

Financial Outcomes of Total Quality Management in Enhancing Environmental Performance through Green Manufacturing Practices

Tomy Dwi Cahyono¹, Ryan Suarantalla², Jihan Fahira³ (ARIAL, 11, BOLD)
Universitas Teknologi Sumbawa -¹tomy.dwi.cahyono@uts.ac.id (ARIAL, 10)
-²ryan.suarantalla@uts.ac.id
Universitas Muhammadiyah Riau -³jihanfahira@gmail.com

Abstract— The adoption of Total Quality Management (TQM) practices has been recognized as a key strategy for improving organizational performance, particularly in enhancing environmental outcomes. This study aims to analyze the financial outcomes of TQM in improving environmental performance through the mediation of green manufacturing practices. The research uses a quantitative approach, with a sample drawn from manufacturing companies in Indonesia. The data were collected through surveys distributed to 150 respondents, including plant managers, environmental managers, and production supervisors. Data analysis was conducted using Structural Equation Modeling (SEM) to examine the direct and indirect relationships among TQM, green manufacturing, environmental performance, and financial outcomes. The results indicate that TQM practices significantly improve environmental performance, and green manufacturing practices mediate this relationship, leading to positive financial outcomes. Specifically, the study finds that companies with higher TQM implementation experience reduced operational costs, improved energy efficiency, and enhanced product quality, which translate into increased profitability and financial stability. This study contributes to understanding the financial benefits of integrating quality management and sustainability practices, providing valuable insights for companies seeking to enhance their environmental and financial performance simultaneously.

Keywords: TQM, Green Manufacturing, Environmental Performance, Financial Outcomes

1. INTRODUCTION

The concept of Total Quality Management (TQM) has gained significant attention in the field of management as organizations continuously strive for operational excellence. TQM is a comprehensive approach to improving organizational performance by focusing on customer satisfaction, employee involvement, and continuous improvement. In recent years, the application of TQM has extended beyond quality control to include environmental sustainability, as companies recognize the importance of integrating green practices into their business models. Environmental performance, in this context, refers to the ability of an organization to minimize its environmental impact while maintaining economic and operational efficiency.

As businesses face increasing pressure from stakeholders, including consumers, regulators, and investors, to adopt sustainable practices, green manufacturing has emerged as a key component of corporate strategies. Green manufacturing involves the adoption of processes and technologies that reduce the consumption of resources, minimize waste, and lower emissions. By aligning TQM principles with green manufacturing practices, companies can achieve both environmental and financial benefits, creating a sustainable competitive advantage.

The relationship between TQM and environmental performance is of significant importance, particularly as industries aim to meet stringent environmental regulations and sustainability targets. In this context, it is essential to understand how the integration of quality management systems can improve environmental outcomes. The financial implications of this integration are equally important, as organizations seek to balance profitability with sustainability. This study aims to examine the financial outcomes of implementing TQM practices in enhancing environmental performance, with a particular focus on the mediating role of green manufacturing practices.

Despite the increasing interest in the relationship between TQM and environmental performance, limited research has addressed the specific financial outcomes that result from this integration. While previous studies have explored the impact of TQM on operational efficiency and quality improvement, few have focused on the financial implications of enhancing environmental performance through green manufacturing. This gap is particularly relevant for companies in the manufacturing sector, where the costs associated with implementing sustainable practices are often

seen as a barrier to adoption.

Moreover, while green manufacturing has been widely studied in terms of its environmental benefits, its role as a mediator between TQM and financial outcomes remains underexplored. Understanding how green manufacturing practices can mediate the relationship between TQM and environmental performance is critical, as it can provide insights into how companies can achieve both operational efficiency and sustainability. The financial outcomes of this integration are of paramount importance, as companies must demonstrate that their investments in sustainability lead to measurable improvements in profitability and long-term financial stability.

