidance to strengthen internal and external coordination in implementing green management and risk management, thereby improving operational efficiency and financial performance.

Keywords: supply chain integration, green supply chain, supply chain risk, and financial performance.

INTRODUCTION

Companies are required to build competitive advantages while maintaining the sustainability of their business through adjustments to applicable national policies and international regulations (Siagian et al., 2023). Within the framework of sustainable development, companies are required to be able to respond strategically to environmental issues to contribute to economic growth without sacrificing social and ecological balance (Karmaker et al., 2023). The implementation of environmentally friendly production activities not only has a positive impact on ecosystem sustainability but also influences community satisfaction and market sustainability (Cherrafi et al., 2018). To achieve this, the company continuously updates its operational systems and processes and strengthens relationships with external partners (Basana et al., 2024). The formation of a sustainable supply chain is highly dependent on effective coordination between various actors within the supply network (Siagian et al., 2022) because strong coordination can improve the timeliness of raw material procurement and product distribution to customers (Basana et al., 2024).

In the context of the manufacturing industry, companies are expected to have concern for environmental issues as part of their global responsibility for sustainable production practices (Wungkana et al., 2023). Export destination countries are also increasingly tightening environmental regulations, requiring companies to implement environmentally friendly production standards to avoid sanctions and maintain market access (Cherrafi et al., 2018). Therefore, various manufacturing companies are trying to integrate sustainability principles into their supply chains to improve environmental and social performance (Huo et al., 2019; Pham et al., 2023). This effort aligns with the contribution to economic sustainability (Basana et al., 2024), where companies adapt their business strategies to leverage local natural and cultural potential, thereby supporting long-term sustainability (Basuki et al., 2023).

Technological advances play an important role in modern production processes, enabling companies to optimize supply chain integration both internally and externally (Santoso et al., 2022; Siagian et al., 2022). Through supply chain integration, companies can ensure efficient production processes and meet customer needs promptly (Pham et al., 2023). Continuous collaboration with business partners is a strategic element in creating mutually beneficial relationships that support the achievement of shared goals. With reasonable

production process control and guaranteed raw material quality, companies can increase product added value while strengthening their competitive advantage (Möldner et al., 2020). Supply chain integration enables suppliers to participate in the company's planning process and supports improvements in overall production quality (Eber et al., 2020; Tse et al., 2018). Supply chain integration plays a role in strengthening a company's ability to face operational risks and environmental uncertainty (Zhu et al., 2017). Through real-time coordination and information exchange, companies can anticipate potential supply disruptions, demand fluctuations, and production constraints (Fan et al., 2017; Basana et al., 2024). This approach also helps improve green performance by strengthening the link between supply chain integration and environmental risk management (Wang et al., 2024). In this context, green supply chain management becomes a key pillar in increasing efficiency while maintaining environmental sustainability (Farias et al., 2019). Green supply chain management can provide economic returns by reducing negative impacts on the environment while creating added value for customers (Huo et al., 2019; Oliveira-Dias et al., 2023). The integration of lean management and green practices such as waste management, reverse logistics, and eco-design has an impact on improving supply chain performance in terms of cost efficiency, value creation, and sustainability (Cherrafi et al., 2018). Furthermore, supply chain risk management plays an important role in maintaining operational stability through preventive measures and responses to potential disruptions (Shou et al., 2018; Pham et al., 2023).

The internal integration implemented by the company contributes to increasing external integration, which ultimately strengthens the organization's financial performance (Chunsheng et al., 2020; Fariz, 2022). Increased synergy between internal divisions enables the company to achieve higher operational efficiency and drive sales growth, thus impacting financial performance (Chang et al., 2016). In addition, supply chain flexibility also has a significant influence on improving the company's financial performance (Pham & Doan, 2020). By strengthening comprehensive business integration, companies can increase their competitiveness and strengthen their financial position amidst increasingly fierce market competition (Jafar et al., 2021). Based on the explanation above, the research objectives can be divided into three main parts: first, to determine the magnitude of the influence of supply chain integration on green supply chain risk and financial performance. Second, to determine the magnitude of the influence of green supply chain on supply chain risk and financial performance. Finally, to determine the magnitude of the influence of supply chain risk on financial performance.

