South African Journal of Business Management
ISSN: (Online) 2078-5976, (Print) 2078-5585

Green practices and supply chain performance in South African textiles: Evidence from Gauteng

Author:
Teboho M. Mofokeng[1]

Affiliation:
[1]Department of Business Management and Economics, Faculty of Economic and Financial Services, Walter Sisulu University, Mthatha, South Africa

Corresponding author:
Teboho Mofokeng,
tmofokeng@wsu.ac.za

Dates:
Received: 18 Mar. 2025
Accepted: 08 Sept. 2025
Published: 17 Oct. 2025

How to cite this article:
Mofokeng, T.M. (2025). Green practices and supply chain performance in South African textiles: Evidence from Gauteng. *South African Journal of Business Management, 56*(1), a5289. https://doi.org/10.4102/sajbm.v56i1.5289

Copyright:
© 2025. The Author. Licensee: AOSIS. This work is licensed under the Creative Commons Attribution 4.0 International (CC BY 4.0) license (https://creativecommons.org/licenses/by/4.0/).

Read online:
Scan this QR code with your smart phone or mobile device to read online.

Purpose: The removal of trade sanctions in 1995 led to trade liberalisation in the South African textile and clothing industry. Although this new regionalism increased economic activity, a decrease in environmental sustainability resulted. Over the years, this impairment has become a concern and national priority, with textile and clothing manufacturing firms urged to adopt green practices. Although some firms have reported improvements in environmental sustainability, many have not adopted green practices and thus their impact on supply chain performance remains unclear. Therefore, this study sought to investigate the impact of green practices on supply chain performance in the textile and clothing industry in South Africa.

Design/methodology/approach: This study was quantitative and it employed a correlational research design with an explanatory and predictive approach using Partial Least Squares-Structural Equation Modelling (PLS-SEM). Data were collected from managers working in the textile and clothing manufacturing firms in Gauteng. This was done through a survey method with the use of convenience sampling. A sample size of 446 textile and clothing manufacturing firms was determined.

Findings/results: Green logistics practices exhibited a statistically insignificant relationship with supply chain performance, but the strongest relationship with green marketing practices.

Practical implications: The results revealed a positive and significant relationship between green marketing practices and supply chain performance, while green logistics practices were found to exhibit an insignificant direct effect on supply chain performance.

Originality/value: This study revealed strong mediating effects, which, mainly verify that green practices ultimately influence the overall supply chain performance in significant ways.

Keywords: green practices; operational performance; environmental performance; supply chain performance; Gauteng; South Africa.

Introduction

'South Africa aspires to be a sustainable, economically prosperous and self-reliant nation state that safeguards its democracy by managing its limited ecological resources responsibly for current and future generations', according to the National Framework for Sustainable Development (NFSD, 2008). This decree is South Africa's vision for sustainable development, and has compelled organisations to be resolute in achieving economic, social and environmental sustainability. The adoption of green practices that influence operational performance, environmental performance and supply chain performance could be a strategy that spearheads organisations into this transition. The term 'green practices' in this study implies a collective reference to green marketing practices and green logistics practices.

Although there are some organisations in South Africa that have adjusted their business models to be sustainable, many have not 'gone green' (Lawton et al., 2025). This is concerning, given that organisations are also mandated by the *National Environmental Management Act* (*NEMA*) *No. 107 of 1998* to be environmentally sustainable. It is also alarming, considering that green practices can drive cost reduction in operations (Fok et al., 2022). This can be achieved while refining efficient resource use to improve environmental performance and ultimately supply chain performance – which can lead to an increase in reliability, responsiveness and flexibility and also contribute towards cost minimisation and assets, according to the Supply Chain Operational Reference (SCOR) Model (Nicoletti, 2023).

Empirical studies into the influence of green practices on operational performance, environmental performance and supply chain performance, however, appear to be limited. For example, Acquaye et al. (2018) applied the robust Multi-Regional Input–Output Framework (MRIO) as a sustainability measurement tool to assess the linear correlation between time and carbon footprint in BRICS nations (Brazil, Russia, India, China and South Africa). While the study had merits, it did not specifically measure the impact of sustainable practices on supply chain performance. In addition, Ngcobo et al. (2022) examined green supply chain management, but only focused on operational efficiency and corporate performance. As such, these gaps in the literature and the resistance by many organisations towards 'going green' (Lawton et al., 2025) underscore the need to examine the impact of green practices on supply chain performance.

This study therefore intended to investigate, in particular, the influence of green marketing practices and green logistics practices on operational performance, environmental performance and supply chain performance in the South African textile and clothing manufacturing industry. The research was conducted in a cross-section of the industry in the Gauteng province of South Africa. Notwithstanding the sector's positive influence on quality of life, its 0.22% share of gross domestic product (GDP) (Trade & Industrial Policy Strategies [TIPS], 2022) and the effort against unemployment make this study even more compelling. This study thus sought to contribute to the existing body of knowledge pertaining to green practices and supply chain performance and also to provide the textile and clothing industry with more insights towards attaining sustainable business practices.

The rest of the article is structured as follows: A Literature review which firstly explains this study's theoretical grounding and secondly, provides an empirical review of the research constructs and hypotheses development. Thereafter, the conceptual model is explained followed by the Methodology section. Results are then presented followed by the Discussion. The article then provides a Conclusion, which highlights the implications, limitations and suggestions for future research.

Literature review

Theoretical grounding

This study is grounded on the theory of Behaviour, Effort and Practice (BEP Theory). This theoretical grounding was guided by and developed on the principles and foundation of the Value-Belief-Norm (VBN) Theory, the Expectancy Theory and the Practice Theory, respectively. The VBN Theory contends that value orientations, environmental beliefs and norms control certain pro-environmental behaviours (Mahpour et al., 2023), while the Expectancy Theory maintains that there is a procedural process of stimuli that stresses individual evaluations of the environment and actions as a result of an individual's expectations (Filipova, 2023). The logic for drawing upon the Practice Theory is that it focuses on *procedures* and actual *practices*, and how practices relate in a particular moment in time and space (La Rocca et al., 2017).

The BEP Theory proposes that values, beliefs and norms that are rooted in the VBN Theory prompt individual behaviour and demeanour, which in turn influences the efforts applied by an individual or entity. These efforts are driven by valence, instrumentality and expectancy, as defined in the Expectancy Theory. These aspects are sustained by expectations, which subsequently influence practices – and these are guided by values, beliefs and norms. In the context of this study, the BEP Theory asserts that operational performance, environmental performance and supply chain performance are expectations that give rise to practices by an organisation in its endeavour to become green. The practices and the expectations are further guided by the organisation's behaviour, which is determined by values, beliefs and norms.

Empirical review and hypotheses development

Green marketing practices

The term green marketing was introduced in 1975 by the American Marketing Association in a workshop on *Ecological Marketing* (Zhu & Sarkis, 2016). This construct is also referred to as environmental marketing, ecological marketing, social marketing and sustainability marketing (Zhu & Sarkis, 2016). In the context of this study, it is defined as the efforts by a company to design, encourage, price and distribute products in a way that endorses environmental conservation (Polonsky, 2011).