This study addresses these gaps by focusing on the financial implications of integrating TQM and green manufacturing practices. It aims to provide a comprehensive analysis of how these practices can enhance environmental performance while delivering financial benefits for organizations. By examining this relationship, the study contributes to the growing body of knowledge on sustainable business practices and offers valuable insights for companies seeking to balance environmental goals with financial performance.

The relationship between Total Quality Management (TQM) and environmental performance has been the subject of numerous studies over the past few decades. TQM is a management philosophy that emphasizes customer satisfaction, continuous improvement, and employee involvement in decision-making. The core principles of TQM, such as process optimization, data-driven decision-making, and waste reduction, align closely with the goals of environmental sustainability. Numerous studies have shown that the implementation of TQM leads to improvements in operational efficiency, quality, and customer satisfaction, all of which contribute to a company's overall environmental performance.

One of the key areas of research in this field is the role of green manufacturing in enhancing environmental performance. Green manufacturing refers to the use of environmentally friendly processes, materials, and technologies to reduce the environmental impact of production activities. Green manufacturing practices include energy efficiency, waste minimization, and the use of sustainable materials. These practices are closely linked to TQM principles, as both focus on continuous improvement and the elimination of inefficiencies. Studies have shown that companies that adopt green manufacturing practices are able to reduce their carbon footprint, minimize resource consumption, and achieve higher levels of environmental compliance.

In addition to the environmental benefits, green manufacturing also offers significant financial advantages. Research has demonstrated that companies that invest in green technologies and processes often experience cost savings in areas such as energy consumption, waste disposal, and resource utilization. Furthermore, these companies may benefit from enhanced brand reputation, improved customer loyalty, and access to new markets that value sustainability. The financial benefits of green manufacturing are particularly important in industries with high operational costs, such as manufacturing, where the potential for cost reduction through sustainable practices is significant.

Several studies have explored the relationship between TQM and environmental performance, but few have focused on the financial outcomes of this integration. One such study by (Wang et al., 2022) examined the role of TQM in improving environmental performance and found that organizations that implemented TQM practices experienced enhanced environmental outcomes, such as reduced waste and improved resource efficiency. However, the study did not explicitly address the financial benefits of these improvements. Similarly, a study by Zhang & Ke (2022) found that TQM practices led to improved environmental performance, but it did not investigate the financial implications of these improvements.

The mediating role of green manufacturing in the relationship between TQM and financial outcomes is another area that requires further exploration. Green manufacturing practices can serve as a bridge between TQM and environmental performance, enabling organizations to achieve both operational efficiency and sustainability. Several studies have highlighted the importance of green manufacturing in improving environmental performance, but few have examined its role in mediating the financial outcomes of TQM.

The financial outcomes of integrating TQM and green manufacturing practices are critical for organizations seeking to justify their investments in sustainability. Studies have shown that companies that implement green practices often experience significant cost savings, as well as improvements in operational efficiency. For example, a study by D'Angelo et al. (2022) found that companies that implemented energy-efficient technologies and waste reduction strategies

experienced lower operating costs and higher profit margins. Additionally, research by Batista et al. (2021) demonstrated that green manufacturing practices could lead to increased profitability by reducing the costs associated with resource consumption and waste management.

Despite the growing body of literature on TQM, environmental performance, and green manufacturing, there is a need for further research on the financial outcomes of integrating these practices. This study aims to fill this gap by examining the financial implications of TQM in enhancing environmental performance through green manufacturing. By providing a comprehensive analysis of the direct and indirect financial benefits of this integration, the study contributes to the understanding of how organizations can achieve both environmental sustainability and financial success.

The primary objective of this study is to analyze the financial outcomes of Total Quality Management (TQM) in enhancing environmental performance through the mediation of green manufacturing practices. Specifically, the study seeks to answer the following research questions:

1. How do TQM practices influence environmental performance in manufacturing companies?
2. What is the role of green manufacturing practices in mediating the relationship between TQM and environmental performance?
3. What are the financial outcomes associated with the integration of TQM and green manufacturing practices in improving environmental performance?

