




# “Examining the role of quality performance and entrepreneurial orientation on green manufacturing and financial performance”

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# EXAMINING THE ROLE OF QUALITY PERFORMANCE AND ENTREPRENEURIAL ORIENTATION ON GREEN MANUFACTURING AND FINANCIAL PERFORMANCE

## Abstract

The concept of green manufacturing is a topical discourse in sustainability studies, but its adoption seems to be lagging due to an unclear link to financial performance. The study aims to test the relationship between green manufacturing and financial performance, with quality performance as a mediator and entrepreneurial orientation as a moderator. The partial least square (PLS) method was applied for hypotheses testing. Data were randomly obtained from 116 managerial staff in manufacturing firms operating in the polymer industry in Southern Nigeria. From the PLS results, green manufacturing is positively related to financial performance ( $\beta = 0.167$ ,  $p = 0.027$ ), and this relationship is mediated by quality performance ( $\beta = 0.194$ ,  $p = 0.000$ ) and moderated by entrepreneurial orientation ( $\beta = 0.115$ ,  $p = 0.000$ ). The results demonstrated that green manufacturing spurs financial performance directly. However, optimality can be achieved indirectly through quality performance and under generative conditions or behaviors effectuated by entrepreneurial orientation. In conclusion, quality performance and entrepreneurial orientation may account for the ways in which green manufacturing enhances financial performance significantly and positively.

## Keywords

sustainable manufacturing, quality improvements,  
entrepreneurial orientation, financial health,  
performance

## JEL Classification

L25, L26, L65, Q50

## INTRODUCTION

The growing ecological debasement has recently compelled firms to adopt green manufacturing (GM) practices (Thamsatitdej et al., 2017; Singh et al., 2022). However, Nigerian manufacturing firms transitioning to sustainable practices has been relatively slow. This stems from the limited knowledge of how the green concept works to enhance profit-making, the resource constraints amid poor economic conditions, and the weak environmental standards and regulatory frameworks (Olayeni et al., 2021; Ogunkan, 2022). Nevertheless, despite these constraints, a positive link has been established between economic and ecological systems (Söderholm, 2020), suggesting that a degrading environment affords scant revenue growth and profitability opportunities. In such a context, greening firms' value chains is a rational means of leveraging new opportunities leading to desirable financial results. To this end, manufacturing firms cannot overlook environmental issues if they are to maintain stable financial conditions for long.

GM is understood as an operational approach that leads to quality improvements. Since the imperative for investing in GM is about meeting the shifting stakeholders' demands and expectations, quality improvement can be realized when production processes align accordingly. The adoption of quality improvement initiatives will make firms more attractive to critical stakeholders (e.g., customers and investors), which can strongly impact firms' financial health. If GM considerations are ignored or lagging, many firms may miss out on the distinctive quality adjustments necessary for financial improvements. In parallel, GM is a relatively new practical concept in the manufacturing sector in Nigeria. Hence, it is plausible that entrepreneurial orientation (EO) would stimulate readiness to adopt new practical approaches, especially when the economic outcomes are not necessarily clear and the probability of success is unknown (Shirokova et al., 2015). EO describes proactive, innovative, and risk-taking actions initiated by firms to successfully create value and better performance (Lumpkin & Dess, 1996). Thus, there is a strong possibility that the EO of manufacturing firms would determine their predisposition to pursue opportunities that generate financial and environmental benefits through the strategic initiation of GM (Jiang et al., 2018). The problem is that if EO activities are low, firms' commitment to organizational renewal through adopting cleaner production processes would gradually weaken. Perhaps, these firms would be inattentive to the adverse effect of existing operational models on their financial well-being. Arguably, EO may create conditions necessary for the adoption of GM to strengthen the financial standing of firms.

Summarily, firms need to be intentional about environmental impact by demonstrating sustainable behavioral change through the application of GM initiatives. However, firms seek assurance whether greening manufacturing processes pay financially (Olayeni et al., 2021). The answer to this question is vital because many manufacturing firms in Nigeria face unfavorable economic conditions in a highly uncertain environment. Consequently, they may not want to compromise their financial position in any way to advance environmental performance targets. Indeed, green strategic initiatives are difficult to execute in challenging environments. However, firms must introduce changes in line with environmental conditions to remain financially viable and competitive. GM handles some manufacturing concerns (Rehman & Shrivastava, 2013), but what would arouse the firms' interest is its connection to financial performance, as these firms exist to make a profit to survive in resource-constrained environments.