This study measures green marketing practices as a unidimensional construct (refer to Figure 1) comparable to a study by Nuryakin and Maryati (2022) of green marketing performance. At the outset, this study hypothesises that there is a positive relationship between green marketing practices and green logistics practices. One of the functions that resonates with both constructs is distribution. In marketing, distribution implies creating awareness of the product or service (Halik et al., 2023) while in a logistics context, it denotes delivery (Konstantakopoulos et al., 2022). Therefore, fulfilling the purpose of green marketing is contingent on effective logistics that is appropriate – and thus 'green'. Green marketing practices have further been hypothesised to also influence operational performance and environmental performance. According to Pandey et al. (2018), green marketing practices encourage green purchasing, which directly influences the methods used in the production and packaging process. This state of affairs implies that green marketing practices are likely to dictate operations as well as the performance thereof. Pandey et al. (2018) add that ecological degradation is directly associated with people's consumption patterns and, therefore with the methods applied in the production and packaging processes. This reality suggests that green marketing practices would improve consumption patterns and therefore influence environmental performance in a positive way. In the same vein, this study contends that there is a positive relationship

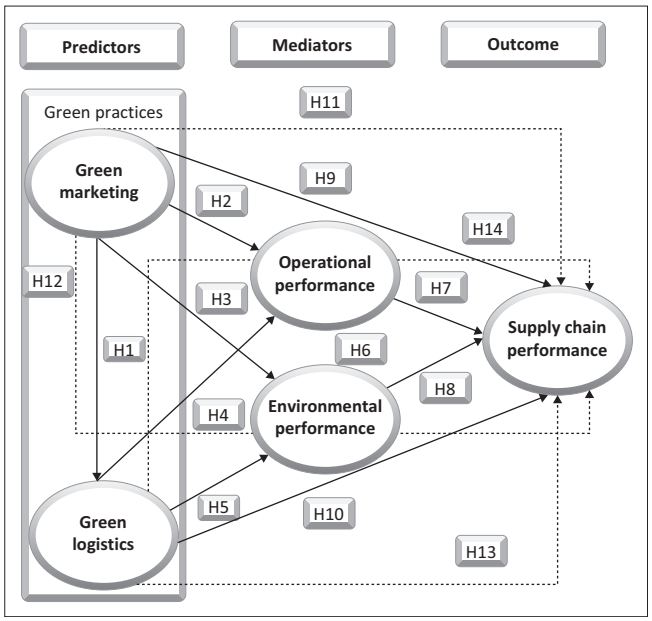


FIGURE 1: Conceptual model.

between green marketing practices and supply chain performance. Given that green marketing practices are reflected in the environmental aspect of the Triple Bottom Line (TBL) concept developed by Elkington (1994), it is argued that the concept is correlated with supply chain performance, which is at the core of the TBL approach (Huang et al., 2021). In addition, this study proposes that both operational performance and environmental performance mediate the relationship between green marketing practices and supply chain performance, respectively. While this study acknowledges the relationship between green marketing practices and supply chain performance, it maintains that operational performance intermediates and should be prioritised on the premise that it enables green marketing practices – which ultimately influence supply chain performance. Equally, green marketing practices need to be realised and identified on the balance sheet of environmental management accounting in order to reinforce the relationship between green marketing practices and supply chain performance. Drawing from this literature, the following hypotheses were therefore developed:

- **H_1:** There is a positive relationship between green marketing practices and green logistics practices of textile and clothing manufacturing firms in Gauteng, South Africa.
- **H_2:** The green marketing practices of textile and clothing manufacturing firms in Gauteng, South Africa, are positively associated with the firms' operational performance.
- **H_3:** The green marketing practices of textile and clothing manufacturing firms in Gauteng, South Africa, are positively related to the firms' environmental performance.
- **H_9:** The green marketing practices of textile and clothing manufacturing firms in Gauteng, South Africa, are positively related to supply chain performance.
- **H_{11}:** The operational performance of textile and clothing manufacturing firms in Gauteng, South Africa, positively mediates the relationship between green marketing practices and supply chain performance.
- **H_{12}:** The environmental performance of textile and clothing manufacturing firms in Gauteng, South Africa, positively mediates the relationship between green marketing practices and supply chain performance.

Green logistics practices

The concept 'green logistics' entails planning, controlling and implementing the flow of logistics through incorporating modern logistics methods with the objective of reducing environmental hazards (Tan et al., 2020). The methods adopted are usually orientated towards logistics environmental management, low-carbon warehousing and packaging as well as low-carbon transportation, fleet management, alternative energy and logistics innovation (Zhang et al., 2014). Brahme and Shafighi (2022) also emphasise that green logistics should be operationalised to the satisfaction of customers, and should support the organisation's goals. For the purpose of this study, green logistics practices are defined as:

> [*A*] function that consists of all activities related to the eco-efficient management of the forward and reverse flows of products and information between the point of origin and the point of consumption whose purpose is to meet or exceed customer demand. (Carter & Rogers, 2008, p. 360).

Although the concept can be examined as a multidimensional construct (see Agyabeng-Mensah et al., 2020b), it is conceptualised as a unidimensional construct (refer to Figure 1) consistent with the literature (e.g. Agyabeng-Mensah & Tang, 2021) and befitting of the purpose of this study.

The measure of green logistics practices as a predictor is corroborated in the literature (e.g. Agyabeng-Mensah et al., 2020a; Agyabeng-Mensah & Tang, 2021). Accordingly, this study predicts that green logistics practices influence operational performance, environmental performance and supply chain performance. Kim et al. (2024) asserted that green logistics practices are important because they help businesses to create value. This value can stem from green practices that minimise environmental degradation related to greenhouse emissions, transportation, packaging and noise pollution (Lai & Wong, 2012) and more importantly applied without detracting from the performance of the firm. This study therefore hypothesises that green logistics practices influence operational performance in a positive way, but only if there is definitive value created. Equally, this study conceives that there is a positive relationship between green logistics practices and environmental performance. The practices that define green logistics practices are regarded as having a progressive influence on environmental performance, particularly if they are regulated by the organisation (Agyabeng-Mensah et al., 2020b). This study further hypothesises that there is a positive relationship between green logistics practices and supply chain performance. According to Huang et al. (2024), green concepts focus on diminishing ecological footprints from

supply chain processes while also improving corporate profits. However, because supply chains have evolved and become more complex, green practices need to be implemented with careful planning and attention, and should be supported by coordination and collaboration. Furthermore, this study acknowledges that environmental performance and operational performance mediate the relationship between green logistics practices and supply chain performance, respectively. There is contention in the literature that green logistics practices need to be reflected in the firm's environmental performance – indeed, the Global Reporting Initiative (GRI, 2014) recommends this if the impact on supply chain performance is to be credible. Because optimisation and sustainability are mandated in firm operations, green logistics practices cannot improve supply chain performance if such operational performance is not realised. For these reasons, this mediation is considered as a hypothesis. In line with this literature, the following hypotheses were therefore developed:

- **H_4:** The green logistics practices of textile and clothing manufacturing firms in Gauteng, South Africa, are positively related to the firms' operational performance.
- **H_5:** The green logistics practices of textile and clothing manufacturing firms in Gauteng, South Africa, are positively related to the firms' environmental performance.
- **H_{10}:** The green logistics practices of textile and clothing manufacturing firms in Gauteng, South Africa, are positively related to supply chain performance.
- **H_{13}:** The environmental performance of textile and clothing manufacturing firms in Gauteng, South Africa, positively mediates the relationship between green logistics practices and supply chain performance.
- **H_{14}:** The operational performance of textile and clothing manufacturing firms in Gauteng, South Africa, positively mediates the relationship between green logistics practices and supply chain performance.

Operational performance

Considerable attention has been given to several performance measures over the past three decades. These include measures such as the TBL, the balanced scorecard, competitive advantage, stakeholder performance, innovation performance, varying financial outcomes and so forth (e.g., see Berman et al., 1999; Brower & Mahajan, 2013; Zaharia & Zaharia, 2021). Given that these measures determine performance in specific value chain activities, it is understandable that there would be differences in the definition of operational performance. This study adopts a definition from Ferdows and De Meyer (1990), who assert that operational performance relates to advances in cost minimisation, quality, delivery and flexibility. While operational performance may be a multidimensional construct (see Saryatmo & Sukhotu, 2021), this study measures the construct as a single dimension (refer to Figure 1).

Furthermore, this study proposes that operational performance influences environmental performance and supply chain performance in a positive way. Before the 1960s, the objective for many organisations was to prioritise operational performance by maximising revenue without much regard for the cost to the environment (Antão et al., 2016). However, since the 1980s, environmental conservation has been imposed and mandated on organisations, compelling firms to conduct their operations in ways that point to greater efficiency in this regard (Agyabeng-Mensah et al., 2022). This situation aims to achieve a balance where revenues are generated without compromising the environment. Therefore, operational performance influences environmental performance in a positive way only if it is applied with efficiency. Furthermore, developments and strategies taken up at the organisational level must be congruent with those that are conducted at the supply chain level. Therefore, adjustments made in operations must be coherent across all supply chain members if there is to be stability and an increase in supply chain performance. In accordance with this literature, the following hypotheses were therefore developed:

- **H_6:** The operational performance of textile and clothing manufacturing firms in Gauteng, South Africa, is positively associated with the firms' environmental performance.
- **H_7:** The operational performance of textile and clothing manufacturing firms in Gauteng, South Africa, is positively related to supply chain performance.