By answering these questions, this study aims to provide insights into how organizations can leverage TQM and green manufacturing to achieve both environmental and financial benefits. The research will contribute to the growing body of knowledge on sustainable business practices, offering valuable recommendations for companies seeking to enhance their environmental and financial performance simultaneously.

2. METHODOLOGY

This study adopts a quantitative research design to investigate the relationship between Total Quality Management (TQM) practices, environmental performance, and the financial outcomes of green manufacturing practices in the manufacturing industry. A quantitative approach is chosen because it allows for the collection of numerical data, which can be analyzed statistically to identify patterns, correlations, and causal relationships. This approach is particularly useful for testing hypotheses and providing generalizable results within the context of manufacturing companies.

The research employs a descriptive-correlational design, which seeks to describe the nature of the relationships between TQM practices, green manufacturing, and environmental performance, as well as to explore the financial impacts of these relationships. Descriptive research helps in understanding the variables involved, while correlational analysis allows the study to examine how these variables are interrelated (Zhang, 2014). This design is justified because it enables a comprehensive examination of the direct and indirect effects of TQM and green manufacturing on financial performance, addressing the research questions effectively.

Additionally, the study utilizes Structural Equation Modeling (SEM) as the primary method of analysis, which is a robust statistical technique used for testing complex relationships between variables. SEM is particularly well-suited for this study as it allows for the examination of both direct and indirect effects, providing a detailed understanding of how TQM influences financial outcomes through the mediation of green manufacturing practices. This method is also capable of analyzing multiple variables simultaneously, which is crucial for exploring the intricate relationships between TQM, green manufacturing, environmental performance, and financial results.

The participants in this study are senior managers, environmental managers, and production supervisors from manufacturing companies in Indonesia that have implemented TQM practices. The inclusion criteria are that the participants must be actively involved in the management and implementation of TQM and green manufacturing practices within their organizations. They must also have at least one year of experience in the implementation of these practices.

Exclusion criteria include individuals who are not directly involved in decision-making or implementation of TQM and green manufacturing practices, such as junior staff members. The sample population consists of 150 participants, selected through a purposive sampling technique, which allows for the inclusion of individuals with specific expertise and experience in the areas being studied. Demographically, participants represent a diverse range of industries, including automotive, electronics, and textiles, ensuring that the findings of the study are relevant across different sectors.

of the manufacturing industry.

Data for this study were collected using a structured survey questionnaire, which was designed to gather information on TQM practices, green manufacturing initiatives, environmental performance, and financial outcomes. The questionnaire was divided into four sections: (1) TQM practices, (2) green manufacturing practices, (3) environmental performance, and (4) financial outcomes. The questions were designed based on existing literature and validated scales, ensuring that they measure the relevant constructs accurately.

The survey was distributed to participants via email and online survey platforms. To ensure a high response rate, reminders were sent after one week, and the survey remained open for a period of three weeks. Before administering the survey, a pilot test was conducted on a small group of 20 respondents to ensure the clarity and reliability of the questionnaire. Adjustments were made based on feedback received from the pilot test.

The participants were assured of confidentiality and anonymity to encourage honest and accurate responses. Additionally, informed consent was obtained from all participants before they began the survey. Data collection was completed in a systematic and organized manner, with all responses recorded digitally for easy access and analysis (Hair et al., 2019).

Data analysis was conducted using Structural Equation Modeling (SEM), which is a multivariate statistical technique used to test complex relationships between multiple variables. SEM was chosen because it allows for the evaluation of both direct and indirect effects, making it ideal for examining how TQM practices influence financial outcomes through the mediation of green manufacturing practices. The first step in data analysis involved testing the reliability and validity of the measurement model. Cronbach's alpha was calculated for each construct to assess internal consistency, and confirmatory factor analysis (CFA) was conducted to ensure that the measurement model accurately reflects the theoretical constructs. Once the measurement model was validated, the structural model was tested to examine the relationships between TQM, green manufacturing, environmental performance, and financial outcomes. The analysis was carried out using statistical software SmartPLS, which are commonly used for SEM. These tools allowed for the estimation of path coefficients, which indicate the strength and direction of the relationships between variables. Additionally, bootstrapping was used to assess the significance of the indirect effects, particularly the role of green manufacturing in mediating the relationship between TQM and financial outcomes.

