



The Effect of Top management commitment on Operational Performance: The Mediating Role of Green Production

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ABSTRACT

The research examined the effect of top management commitment (TMC) on operational performance and the mediating effect of green production. The study selected 219 manufacturing companies of Iraq. The result analyzed the direct effect of TMC on green production and operational performance. Also, the effect of green production on operational performance is analyzed. In addition, the mediating effect of green production between the association of TMC and operational performance analyzed. So, the direct and also indirect results found in the study were significant. This finding offers crucial understanding for managers in the manufacturing business, indicating that a strong commitment from top management and the use of green production may improve operational performance. Moreover, this study expands on the findings of prior research about the correlation between TMC and GP in enhancing OP. Therefore, this study enhances the existing research in Structural Equation Model (SCM).

Keywords: top management commitment, manufacturing industry, green production, operational performance

INTRODUCTION

Protecting the environment garnered significant attention in the past few decades, with experts accentuating the criticality of mitigating the effects of climate change. Consequently, the global climate conference has been attended by world leaders from over 40 nations. The Summit highlighted the potential of these climate objectives to provide high-paying employment opportunities, foster technology advancements, and support underdeveloped nations in their efforts to adapt to the impacts of global warming (Whitehouse, 2021). In response to the recommendation, several organizations started showing concern for the surroundings due to the increasing worldwide recognition of the importance of environmental conservation (Kalyar et al., 2020). The growing emphasis on nourishing the Earth's resources in an environmentally friendly manner has reached a crucial stage, compelling corporations to seriously consider implementing environmentally sustainable practices. The use of green supply chain techniques has the ability to have a positive impact at every stage of the supply chain, starting with producers and suppliers, and extending to consumers and product disposal (Nguyen et al., 2022). Implementing cost-effective approaches may lower expenses related to raw material procurement, energy use, waste management, and damages to the environment, hence improving the organization's operational productivity (Santoso et al., 2022). The Ministry of Environment has implemented environmental restrictions and issued warnings to people who breach ecological norms (Novitasari & Tarigan, 2022).

Implementing green production techniques necessitates a financial commitment and the implementation of a novel approach and regulation to address ecological issues. Therefore, it is crucial for senior management to demonstrate a strong commitment to implementing environmentally-friendly industrial practices. The objective of green production is to implement ecologically sustainable business practices with both customers and suppliers in order to minimize the potential for ecological damage resulting from their products, services, and other operations. Manufacturers are increasingly focusing on green product creation and its production processes due to changes in customer behavior, which in turn affects their manufacturing behavior. It is present in a diverse range of industries. Green production is essential for corporate enterprises' green business plan (Abdallah & Al-Ghwayeen, 2020). As people's awareness of environmental preservation grows, there is a rising demand for ecological goods. Implementing

environmentally friendly production procedures allows enterprises to improve their environmental reputation and raise the market worth of their goods. Green production enables businesses to collaborate with suppliers in order to establish supply chain processes both upstream and downstream, leading to enhanced performance in operations (Yu et al., 2019). The green production concerns are becoming a growing worry due to the firm's growth and increased awareness from consumers and other constituents. Therefore, the investigation and implementation of environmentally-friendly manufacturing methods are crucial and growing concerns that need to be examined to address the lack of sustainable practices in the green supply chain (Dubey et al., 2017).

The preceding explanation illustrates the direct impact of top management commitment (TMC) and green production on the operational success of the organization. However, prior research only examined the direct correlation between the two variables. In addition, to the authors' understanding, no research has examined the connections between all three factors concurrently. The primary objective of this research is to examine how green production contributes to enhancing the operational performance through green production. The results of this research are anticipated to provide new perspectives on how implementing environmental protection measures might enhance operational performance. Moreover, this study has the potential to enhance the current body of knowledge in supply chain management.

