

The Impact of Top Management Commitment, Green Purchasing, and Supply Chain Management Practices on Operational Performance

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Globalisation has forced the manufacturing industry to take care of environmental sustainability. This research examines the impact of top management commitment, green purchasing, supply chain management practices on operational performance. This research distributed questionnaires to 150 manufacturing companies in East Java, Indonesia, and 135 questionnaires were returned and completed correctly. Of the 135, only 81 questionnaires were considered valid due to the respondent profile relevance. Data analysis used the Partial least square, utilising the SmartPLS software. The results reveal that top management commitment directly influences green purchasing and supply chain practices. However, top management commitment does not directly affect operational performance. Green purchasing affects supply chain management practices and operational performance. Supply chain practices directly affect operational performance. This study provides insight for managers to improve the company's operational performance. This study also contributes to the current research on supply chain management theory.

Key words: *Green purchasing, Top management commitment, Operational performance, Supply chain practices.*

INTRODUCTION

Global competition has forced countries to prioritise the growth of the manufacturing industry in pushing economic growth. This strategic decision is considered rational since the manufacturing industry's growth has become central the country's economic growth in many

countries, including Indonesia (Nuryanto et al, 2020). The manufacturing industry has become one of Indonesia's mainstay sectors in sustaining economic growth during global economic uncertainty in terms of changes and development. However, logistical performance in Indonesia is dependent on infrastructural support (Reza, 2013). A propitious logistics system allows the rapid flow of goods from suppliers to manufacturing companies and customers. The goals of a supply chain system are to provide satisfaction to customers by communicating well with customers, building customer trust, and on-time delivery using the information technology needed to provide the best service (Ju et al, 2019).

The company's ability to handle the flow of goods, information, and money from upstream to downstream destinations through processes of procurement, storage, transportation, distribution, and delivery services according to the type, quality, quantity, time, and place desired is called supply chain management (Sundram et al, 2018). Green supply chain management could improve environmental performance by reducing waste, costs efficiency, and economic performance (Paulraj, 2011; Nguyen, 2020; Cosimato & Troisi, 2015). Green supply chain management in construction companies includes green design project activities, green purchasing, green transportation, green construction, and green facility practices to improve organisational performance, economic performance, and environmental performance (Balasubramanian & Shukla, 2017). A company's ability to implement an efficient and effective supply chain flow is defined as supply chain performance (Zhu et al, 2013).

Supply chain performance is the extent to which a company can manage efficient inventory movement and supply chain flexibility to meet customer orders on time, provide quantity and quality, and administrative documents (Kalyar et al, 2019, Lee, 2015; Doan, 2020; Saragih et al, 2020; Usman, 2020). A company can achieve supply chain performance by implementing supply chain management practices with continuous support from the top management to make efficient and effective decisions (Gawankar et al, 2013). Top management should understand that supply chain management practices could result in excellent supply chain performance (Sandberg & Abrahamsson, 2010). Top management's commitment will support the successful execution of any programs that support company performance because the company's top management can build the atmosphere and corporate culture by building employee perceptions and empowering employees to achieve the stated goals (Lee et al, 2016). Also, top management's commitment to providing support and developing capabilities positively improve the implementation of information technology (Dabari & Saidin, 2014; Tarigan, 2018). Top management support can moderate the influence of supplier integration on supply chain performance, but top management support cannot moderate customer integration to supply chain performance (Shee et al, 2018). Top management's commitment has a significant impact on the company's competitiveness by applying enterprise resources planning and integrating the company's internal management of the supply chain (Tarigan et al, 2020a).