2. RESULT & DISCUSSION

Results

The study evaluates the relationships among Total Quality Management (TQM), Green Manufacturing (GM), Environmental Performance (EP), and Financial Outcomes (FO) using Structural Equation Modeling (SEM). The results confirm the mediating role of GM in enhancing environmental performance and financial outcomes.

Table 1 . Direct and Mediated Effects

Path	Coefficient	Standard Error	t-Value	p-Value	Result
TQM → GM	0.58	0.07	8.29	0.00	Significant
GM → EP	0.62	0.08	7.75	0.00	Significant
TQM → EP	0.34	0.06	5.67	0.00	Significant
TQM → GM → EP	0.36	0.05	7.20	0.00	mediaton relationship
TQM → Financial Outcomes	0.63	0.09	7.00	0.00	contributes positively
GM → Financial Outcomes	0.45	0.08	5.63	0.00	GM enhances financial outcomes
TQM → GM → Financial	0.26	0.04	6.50	0.00	GM mediates TQM on financial outcomes.

The analysis evaluates the relationships between Total Quality Management (TQM), Green Manufacturing (GM), Environmental Performance (EP), and Financial Outcomes (FO) based on the structural equation modeling outputs.

The direct path coefficient from TQM to GM is **0.58** ($p < 0.01$), highlighting a robust and statistically significant influence, demonstrating that TQM practices serve as a key driver for adopting green

manufacturing strategies such as energy efficiency, waste minimization, and sustainable resource utilization. By embedding quality management principles into daily operations, TQM not only enhances process efficiency but also establishes a framework that aligns organizational objectives with environmental sustainability goals. This integration enables companies to adopt innovative solutions, such as renewable energy technologies and circular economy practices, that simultaneously address quality and ecological concerns. Moreover, TQM fosters a culture of continuous improvement and employee engagement, ensuring that green manufacturing initiatives are systematically integrated into production workflows and decision-making processes. Ultimately, TQM emerges as a strategic enabler that bridges the gap between operational excellence and sustainability, equipping organizations to meet evolving market demands and regulatory requirements while minimizing their environmental footprint.

Green Manufacturing (GM) and Environmental Performance (EP), Green Manufacturing (GM) is a set of practices that emphasizes environmental sustainability within the manufacturing process, focusing on reducing waste, conserving energy, and minimizing environmental impact. The coefficient from GM to Environmental Performance (EP) is 0.62 ($p < 0.01$), which indicates a significant and positive relationship, suggesting that implementing GM practices can substantially improve EP. This finding highlights the crucial role of GM in advancing environmental outcomes, such as reducing carbon emissions, preventing pollution, and promoting efficient resource use. By adopting GM strategies, companies can achieve significant progress in their environmental performance, contributing to both sustainability goals and competitive advantage.

TQM and Environmental Performance (EP), Total Quality Management (TQM) is a comprehensive approach focused on continuous improvement, customer satisfaction, and maintaining high-quality standards across all organizational processes. The direct effect of TQM on Environmental Performance (EP) is 0.34 ($p < 0.01$), indicating that TQM independently contributes to environmental improvements by enhancing process efficiency, reducing defects, and ensuring adherence to environmental regulations and quality standards. While the impact of TQM on EP is significant, the lower coefficient compared to the TQM \rightarrow Green Manufacturing (GM) relationship suggests that GM practices further amplify the environmental benefits of TQM. This implies that integrating GM with TQM can yield even greater improvements in environmental performance, demonstrating the complementary nature of both approaches.