LITERATURE REVIEW

Supply Chain Integration

The company seeks to strengthen its competitiveness by making supply chain integration a means of increasing innovation capabilities (Freije et al., 2022). This supply chain integration concept encompasses three main dimensions: internal integration, supplier integration, and customer integration, which can be optimized through the implementation of single-database-based resource planning to streamline cross-functional coordination (Siagian et al., 2021). Through strategic collaboration with external partners, companies can create greater efficiency and effectiveness as a form of long-term collaboration (Birasnav & Bienstock, 2019). However, building communication and coordination with external partners often takes a long time to achieve alignment of goals (Dhaigude et al., 2020). Therefore, intensive communication is key to ensuring alignment between the company's internal needs and external partners (Yuan et al., 2022). Real-time information-based coordination in the internal environment is an important element in strengthening supply chain integration (Fan et al., 2017).

Synchronization between departments is the foundation for effective internal integration (Riley et al., 2016; Jajja et al., 2018). This internal integration functions as a bridge between the company and supplier integration, as well as between the company and customer integration (Qiao & Zhao, 2023). With real-time synchronization between functions, companies can accelerate the decision-making process that aligns with cross-departmental needs (Munir et al., 2020). A company's ability to manage external integration with both suppliers and customers contributes directly to operational efficiency and effectiveness (Yuan et al., 2022). The effectiveness of such integration can only be achieved if companies develop a single, connected, data-driven system, enabling real-time information exchange and accurate decision-making (Basana et al., 2024; Hartono et al., 2023). Exemplary supply chain integration implementation will help companies reduce

production lead times, reduce inventory levels, and improve overall operational efficiency (Siagian et al., 2022).

Green Supply Chain

Green Supply Chain Management (GSCM) is a strategic approach that involves all internal and external partners of the company to maintain environmental sustainability and achieve sustainable performance (Karmaker et al., 2023). Currently, more companies are demonstrating a strong commitment to the environment by establishing strategic steps oriented towards sustainability and enhancing their economic viability (Kosasih et al., 2023; Basuki et al., 2023). Pressure from society and the government also encourages companies to carry out environmentally friendly business activities (Tarigan et al., 2020), while social demands also increasingly emphasize the importance of operational activities that do not damage the environment (Novitasari & Tarigan, 2022).

In response to this, many companies have begun to adopt the concepts of eco-design, green purchasing, and green manufacturing so that their business processes take environmental impacts into account comprehensively and sustainably (Wungkana et al., 2023). Global climate change is also a major driving factor for companies to implement green supply chain principles (Setiawan et al., 2023). The implementation of these environmentally friendly practices usually covers the entire supply chain, from raw material suppliers, internal production processes, to the delivery of finished products to customers (Cherrafi et al., 2018).

More broadly, GSCM encompasses green practices in purchasing, manufacturing, material handling, distribution, and marketing activities that aim to reduce waste and maximize operational efficiency (Siagian et al., 2023). This approach also contributes to optimizing material use, supporting recycling processes, and ensuring safe waste disposal. Companies that implement GSCM actively involve suppliers in environmentally friendly activities and educate customers about using green products (Hartono et al., 2023). In the context of this research, green supply chain management is defined as a company's ability to establish relationships with business partners to integrate environmental principles throughout the supply chain flow, from raw material selection, manufacturing processes, to product delivery to customers (Cherrafi et al., 2018).

Supply Chain Risk Management

Supply Chain Risk Management (SCRM) refers to a company's ability to design and implement effective strategies for anticipating potential losses along the supply chain flow, utilizing relevant information (Fan et al., 2017; Ali et al., 2023). This approach enables companies to develop prevention systems that can reduce the likelihood of disruptions or losses in supply chain activities (Qiao & Zhao, 2023). The success of SCRM depends on the synergy between internal cross-functional collaboration and external partnerships with suppliers and customers, which together can identify and address risks both partially and comprehensively (Jajja et al., 2018).