## 1. LITERATURE REVIEW

The degrading ecological system has become an urgent strategic concern owing to its sustainability implications on corporate organizations and society. The environment faces high pollution and degradation from a broad spectrum of waste generated by manufacturing firms. This challenge has made the construct of green manufacturing (GM) to be topical, as most firms want to know whether GM adoption would translate to better financial performance (FP). In doing so, the study looked at the contextual roles played by quality performance (QP) and entrepreneurial orientation (EO) in the GM-FP link.

### 1.1. GM and FP

GM is a strategic approach that includes processes and systems for operational improvement and environmental impact throughout the product's life

cycle (Fernando & Uu, 2017; Machado et al., 2020). It represents many design-environment approaches often labeled as sustainable manufacturing, green production, sustainable production, clean manufacturing, environmentally responsible manufacturing, and environmentally conscious manufacturing, amongst others (Schäfer & Löwer, 2021). GM aims to integrate clean production processes that reduce the ecological effects of a product during its life cycle (Eltayeb et al., 2011; Al Khattab et al., 2015). GM mechanisms, tools, and methodologies create products relating to sustainable development concepts and life cycle thinking (Li et al., 2015). Its highly probable environmental impact is addressed mainly from assessments of eco-consequences in each production phase (Rehman & Shrivastava, 2013). GM links together "the selection of low-impact materials, the reduction of materials used, the optimization of production techniques and distribution system, the re-

duction of impact during use, the optimization of initial, lifetime and end-of-life (EoL) systems, and new concept development” (Li et al., 2015, p. 842).

FP is a subjective assessment of the extent to which a firm attains its financial objectives in a specified period, usually for the year. Managers pay close attention to profit-making because of its crucial role in current developments and the potential growth of a firm. However, FP is often challenged by many endogenous and exogenous factors operating in the environment, leading to poor business performance (Le Thi Kim et al., 2021). The measurement of financial performance is not an end, but a means for more effective and efficient management and has strategic implications for the deployment and utilization of organizational resources (Vij & Bedi, 2016). FP’s connection to firm performance and survival makes its determination necessary before any other performance measure (Udofia et al., 2021). Some subjective FP measures include return on investment, profitability, sale growth, and market share (Vij & Bedi, 2016).

The transitioning to sustainable manufacturing has been quite tasking for most manufacturing firms, especially in Nigeria, because of the resource constraints impeding the reconfiguration of existing operational processes. Besides, managers may seem unmotivated about such investments because of the long return on the investment cycle and the risks of failure (Guo et al., 2022). Further, it is plausible that Nigeria’s existing policy and regulatory frameworks are ineffective in making firms respond decisively to negative environmental externalities (Ogunkan, 2022). Manufacturing firms leaning on the orientations stated above could be adversely affected as the integration of sustainability practices is now a global imperative for business. The attainment of economic and environmental sustainability should not be at opposite ends, where a movement in the direction of one affects the optimization of the construct in the other. Both sustainability components can be targeted because the two are interrelated. In other words, they complement each other to enhance a firm’s long-term survival.

Manufacturing firms face increasing internal and external pressures from critical stakeholders to adapt and integrate eco-friendly business models

and practices to enhance organizational sustainability (El-Kassar & Singh, 2019). Organizational sustainability entails finding the right balance between economic, social, and environmental objectives. In this line, the economic objective is closely related to financial performance, defined as the extent to which an organization delivers desirable financial results with a given set of resources during a specific period. The realization of financial performance is the main objective for profit-making firms because it plays a vital role in organizational growth and development. However, this objective is often challenged by an array of factors, resulting in a low level of organizational performance. Therefore, studying the antecedent factor(s) of financial performance is necessary to stimulate competitive advantage in a highly turbulent environment because competitive advantage strengthens financial performance considerably.

Unarguably, financial performance has a significant influence on decisions and actions impacting organizational sustainability. One of the decisions that manufacturing firms make to achieve sustainable financial performance is adopting eco-friendly business models and practices. Essentially, sustainability management models improve corporate image and reputation and build relevance among consumers through increased market share, customer satisfaction, retention, and patronage. Further, it incorporates cost reduction improvements that can enhance an organization’s revenue (Khan et al., 2019). Additionally, operating in ways that compromise the quality of the social and natural environment can result in cost sanctions by the government on corporate organizations, which may limit the optimization of long-term profitability (Das, 2018).