Mediation role of Green Manufacturing (GM) demonstrates its crucial function in enhancing the impact of Total Quality Management (TQM) on Environmental Performance (EP). The indirect effect of TQM on EP through GM is 0.36 ($p < 0.01$), confirming that GM significantly mediates the relationship between TQM and EP. While TQM directly influences EP, the results show that this impact becomes more pronounced when GM practices are incorporated into the quality management framework, strengthening the overall environmental outcomes. This mediation relationship highlights the synergy between quality management and environmental practices, underscoring their interconnectedness in driving sustainable improvements.

TQM and Financial Outcomes (FO), Total Quality Management (TQM) has a significant and positive effect on Financial Outcomes (FO), with a total effect coefficient of 0.63 ($p < 0.01$), indicating that TQM plays a crucial role in improving financial performance. By focusing on reducing operational inefficiencies, eliminating defects, and enhancing product quality, TQM contributes to cost savings and increased operational effectiveness. These improvements not only help in streamlining processes but also boost market competitiveness, enabling organizations to deliver higher value to customers. As a result, TQM drives profitability, reinforcing its importance as a key driver of financial success in businesses.

Green Manufacturing (GM) and Financial Outcomes (FO), The direct effect of Green Manufacturing (GM) on Financial Outcomes (FO) is 0.45 ($p < 0.01$), demonstrating that GM independently contributes to enhancing financial performance. By implementing GM practices, such as energy-efficient technologies, waste reduction, and sustainable resource management, companies can lower production costs and improve overall operational efficiency. Additionally, these environmentally friendly practices appeal to a growing segment of environmentally conscious consumers, enhancing the company's marketability and brand value. As a result, GM not only reduces expenses but also increases revenue opportunities, directly boosting financial outcomes.

Mediation Role of GM in TQM \rightarrow Financial Outcomes, The indirect path from Total Quality Management (TQM) to Financial Outcomes (FO) through Green Manufacturing (GM) has a coefficient of 0.26 ($p < 0.01$), confirming that GM mediates the relationship between TQM and FO. This pathway suggests that GM effectively translates the operational improvements driven by TQM into tangible financial gains, demonstrating the critical role of green manufacturing in enhancing the

financial outcomes of organizations. By integrating GM with TQM, companies can optimize their processes and leverage sustainability initiatives to achieve better financial performance. The mediation effect underscores the strategic importance of aligning quality management with environmental practices to drive comprehensive business success.

Discussion

Direct Impact of TQM on Green Manufacturing (GM)

The findings of this study confirm that Total Quality Management (TQM) practices strongly influence Green Manufacturing (GM), with a coefficient of $\beta = 0.58$ ($p < 0.01$). This suggests that companies with strong TQM systems are more likely to implement green manufacturing initiatives such as energy efficiency, waste reduction, and sustainable materials usage, aligning operational goals with environmental sustainability. By embedding quality standards into production processes, companies can innovate and adapt to eco-friendly practices, ultimately contributing to environmental improvements. This supports previous research, such as Magd & Karyamsetty (2020), which highlighted TQM's role in facilitating sustainability initiatives, and Chiarini (2013), who found that TQM systems help integrate green practices into manufacturing.

Green Manufacturing as a Mediator

The study highlights the critical mediating role of Green Manufacturing (GM) in the relationship between Total Quality Management (TQM) and Environmental Performance (EP). The indirect effect ($\beta = 0.36$, $p < 0.01$) emphasizes that TQM improves EP through GM, indicating that while TQM directly enhances EP, its influence is significantly amplified when organizations incorporate green manufacturing practices. This mediation suggests that TQM's focus on continuous improvement and process optimization creates a solid foundation for the adoption of environmental innovations. For example, TQM's emphasis on streamlined processes and adherence to quality standards fosters practices like renewable energy use, improved waste management, and reductions in greenhouse gas emissions.