Top Management Commitment

Top management commitment (TMC) is the act of top-level executives showcasing their belief in the significance of implementing a strategy or plan that brings value to the organization (S Basana et al., 2022). In addition, K. Digalwar et al. (2013) said TMC refers to a structured approach inside an organization that facilitates the execution of initiatives aimed at enhancing sustainability in the environment. The company's top management establishes the environmental strategies to be implemented, establishes the extent of employee training, along with decides on the level of engagement that is required for ecological sustainability. These measures seek to accomplish both production targets in terms of quality and quantity, as well as the sustainable future of the environment. Top management establishes a communication system that functions as a framework, necessitating the use of technological devices (Ram et al., 2023). TMC is shown in corporations when senior executives affirm the significance of a program as the primary

strategic direction for the company and demonstrate that the program may provide a favorable influence on its economic sustainability. In order to prevent disputes across departments, it is crucial to have the full support and dedication of top-level management. This is particularly important when implementing a new system or program, as it might potentially disrupt the established responsibilities and duties of various departments, hence challenging the existing organizational structure. Hence, it is essential for senior executives to clearly communicate to the whole organization that the initiative's functions are not to be approached in a competing manner by different departments within the company's organizational structure. Instead, all departments have the ability and should actively participate towards fostering improved relationships (H. Siagian & Z. Tarigan, 2021). An exemplary demonstration of top management dedication is seen when top management is able to help the staff via its functions. The strong commitment of senior management will ensure the alignment of corporate goals and program objectives, therefore guiding the choice of partners based on factors that are consistent with these aims.

Operational Performance

Operational performance refers to the business's willingness to fulfill the standards established by the customer and evaluate its performance throughout the manufacturing process, starting with raw materials and ending with final products (Miteku et al., 2022). The client expects the organization to meet their satisfaction level in order to keep their contentment with the items and services offered (Tarigan et al., 2021). The organization offers expedient delivery of items to clients via either shipping or in-person delivery. The distribution of this product must also consider the product's integrity in terms of its quantity and quality (Tarigan et al., 2021). The organization may enhance its operational effectiveness by cultivating strong connections with both internal stakeholders (such as senior management, divisions, and workers) and external stakeholders (including vendors, resellers, retailers, and consumers) (Tarigan et al., 2019). The company's connections to external parties encompass various aspects. This includes establishing a strong rapport with suppliers to ensure the timely acquisition of materials at a favorable price. Additionally, fostering a positive relationship with customers is crucial for meeting their demands. Internally, the company focuses on coordinating and collaborating between departments to produce services and goods that align with the marketplace.

Green Production

The idea of sustainability encompasses almost every stage of a process, including the acquisition of raw materials, manufacture, storage, packing, transportation, and distribution of products (Sdrolia & Zarotiadis, 2019). The main objective of green production is to ensure long-term sustainability, that means every manufacturing industry should preserve renewable resources for the benefit of the next generation. Moreover, the industrial sector should have a clear understanding of the limits of its obligations and the detrimental impact of its hazardous emissions on the environment. Zhu and He (2017) state that green product creation is widely acknowledged as a crucial aspect of sustainable SCM, as shown by several literary works. Companies use technologies such as design for atmosphere, design for disassembly, and analysis of life cycles to minimize the detrimental impact on the environment. Based on the analysis of green production literary works, Pinto (2020) used the parameters of green production in the following manner: 1) Strive to eradicate inefficiencies in the manufacturing process, 2) endeavor to minimize contamination of the environment, 3) aim to establish a recycling system, 4) adopt eco-friendly production methods, 5) focus on minimizing material expenses, 6) ensure the production process operates efficiently, 7) enhance the punctual delivery of goods, 8) abstain from utilizing hazardous substances, 9) leverage technology to promote eco-conscious production.