Environmental performance

These days, effective environmental performance is expected from an organisation. It is believed that good environmental performance results in a competitive advantage that derives from cost savings and corporate reputation (Uddin, 2021). According to Kim et al. (2019), environmental performance includes the accomplishments emanating from improving the natural and social environment through the support of management tools. It entails a process that requires the involvement of a firm's resources, including the commitment of top management, incorporating business strategy with environmental objectives and adhering to environmental management accounting. Performance indicators are used to evaluate the process and are listed by GRI in terms of materials, energy, water, biodiversity, emissions, effluents and waste, products and services, compliance, transport, total expenditure and investments in environmental initiatives, supplier environment assessment and environmental grievance mechanism (GRI, 2014).

This study examines environmental performance as a unidimensional construct (refer to Figure 1) and defines it as a firm's awareness of its liability and accountability towards sustainable development (Cho et al., 2012). The study further hypothesises that environmental performance influences supply chain performance in a positive way. The reasoning here is that environmental performance has been found to lead to a competitive advantage (Uddin, 2021), which results in an increase in supply chain performance. According to the resource-based view, firm-specific organisational resources and

capabilities, such as environmental technologies, can increase efficiency through productivity while minimising environmental impairment simultaneously (Arda et al., 2023; Lubis, 2022). Organisational efforts towards becoming environmentally sound could further help to stimulate environmental innovation. This can give rise not only to improved environmental performance but also to an increase in revenue as well as cost reduction. The general understanding, therefore, is that the initiative of a firm to improve its environmental performance is likely to result in a competitive advantage, and also in improved supply chain performance. On the basis of this literature, the following hypothesis was then developed:

H_8: The environmental performance of textile and clothing manufacturing firms in Gauteng, South Africa, is positively related to supply chain performance.

Supply chain performance

A supply chain generally refers to the action of getting a product to the end customer (Jain et al., 2022) with performance measured by the costs, resource deployment and service delivery (Nicoletti, 2023). This study adopts a definition by Green and Inman (2005), who describe this function as the ability of a supply chain to provide quality, quick and dependable service delivery in addition to minimising total overheads for the end customer. It is measured as a unidimensional construct (refer to Figure 1) similar to a study by Mofokeng and Chinomona (2019).

This study predicts green marketing practices, green logistics practices, operational performance and environmental performance to have a salient bearing on supply chain performance. While this conceptual model can contribute to new knowledge by explaining the influence of green practices on supply chain performance with empirical evidence, the literature brings to light that supply chain performance is more dynamic than often perceived. For example, Hanaysha and Alzoubi (2022) emphasise this function as a challenging task that requires managing the relationships between each of the links in the supply chain through customer relationship management and supplier relationship management. However, these authors also highlight the significance of measuring supply chain performance. Supply Chain Performance Measurement (SCPM) functions as an indicator of how efficiently the supply chain system is operating. Using this measure allows for a deeper understanding of the supply chain, which can drive an improvement in overall performance. Over 16 SCPM methods in general practice have been identified with the SCOR Model, which has been acknowledged as the best method, comparatively speaking (cf. Dissanayake & Cross, 2018; Estampe et al., 2013; Gonzalez-Pascual et al., 2021). Created by the Supply Chain Council, the SCOR Model applies a methodology for managing supply chain activities and processes, thus generating a set of practical guidelines for analysing supply chain management practices (Nicoletti, 2023). Supply chain performance therefore is quite dynamic – and this study hopes to contribute towards a more profound understanding of the concept.

Conceptual model

Drawing from the literature and the theory of BEP, a conceptual model was developed. The model is formative, with 14 hypothesised relationships. Green marketing practices and green logistics practices (together constituting green practices) were conceptualised to predict operational performance, environmental performance and supply chain performance, respectively. The model was developed with the purpose of explaining the relationship between the constructs in the context of the textile and clothing industry in South Africa. Figure 1 illustrates the conceptual model.

Methodology

A quantitative research approach was undertaken for this study with a correlational research design. Textile and clothing manufacturing firms in the southern part of Gauteng were selected to be representative of the target population. The province was selected based on its industry being productive within the economy and significant enough (BusinessTech, 2021) to provide data indicative of the current position and potential for the textile and clothing industry in South Africa. The local telephone directories, the Textile Federation of South Africa database and the National Bargaining Council for the Clothing Manufacturing Industry database were the platforms from which the sample frame was determined. The textile and clothing manufacturing firms in the cities of Johannesburg, Vereeniging and Vanderbijlpark, together formed the sample frame of this study. There was a single sample frame for the actual respondents because they were scattered among these firms. Specifically, the sample frame comprised managers working in the profiled textile and clothing manufacturing firms (see Table 1).

According to Siddiqui (2013), at least 15 cases per observed variable are required in order to determine the sample size for Structural Equation Modelling. This potential sample size was therefore calculated using this formula, for example, 15 × 27 (observed variables) = 405. This estimate corresponded with the sample sizes that averaged between 220 and 320 in studies by Feng et al. (2016) and Mafini and Muposhi (2017), where green sustainability and performance were examined, respectively. Precision was also confirmed when a 4.87 margin of error was determined following a test on a 95% confidence level. The potential sample size for this study was increased to 512 in order to account for non-response, deferral and poor cooperation (cf. Bagiella & Chang, 2019). This was carried out using the inflation factor method that applies the formula: $^{n}\text{adjusted} = n/\text{expected response rate}$ (Groves et al., 2011), where n is the potential sample size and the expected response rate is, in this case, that of Mafini and Muposhi (2017) expressed as a percentage.

This expected response rate was selected because the study's data were analysed through structural equation modelling and that in this regard, large sample sizes often increase confidence when seeking to explain the properties of a population well (Kutzner et al., 2017).

Data were then collected on the basis of convenience sampling. This entailed selecting participants who were reachable (Golzar et al., 2022). A survey method that entailed a self-administered questionnaire was adopted for collecting data. Six-item and five-item scales were appropriated from Luthra et al. (2016) in order to measure green marketing practices and green logistics practices, respectively. Operational performance was further measured on a five-item scale adopted from Luthra et al. (2016), while environmental performance was measured on a six-item scale adopted from Ezzi and Jarboui (2016). Supply chain performance was measured on a five-item scale adopted from Green et al. (2012). All measurement items (Online Appendix Table 1) were adapted to align with the study's context and purpose, and were evaluated on a five-point Likert scale anchored by: 1 = Strongly Disagree to 5 = Strongly Agree. The data were analysed through Partial Least Squares-Structural Equation Modelling for explanation and prediction.

TABLE 1: Company background information.

Organisational profile	Freq.	%
Number of employees in the profiled manufacturing firms		
10–20	91	20.4
20–49	163	36.5
50–99	82	18.4
100–200	55	12.3
201 and more	55	12.3
Total	446	100.0
Number of years the profiled manufacturing firms have been in operation		
3–6	124	27.8
6–10	221	49.6
≥ 11	101	22.6
Total	446	100.0
Regions of the profiled manufacturing firms		
Vereeniging	143	32.1
Johannesburg	177	39.7
Vanderbijlpark	108	24.2
Other	18	4.0
Total	446	100.0
Profiled manufacturing firms forms of business ownership		
Sole proprietor	69	15.5
Partnership	122	27.4
Close corporation	63	14.1
Private company	103	23.1
Public company	84	18.8
Other	5	1.1
Total	446	100.0
Annual turnover of profiled manufacturing firms (South African rand, million)		
1–9	279	62.6
10–25	91	20.4
26–50	60	13.5
≥ 51	16	3.6
Total	446	100.0

Freq., frequency.

Results

Descriptive statistics

Of the 512 questionnaires distributed, 497 were retrieved, with 446 confirmed usable. These usable questionnaires represented 446 respondents who formed the actual sample size of the study.

Company background information and respondent profile

Statistics gathered following company background information check indicated that a majority of the manufacturing firms (49.6%) had been in operation between 6 and 10 years, with 39.7% of the total sample situated in the Johannesburg metro. Partnership was the form of business ownership that the majority of profiled manufacturing firms (27.4%) had and 63% of the total reported an annual turnover of between R1 million and R9 million. Only 12.3% of the firms had more than 200 employees. Table 1 provides more information about company background. Statistics about respondent profile indicated that a majority (53.4%) were designated in the operations and manufacturing department, with 42.4% of the total having between 6 and 10 years of work experience. A majority of the respondents (29.8%) were also managers and supervisors.