In an operational context, companies must manage and minimize potential risks to avoid increased costs or delays in product or service delivery, ensuring each actor in the supply chain operates in a balanced manner (Yuan & Li, 2022). Supply-side risks can manifest in various forms, such as delays in raw material procurement, production process disruptions, and errors in production scheduling (Sturm et al., 2022; Huma et al., 2020). Therefore, SCRM can be understood as an organization's ability to recognize potential risk sources and implement appropriate mitigation strategies through strong collaboration with all supply chain partners (Kumar et al., 2018).

The risks faced by companies generally occur when business partners fail to meet agreed performance standards or criteria (Munir et al., 2020). One form of external risk is the failure to meet raw material supply requirements according to production needs, which can hinder the smooth running of operational processes (Huma et al., 2020). When suppliers are unable to provide materials according to predetermined specifications, the company experiences supply risk, which can disrupt the flow of raw materials and hinder production activities (Pham et al., 2023; Tse et al., 2018). Most companies try to avoid risks that result in financial losses, because this can disrupt operational stability and efficiency (Qiao & Zhao, 2023). In addition, external risks can also arise when key suppliers fail to meet the company's needs, which ultimately affects

product operations and distribution up to the delivery stage to customers (Jajja et al., 2018). A study of manufacturing companies in Sri Lanka showed that SCRM has become part of the organizational culture, where all employees actively participate in identifying potential risks, sharing knowledge, and creating innovative ideas to accelerate market response and strengthen operational resilience (Abeysekara et al., 2019).

Financial Performance

Financial performance is used to describe the level of success of a company in achieving its economic goals. Referring to Jafari et al. (2021), the indicators used include average profitability, return on investment, return on assets, and return on sales. Supply chain digitization enables companies to plan and control their workforce more accurately and efficiently. (Zhao et al., 2021). By implementing a digital supply chain, companies can better monitor and control inventory levels.

In general, financial performance in an organization is measured through economic indicators such as profitability, return on investment, return on sales, and company growth rate (Chang et al., 2016; Heryanto & Leng, 2022). A company's ability to maintain an integrated and controlled operational system contributes to improving its financial performance. Pham and Doan (2020) added that financial performance can be identified from market share, sales, revenue, and organizational efficiency.

Besides that, Yu et al. (2019) measure financial performance by comparing the company's performance to competitors through measurement items such as sales growth, profit growth, market share growth, return on investment, and return on assets growth. Based on the results of previous studies, this study establishes four financial performance measurement items, namely: increasing the organization's market share (FP1), increasing sales growth (FP2), increasing organizational profitability (FP3), and increasing organizational efficiency (FP4).

Relationship between Research Concepts

The Relationship between the Concept of Supply Chain Integration and the Green Supply Chain

Process integration within a company plays a crucial role in driving a green supply chain by minimizing products with a negative environmental impact and reducing pollution levels (Huang et al., 2023). The implementation of environmentally friendly initiatives, such as the green hotel program, requires strong coordination and collaboration between internal and external integration, which includes upstream and downstream integration relationships (Basana et al., 2022).

Furthermore, supply chain integration, consisting of supplier integration and customer integration, has a significant influence on the implementation of green supply chain practices through activities such as green purchasing and green manufacturing (Siagian et al., 2021). The use of Enterprise Resource Planning (ERP) technology allows companies to connect directly with external partners, thereby strengthening the implementation of green supply chain management (Santoso et al., 2022). In addition, the existence of an integrated system between internal stakeholders and a production planning sharing mechanism has been proven to increase the effectiveness of implementing green supply chain management in companies (Setiawan et al., 2023).
H_1 : Supply chain integration has an impact on the green supply chain.