Top management Commitment and Operational Performance

The effect of mission statements on business performance is influenced by the commitment of top management. This influence is mediated via efficient collaboration, widespread participation within the organization, establishment of objectives, and timely modifications (I. Williams Jr et al., 2014). The success of innovative products is significantly influenced by the level of commitment shown by top management (Mokhtar & Yusof, 2010) A study conducted by Caroline et al. (2016) demonstrates a substantial correlation between top-level management and the performance of an organization. Research conducted by revealed that there is a significant correlation between good leadership and corporate success. Furthermore, a research conducted by Semuel and Herlina (2017) has shown that leadership has positive effects on the performance of manufacturing firms in Indonesia. In addition, the implementation of effective leadership techniques inside a manufacturing business has a significant role in enhancing performance (Tarigan & Siagian, 2021). Furthermore, a recent research conducted by Setiabudi et al. (2021)

indicated that the implementation of transformational leadership has the potential to improve the overall performance of manufacturing companies. The research was carried out on the industrial sector in Iraq.

H1: The effect of TMC on operational performance

Top Management Commitment and Green Production

In their study, Burki et al. (2019) found that TMC is crucial for achieving success in implementing innovation in green processes inside exporting enterprises. Green innovation in processes is a component of green production. A recent research conducted on the Indian automobile sector, including 96 participants, revealed that TMC has a direct effect on the expansion of green products innovation (Bhatia & Jakhar, 2021) The research found that the concept of innovative green products is similar to green production. The research of 148 Chinese manufacturing businesses shown the positive correlation with top management champion and the adoption of green culture as well as practices, such as GP (Li et al., 2019).

H2: the effect of TMC on green production

Top Management Commitment and Operational Performance and Green Production

The use of environmentally friendly manufacturing processes may provide competitive advantages for companies, leading to increased customer satisfaction and accelerated corporate growth (Achillas et al., 2018). Moreover, the use of green manufacturing methods may lead to a decrease in energy consumption costs, hence enhancing the overall performance of products (Sezen & Cankaya, 2013). So, the firm may get a competitive edge by offering environmentally-friendly products, since it may market byproducts at more affordable rates or transform them into high-quality goods. Similarly, the corporation may enhance its adaptability and decrease its manufacturing expenses. However, achievement of green manufacturing relies heavily on the commitment of senior management. This commitment is necessary to allocate resources including innovative technology, workers, and new capabilities. Prior discussions have emphasized the need of senior management commitment, which has a direct impact on the implementation of green production practices (Bhatia & Jakhar, 2021). According to this reasoning, an additional hypothesis is proposed in the following manner.

H3: the effect of green production on operational performance

H4: The mediating effect of green production on the association between top management commitment and operation performance

METHODOLOGY

A survey that was self-administered was distributed to a representative of 219 industrial enterprises in Iraq. Each organization was allocated one questionnaire for its spokesperson. The representatives were thereafter urged to disseminate the survey to the HR manager. Every participant was sent with a survey with a cover letter, which outlined the study's objectives and provided directions on how to complete the survey. The data were gathered from January 2024 to April 2024, using a snowball sampling technique to choose the study's sample. A grand total of 290 questionnaires were gathered, all of which were suitable for further analysis. The study's final sample included 21.3% female and 78.7% male responses. Among the participants, 19.2% were aged 22-27, 41.2% were aged 28-33, 27.3% were aged 34-39, 10.3% were aged 40-45, and 3% were over the age of 45. In addition, 11.5 percent of the participants have been employed by the firm for less than two years, while 46.3 percent have been doing jobs there for 2-7 years. Furthermore, 31.6 percent have been with the company for 7-12 years, 8.2 percent for 13-18 years, and just 2.4 percent have been employed for 19-24 years.

Measurement

The scale is of five-point Likert. Green production with nine items used by (Pinto, 2020), operational performance with five items used by (Lai & Wong, 2012). Measures of top management commitment with nine items were adapted from (K. Digalwar et al., 2013).

Data Analysis

To accomplish the objective, a quantitative method was applied by using the partial least square (PLS) method. There are two parts of this PLS.

Measurement Model

In this part, all items have more than 0.50 values of factor loadings and less than 0.50, Two items, TM7 and GP6 were deleted. All values of Cronbach's α were greater than 0.70 and the value of average variance extracted (AVE) to assess convergent and discriminant validity were

more than 0.50. Convergent validity means to what extent a number of items calculating the similar variable (Sekaran & Bougie, 2016).