Measurement model assessment

Cronbach's alpha (α) and composite reliability (CR) tests were undertaken to assess the reliability of measurement items while standardised regression weights were observed for validity including a test for the Average Variance Extracted (AVE). The results are shown in Table 2.

Reliability

Alpha coefficients indicated in Table 2 ranged between 0.839 and 0.887, and therefore signified construct reliability according to Kennedy (2022). Tests for CR further yielded results of at least 0.88 CR for all research constructs, thus confirming reliability (≥ 0.7) (Chin, 1998).

Validity

In addition to testing the AVE, measurement scales were also assessed against convergent validity and discriminant validity. Table 2 illustrates that standardised regression weights (factor loadings) loaded well (≥ 0.5) on their relative constructs to indicate convergent validity, according to the seminal work of Anderson and Gerbing (1988). The variance extracted estimates for all constructs ranged from 0.56 to 0.69 and thus confirmed validity as they aligned with the ≥ 0.5 threshold advocated by Sarstedt et al. (2014). The presence of discriminate validity was confirmed when the square roots of each construct's AVE were found to be greater than their respective correlations with other constructs (Yusoff et al., 2020). The results for discriminate validity are presented in Table 3.

Structural model assessment

Explanatory power assessment

Once the measurement model assessment had been concluded, the next step was to measure the model's explanatory power by ascertaining the coefficient of determination (R^2) (cf. Hair et al., 2019). To start with, a standard test for collinearity was conducted to determine if there are two or more predictor variables that are linearly correlated, which would imply that predictors within the statistical model are misconceptualised. Table 4 exhibits the results from the collinearity analysis.

Variance Inflation Factors (VIF) were ascertained and compared against the recommended threshold of ≤ 3 (Becker et al., 2015). All inner VIF values presented in Table 4 confirm collinearity as non-existent.

Given that there were no concerns for collinearity, the next step was to examine the R^2. The results illustrated in Figure 2 indicates operational performance (0.489), environmental performance (0.484) and supply chain performance (0.498) as having moderate explanatory power (0.25–0.50), respectively, with green logistics practices (0.238) representing a relatively weaker explanatory power (< 0.25) (Hair et al., 2011). A greater statistical power denotes that Partial Least Squares-Structural Equation Modelling (PLS-SEM) is more likely to acknowledge relationships as significant when they are present in the population (Sarstedt & Mooi, 2019).

TABLE 2: Measurement model assessment.

Research constructs	Scale item		Cronbach's test α value	CR	AVE	Factor loadings
	Mean	SD				
Green marketing practices	3.39	0.77	0.867	0.90	0.60	-
GMP1	-	-	-	-	-	0.710
GMP2	-	-	-	-	-	0.795
GMP3	-	-	-	-	-	0.798
GMP4	-	-	-	-	-	0.832
GMP5	-	-	-	-	-	0.765
GMP6	-	-	-	-	-	0.746
Green logistics practices	3.26	0.84	0.881	0.91	0.68	-
GLP1	-	-	-	-	-	0.726
GLP2	-	-	-	-	-	0.842
GLP3	-	-	-	-	-	0.871
GLP4	-	-	-	-	-	0.850
GLP5	-	-	-	-	-	0.827
Operational performance	3.38	0.86	0.876	0.91	0.67	-
OP1	-	-	-	-	-	0.744
OP2	-	-	-	-	-	0.844
OP3	-	-	-	-	-	0.850
OP4	-	-	-	-	-	0.831
OP5	-	-	-	-	-	0.817
Environmental performance	3.36	0.75	0.839	0.88	0.56	-
EP1	-	-	-	-	-	0.765
EP2	-	-	-	-	-	0.721
EP3	-	-	-	-	-	0.768
EP4	-	-	-	-	-	0.712
EP5	-	-	-	-	-	0.762
EP6	-	-	-	-	-	0.739
Supply chain performance	3.38	0.84	0.887	0.91	0.69	-
SCP1	-	-	-	-	-	0.794
SCP2	-	-	-	-	-	0.867
SCP3	-	-	-	-	-	0.856
SCP4	-	-	-	-	-	0.822
SCP5	-	-	-	-	-	0.812

GMP, green marketing practices; GLP, green logistics practices; OP, operational performance; EP, environmental performance; SCP, supply chain performance; SD, standard deviation; CR, composite reliability; AVE, average variance extracted.

Predictive accuracy assessment

Examining predictive performance is important for theory building and validation purposes (Sharma et al., 2022). This was performed by calculating the Q^2, which is a blindfolding procedure that removes single points in the data matrix, credits the removed points with the mean and estimates the model parameters (Sarstedt et al., 2014). Table 5 presents the results following the test for predictive accuracy using blindfolding. Q^2 indicators with a 0.220–0.336 range can be observed. This suggests that endogenous constructs exhibit a medium predictive accuracy (0.025–0.5) of the structural model (Hair et al., 2019). In other words, the constructs green logistics practices, operational performance, environmental performance and supply chain performance illustrate that this study has a medium chance of accuracy with the hypotheses developed and ultimately the theory adopted.

Path analysis

Partial Least Squares-Structural Equation Modelling maintains that unobserved variables directly or indirectly influence other unobserved variables and that testing results in estimations that indicate how these variables are related (Memon et al., 2021). Table 6 presents the results obtained from path analysis. A positive Beta coefficient (β) implies that there is a strong relationship between unobserved variables (Nohara et al., 2022), while *t*-statistics and *p*-values express statistical significance and power (Becker et al., 2013).

TABLE 3: Results from discriminant validity testing using the average variance extracted method.

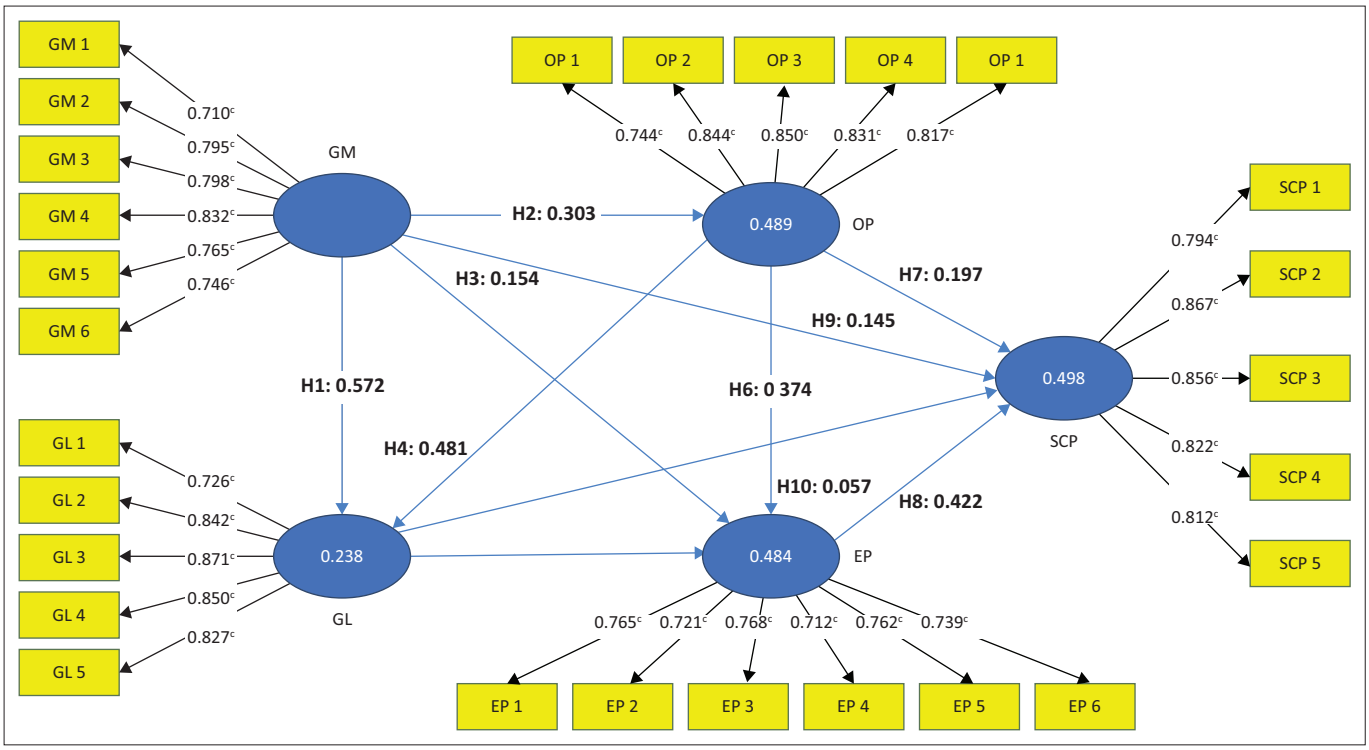
Research constructs	GMP	GLP	OP	EP	SCP
Green marketing practices (GMP)	0.774†	-	-	-	-
Green logistics practices (GLP)	0.572	0.824†	-	-	-
Operational performance (OP)	0.578	0.654	0.818†	-	-
Environmental performance (EP)	0.525	0.604	0.640	0.748†	-
Supply chain performance (SCP)	0.513	0.524	0.588	0.659	0.830†