The company's management will provide policies related to internal conditions adapted to external changes in the company (Paulraj, 2011). Many industries do not implement the green environment properly, and have only just started implementing it. The purpose of green supply chain management is related to three dimensions: economic performance, environmental performance, and social performance (Çankaya & Sezen, 2019). Green supply chain management includes green products, green design, green purchasing, green marketing, and eco-design. Green supply chain management is often also referred to as green logistics consisting of green purchasing activities, green packaging, and green transportation. Green purchasing is applied to companies in providing benefits to reduce material waste, reduce liability costs, and build the image that companies have in regard to the environment (Sharma et al, 2017, Cosimato & Troisi, 2015).

Green supply chain management is essential for company development and survival through collaboration with suppliers and customers in the pursuit of improving performance (Lee & Joo, 2020). Green purchasing is a top management policy that encourages suppliers to take care in regard to environmental issues. Green purchasing has a positive and significant impact on operational performance (González-Benito et al, 2016). The influence of green purchasing on competitive operational outcomes is related to lower costs and improved quality, delivery time, and flexibility (Famiyeh et al, 2018). Green purchasing, as determined by the company, is part of the supply chain practice. A company's ability to practically build an integrated link in the company's internal and cross-functional business with external companies in providing products or information according to customer needs along the supply chain flow is defined as supply chain management practices (Al-Shboul et al, 2017). The company's performance in terms of market share financial performance is affected by supply chain management practices. Excellent supply chain management practices improve firm performance because of its ability to implement enterprise resource planning to integrate the quality management system (Saragih et al, 2020; Tarigan et al, 2020a). In contrast, customer relationships do not impact the supply chains of electronic manufacturing performance (Sundram et al, 2011). Green purchasing adopted by the local government in several cities in Japan showed that adopting a stipulated policy regarding green purchasing is positively related to the implementation of green purchasing in all categories of purchasing items, including paper products, stationery, lighting equipment, and others (Miyamoto et al, 2020).

This paper investigates the impact of top management commitment on operational performance through the mediating role of green purchasing and supply chain practice. This research would provide a managerial basis for improving operational performance by considering the establishment of top management commitment and the adoption of green purchasing and supply chain management practices. This study also would contribute to the current research in the field of supply chain management.

SUPPLY CHAIN MANAGEMENT

Supply chain management enhances the manufacturing industry's ability to integrate a network from suppliers, manufacturers, and distributors to benefit customers (Kalyar et al, 2019; Lee, 2015). Supply chain management is also defined as a process of coordination between business functions in an integrated internal company and external business functions effectively in providing products and information to customers (Al-Shboul et al, 2017; Al-Ghwayeen & Abdallah, 2018).

Top management commitment

Many researchers have studied the presence of top management commitment concerning the firm performance. Top management involves active communication and discussion between functions in adjusting their respective roles to achieve company goals (Sandberg & Abrahamsson, 2010). Top management of the company must act as a driver for change in the company to understand the potential of supply chain practices in depth (Diabat & Govindan, 2011; Tarigan, 2018). Top management support from the company is required to support the company's execution and adoption (Doan, 2020). The strength of corporate management support for the programs implemented is essential because it can build organisational culture and improve its atmosphere (Lee et al, 2016). Top management support impacts collaboration with suppliers and customers on green supply chain management in Korea's manufacturing companies (Lee & Joo, 2020). Top management with clear policies and effective strategic planning that provides the required resources, and adequate training for employees can increase green purchasing (Tarigan et al, 2020b).

Top management support is required to provide the required financial resources, that is, the resources needed to build a company's productive culture. Top management support has a positive effect on enterprise resource management; without top management, the system's implementation will not succeed (Dabari & Saidin, 2014). Top management support in the company can play an essential role in generating value for the company, where top management support can have a role in increasing the positive influence between supply chain integration on supply chain performance (Shee et al, 2018). Top management's commitment is defined as clear company policies in setting company goals, the ability to develop employees and provide adequate training. It also involves a willingness towards achievement, the provision of resources when needed, and periodic evaluations of the system (Tarigan et al, 2020a). Based on these arguments, the first, second, and third hypothesis is formulated as follows:

H1: Top management commitment affects supply chain management practices.