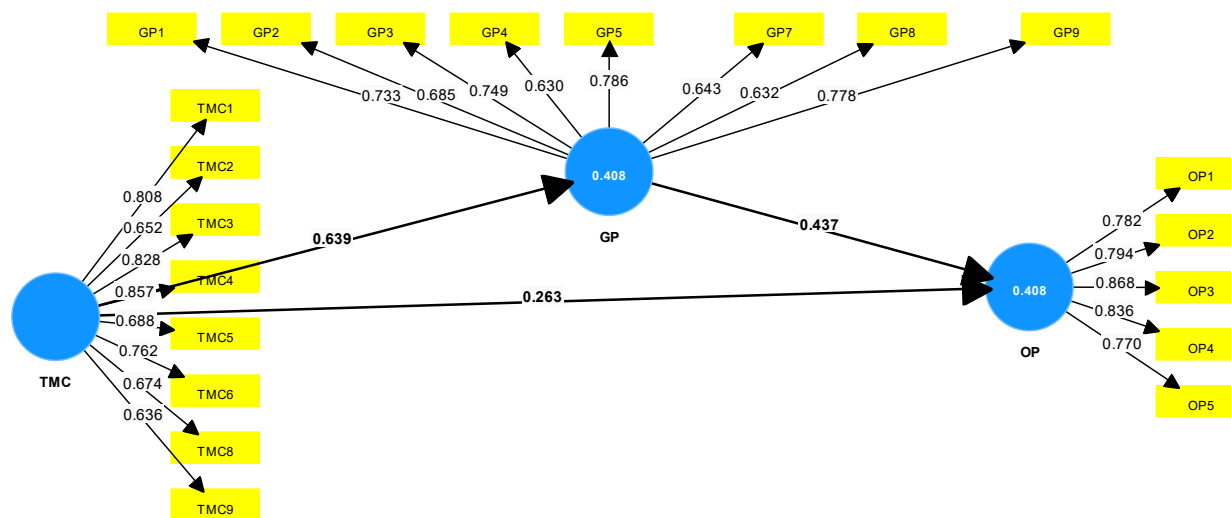


Figure 1: Internal consistency

Table 1: Internal Consistency and Validity

Constructs	A	Composite reliability (rho_a)	Composite reliability (rho_c)	AVE
GP	0.890	0.892	0.888	0.501
OP	0.906	0.907	0.906	0.658
TMC	0.907	0.913	0.907	0.551

Subsequently, the data is examined to evaluate its discriminant validity (DV), which is determined by associating AVE value for every construct with the squared correlation between that construct. The goal of examining DV is to verify that there are no two items within the same variable that measure the same thing, since this would result in redundant data (Sekaran & Bougie, 2016). To prove DV, the AVE should exceed that of the other variables.

Table 2: Discriminant Validity

Constructs	GP	OP	TMC
GP	0.707		
OP	0.606	0.811	
TMC	0.639	0.543	0.742

The value of R square refers to what extent the variance of the DV clarifies the variance of the IVs. For instance, OP with R square value is 0.408 indicating the variance of OP were clarified by TMC and green production up to 41%.