AVE, average variance extracted.
†, A square root of the AVE value.

TABLE 4: Collinearity analysis.

Inner VIF values	GMP	GLP	OP	EP	SCP
Green marketing practices (GMP)	-	1.000	-	1.667	1.713
Green logistics practices (GLP)	-	-	1.487	1.940	2.083
Operational performance (OP)	-	-	1.487	1.959	2.229
Environmental performance (EP)	-	-	-	-	1.938
Supply chain performance (SCP)	-	-	-	-	-

VIF, Variance Inflation Factor.



GM, green marketing practices; GL, green logistics practices; OP, operational performance; EP, environmental performance; SCP, supply chain performance.

FIGURE 2: Structural Model.

TABLE 5: Predictive accuracy using blindfolding.

Description	SSO	SSE	Q^2 (= 1-SSE/SSO)
Green marketing practices	2676.000	2676.000	-
Green logistics practices	2230.000	1739.434	0.220
Operational performance	2230.000	1505.823	0.325
Environmental performance	2676.000	1970.270	0.264
Supply chain performance	2230.000	1480.203	0.336

SSO, sum of squares of observations; SSE, sum of squared errors.

The tests in this procedure were performed on a 95% confidence interval to ensure that false positives are averted (Kock, 2016). Accordingly, *p*-value tests were based on the 0.05 significance level (i.e. 1% – 95%), while *t*-statistics were compared against a threshold of 1.96 (Kock, 2016). Nine out of the ten hypothesised relationships were levelled at a *t*-statistic of at least 2.95, with power identified at ≤ 0.05. These hypotheses convey that there is a significant relationship between green practices and supply chain performance within the textile and clothing industry. However, H10 was rejected, suggesting that green logistics practices are, in essence, ineffective in directly improving the supply chain performance of South African manufacturing firms in the textile and clothing industry.

Mediating effect analysis

The purpose of testing mediation effect is to learn, for instance, more about potential false effects or suppressor effects (O'Rourke & MacKinnon, 2018). A two-step approach was used for an inclusive mediation analysis (Yang & Liu, 2023). The test for indirect effect was performed in Step 1, followed by a test for mediating strength in Step 2. Table 7 exhibits the results from the mediating effect analysis (Step 1).

TABLE 6: Results from the path analysis.

Description	Hypothesis	Beta coefficient (β)	*T*-statistics	*P*	Rejected/ Supported
Green marketing practices (GMP) → Green logistics practices (GLP)	H1	0.572	17.115	0.000	Supported
Green marketing practices (GMP) → Operational performance (OP)	H2	0.303	6.325	0.000	Supported
Green marketing practices (GMP) → Environmental performance (EP)	H3	0.154	3.005	0.003	Supported
Green logistics practices (GLP) → Operational performance (OP)	H4	0.481	10.220	0.000	Supported
Green logistics practices (GLP) → Environmental performance (EP)	H5	0.272	5.476	0.000	Supported
Operational performance (OP) → Environmental performance (EP)	H6	0.374	6.242	0.000	Supported
Operational performance (OP) → Supply chain performance (SCP)	H7	0.197	3.193	0.001	Supported
Environmental performance (EP) → Supply chain performance (SCP)	H8	0.422	8.161	0.000	Supported
Green marketing practices (GMP) → Supply chain performance (SCP)	H9	0.145	2.953	0.003	Supported
Green logistics practices (GLP) → Supply chain performance (SCP)	H10	0.057	0.981	0.326	Rejected

Operational performance and environmental performance were tested for mediating effects between green practices and supply chain performance. The results indicated that the four mediation tests equated to a *t*-statistics ratio of at least 2.91 with power identified at ≤ 0.05. This meant that all four tests for mediation were found to be significant and supported. In addition, the Variance Accounted For (VAF) values were computed in order to ascertain the

strength of each mediating effect. The results are illustrated in Table 8 (Step 2).

A VAF value less than 20% suggests a near-zero mediation, and a value greater than 20%, but less than 80% can be characterised as typical partial mediation (Hair et al., 2014). As such, the results presented in Table 8 can be understood as reflecting partial mediations, given that effects conformed to the > 20% and < 80% pragmatism. The two intermediate variables, which are, operational performance and environmental performance, therefore support and complement the hypothesised relationships between the independent variables, green marketing practices and green logistics practices and the dependent variable, supply chain performance.

Discussion

The purpose of this study was to investigate the influence of green practices on supply chain performance in the textile and clothing manufacturing industry in Gauteng, South Africa.

Fourteen hypotheses were developed and tested. Out of the 14, 13 were validated. Green marketing practices were found to influence supply chain performance in a positive and significant way. This relationship was further found to be complemented by the mediating effects of operational performance and environmental performance, respectively. This finding implies that there is a strong correlation between green marketing practices and supply chain performance that can provide competitive strength to textile and manufacturing firms operating in Gauteng, South Africa. However, the results also indicated that green logistics practices have a statistically insignificant relationship with supply chain performance. This suggests that the influence of green logistics practices on supply chain performance is ineffective and therefore cannot be expected to create much value within the industry in Gauteng province. Conversely, the results indicated green marketing practices as having the strongest influence on green logistics practices. These green practices have previously been found to be interrelated (Sugandini et al., 2020) and as being significant in manufacturing industries (Pandey et al., 2018). South African textile and clothing manufacturing firms must therefore acknowledge the value of this correlation and those in Gauteng must further prioritise it.

Tests for mediating effects highlighted both operational performance and environmental performance as complementary in their role between green practices and supply chain performance. Particularly high mediating effects in the relationship between green logistics practices and supply chain performance were exhibited amid the statistically insignificant direct relationship that exists between the constructs. The result therefore suggests green logistics practices can only be effective for supply chain performance if their influence can first be exhibited in the firms' operational performance and environmental performance.

TABLE 7: Mediating effects analysis.

Mediation	Hypothesis	*T*-statistics	*P*	Rejected/Supported
GMP → OP → SCP	H11	2.919	0.004	Supported
GMP → EP → SCP	H12	3.101	0.002	Supported
GLP → EP → SCP	H13	4.397	0.002	Supported
GLP → OP → SCP	H14	3.085	0.000	Supported

GMP, green marketing practices; GLP, green logistics practices; OP, operational performance; EP, environmental performance; SCP, supply chain performance.

Conclusion

Implications

Based on the results of this study, it appears that green logistics practices cannot simply be expected to influence supply chain performance in a meaningful way. However, when the impact of such practices is exhibited in firms' operational performance and environmental performance, their significance can be acknowledged. Green logistics practices are therefore passive rather than commanding in nature. This also implies that as a construct, it cannot be entrusted as a sole predictor of supply chain performance; results for collinearity further verify this. The strongest relationship within the industry was found to be between green marketing practices and green logistics practices. This suggests that the eco-efficient management of the flow of goods and services is successful when the products themselves are designed, promoted, priced and distributed in a manner that is environmentally sustainable. A general consensus is that a sustainable practice that is complemented or supported by other sustainable means creates the right solution that is fit for purpose. This result, together with that following Q^2 test, further validates this hypothesis developed from the literature (cf. Norazah, 2013a, 2013b; Rahbar & Wahid, 2011).