H2: Top management commitment influences operational performance.

H3: Top management commitment affects green purchasing.

Green purchasing

There have been several studies in the literature concerning green purchasing. Green supply chain management is a series of activities related to the company's concern for the supply chain flow environment, including the procurement of materials, called green purchasing, green design, production processes with the terms green process, green distribution, and green marketing (Çankaya & Sezen, 2019). The green supply chain is also known as green logistics or green purchasing (Sharma et al. 2017). The aim is to purchase and use environmentally friendly materials to reduce waste from production, packaging, and transportation (Cosimato & Troisi, 2015). The adoption of the green supply chain in India has constraints related to its costs, the complexity of carrying out established procedures, and the lack of support from company executives in implementing it (Soda et al, 2015).

Green purchasing can be defined as procuring raw materials by considering the impact of environmental damage or purchasing raw materials to consciously care for the environment by reducing waste sources and reusing materials, while still paying attention to product quality and customer satisfaction (González-Benito et al, 2016). Green purchasing has a strategic function in maintaining environmental sustainability (Diabat & Govindan, 2011). Green purchasing can reduce climate change by procuring environmentally friendly products such as air conditioning with an eco-label (Miyamoto et al, 2020). The implementation of green purchasing needs a policy establishing the procedure to purchase the product, following government regulations that care for the environment. The adoption of green purchasing positively improves firm performance (Tarigan et al, 2020b). Green purchasing at construction companies is measured by purchasing decisions for environmentally friendly raw materials. Environmental criteria are included as decisions in determining the implementation of tenders so that construction companies pay attention to environmental sustainability (Balasubramanian & Shukla, 2017).

Concerning the procurement function, green purchasing has six internal roles, namely building supplier awareness, building a supplier system to care about the business environment, collaborating with suppliers in sharing knowledge regarding the environment, explaining to suppliers green production, communicating that suppliers are required to have environmental requirements, and that they actively contribute to the environment (Cosimato & Troisi, 2015). Green purchasing is the extent to which the company has collaborated with suppliers in meeting needs according to environmental criteria. Green purchasing emphasises the purchase of environmentally friendly raw materials and prioritises suppliers who already have environmental certificates and have experience in resolving environmental problems (Zhu et al, 2013; Al-Ghwayeen & Abdallah, 2018). Measurement items for green purchasing proposed by González-Benito et al (2016) involve the way in which a company empowers the supplier

on an ongoing basis, the way in which a company always evaluates suppliers in relation to other suppliers, the way in which a company applies environmental criteria that must be considered by suppliers, and the way in which the company always tries to find sustainable suppliers. The company tries to maintain existing suppliers, but it will find a sustainable supplier if it is not possible. The above discussion leads to the fourth and fifth hypotheses, which are formulation as follows:

H4: Green purchasing affects supply chain management practices.

H5: Green purchasing influences operational performance.

Supply chain management practices

Supply chain management practices are defined as the company's ability to practically connect the internal with the external business functions to pursue a propitious flow of information and products to improve company performance (Tarigan et al, 2020a; Usman, 2020). Al-Shboul et al (2017) state that supply chain management practices consist of seven dimensions: integration with the strategic supplier, information sharing with partners, and customer relationship management. Green supply chain management practices in India's manufacturing companies have dimensions of eco-design, green purchasing, environmental cooperation, and reverse logistics (Younis et al, 2016). Green supply chain management practices are focused on the dimensions of green supplier integration, green customer cooperation, and intra-organisational environmental management. Companies can adopt green supply chain management in practice by building integration with suppliers in providing environmentally friendly materials, and developing environmentally friendly production processes that delivers finished products to environmentally friendly customers (Geng et al, 2017).