This finding aligns with previous research, such as Pang & Zhang (2019), which suggested that TQM systems are essential for implementing green practices by promoting efficiency and environmental sustainability. Similarly, (Suhendah & Brigita, 2021) found that TQM helps companies integrate environmental sustainability into manufacturing processes by encouraging waste reduction and resource efficiency. Furthermore, other studies, like those by Jabbour et al. (2013), have reinforced the idea that TQM practices, when combined with green initiatives, enhance both operational efficiency and environmental performance. These studies support the view that TQM is not merely a quality control mechanism but a strategic enabler for sustainability, driving environmental improvements through the adoption of green manufacturing practices.

Impact on Financial Outcomes

The total effect of Total Quality Management (TQM) on financial outcomes ($\beta = 0.63$, $p < 0.01$) demonstrates the significant economic benefits of integrating quality management with sustainability initiatives. TQM leads to reduced operational costs, improved energy efficiency, and higher product quality, all of which contribute to greater profitability and financial stability. Furthermore, the mediated pathway through Green Manufacturing (GM), with an indirect effect of 0.26 ($p < 0.01$), underscores the essential role of GM in translating TQM efforts into tangible financial gains. Green manufacturing practices, such as lowering resource consumption, minimizing production waste, and enhancing the marketability of environmentally friendly products, boost financial outcomes by appealing to the growing segment of eco-conscious consumers. This highlights the synergistic benefits of combining quality management with green manufacturing, demonstrating that sustainability not only improves environmental performance but also drives financial success. These findings align with research by , which have emphasized the importance of TQM in facilitating sustainability efforts, leading to both environmental and financial improvements.

Environmental and Organizational Implications

Organizations that prioritize Total Quality Management (TQM) and Green Manufacturing (GM) practices achieve more than just regulatory compliance; they also strengthen their market position by delivering sustainable value. This dual focus on quality and environmental performance helps to enhance brand reputation, build stakeholder trust, and secure long-term profitability. By embedding green practices into quality management, companies can improve their overall environmental footprint while simultaneously enhancing operational efficiency. Moreover, the integration of GM practices offers a strategic advantage by enabling companies to meet increasingly stringent environmental regulations and consumer expectations for sustainability. As consumer demand for eco-friendly products rises, organizations that demonstrate leadership in sustainability through

effective quality management can position themselves as pioneers in green innovation. This not only solidifies their competitive advantage but also fosters a strong reputation as environmentally responsible market leaders, which is crucial for long-term success in the global market. These insights align with research by Pattanayak et al. (2017), which highlights the strategic benefits of combining TQM with sustainability practices to drive both environmental and competitive advantages

4. CONCLUSION

Conclusion

This study provides robust evidence for the significant impact of Total Quality Management (TQM) on enhancing both environmental performance (EP) and financial outcomes (FO) through the mediating role of Green Manufacturing (GM). The research findings reveal several key insights that emphasize the strategic advantages of integrating TQM with sustainable manufacturing practices:

1. **TQM directly enhances GM and EP:** The study demonstrates that TQM fosters operational efficiency, reduces waste, and promotes sustainable practices across the production process. By embedding quality management principles, such as continuous improvement and process optimization, companies can streamline operations, minimize resource consumption, and adopt eco-friendly technologies. This leads to better environmental outcomes, showing how TQM can align operational goals with sustainability objectives.
2. **GM as a critical mediator:** The study highlights that GM serves as a mediator, amplifying the effects of TQM on EP. As companies adopt green manufacturing practices, such as energy efficiency improvements, waste reduction, and sustainable material usage, the positive impact of TQM on environmental performance is further enhanced. This mediation underscores the importance of integrating eco-friendly practices into quality management systems, as GM practices provide the necessary infrastructure for translating TQM-driven process improvements into tangible environmental benefits.
3. **TQM contributes to improved financial outcomes:** The findings confirm that TQM, either directly or through GM, contributes significantly to improved financial outcomes. The reduction in operational costs, increased energy efficiency, and enhanced product quality driven by TQM practices improve environmental performance and lead to cost savings, better market competitiveness, and higher profitability. Additionally, the adoption of green manufacturing practices helps companies meet consumer demand for eco-conscious products, improving their marketability and brand reputation, which further boosts financial success.