In the light of this study's aim of investigating the impact of green practices on supply chain performance in the textile and clothing industry in Gauteng, South Africa, the results indicated positive effects with a single exception. Green marketing practices were found to have a positive relationship with supply chain performance that is significant on at least a 95% confidence interval. This relationship is further

TABLE 8: Mediating effects analysis using the variance accounted for method.

Mediation	Hypothesis	Indirect effect A × B	Direct effect C'	Total mediating effect	VAF value (%)	Type
GMP → OP → SCP	H11	0.060	0.145	0.205	29	Complementary, partial mediation
GMP → EP → SCP	H12	0.065	0.145	0.210	31	Complementary, partial mediation
GLP → EP → SCP	H13	0.115	0.057	0.172	67	Complementary, partial mediation
GLP → OP → SCP	H14	0.095	0.057	0.152	63	Complementary, partial mediation

GMP, green marketing practices; GLP, green logistics practices; OP, operational performance; EP, environmental performance; SCP, supply chain performance; VAF, variance accounted for.

complemented by the mediating effect of operational performance and environmental performance with an indirect-to-total effect of 29%. South African textile and clothing manufacturing firms must therefore acknowledge that there is a possibility of realising a competitive advantage through a supply chain performance that is driven by internal green marketing practices. Operational performance and environmental performance further complement this relationship, but their impact was found to be significantly higher between green logistics practices and supply chain performance – perhaps rather telling given their statistically insignificant direct relationship. Despite this statistically insignificant relationship, the overall impact of green practices on the bottom line is compelling and should be given precedence, especially given the challenges that plague the industry (e.g. increased competition from the import of Chinese products). The strongest correlation, as found between green marketing practices and green logistics practices, should always be exploited. Given that statistical analysis provides support for this study's theory of BEP (e.g. predictive accuracy assessment), it is a testament that firms' expectations for improved performance naturally elicit efforts that translate into practices that are guided by sustainable behaviour – indeed, a key principle of the theory. This theory can therefore succeed in grounding future empirical studies and providing a foundation for informed decision-making by practitioners.

Limitations and suggestions for future research

This study is not without limitations. The outcome variable, that of supply chain performance, has been operationalised and measured as a unidimensional construct. While this is valid, it would be of interest to examine the construct as a multidimensional construct in order to understand the attributes that react more significantly to the influence of independent constructs. Perhaps the SCOR Model developed by Stewart (1997) can be a reference point for such high-dimensional modelling. This would also enlighten scholars on its low explanatory power. Although this study made use of the theory of BEP, it could be further refined. It is therefore recommended that future studies should extend further tests regarding the theory for applicability and credibility.

Environmental sustainability is a mandate for firms across all industries. It would be ideal for this research to be extended as a longitudinal study in order to ascertain the influence of green practices over time. Such a study should also be undertaken with a rigorous document analysis on local and foreign trade policies, which was limited in this study. This would further provide an informed interpretation of the results. Given that the study's findings are representative of the textile and clothing industry in Gauteng, they can only serve as a reflection of the industry in the context of South Africa as a whole. Future studies should therefore also consider expanding the scope of this study to the rest of the country so that the findings can be generalised across South Africa. This would: (1) advance our understanding of the textile and clothing industry in South Africa; (2) determine the collective progress towards reaching a national development plan of sustainable development; and (3) direct stakeholders where intervention may be required to reinforce sustainability.

Acknowledgements

The author would like to confer his gratitude to Walter Sisulu University for funding the publication of this research article.

This article is based on data from a larger study. A related article focusing on the mediating and moderating effects of green logistics and marketing practices on the relationship between environmental and operational performance has been published in the *Journal of Transport and Supply Chain Management*, Volume 19(0), Article ID a1182. This article addresses a distinct research question, focusing on the impact of green practices on supply chain performance, with operational and environmental performance examined as mediating variables.

Competing interests

The author declares that there are no financial or personal relationships that may have inappropriately influenced the writing of this article.

Authors' contribution

T.M.M. is the sole author of this article.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of the Witwatersrand, Human Research Ethics Committee (non-medical) (H17/06/32).

Funding information

This work was supported solely by Walter Sisulu University. The author did not receive any financial support for the research, authorship, and/or publication of this article from any other funding agency in the public, commercial, or not-for-profit sectors.

Data availability

The data that support the findings of this study are available from the corresponding author, T.M.M. upon reasonable request.

Disclaimer

The views and opinions expressed in this article are those of the author and are the product of professional research. They do not necessarily reflect the official policy or position of any affiliated institution, funder, agency or that of the publisher. The author is responsible for this article's results, findings and content.

References

Acquaye, A., Ibn-Mohammed, T., Genovese, A., Afrifa, G.A., Yamoah, F.A., & Oppon, E. (2018). A quantitative model for environmentally sustainable supply chain performance measurement. *European Journal of Operational Research, 269*(1), 188–205. https://doi.org/10.1016/j.ejor.2017.10.057

Agyabeng-Mensah, Y., & Tang, L. (2021). The relationship among green human capital, green logistics practices, green competitiveness, social performance and financial performance. *Journal of Manufacturing Technology Management, 32*(7), 1377–1398. https://doi.org/10.1108/JMTM-11-2020-0441

Agyabeng-Mensah, Y., Afum, E., & Ahenkorah, E. (2020a). Exploring financial performance and green logistics management practices: Examining the mediating influences of market, environmental and social performances. *Journal of Cleaner Production, 258*, 120613. https://doi.org/10.1016/j.jclepro.2020.120613

Agyabeng-Mensah, Y., Afum, E., Baah, C., & Essel, D. (2022). Exploring the role of external pressure, environmental sustainability commitment, engagement, alliance and circular supply chain capability in circular economy performance. *International Journal of Physical Distribution & Logistics Management, 52*(5/6), 431–455. https://doi.org/10.1108/IJPDLM-12-2021-0514

Agyabeng-Mensah, Y., Ahenkorah, E., Afum, E., Dacosta, E., & Tian, Z. (2020b). Green warehousing, logistics optimization, social values and ethics and economic performance: The role of supply chain sustainability. *The International Journal of Logistics Management, 31*(3), 549–574. https://doi.org/10.1108/IJLM-10-2019-0275

Anderson, J.C., & Gerbing, D.W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411–423. https://doi.org/10.1037/0033-2909.103.3.411

Antão, P., Calderón, M., Puig, M., Michail, A., Wooldridge, C., & Darbra, R.M. (2016). Identification of occupational health, safety, security (OHSS) and environmental performance indicators in port areas. *Safety Science, 85*, 266–275. https://doi.org/10.1016/j.ssci.2015.12.031

Arda, O.A., Montabon, F., Tatoglu, E., Golgeci, I., & Zaim, S. (2023). Toward a holistic understanding of sustainability in corporations: Resource-based view of sustainable supply chain management. *Supply Chain Management: An International Journal, 28*(2), 193–208. https://doi.org/10.1108/SCM-08-2021-0385

Bagiella, E., & Chang, H. (2019). Power analysis and sample size calculation. *Journal of Molecular and Cellular Cardiology, 133*, 214–216. https://doi.org/10.1016/j.yjmcc.2019.01.006

Becker, J.M., Rai, A., & Rigdon, E. (2013). Predictive validity and formative measurement in structural equation modeling: Embracing practical relevance. *Proceedings of the 34th International Conference on Information Systems* (pp. 1–19). January 2013.