The dimensions of supply chain management practices related to the company's internal business are internal information sharing, internal lean practices, process postponement, and total quality management adoption. Green supply chain management practices positively impact financial performance and non-financial performance in Vietnamese tourism enterprises (Nguyen, 2020). The Supply chain practice used by Sundram et al (2011) related to external factors is a supplier strategic partnership and customer relationship. The internal practices in the company are information sharing, information quality, postponement, agreement regarding vision and goals, and finally, risk-sharing and reward sharing. Based on this argument, the sixth hypothesis is proposed:

H6: Supply chain management practices affect operational performance.

Operational performance

Firm performance is a broad concept that covers various dimensions of company operations, company management, and competitive advantage, and is based on financial performance, customer satisfaction, the customer complaints rate, and non-financial performance (Tseng & Liao, 2015; Nuryanto et al, 2020). Financial performance as measured in logistics services includes high investment returns, the growth rate of company profits, fewer asset-liabilities ratios, and a rapidly growing market share for company products (Ju et al, 2019).

Corporate performance related to the impact of green supply chain management practices is determined by environmental performance, economic performance, social performance, and operation performance (Younis et al, 2016). Measurements on the environmental performance dimension include reducing air emissions, reducing water use, reducing solid and liquid waste, using environmentally friendly materials, and improving company conditions to be environmentally friendly. Measurements stipulated in economic performance reduce the cost of purchasing materials, reduce energy use, reduce company waste treatment costs, reduce costs in work accidents, and increase company profits. Measurements used for social performance include improving the company's image, committing to social problems, preserving its environment, and increasing company employees' job satisfaction. Operational performance is measured by improving the health and safety of employees of the company, a reduction in lead time, an increase in the quality of the company's products, an increase in the competitiveness of enterprises, enhancing the company's product development, implementing green practices on an ongoing basis and increasing the chances of products for export to other countries.

Firm performance is the company's achievement in a particular period in terms of non-financial goals. It determines competitiveness in operational performance, including improved efficiency, quality improvement, productivity improvement, and cost savings (Cosimato & Troisi, 2015). Organisational performance in construction companies in implementing green supply chain management is measured by increasing sales, increasing selling prices, increasing market share, increasing return on investment, and increasing company profits (Balasubramanian & Shukla, 2017). Operational performance in the procurement function is determined by several measurement items, including companies getting high-quality raw materials, companies getting the lower price of raw materials, companies getting materials with fast lead times, and lower total costs to provide efficiency (González-Benito et al, 2016). Supply chain performance, which falls under operational performance, is related to reducing manufacturing costs, delivery reliability, and conformance quality (Shee et al, 2018). Manufacturing performance is also defined by customer satisfaction, delivery, flexibility, and speed (Sundram et al, 2018; Tarigan, 2018). The supply chain performance stated by Gawankar et al (2017) related to purchasing is material efficiency, supply chain integration, supply chain flexibility, product quality, partnership quality, and product innovation. Firm performance is

the company's goal as determined by two dimensions: market share performance and financial performance (Al-Shboul et al, 2017). Operational competitive capabilities indicators reduce cost, improve quality, delivery, and flexibility (Famiyeh et al, 2018).

RESEARCH METHOD

This research collects data using a research questionnaire designed with a Likert scale from 1 (strongly disagree) to 5 (strongly agree) (Sekaran & Bougie, 2016). Top management commitment assesses the extent to which the top management is committed to supporting the organisation in terms of the socialisation of the company goal to all functions (TMC1), the establishment of management policies that can be understood by all departments (TMC2), provision of required resources (TMC3), and provision of time for meeting with all departments (TMC4). Green purchasing measures the extent to which the company established policies that suppliers are supplying environmentally friendly raw materials (GP1), the purchasing department sets clear green material criteria (GP2), raw materials are more environmentally friendly (GP3), and the company collaborates with suppliers on an ongoing basis (GP4). The measurement items for supply chain management practices concern suppliers: strategic supplier partnership (SCP1), enhanced level of information sharing with partners (SCP2), and collaboration with suppliers (SCP3). The measurement items for operational performance related to green purchasing are conformance quality (OP1), lead time reduction (OP2), companies obtain raw materials at a lower cost (OP3), and efficient use of company raw materials (OP4).