The Relationship between the Concept of Supply Chain Integration, Green Supply Chain, and Supply Chain Risk Management

Supply chain integration formed between the company and external partners provides significant benefits in strengthening the company's ability to manage supply chain risk (supply chain risk management), especially in reducing potential financial risks (Qiao & Zhao, 2023). In the context of risk management, companies need to identify and control risks originating from both suppliers and customers. Meanwhile, on the demand side, companies require flexibility as a form of proactive approach and agility as a reactive response to changes in market demand. Implementing procedures capable of detecting threats and an early warning system will help

employees respond quickly and appropriately to potential disruptions (Riley et al., 2016). Ali et al. (2023) emphasized that strengthening internal and external integration can effectively mitigate risks arising from supply, production, and demand. One form of this integration is supplier integration, which helps companies minimize procurement risks by ensuring timely material availability and meeting production needs (Huma et al., 2020). In addition, the practice of information sharing and data analysis between companies and external partners allows for more accurate and coordinated supply chain risk management (Yuan & Li, 2022). In the digital era, implementing a digital supply chain strengthens internal and external integration, thereby reducing disruptions in supply, demand, and product distribution along the supply chain (Song et al., 2024).

The implementation of automation in manufacturing companies plays a crucial role in enhancing product quality while reducing dependence on human labor, which ultimately can mitigate the risk to the quality of environmentally friendly products (Kumar et al., 2018). An uncertain business environment, which is influenced by factors such as disease, natural disasters, and political and economic conditions, serves as a moderating variable in the relationship between digital supply chains and various types of disruption risks, including supply disruption risk, production disruption risk, demand disruption risk, and circulation disruption risk (Song et al., 2024). A good collaborative relationship between companies and suppliers, fostered by supplier involvement in the new product development process, can improve risk-sharing practices, especially in dealing with problems that arise along the supply chain (Tse et al., 2018). However, the risk assessment practices carried out by companies do not always have a direct impact on environmental aspects in supply chain management (Miemczyk & Luzzini, 2024). In addition, green innovation has been proven to provide a positive contribution to improving firm performance (Novitasari & Tarigan, 2022). Environmentally friendly products produced within the green supply chain framework are generally developed through collaboration between supply chain members with risk-sharing and cost-sharing mechanisms that are distributed equally among the parties involved (Wang et al., 2024).
H_2 : Supply chain integration has an impact on supply chain risk management.
H_3 : Green supply chain management has an impact on supply chain risk management.

Hubungan Konsep Supply Chain Integration, Green Supply Chain, Supply Chain Risk Management Terhadap Financial Performance

A company's ability to build internal and external integration can improve manufacturing efficiency. A company's financial performance can be improved through the continuous implementation of supply chain integration (Zhao et al., 2021). A company's ability to build supply chain resilience with the support of supply chain integration has a positive impact on improving financial performance (Chunsheng et al., 2020; Heryanto & Leng, 2022). In the context of the hospitality industry, supply chain integration contributes to improving green hotel performance by increasing market share and strengthening management's commitment to environmental sustainability (Basana et al., 2022). In addition, internal integration has an indirect impact on financial performance through the mediating role of supplier integration and customer integration, as found in a study in the agro-food business industry (Jafari et al., 2021). Supply chain integration is part of the transformation towards a digital supply chain, ultimately improving business performance and strengthening financial performance. Integration, which includes internal integration, supplier integration, and customer integration as the main components of a digital supply chain, has been proven to increase operational efficiency and reduce production costs, thus directly impacting overall company performance.

The implementation of green practices in small-scale companies has been proven to increase sustainable performance, especially in the economic performance dimension (Kosasih et al., 2023). Furthermore, the implementation of green supply chain management in manufacturing companies makes a significant contribution to improving sustainable performance, which includes economic, social, and environmental performance aspects (Huo et al., 2019). Similar results were also found in garment manufacturing companies in Bangladesh, where green supply chain practices significantly improved the organization's sustainable performance (Karmaker et al., 2023). In the manufacturing context, the implementation of green manufacturing plays a significant role in improving operational performance by increasing product quality and on-time delivery (Siagian et al., 2023). Although environmental supply chain aspects do not have a direct relationship with risk assessment practices or organizational performance, these aspects still contribute to achieving the triple bottom line, namely economic, social, and environmental sustainability (Miemczyk & Luzzini, 2024). In addition, the implementation of green purchasing in the hotel sector has been proven to

have a positive impact on green performance, demonstrated by waste reduction and energy efficiency, resulting in lower operational costs (Tarigan et al., 2020). The combination of green purchasing, green manufacturing, and the implementation of green information systems can also improve overall manufacturing performance by creating more efficient, environmentally friendly, and value-added processes for the company (Wungkana et al., 2023).