Wang et al. (2021) explained that GM practices result in a first-mover advantage, which presents new financial and non-financial opportunities. The effective exploitation of these opportunities can increase sales, market share, profitability, and overall financial position. Further, GM impacts operational performance by lessening resource inefficiencies and production costs and facilitating entry to new markets, furthering financial performance to a certain extent (Fernando & Uu, 2017; Novitasari & Agustia, 2021). GM is a business model innovation because it seeks to introduce

new practical concepts to optimize manufacturing process effectiveness and efficiency, and green innovation practices are precursors for positive FP (El-Kassar & Singh, 2019; Wang et al., 2021). Further, studies on eco-design practices (Habib et al., 2020, 2021; Park et al., 2022), closely related to the GM concept, have demonstrated its direct and positive link to FP.

Following the ecological modernization discourse, sustainability practices are intended to shape and drive economic activities in a socially responsible manner. In any way, GM provides a win-win situation whereby its inclusion helps firms to co-produce economic and environmental benefits. Thus, prioritizing the diffusion of such practices may act as a driving force for stimulating financial sustainability. Rusinko (2007) found that GM practices positively affect competitive outcomes in the commercial carpet industry in the USA. Sezen and Çankaya (2013) found no connection between GM and economic performance, viewed in terms of FP, in selected manufacturing firms in Turkey. Rehman et al. (2016) indicated that GM factors relate positively to FP in selected manufacturing firms in India. Singh et al. (2022) demonstrated that the fear of financial loss from GM integration was refutable because high-profit margins and market share were evidenced for manufacturing firms that embraced GM in India. Ali et al. (2021) evidenced a positive and significant relationship between GM practices and sustainable performance in manufacturing firms in China. Thekkootte (2022) found that GM practices have a positive and significant link to the sustainable performance of manufacturing firms in South Africa.

Given the above, GM is assumed to affect FP, but the problem is whether there would be effect variations for manufacturing firms operating in an unregulated and unsupportive environment. Second, it can be inferred from the reviewed studies that the link between GM and FP is mixed, as the contrary result was evidenced by Sezen and Çankaya (2013). Third, most of the reviewed studies were conducted outside Nigeria, making the applicability of findings an open issue for research due to the operating economic conditions and contexts.

QP measures the extent to which production processes follow specific quality guidelines and stand-

ards that conform to critical stakeholders' needs and demands. The logic is that QP is to create a production process responsive to quality concerns emanating from the environment. Quality integration in production processes is manifested in higher product quality, cost reductions, reduced customer complaints, and improved customer satisfaction, amongst others (Udofia et al., 2021). QP is subjectively assessed by considering attributes relating to the mainly perceptible production process.

Quality is a priority area for strategic actions within firms. Many firms have integrated systems and mechanisms to improve quality from a product life cycle perspective. GM practices ensure quality by making the product lifecycle account for environmental impact. By attending to issues of environmental conformance, quality processes and systems can be optimized so that high performance will be engendered. Continuous quality improvements should be seen as an essential aspect of GM. Tan et al. (2017) demonstrated that green initiatives foster competitiveness in quality in terms of differentiation and cost. Olayeni et al. (2021) indicated that GM strategic actions enhance product quality, suggesting that firms that adopt a green strategy focus on attaining and maintaining high conformance quality using GM practices. GM yields quality benefits by reducing variability through uniform compliance with customers and environmental specifications or requirements.

The significance of QP is tethered to customer satisfaction performance and FP of all firms (Udofia et al., 2021). This may be true because quality improvements enable firms to become more competitive, which should lead to better FP. The quality of production mechanisms can impact costs and revenues directly by reducing waste, scrap, materials used, defective products, warranty costs, and time spent on rework. When the production process has high reliability and low volatility to specified environmental requirements, firms' exposure to economic risk is vastly reduced. This furthers the development of the financial value of a firm to a certain extent (García-Bernal & Ramírez-Alesón, 2015). Given this, there is a close link between QP and FP, which has also been evidenced in past empirical studies (Kaynak, 2003; Parvadavardini et al., 2016; Olayeni et al., 2021).