The research population comprises of the manufacturing companies in East Java, Indonesia, that have adopted supply chain management practices and green purchasing. This research has distributed 150 questionnaires to 150 manufacturing companies. 135 questionnaires were completed correctly. The distribution of so many questionnaires is possible with the support of grant funding from the government. As had been identified previously, this study's concern is the effect of supply chain management practices and green purchasing adoption on operational performance. Hence, the relevant criteria for the respondents are from the purchasing or supply chain management department. Based on these underlying criteria, only 81 questionnaires were considered valid for further analysis. Data analysis used the Partial least square by utilising the SmartPLS software.

RESULT

The first step is to examine the measurement model in terms of validity and reliability.

Table 1. The convergent validity assessment result

| Indicator | Factor loading | Standard Deviation | T-Statistics |
|-----------|----------------|--------------------|--------------|
| TMC1 | 0.610 | 0.196 | 3.114 |
| TMC2 | 0.658 | 0.175 | 3.765 |
| TMC3 | 0.811 | 0.125 | 6.463 |
| TMC4 | 0.899 | 0.063 | 14.355 |
| SCP1 | 0.556 | 0.262 | 2.121 |
| SCP2 | 0.769 | 0.224 | 3.432 |
| SCP3 | 0.722 | 0.270 | 2.674 |
| GP1 | 0.836 | 0.128 | 10.488 |
| GP2 | 0.796 | 0.085 | 9.415 |
| GP3 | 0.674 | 0.115 | 5.856 |
| GP4 | 0.832 | 0.048 | 17.502 |
| OP1 | 0.866 | 0.044 | 19.455 |
| OP2 | 0.781 | 0.116 | 6.717 |
| OP3 | 0.877 | 0.055 | 15.808 |
| OP4 | 0.834 | 0.037 | 22.32 |

The validity test assesses each indicator factor loading value as less or greater than 0.5. An indicator is considered valid when the factor loading value exceeds 0.5. Table 1 demonstrated convergent validity in terms of factor loading. The construct of top management commitment (denoted as TMC) has the lowest value of 0.610, supply chain management practices (SCP) has the lowest value of 0.556, green purchasing (G.P.) has the lowest value of 0.674, and operational performance (O.P.) has the lowest value of 0.781. Those results indicated that all indicators are valid as the factor loading value is higher than 0.50 as the minimum recommended value (Hair et al. 2012).

Furthermore, the reliability test assesses the value of composite reliability, and the block on indicators is considered reliable when the composite reliability value exceeds 0.7. Table 2 shows the result of reliability assessment in terms of composite reliability. All composite reliabilities are greater than 0.70, the minimum recommended value (Hair et al, 2012).

Table 2. Reliability measurement

| Research variable | Composite reliability |
|---------------------------|-----------------------|
| Top Management Commitment | 0.837 |
| Supply Chain Practice | 0.727 |
| Green Purchasing | 0.866 |
| Operational Performance | 0.906 |

Thus, the research's outer model is valid and reliable, and the subsequent analysis is allowed. Further analysis focuses on hypothesis testing in Table 3.