Supply chain risk arising from integration with suppliers has a more substantial influence on agility performance compared to customer integration (Jajja et al., 2018). In the manufacturing context, companies strive to identify internal and external risks to ensure that production processes and service delivery can run on time, thus having a positive impact on profitability and business performance (Kumar et al., 2018; Fariz, 2022). Thus, effective supply chain risk management contributes directly to improving firm performance (Huma et al., 2020). In addition, supply chain risk information analysis conducted by companies plays a crucial role in assessing processes and identifying potential risks, which ultimately impacts supply chain finance performance through increased loan volume and payment flexibility (Yuan & Li, 2022). Companies can also strengthen operational performance by implementing risk, cost, and profit-sharing mechanisms among partners in the supply chain (Zhu et al., 2017). A study of companies in Sri Lanka showed that a risk management culture implemented through employee training policies in creative problem solving and sharing knowledge about operational risks has contributed to increased firm performance, as indicated by market share growth (Abeysekara et al., 2019).

H_4 : Supply chain integration has an impact on financial performance.
H_5 : Green supply chain management has an impact on financial performance.
H_6 : Supply chain risk management has an impact on financial performance.

METHODOLOGY

This study uses a causal research approach, which aims to determine the influence of one variable on another. This study aims to examine the effect of supply chain integration on financial performance through green supply chain and supply chain risk management in manufacturing companies in East Java. The research model established in this study is shown in Figure 1.

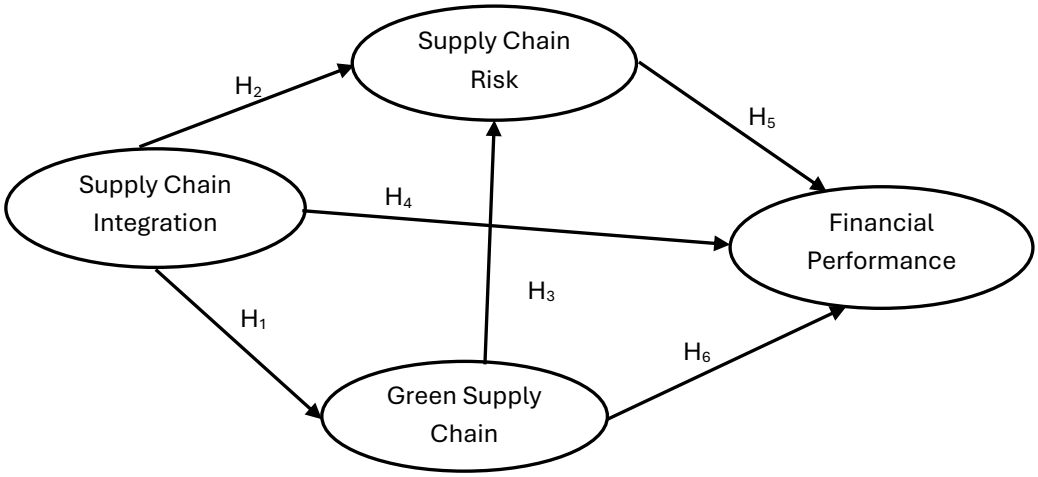

Figure 1. Research concept framework

Data collection in the study was conducted in manufacturing companies that have committed to implementing environmentally friendly practices. Companies that have carried out their own waste processing and provided waste disposal sites on site that have been carried out, companies that have used product recycling to reduce waste, companies that are committed to reducing electricity and water energy, companies that have implemented ISO practices on the environment and also companies that have been willing to implement the 5S program, namely seiri (sort), seiton (set in order), seiso (shine), seiketsu (standardize), and shitsuke (sustain).