Becker, J.M., Ringle, C.M., Sarstedt, M., & Völckner, F. (2015). How collinearity affects mixture regression results. *Marketing Letters, 26*, 643–659. https://doi.org/10.1007/s11002-014-9299-9

Berman, S.L., Wicks, A.C., Kotha, S., & Jones, T.M. (1999). Does stakeholder orientation matter? The relationship between stakeholder management models and firm financial performance. *Academy of Management Journal, 42*(5), 488–506. https://doi.org/10.2307/256972

Brahme, S.S., & Shafighi, N. (2022). Green logistics in last-mile delivery: A focus on customers' requirements and satisfaction. *International Journal of Humanities & Social Science Invention, 9*(9), 7230–7238. https://doi.org/10.18535/ijsshi/v9i09.08

Brower, J., & Mahajan, V. (2013). Driven to be good: A stakeholder theory perspective on the drivers of corporate social performance. *Journal of Business Ethics, 117*, 313–331. https://doi.org/10.1007/s10551-012-1523-z

BusinessTech. (2021, December 18). Joburg and foreign buyers are flocking to these areas in South Africa. *Business Tech*. Retrieved from https://businesstech.co.za/news/trending/546606/what-to-expect-in-south-africas-housing-market-in-2022/.

Carter, C.R., & Rogers, D.S. (2008). A framework of sustainable supply chain management: Moving toward new theory. *International Journal of Physical Distribution & Logistics Management, 38*(5), 360–387. https://doi.org/10.1108/09600030810882816

Chin, W.W. (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research, 295*(2), 295–336.

Cho, C.H., Guidry, R.P., Hageman, A.M., & Patten, D.M. (2012). Do actions speak louder than words? An empirical investigation of corporate environmental reputation. *Accounting, Organizations & Society, 37*(1), 14–25. https://doi.org/10.1016/j.aos.2011.12.001

Dissanayake, C.K., & Cross, J.A. (2018). Systematic mechanism for identifying the relative impact of supply chain performance areas on the overall supply chain performance using SCOR model and SEM. *International Journal of Production Economics, 201*, 102–115. https://doi.org/10.1016/j.ijpe.2018.04.027

Elkington, J. (1994). Towards the sustainable corporation: Win-win-win business strategies for sustainable development. *California Management Review, 36*(2), 90–100. https://doi.org/10.2307/41165746

Estampe, D., Lamouri, S., Paris, J.L., & Brahim-Djelloul, S. (2013). A framework for analysing supply chain performance evaluation models. *International Journal of Production Economics, 142*(2), 247–258. https://doi.org/10.1016/j.ijpe.2010.11.024

Ezzi, F., & Jarboui, A. (2016). Does innovation strategy affect financial, social and environmental performance? *Journal of Economics, Finance and Administrative Science, 21*(40), 14–24. https://doi.org/10.1016/j.jefas.2016.03.001

Feng, T., Cai, D., Wang, D., & Zhang, X. (2016). Environmental management systems and financial performance: The effect of switching cost and competitive intensity. *Journal of Cleaner Production, 113*, 781–791. https://doi.org/10.1016/j.jclepro.2015.11.038

Ferdows, K., & De Meyer, A. (1990). Lasting improvements in manufacturing performance: In search of a new theory. *Journal of Operations Management, 9*(2), 168–184. https://doi.org/10.1016/0272-6963(90)90094-T

Filipova, A.A. (2023). Expectancy theory in organizations. In A. Farazmand (Eds.), *Global encyclopedia of public administration, public policy, and governance* (pp. 4604–4612). Springer International Publishing.

Fok, L., Zee, S., & Morgan, Y.C.T. (2022). Green practices and sustainability performance: The exploratory links of organizational culture and quality improvement practices. *Journal of Manufacturing Technology Management, 33*(5), 913–933. https://doi.org/10.1108/JMTM-11-2021-0439

Global Reporting Initiative (GRI). (2014). *Global reporting initiative. Sustainability reporting guidelines*. Version 4.0. Author. Retrieved from https://www.globalreporting.org/standards.

Golzar, J., Noor, S., & Tajik, O. (2022). Convenience sampling. *International Journal of Education and Language Studies, 1*(2), 72–77.

Gonzalez-Pascual, E., Nosedal-Sanchez, J., & Garcia-Gutierrez, J. (2021). Performance evaluation of a road freight transportation company through SCOR metrics. *Case Studies on Transport Policy, 9*(4), 1431–1439. https://doi.org/10.1016/j.cstp.2021.07.001

Green, K.W., & Inman, R.A. (2005). Using a just-in-time selling strategy to strengthen supply chain linkages. *International Journal of Production Research, 43*(16), 3437–3453. https://doi.org/10.1080/00207540500118035

Green, K.W., Jr, Whitten, D., & Inman, R.A. (2012). Aligning marketing strategies throughout the supply chain to enhance performance. *Industrial Marketing Management, 41*(6), 1008–1018. https://doi.org/10.1016/j.indmarman.2012.02.003

Groves, R.M., Fowler, F.J., Jr, Couper, M.P., Lepkowski, J.M., Singer, E., & Tourangeau, R. (2011). *Survey methodology*. John Wiley & Sons.

Hair, J.F., Jr, Hult, G.T.M., Ringle, C.M., & Sarstedt, M. (2014). *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Sage Publications.

Hair, J.F., Ringle, C.M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice, 19*(2), 139–152. https://doi.org/10.2753/MTP1069-6679190202

Hair, J.F., Risher, J.J., Sarstedt, M., & Ringle, C.M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Halik, J.B., Parawansa, D.A.S., & Sudirman, I. (2023). Implications of IT awareness and digital marketing to product distribution on the performance of Makassar SMEs. *Journal of Distribution Science, 21*(7), 105–116.

Hanaysha, J.R., & Alzoubi, H.M. (2022). Investigating the impact of benefits and challenges of IOT adoption on supply chain performance and organizational performance: An empirical study in Malaysia. *Uncertain Supply Chain Management, 10*(2), 537–550. https://doi.org/10.5267/j.uscm.2021.11.009

Huang, J., Wang, X., Luo, Y., Yu, L., & Zhang, Z. (2021). Joint green marketing decision-making of green supply chain considering power structure and corporate social responsibility. *Entropy, 23*(5), 564. https://doi.org/10.3390/e23050564

Huang, Z., Cao, J., & Pan, L. (2024). Greening your way to profits: Green strategies and green revenues. *Finance Research Letters, 61*, 105029. https://doi.org/10.1016/j.frl.2024.105029

Jain, V., Kumar, S., Mostofi, A., & Momeni, M.A. (2022). Sustainability performance evaluation of the E-waste closed-loop supply chain with the SCOR model. *Waste Management, 147*, 36–47. https://doi.org/10.1016/j.wasman.2022.05.010

Kennedy, I. (2022). Sample size determination in test-retest and Cronbach alpha reliability estimates. *British Journal of Contemporary Education, 2*(1), 17–29. https://doi.org/10.52589/BJCE-FY266HK9

Kim, D., Na, J., & Ha, H.K. (2024). Exploring the impact of green logistics practices and relevant government policy on the financial efficiency of logistics companies. *Heliyon, 10*(10), 30916. https://doi.org/10.1016/j.heliyon.2024.e30916

Kim, Y.J., Kim, W.G., Choi, H.M., & Phetvaroon, K. (2019). The effect of green human resource management on hotel employees' eco-friendly behavior and environmental performance. *International Journal of Hospitality Management, 76*, 83–93. https://doi.org/10.1016/j.ijhm.2018.04.007

Kock, N. (2016). Hypothesis testing with confidence intervals and P values in PLS-SEM. *International Journal of e-Collaboration (IJeC), 12*(3), 1–6. https://doi.org/10.4018/IJeC.2016070101

Konstantakopoulos, G.D., Gayialis, S.P., & Kechagias, E.P. (2022). Vehicle routing problem and related algorithms for logistics distribution: A literature review and classification. *Operational Research, 22*(3), 2033–2062. https://doi.org/10.1007/s12351-020-00600-7

Kutzner, F.L., Read, D., Stewart, N., & Brown, G. (2017). Choosing the devil you don't know: Evidence for limited sensitivity to sample size–based uncertainty when it offers an advantage. *Management Science, 63*(5), 1519–1528. https://doi.org/10.1287/mnsc.2015.2394

La Rocca, A., Hoholm, T., & Mørk, B.E. (2017). Practice theory and the study of interaction in business relationships: Some methodological implications. *Industrial Marketing Management, 60*, 187–195. https://doi.org/10.1016/j.indmarman.2016.04.002

Lai, K.H., & Wong, C.W. (2012). Green logistics management and performance: Some empirical evidence from Chinese manufacturing exporters. *Omega, 40*(3), 267–282. https://doi.org/10.1016/j.omega.2011.07.002