Table 3. Hypothesis test result

| Direct Effect | Path coefficient | Standard deviation | T-Statistic |
|--|------------------|--------------------|-------------|
| Top Management Commitment -> Supply Chain Management Practice (H1) | 0.342 | 0.160 | 2.136 |
| Top Management Commitment -> Operational Performance (H2) | 0.115 | 0.146 | 0.786 |
| Top Management Commitment -> Green Purchasing (H3) | 0.440 | 0.168 | 2.623 |
| Green Purchasing -> Supply Chain Management Practice (H4) | 0.406 | 0.138 | 2,934 |
| Green Purchasing -> Operational Performance (H5) | 0.593 | 0.143 | 4.155 |
| Supply Chain Management Practice -> Operational Performance (H6) | 0.489 | 0.130 | 3.755 |

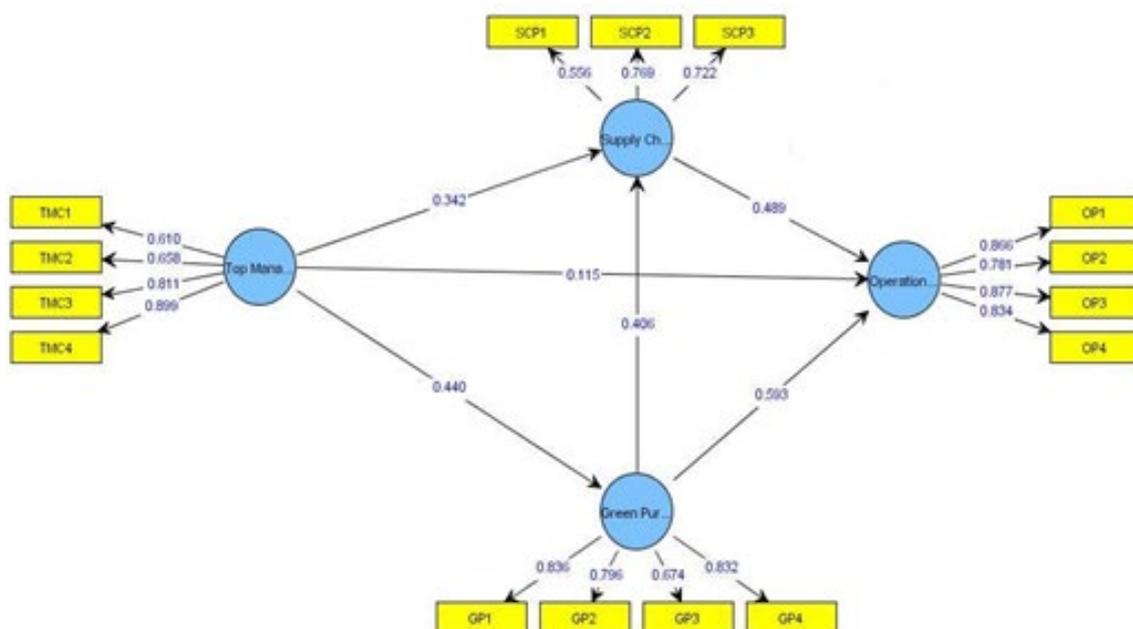


Figure 1. The Result of Model Research

There are six hypotheses to be examined: top management commitment effect on supply chain practices (H1), top management commitment influence on operational performance (H2), top management commitment influences on green purchasing (H3), the effect of green purchasing on supply chain management practices (H4), green purchasing influence on operational performance (H5), and supply chain management practices influence operational performance (H6). Table 3 and Figure 1 show the result of hypothesis testing in terms of path coefficient and the t-statistic value. The result indicated that the first hypothesis, the effect of top management commitment on supply chain practices, has a coefficient of 0.342 and a t-value of 2.136. This result is in line with the previous research by Dabari and Saidin (2014), which shows that top management commitment improves supply chain management practices. The second hypothesis, the effect of top management commitment on operational performance, is not supported (coefficient 0.115, and the t-statistic of $0.786 < 1.96$). This finding is contrary to the previous study by Shee et al, (2018), which stated that top management commitment improves operational performance.