A questionnaire was chosen as the research instrument because it was considered the most effective and efficient way to obtain data that could be processed quantitatively. This study used a Likert scale with a value

range of 1 to 5, where 1 indicates strongly disagree and 5 indicates strongly agree. The data collection process was conducted online via Google Form, which was distributed directly to respondents. Measurement items for each variable were determined by adopting previous research. Supply chain integration is defined as the synchronization of information that occurs internally and externally in a company, utilizing integrated data to carry out supply chain activities. Measurement items for supply chain integration adopted from Yuan et al. (2022) include involving partners in strategic planning (SCI1), involving partners in addressing operational issues (SCI2), ensuring good connectivity between internal activities and partners (SCI3), and sharing quality information with partners (SCI4). The mediating variables include green supply chain management and supply chain risk management. Green supply chain management is a program implemented by companies involving external partners to protect the environment. The measurement items established for green supply chain management are based on research conducted by Setiawan et al. (2023), which include the tendency of companies to choose environmentally conscious suppliers (GSC1), companies to prioritize environmentally friendly raw materials (GSC2), companies to monitor suppliers in environmental activities (GSC3), and companies to use recyclable raw materials (GSC4).

Supply chain risk management is the process by which manufacturing companies regulate, manage, and minimize losses that occur internally and within their partners. Measurement items established in supply chain risk management are based on research. Qiao & Zhao (2023) namely the company can anticipate operational risks with existing systems (SCR1), the company has a system to anticipate disruption conditions (SCR2), the company has a system that can maintain a level of flexibility (SCR3), and the company has a system that can involve all internal functions in anticipating uncertainty (SCR4). The final dependent variable is financial performance, which is determined in research with four items: reducing company operational costs (Fpe1), increasing company profits (FPe2), increasing company sales volume (Fpe3), and increasing company efficiency (Fpe4).

The study population included manufacturing companies operating in East Java. The selected respondents were permanent employees with a minimum staff position and more than two years of work experience. This study was quantitative, utilizing numerical data that allows for statistical analysis. Data were obtained through a questionnaire containing statements that respondents must answer according to the actual conditions in the medium and large companies where they work. A total of 89 manufacturing companies were obtained. Data analysis in this study tested the established hypotheses using SmartPLS version 4. Tests were conducted to obtain goodness of fit using outer and inner model tests. The outer model testing in this study consisted of validity and reliability tests, while the inner model testing involved predictive relevance testing with Q-square and research hypothesis testing.

ANALYSIS AND DISCUSSION

Data processing was carried out on 90 respondents who had filled in the respondent profile shown in Table 1.

Table 1. Profile respondent

Variable	Description	Frequency	%
Gender	Male	45	50
	Female	45	50
Levels in the company	Senior staff	45	50
	Supervisor	26	29
	Manager	16	18
	Top Management	4	4
Experience	2-3 years	33	37
	4-6 years	29	32
	7-10 years	11	12
	More than 10 years	18	20
Age	21-30 years old	17	19
	31-40 years old	34	38
	41-50 years old	26	29
	Above 51 years old	13	14

Table 1 shows that for gender, men and women have the same number of 50% each, while for the level of the largest company, the senior staff amounting to 50% who are directly responsible for the implementation

of the green supply chain in the company, in running the company's operations to protect the environment. In this position, he has knowledge of operations to build interconnections within the company and external companies to build supply chain integration. Table 1 indicates that 62 respondents (69%) have 2-6 years of experience with operations that run green programs and activities in manufacturing companies, among employees who understand them. At the same time, the largest age group of respondents is 31-40 years old, accounting for 38%.

The results of data processing on 90 respondents are presented in Table 2, which shows the outcomes of testing the outer model for validity and reliability.