Table 3: R-square

Constructs	R-square	R-square adjusted
GP	0.409	0.406
OP	0.408	0.405

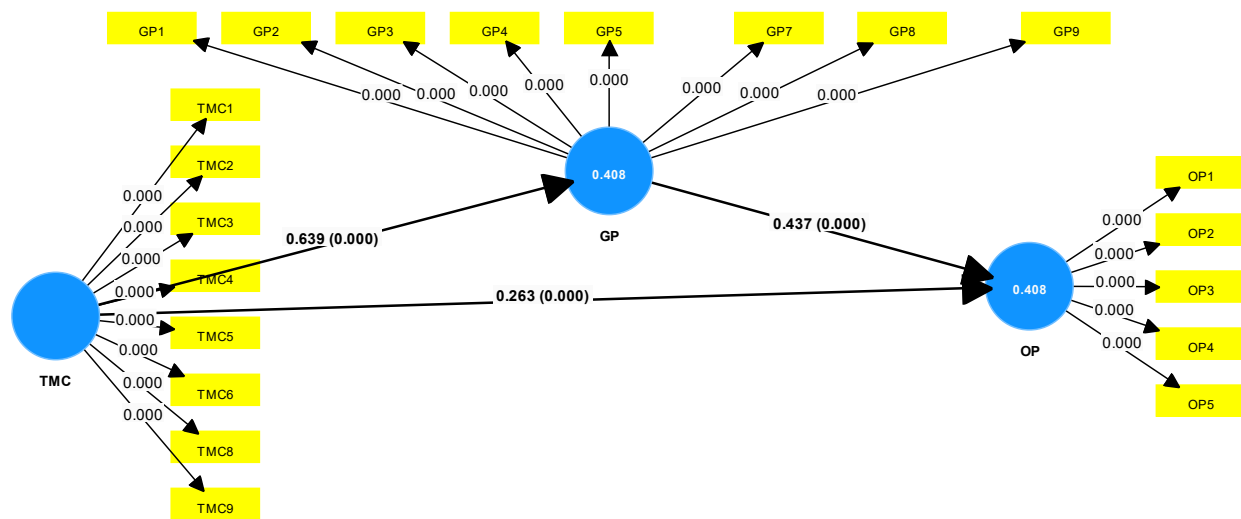


Figure 2: Path Coefficient and p value

Structural Equation Model

The SEM and hypotheses tested in table 4, were evaluate the acceptance or rejection of the prosed hypotheses. This study uses a one tailed t-statistic value which should be the t value>1.64 and the p-value<0.5. Using the bootstrapping, the significance of the structural paths was considered. This is showed in Figure 2 and 3, where the effect of TMC on operation performance (b value=0.263, t-value=3.623>1.64, p-value= 0.000<0.05). So, H1 is accepted. Operational performance is assessed based on enhancing product quality, expediting delivery processes, enhancing new product development, and augmenting sales in both domestic and global markets. It is evident that achieving operational performance requires a firm dedication from management in assigning the necessary resources and implementing appropriate procedures. Therefore, it is logical to conclude that when management is committed, it allows the firm to enhance its

operational performance. So, this finding aligns with the results of earlier research conducted by (Sautma Basana et al., 2022; H. Siagian & Z. J. H. Tarigan, 2021). The effect of TMC on green production (b value=0.639, t-value=11.524>1.64, p-value= 0.000<0.05). So, H2 is accepted. The strong commitment from senior management to allocate resources towards green production technology as well as human resources allows for the adoption of a green production system (Chu & Chen, 2016). Thus, such operations need a dedicated effort from management, primarily including the provision of resources, objectives, and new policies. Therefore, it is logical to conclude that the endorsement of the practice of green production by senior management is essential. The finding expands upon the acknowledgement of prior research conducted by (Bhatia & Jakhar, 2021) The effect of green production on operation performance (b value=0.437, t-value=6.677>1.64, p-value= 0.000<0.05). So, H3 is accepted. Sustainable green production processes include the implementation of measures to minimize environmental pollution, adopting production procedures that are ecologically friendly, optimizing production efficiency, ensuring prompt delivery, and making use of eco-friendly technology. Green production allows manufacturing organizations to meet client expectations for environmentally friendly products, while also increasing sales and operational success. The finding confirmed the widespread acceptance of earlier research indicating that using environmentally friendly manufacturing methods improves operational performance (Dubey et al., 2013; Sezen & Cankaya, 2013).