The third hypothesis, the effect of top management commitment on green purchasing, is supported with a coefficient of 0.440 and the t-value of 2.623. This result supported the previous research by Shee et al, (2018), which suggested that top management commitment supported green purchasing adoption. The fourth hypothesis, the influence of green purchasing on supply chain management practices, has an effect of 0.406 and a t-statistic of 2.934. This finding supported the previous study by Çankaya and Sezen (2019), which suggested that green purchasing is a critical part of supply chain management practices. The fifth hypothesis, the effect of green purchasing on operational performance, has a coefficient of 0.593 and a t-statistic of 4.155. This result coincided with the study by Cosimato and Troisi (2015), which stated that green purchasing could improve operational performance. Finally, as shown in Table 3, it was found that the sixth hypothesis, the influence of supply chain practice on operational performance, is also empirically supported with the path coefficient of 0.489 and t-statistic of 3.755.

DISCUSSION

This research found that top management commitment improves supply chain management practices in manufacturing companies (H1). Management support can be in the form of providing adequate resources and information sharing with partners in its supply chain management practices. Supply chain management practices require full support from the top management in terms of resource allocation. However, the study revealed that top management's commitment has no direct effect on improving operational performance (H2). This finding might suggest that top management's commitment should be put into action to allocate the resources required to adopt the green purchasing approach and implement the supply chain management concept. Otherwise, the top management commitment will not have any impact on operational performance.

Furthermore, this study also shows that top management commitment can improve green purchasing implementation (H3). Management needs to provide adequate resources, communicate with all departments, and establish policies that encourage the purchasing department to find particular suppliers to provide environmentally friendly raw materials and appliances. The result also revealed that green purchasing could improve supply chain management practices directly (H4). Green purchasing implementation requires collaboration with suppliers on an ongoing basis. Hence, information sharing with partners in the company's supply chain management practices becomes mandatory.

Green purchasing adoption enables the company to improve supply chain management practices in terms of a better relationship, information sharing, and collaboration. This study also found that green purchasing improves operational performance directly (H5). The green purchasing implementation requires the suppliers to supply environmentally friendly raw materials, enabling the company to reduce waste. The customer will also consider the company's products and, in the end, will improve operational performance. The last finding shows that supply chain management practices can improve operational performance. Collaboration with suppliers in the form of enhanced information sharing with partners and the establishment of strategic supplier partnerships can improve product quality as indicated by conformance quality and efficient use of materials. Supply chain management practices can improve operational performance.

One of the exciting findings from this study is that top management commitment did not directly affect operational performance. Top management commitment needs to be realised in supply chain management practices and green purchasing adoption to improve operational performance. The top management needs to allocate the resources and establish policies in terms of green purchasing adoption and supply chain management practices to pursue improved operational performance. Based on this finding, top management commitment can only improve operational performance by adopting green purchasing and supply chain management practices.

This research proposes a model for improving the manufacturing company's operational performance in a supply chain management context. A company's management needs to be committed to allocating adequate resources to implement supply chain management practices and green purchasing. The resources could be in the form of human resources, information technology, capital allocation, and adequate organisational structure. This research limited the research population only to cover manufacturing companies in Indonesia. For future research, the author proposes expanding the research for service companies with broader area coverage. This research also contributes to the current research in the field of supply chain management



CONCLUSION

As previously stated, this study investigates the impact of top management commitment, green purchasing, and supply chain management practices on operational performance. The research results were drawn as follows: top management commitment influences the supply chain management practices and green purchasing directly. However, top management commitment did not directly affect operational performance. Green purchasing affects supply chain management practices. Green purchasing improves the operational performance of the company. Also, supply chain management practices affect operational performance. This study proposed a model for improving operational performance through top management commitment, supply chain management practices, and green purchasing adoption. Green purchasing adoption needs top management support, such as allocating the resources or establishing agreements with partners. Supply chain management practices are implemented with collaboration with suppliers, increasing information sharing with partners. Strategic supplier partnerships improve operational performance. This study shows that top management commitment can only improve operational performance through supply chain management practices and green purchasing adoption. This research provides insight for managers on how to improve the operational performance in the context of supply chain management. This study also contributes to ongoing research in supply chain management.

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