QP is closely related to GM and FP, suggesting that QP could function as a mediational pathway through which GM exerts influence on FP. However, whether this proposition holds true is yet to be determined empirically.

## 1.2. EO moderation role in GM and FP

EO is seen as a firm's propensity to take a business-related risk (the risk-taking dimension), search for and capitalize on new opportunities (the proactiveness dimension), and embrace creativity and experimentation (the innovation dimension) in order to achieve desired organizational outcomes (Kreiser & Davis, 2010; Shirokova et al., 2015; Park & Xiao, 2020). The EO dimensions (risk-taking, proactiveness, and innovativeness), whether treated individually or collectively, play an essential role in cultivating the entrepreneurial behavior of a firm (Certo et al., 2009). According to Dickel (2018), EO represents organizational capability for opportunity identification and exploitation and indicates how manufacturing firms consider internal and external factors to make investment decisions that transform resources to the desired end. Furthermore, EO stimulates strategy, practice, and performance in highly dynamic contexts because its dimensions foster organizational adaptation amid risks and uncertainties (Menguc & Ozanne, 2005; Jiang et al., 2018; Muangmee et al., 2021).

Drawing from the dynamic capability perspective's arguments, EO helps firms analyze the environmental impact, integrate findings and results when transforming existing organizational processes, and utilize the transformed processes to exploit sustainable business opportunities with high-profit potentials (Habib et al., 2021). This is to say that the dynamic capabilities inherent in EO are critically important when manufacturing firms want to have an active strategic position in a highly demanding environment (Shirokova et al., 2015; Dickel, 2018). As stated by Obamen et al. (2021), manufacturing firms should aim to create value and optimize economic outcomes, such as profitability, increased shareholder value, return on investment, without undermining the environment. However, achieving a positive link between GM and FP may be conditioned by the level of EO of manufacturing firms. Studies have treat-

ed EO as an addictive concept, such that the dynamic generative dimensions indicate the extent to which a firm demonstrates entrepreneurship in highly challenging environments (Lumpkin & Dess, 1996; V. Gupta & A. Gupta, 2015).

Jiang et al. (2018), Habib et al. (2020), and Muangmee et al. (2021) have shown that entrepreneurial behaviors reflective of green concepts have a positive association with organizational profitability as well as FP. In this line, the interaction of EO dimensions with green practices could simultaneously advance economic and environmental benefits. However, GM's impact on FP remains unclear as explanatory contextual factors are missing. This is among the first studies examining EO's moderation role in this context. Therefore, the study argues that the strength and direction of the link between GM and FP are shaped by the level of EO comprising risk-taking, proactiveness, and innovativeness.

## 2. AIM AND HYPOTHESES

This study aims to test the link between green manufacturing and financial performance, with quality performance as a mediator and entrepreneurial orientation as a moderator. Following the arguments in the literature review, three hypotheses were developed:

- H1: Green manufacturing is positively related to financial performance.*
- H2: Quality performance mediates a positive relationship between green manufacturing and financial performance.*
- H3: Entrepreneurial orientation moderates a positive relationship between green manufacturing and financial performance.*

## 3. METHODOLOGY

The study's population comprised manufacturers in the polymer industry in Nigeria. This industry generates a large amount of waste that has compromised the quality of the natural environment in Nigeria. Interestingly, the high plastic pollution

has necessitated the drafting and passing legislation at the National Assembly for its outright ban in Nigeria. The study selected firms operating in southern Nigeria. Besides, the security challenge in Northern Nigeria did not permit a more holistic investigation of the subject matter. An introduction letter was sent to the general managers of 24 manufacturing firms operating in the target area, indicating the research aims and significance. Of the 17 firms, 11 accepted the invitation to participate in the survey probe. The target participants were managerial staff working in departments related to operations, production, marketing, distribution and supply, research and development, and finance.

The survey was conducted for three months, from May to July 2022. The researchers performed the questionnaire administration. The respondents were followed up fortnightly via calls and messages to ensure a high questionnaire completion rate. The reminders proved helpful in this regard. Out of the 129 questionnaires administered, 116 respondents completed and returned the questionnaire, 13 were not returned, indicating a response rate of 89.9 percent. 116 completed questionnaires had no missing data and were all used for analysis. Concerning the demographic profile, 87 were males (75%), and 29 (25%) were females. The respondents were well educated, having a minimum of a bachelor's degree. Therefore, it is reasonable to infer that they can comprehend and respond appropriately to the questions. The mean age and tenure were 34.5 years and 9.9 years, respectively.