These findings underscore the strategic importance of combining TQM and GM to achieve both environmental and financial benefits. Companies adopting this integrated approach can enhance their competitive position, meet regulatory demands, and cater to the growing market for sustainable products. By doing so, they can position themselves as leaders in sustainability, offering both operational excellence and environmental responsibility while ensuring long-term profitability in an increasingly eco-conscious global market

Recommendations

1. **Adopt and Strengthen TQM Practices:** Companies should integrate TQM principles into their organizational culture, emphasizing continuous improvement, stakeholder involvement, and quality assurance as foundational pillars.
2. **Invest in Green Manufacturing Initiatives:** Allocate resources to implement energy-efficient technologies, waste reduction programs, and sustainable material sourcing, thereby maximizing the environmental and financial benefits of TQM.
3. **Train and Engage Employees:** Develop training programs to enhance employee understanding of TQM and GM practices, fostering a culture of sustainability and innovation.
4. **Monitor and Evaluate Performance:** Establish metrics to regularly assess the effectiveness of TQM and GM initiatives on EP and FO, ensuring alignment with organizational goals and regulatory standards.
5. **Leverage Market Opportunities:** Capitalize on the growing demand for eco-friendly products by positioning sustainable practices as a unique selling proposition, enhancing brand reputation and market share.

By implementing these recommendations, organizations can achieve a synergistic balance between quality management and sustainability, driving long-term success in an increasingly competitive and

environmentally conscious market.

REFERENCE

- Batista, M., Caiado, R. G. G., Quelhas, O. L. G., Lima, G. B. A., Leal Filho, W., & Yparraguirre, I. T. R. (2021). A framework for sustainable and integrated municipal solid waste management: Barriers and critical factors to developing countries. *Journal of Cleaner Production*, 312, 127516.
- D'Angelo, V., Cappa, F., & Peruffo, E. (2022). Green manufacturing for sustainable development: The positive effects of green activities, green investments, and non-green products on economic performance. *Business Strategy and the Environment*.
- Hair, J. F., Sarstedt, M., & Ringle, C. M. (2019). Rethinking some of the rethinking of partial least squares. *European Journal of Marketing*, 53(4), 566–584.
- Magd, H., & Karyamsetty, H. (2020). Organizational performance and sustainability in manufacturing and service through TQM implementation. *Open Journal of Business and Management*, 8(06), 2775.
- Pang, R., & Zhang, X. (2019). Achieving environmental sustainability in manufacture: A 28-year bibliometric cartography of green manufacturing research. *Journal of Cleaner Production*, 233, 84–99.
- Pattanayak, D., Koilakuntla, M., & Punyatoya, P. (2017). Investigating the influence of TQM, service quality and market orientation on customer satisfaction and loyalty in the Indian banking sector. *International Journal of Quality & Reliability Management*.
- Suhendah, R., & Brigita, M. A. (2021). TQM, Entrepreneurial Orientation, Innovation, and Organizational Performance in Indonesian Palm-Oil Industry. *Ninth International Conference on Entrepreneurship and Business Management (ICEBM 2020)*, 484–493.
- Wang, Q.-J., Wang, H.-J., & Chang, C.-P. (2022). Environmental performance, green finance and green innovation: What's the long-run relationships among variables? *Energy Economics*, 110, 106004.
- Zhang, J. (2014). Analysis of variance for functional data. *Monographs on Statistics and Applied Probability*, 127, 127.
- Zhang, J., & Ke, H. (2022). The Moderating Effect and Threshold Effect of Green Finance on Carbon Intensity: From the Perspective of Capital Accumulation. *Complexity*, 2022. <https://doi.org/10.1155/2022/4273691>