Table 2. Goodness of fit model

Item Measurement	Factor Loadings	Cronbach Alpha	AVE	Composite Reliability
SCI1	0.838			
SCI2	0.923			
SCI3	0.797			
SCI4	0.788			
Supply chain integration (SCI)		0.857	0.702	0.864
SCR.1	0.683			
SCR.2	0.845			
SCR.3	0.765			
SCR.4	0.825			
Supply chain risk management (SCRM)		0.785	0.611	0.862
GSC.1	0.832			
GSC.2	0.880			
GSC.3	0.862			
GSC.4	0.787			
Green supply chain management (GSCM)		0.861	0.754	0.906
FPe.1	0.733			
FPe.2	0.911			
FPe.3	0.841			
FPe.4	0.868			
Financial Performance (FP)		0.859	0.707	0.866

Table 2 shows the goodness of fit for the outer model with a validity value greater than 0.500 on the measurement item shown at the lowest value.SCR.1 (the company has a system capable of maintaining a level of flexibility) is 0.683. The reliability test with a Cronbach alpha value for supply chain integration is 0.857, and the composite reliability is 0.864. Supply chain risk management (SCRM) has a Cronbach's alpha of 0.785 and a composite reliability of 0.862; green supply chain management (GSCM) has a Cronbach's alpha of 0.861 and a composite reliability of 0.906; financial performance has a Cronbach's alpha of 0.859 and a composite reliability of 0.866.

Figure 3 and Table 2 show the testing of the first research hypothesis up to the sixth hypothesis (H1-H6). The hypothesis regarding the effect of supply chain integration on the green supply chain yielded a t-statistic value of 17.414 (>1.96) and a p-value of 0.000 (<0.05), thereby supporting the acceptance of the first hypothesis. Supply chain integration in companies, achieved by involving partners in addressing operational problems, can lead to an increase in the adoption of green supply chain practices. This is because it enables companies to monitor their suppliers more effectively in terms of their environmental activities. Supply chain integration affects supply chain risk management, as evidenced by the second hypothesis, which has a t-statistic value of 4.088 (>1.96) and a p-value of 0.000 (<0.05), thereby supporting the acceptance of this hypothesis. Supply chain integration can improve supply chain risk management by creating a strong system for anticipating disruption conditions. The third hypothesis, with the green statement, indicates that supply chain influences supply chain risk management, as evidenced by a t-statistic value of 6.297 (>1.96) and a p-value of 0.000 (<0.05), leading to the acceptance of this hypothesis. This condition suggests that a green supply chain, formed by prioritizing environmentally friendly and recyclable raw materials, enhances supply chain risk management by involving all internal functions in anticipating uncertainty. The fourth hypothesis is that supply chain integration affects financial performance with a t-statistic value of 0.943 (<1.96) and a p-value of 0.346 (>0.05), so that the fourth hypothesis is rejected. Supply chain integration is established in companies with well-established internal activity connectivity with partners. Sharing quality information with partners does not

directly impact financial performance; therefore, it requires a green supply chain and supply chain risk as mediating variables. The green supply chain's impact on financial performance yielded a t-statistic value of 3.002 (>1.96) and a p-value of 0.003 (<0.05), leading to the acceptance of the hypothesis. Green supply chains, formed in manufacturing companies that prioritize environmentally friendly raw materials, monitor suppliers' environmental activities, and use recyclable raw materials, can lead to increased financial performance by boosting company profits and sales volume. The final hypothesis, which posits that supply chain risk management influences financial performance, yields a coefficient of 0.357, a t-statistic value of 2.734 (>1.96), and a p-value of 0.006 (<0.05), leading to the acceptance of the hypothesis. Supply chain risk management enables the company's system to anticipate disruption conditions, maintain flexibility, and involve all internal functions in anticipating uncertainty. This approach has a positive impact on financial performance, as it increases company profits and reduces operational costs.