Table 4: *Direct Relationship*

Relationship	Path Coefficient	Standard deviation	T statistics	P values	Decision
TMC -> OP	0.263	0.073	3.623	0	Accepted
TMC -> GP	0.639	0.055	11.524	0	Accepted
GP -> OP	0.437	0.066	6.677	0	Accepted

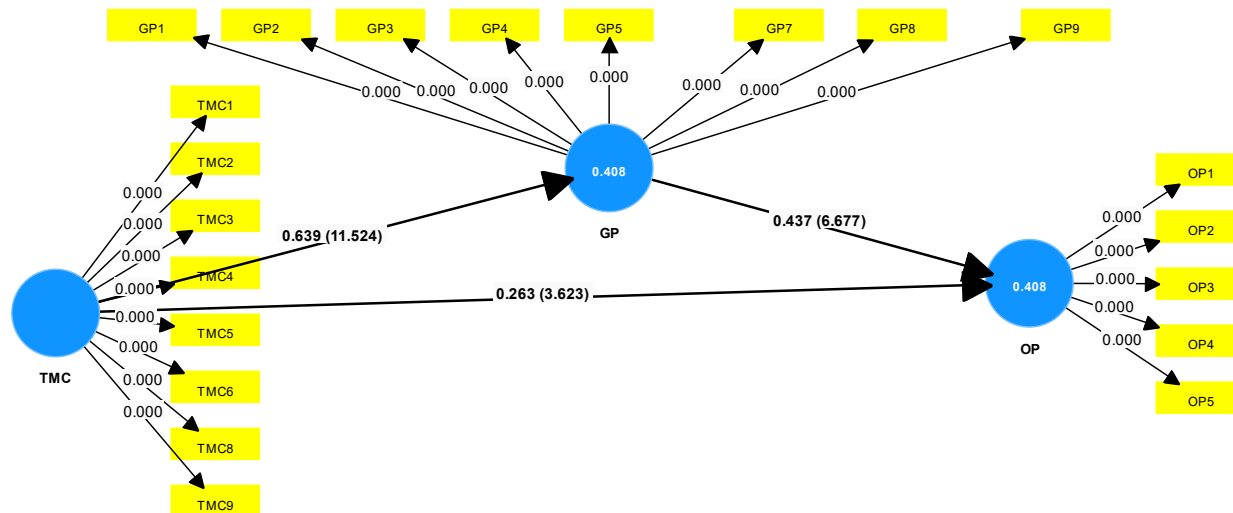


Figure 3: Path Coefficient and t value

The mediating effect of green production between the association of TMC and operation performance (b value=0.279, t-value=5.511>1.64, p-value= 0.000<0.05). So, H4 is accepted. TMC empowers the organization to fix the policy and goals of the business to assume GP, and then, GP would expand the operational performance.

Table 5: Indirect Relationship

Relationship	Path Coefficient	Standard deviation	T statistics	P values	Decision
TMC -> GP -> OP	0.279	0.051	5.511	0	Accepted

Managerial Implication and Theoretical Contribution

This research has uncovered intriguing findings and has the potential to provide crucial understanding for those in administrative positions. Firstly, the discovery of this research demonstrated the widespread acceptability of several prior studies conducted in diverse groups and geographic locations. The findings demonstrate that the level of commitment from top management has a direct impact on both green production as well as operational performance. In addition, green production has a direct impact on OP. The key observation from the finding may be summarized as follows. Although the use of green production remains an issue for practitioners with regard to cost and value, this research found that implementing green production, with strong the commitment of management, may enhance the OP of enterprises.

Therefore, firm management should not hesitate to use environmentally friendly manufacturing methods. Undoubtedly, the implementation of environmentally friendly manufacturing methods necessitates investing in the provision of resources, such as advanced production technology. However, the organization will get advantages from implementing environmentally-friendly practices both in the short and long term. Furthermore, the strong dedication of top management has various impacts on operational performance by means of the intermediary function of green production. The achievement of the green adoption is contingent upon the management's continuous commitment of supplying the necessary resources. Otherwise, the efficacy of green manufacturing will not be achieved. Hence, such findings have the potential to enhance the knowledge in SCM research.

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