Lawton, J., McKay, T.J., & Tantoh, H.B. (2025). The emerging green economy: Exploring the influence of ISO 14001 on South African manufacturing sector. *Development Southern Africa, 42*(3), 363–382. https://doi.org/10.1080/0376835X.2025.2456247

Lubis, N.W. (2022). Resource based view (RBV) in improving company strategic capacity. *Research Horizon, 2*(6), 587–596. https://doi.org/10.54518/rh.2.6.2022.587-596

Luthra, S., Garg, D., & Haleem, A. (2016). The impacts of critical success factors for implementing green supply chain management towards sustainability: An empirical investigation of Indian automobile industry. *Journal of Cleaner Production, 121*, 142–158. https://doi.org/10.1016/j.jclepro.2016.01.095

Mafini, C., & Muposhi, A. (2017). The impact of green supply chain management in small to medium enterprises: Cross-sectional evidence. *Journal of Transport and Supply Chain Management, 11*(1), 1–11. https://doi.org/10.4102/jtscm.v11i0.270

Mahpour, A., Farzin, I., Izadi, A.R., & Ashouri, S. (2023). Expanding the VBN theory on succeeding the transportation demand management policies. *Transportation Research Interdisciplinary Perspectives, 21*, 100903. https://doi.org/10.1016/j.trip.2023.100903

Memon, M.A., Ramayah, T., Cheah, J.H., Ting, H., Chuah, F., & Cham, T.H. (2021). PLS-SEM statistical programs: A review. *Journal of Applied Structural Equation Modeling, 5*(1), 1–14. https://doi.org/10.47263/JASEM.5(1)06

Mofokeng, T.M., & Chinomona, R. (2019). Supply chain partnership, supply chain collaboration and supply chain integration as the antecedents of supply chain performance. *South African Journal of Business Management, 50*(1), 1–10.

National Framework for Sustainable Development (NFSD). 2008. *National framework*. Retrieved from https://www.dffe.gov.za/sites/default/files/docs/publications/national_framework_sustainabledevelopment.pdf.

Ngcobo, A.M., Mafini, C., & Okoumba, W.L. (2022). Extending green supply chain management to the mining sector in South Africa: Implications for corporate performance. *African Journal of Inter/Multidisciplinary Studies, 4*(1), 311–324. https://doi.org/10.51415/ajims.v4i1.1044

Nicoletti, B. (2023). SCOR model. In B. Nicoletti (Ed.), *Supply network 5.0: How to improve human automation in the supply chain* (pp. 19–41). Springer International Publishing.

Nohara, Y., Matsumoto, K., Soejima, H., & Nakashima, N. (2022). Explanation of machine learning models using Shapley additive explanation and application for real data in hospital. *Computer Methods and Programs in Biomedicine, 214*, 106584. https://doi.org/10.1016/j.cmpb.2021.106584

Norazah, M.S. (2013a). Green products purchases: Structural relationships of consumers' perception of eco-label, eco-brand and environmental advertisement. *Journal of Sustainable Science and Management, 8*(1), 1–10.

Norazah, M.S. (2013b). Young consumer ecological behaviour: Effects of environmental knowledge, healthy food, and healthy way of life with the moderation of gender and age. *Management of Environmental Quality: An International Journal, 24*(6), 726–773. https://doi.org/10.1108/MEQ-02-2013-0010

Nuryakin, N., & Maryati, T. (2022). Do green innovation and green competitive advantage mediate the effect of green marketing orientation on SMEs' green marketing performance? *Cogent Business & Management, 9*(1), 2065948. https://doi.org/10.1080/23311975.2022.2065948

O'Rourke, H.P., & MacKinnon, D.P. (2018). Reasons for testing mediation in the absence of an intervention effect: A research imperative in prevention and intervention research. *Journal of Studies on Alcohol and Drugs, 79*(2), 171–181. https://doi.org/10.15288/jsad.2018.79.171

Pandey, R.U., Surjan, A., & Kapshe, M. (2018). Exploring linkages between sustainable consumption and prevailing green practices in reuse and recycling of household waste: Case of Bhopal city in India. *Journal of Cleaner Production, 173*, 49–59. https://doi.org/10.1016/j.jclepro.2017.03.227

Polonsky, M.J. (2011). Transformative green marketing: Impediments and opportunities. *Journal of Business Research, 64*(12), 1311–1319. https://doi.org/10.1016/j.jbusres.2011.01.016

Rahbar, E., & Wahid, N.A. (2011). Investigation of green marketing tools' effect on consumers' purchase behavior. *Business Strategy Series, 12*(2), 73–83. https://doi.org/10.1108/17515631111114877

Sarstedt, M., & Mooi, E.A. (2019). *A concise guide to market research: The process, data, and methods using IBM SPSS statistics*. Springer.

Sarstedt, M., Ringle, C.M., Smith, D., Reams, R., & Hair, J.F., Jr. (2014). Partial least squares structural equation modeling (PLS-SEM): A useful tool for family business researchers. *Journal of Family Business Strategy, 5*(1), 105–115. https://doi.org/10.1016/j.jfbs.2014.01.002

Saryatmo, M.A., & Sukhotu, V. (2021). The influence of the digital supply chain on operational performance: A study of the food and beverage industry in Indonesia. *Sustainability, 13*(9), 5109. https://doi.org/10.3390/su13095109

Sharma, P.N., Liengaard, B.D., Hair, J.F., Sarstedt, M., & Ringle, C.M. (2022). Predictive model assessment and selection in composite-based modeling using PLS-SEM: Extensions and guidelines for using CVPAT. *European Journal of Marketing, 57*(6), 1662–1677. https://doi.org/10.1108/EJM-08-2020-0636

Siddiqui, K. (2013). Heuristics for sample size determination in multivariate statistical techniques. *World Applied Sciences Journal, 27*(2), 285–287.

Stewart, G. (1997). Supply-chain operations reference model (SCOR): The first cross-industry framework for integrated supply-chain management. *Logistics Information Management, 10*(2), 62–67. https://doi.org/10.1108/09576059710815716

Sugandini, D., Susilowati, C., Siswanti, Y., & Syafri, W. (2020). Green supply management and green marketing strategy on green purchase intention: SMEs cases. *Journal of Industrial Engineering and Management (JIEM), 13*(1), 79–92. https://doi.org/10.3926/jiem.2795

Tan, B.Q., Wang, F., Liu, J., Kang, K., & Costa, F. (2020). A blockchain-based framework for green logistics in supply chains. *Sustainability, 12*(11), 4656. https://doi.org/10.3390/su12114656

Trade & Industrial Policy Strategies (TIPS). 2022. *The real economy bulletin – First quarter 2023*. Retrieved from https://www.tips.org.za/images/The_Real_Economy_Bulletin_-_First_Quarter_2023.pdf.

Uddin, M. (2021). Exploring environmental performance and the competitive advantage of manufacturing firms: A green supply chain management perspective. *International Journal of Economics & Management, 15*(2), 219–239.

Yang, X., & Liu, X. (2023). Path analysis and mediating effects of influencing factors of land use carbon emissions in Chang-Zhu-Tan urban agglomeration. *Technological Forecasting and Social Change, 188*, 122268.

Yusoff, A.S.M., Peng, F.S., Abd Razak, F.Z., & Mustafa, W.A. (2020). Discriminant validity assessment of religious teacher acceptance: The use of HTMT criterion. *Journal of Physics: Conference Series, 1529*(4), 042045. https://doi.org/10.1088/1742-6596/1529/4/042045

Zaharia, R.M., & Zaharia, R. (2021). Triple bottom line. In D. Crowther, & S. Seifi (Eds.), *The Palgrave handbook of corporate social responsibility* (pp. 75–101). Springer International Publishing.

Zhang, Y., Thompson, R.G., Bao, X., & Jiang, Y. (2014). Analyzing the promoting factors for adopting green logistics practices: A case study of road freight industry in Nanjing, China. *Procedia-Social and Behavioral Sciences, 125*, 432–444. https://doi.org/10.1016/j.sbspro.2014.01.1486

Zhu, Q., & Sarkis, J. (2016). Green marketing and consumerism as social change in China: Analyzing the literature. *International Journal of Production Economics, 181*, 289–302. https://doi.org/10.1016/j.ijpe.2016.06.006