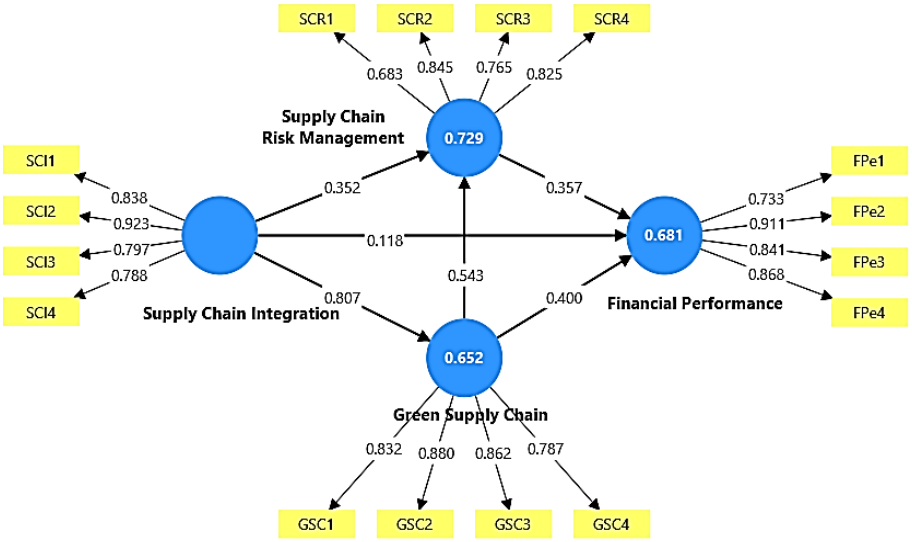

Figure 2. Complete the structural equation model

Table 3. Path coefficients

Path Coefficients	Original sample	T statistics	P values
Supply Chain Integration → Green Supply Chain	0.807	17.414	0.000
Supply Chain Integration → Supply Chain Risk Management	0.352	4.088	0.000
Green Supply Chain → Supply Chain Risk Management	0.543	6.297	0.000
Supply Chain Integration → Financial Performance	0.118	0.943	0.346
Green Supply Chain → Financial Performance	0.400	3.002	0.003
Supply Chain Risk Management → Financial Performance	0.357	2.734	0.006

This study reinforces the theory that internal and external supply chain integration is the primary foundation for building a green supply chain. The significant correlation between supply chain integration and green supply chain ($\beta = 0.807$, $p < 0.05$) supports the concept that cross-functional connectivity and collaboration between external partners can drive stronger sustainability practices. This finding extends integration theory by adding an environmental and sustainability perspective. The results indicate that supply chain integration does not directly affect financial performance, but rather through green supply chain and risk management. This expands previous conceptual models by emphasizing the importance of sustainability and risk management, mediating variables in bridging the relationship between operational efficiency and financial performance. Manufacturing managers need to build a digital-based integration system to facilitate internal and external collaboration. The results demonstrate that supply chain integration is crucial for establishing an effective green supply chain, thereby increasing efficiency and reducing operational costs. Company leaders are advised to develop risk assessment and warning systems that enable early detection of disruptions. This approach allows risk management to serve not only as a protective measure but also as a value-enhancing strategy, ultimately driving high financial performance and enhancing company competitiveness.

CONCLUSIONS

This study confirms that the synergy of supply chain integration, green supply chain, and supply chain risk is a key factor in improving the financial performance of manufacturing companies in East Java. The analysis

reveals that supply chain integration significantly influences green supply chain management and supply chain risk management, but it does not directly impact financial performance. Therefore, improving financial performance cannot be achieved through supply chain integration alone; green practices and effective risk management must mediate it.

Green supply chain management has been shown to play a significant role in driving operational efficiency, reducing waste, and improving a company's image and profitability. Companies that prioritize environmentally friendly raw materials, monitor suppliers' environmental activities, and implement recycling systems have demonstrated a significant impact on financial performance. Supply chain risk management also contributes to financial performance through the company's ability to anticipate disruptions, maintain operational flexibility, and involve all internal functions in mitigating market uncertainty. These findings reinforce the view that sustainability is a business strategy that contributes to the financial performance of manufacturing companies. The financial success of manufacturing companies depends on the integration of supply chain, green supply chain, and supply chain risk to create a sustainable and resilient supply chain capable of facing global environmental pressures while maintaining long-term competitiveness.

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