The measures utilized in this study were adapted from previously validated scales. 6 question items for GM were taken from Ali et al. (2021). Sample item includes "My firm uses energy efficiently." 9 question items for EO were taken from Dickel (2018). Sample item includes "Our firm has marketed new products within the last three years." 5 question items for FP were taken from Habib et al. (2020) and Udofia et al. (2021). Sample item includes "Green initiatives have increased our firm's profitability." 5 question items for QP were taken from Udofia et al. (2021). Sample item includes "There is a significant improvement in product quality." Cronbach's Alpha for the scales were .870, .839, .766, and .783, respectively. The questionnaire was rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test for sphericity (BTS) were performed to ascertain the appropriateness of running factor analysis on the dataset. These tests were aided with SPSS 20.0. The KMO values (GM = .815, financial performance = .802, QP = .740, EO = .793) were above the benchmark point of .060. BTS values for all the constructs were significant at  $p < .05$ . Consequently, 116 valid responses were analyzed using the Partial Least Square (PLS) structural equation modeling method. The two-step approach comprising the outer model and inner model estimation was followed (Anderson & Gerbing, 1988). The moderation was tested using the two-step approach suggested by Hair et al. (2017). The first step involves the direct effect, while the second introduces mediation and moderation factor to the hypothesized relationship. The bootstrap method was used to establish the significance in both steps using 5,000 subsamples. Further, the specific indirect effect was used to assess the mediational effect of eco-design practices. The test was performed with SmartPLS 3.2.7, a popular structural equation modeling software for PLS analysis.

## 4. RESULTS AND DISCUSSION

As mentioned earlier, the study followed the two-step procedure for statistical analysis. First, the inner model estimation was performed to establish the reliability and validity of the measurement model. The reliability was determined using the standardized factor loading (FL) and composite reliability (CR), while validity was determined with average variance extracted (AVE) and discriminant validity (Fornell-Larcker criterion). The rule of thumb by Hair et al. (2017) was followed in the interpretation of the resulting values. As shown in Table 1, the factors loadings of the respective constructs were above the recommended score of .707, suggesting acceptable item reliability. CR values were above .70, which demonstrated construct reliability. The AVEs exceeded the recommended cut-off point of .50, demonstrating satisfactory convergent validity. Regarding the Fornell-Larcker criterion used to measure discriminant validity, the AVEs for the constructs (bolded) were higher than the inter-construct AVEs (non-bolded), confirming that the constructs were unrelated. Thus,

**Table 1.** Outer model estimates

Construct	Item	FL	CR	AVE	EO	FP	GM	QP
Entrepreneurial Orientation (EO)	EO1	.816	.863	.603	<b>0.827</b>	-	-	-
	EO2	.721						
	EO3	.809						
	EO4	.751						
	EO5	.755						
	EO6	.824						
	EO7	.830						
	EO8	.768						
	EO9	.797						
Financial Performance (FP)	FP1	.802	.809	0.594	.210	<b>.809</b>	-	-
	FP2	.814						
	FP3	.738						
	FP4	.791						
	FP5	.770						
Green Manufacturing (GM)	GM1	.782	.789	.676	.101	.018	<b>.758</b>	-
	GM2	.763						
	GM3	.744						
	GM4	.792						
	GM5	.828						
	GM6	.761						
	GM7	.779						
Quality Performance (QP)	QP1	.786	.886	.632	.190	.157	0.072	<b>.771</b>
	QP2	.749						
	QP3	.892						
	QP4	.804						
	QP5	.833						

**Table 2.** Inner model estimates for hypotheses testing

Hypothesis	Paths	B	P-value	Decision
H1	GM → FP	0.167	0.027	Support
	GM → QP	0.244	0.000	Support
H2	QP → FP	0.319	0.000	Support
	GM → FP	0.158	0.003	Support
	GM → QP → FP	0.194	0.000	Support
H3	GM*EO → FP	0.115	0.000	Support

Note: P < 0.05; R2 = .539.

discriminant validity was attained. Holistically, the outer or measurement model scores were considered acceptable and satisfactory by the established rule of thumb. Thus, the study proceeded to the second step, the inner model estimation.

The study assessed the inner (also known as a structural model) for the direct effect before determining the mediation and moderation effect. In line with the rule of thumb, the R<sup>2</sup> shows that the model has moderate explanatory power. H1 pro-

posed that GM is positively related to FP. The estimates ( $\beta = 0.167$ ,  $p = 0.027$ ) fully supported this proposition; thus, GM and FP are positively related. This result supported past empirical studies (Rusinko, 2007; Rehman et al., 2016; Singh et al., 2022; Ali et al., 2021; Thekkoote, 2022) that GM allows for the alignment of sustainability paradigms with value-creation processes in such a way that superior FP can be achieved. It also agrees with the ecological modernization theory, which rightly states that firms may hold a positive view toward



GM practices to create a win-win situation whereby its integration enables them to co-produce economic and environmental benefits. Finally, it contradicts Sezen and Çankaya (2013), who reported a non-significant relationship between GM and FP.

*H2* stated that QP mediates GM-FP positive relationship. The estimates showed that GM → QP link ( $\beta = 0.244$ ,  $p = 0.000$ ) and QP → FP link ( $\beta = 0.319$ ,  $p = 0.000$ ) were significant and positive. Further, applying the mediational factor “QP” slightly reduced the GM → FP significant and positive link ( $\beta = 0.158$ ,  $p = 0.003$ ). The specific indirect result ( $\beta = 0.194$ ,  $p = 0.000$ ) demonstrated that the hypothetical statement of *H2* was fully accepted; thus, QP mediates GM-FP positive relationship. Given that GM is closely connected to QP, optimality can be achieved when GM influences FP via the enhancement of QP. This argument is reinforced by the results showing the QP → FP link being higher than the GM → FP link. Besides, the specific indirect correlation was higher than the direct effect correlation. The mediational role of QP in the GM-FP link is relatively new to the extant literature; however, it is plausible that quality improvements are needed for GM practices to translate to high FP.

*H3* predicted that EO moderates GM-FP positive relationship. The estimates illustrate that EO

( $\beta = 0.115$ ,  $p = 0.000$ ) moderated GM-FP positive relationship; thus, *H3* was confirmed. This suggests that a high level of entrepreneurial orientation comprising risk-taking, proactiveness, and innovativeness leads to a stronger GM-FP link. This may be true because uncertain economic conditions characterize the Nigerian business environment, and firms with high EO levels are more capable of developing mechanisms to foster organizational adaptation for better financial health in a highly disruptive environment (Shirokova et al., 2015). Further, capitalizing on the dynamic capability perspective, EO enables firms to reconfigure ordinary capabilities by including GM practices to adjust to the imperatives of a changing environment. In doing so, firms can create, identify, and exploit new opportunities with desirable financial implications. Relevant to this result is the proposition of the green entrepreneurial orientation that organizational behavioral actions evolve to a certain extent under the influence of economic and environmental considerations (Jiang et al., 2018; Habib et al., 2020; Muangmee et al., 2021). EO, as marked by its dynamic generative capabilities, guides the strategic choice and actions of manufacturing firms by integrating green practices to achieve a specific sustainable goal concerning sustainable economic performance (Lumpkin & Dess, 1996; Habib et al., 2021).

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## CONCLUSION

This study examined the nexus between green manufacturing and financial performance, with quality performance operationalized as a mediator and entrepreneurial orientation as a moderator in the Nigerian manufacturing firm context. The results demonstrated that while green manufacturing enhances financial performance significantly, quality performance mediated this relationship optimally. Further, entrepreneurial orientation positively moderated the relationship between green manufacturing and financial performance. Bearing these findings in mind, the study recommended that manufacturing firms target investment resources for implementing or strengthening green manufacturing practices because of their environmental and financial benefits. Managers should facilitate the development of programs that can rightly cultivate entrepreneurial orientation in manufacturing firms as well as participation in eco-friendly activities. With this, superior financial performance can be spurred from the competitive advantage. The adoption of green manufacturing should be predicated on quality improvements to ensure its translation to superior financial performance. Furthermore, future studies should pay attention to the contextual role of green dynamic capabilities in the research model contexts for more insights.

## AUTHOR CONTRIBUTIONS

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