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Motives for Sustainable Supply Chain Management Practices Adoption Among Established Non-Service Sector Enterprises: A Cross-Country Study

Oluwafemi Joshua Dele-Ijagbulu ¹ and Progress Hove-Sibanda ^{2,*} 

¹ Nelson Mandela University (NMU) Business School, Business and Economic Sciences, Nelson Mandela University (NMU), Port Elizabeth 6019, South Africa; oluwafemi.dele-ijagbulu@mandela.ac.za

² Logistics Department, Nelson Mandela University (NMU), Port Elizabeth 6019, South Africa

* Correspondence: progresshs@mandela.ac.za

Abstract

Background: Although industrialisation of the 20th century advanced economic prosperity, it resulted in significant environmental deterioration and other industrialisation-related deleterious environmental impact. However, extant research has mainly focused on outcomes rather than on the underlying motives for sustainable supply chain management (SSCM) adoption, while limited studies focus on cross-country evidence from non-service small and medium enterprises (SMEs) in Africa. This study investigates the motives for adopting SSCM practices among SMEs operating in non-service sector-based industries in Ghana, Kenya, Nigeria, and South Africa. **Methods:** A quantitative approach was employed, drawing on instrumental, relational, and moral theoretical lenses. Data were collected through an online survey of 378 SME owners/managers using purposive and convenience sampling and analysed using comparative statistical techniques. **Results:** The findings reveal that relational and moral motives are the strongest drivers of SSCM adoption, with moral motives strongest in Ghana and Nigeria, moderate in South Africa, and weakest in Kenya. Significant cross-country differences and a notable motive-adoption gap were identified, highlighting the role of institutional and operational constraints. **Conclusions:** The study contributes novel cross-country empirical evidence from Africa and highlights the need for context-specific SSCM strategies that strengthen governance and capacity to translate ethical intent into practice.

Keywords: sustainability; motives; sustainable supply chain management; practices; SMES; cross-country



Academic Editor: Robert Handfield

Received: 14 January 2026

Revised: 7 May 2026

Accepted: 11 May 2026

Published: 13 May 2026

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1. Introduction

The transformative industrial advancements of the past two centuries have yielded significant economic prosperity in many countries [1,2], and there has been notable progress reported in African economies as well with uninterrupted growth since the mid-1990s. However, this advancement in economic growth and development has been accompanied by ecological deterioration and a notable deleterious impact on the physical environment; hence, it is considered unsustainable. In an effort to maintain competitiveness, African governments keep encouraging local and foreign investments in non-service sector commercial activities such as mining, production, manufacturing, and infrastructure development, and in the active participation of both large and small businesses. While the need to attain economic relevance is justifiable, wealth must be created in a sustainable manner. Indeed,

business process and practices must be cognisant of the needs of the present generation without compromising the ability of future generations to meet their own needs [3]. Interestingly, the idea of sustainability and development appears to be conflicting, since economic growth through increased production and industrialisation may require consequential changes to the physical environment. This is besides the changes in social order that often characterises development.

From a business perspective, managers are compelled to reconsider the role of supply chain management practices and to re-evaluate their actions as it is increasingly evident that the supply chain activities of both large and small enterprises and their corresponding environmental and social impact will have reaching implications [4,5]. In fact, businesses across the continent face immense stakeholder pressure to provide concrete evidence of their compliance with the sustainability principles requirements [6,7]). Hence, businesses are adopting sustainable practices along their supply chain [8]. Sustainable supply chains strive to strike a balance between their conventional financial performance measures and their social and environmental performance measures [8].

However, if the reason for business venturing is primarily to maximise profit, then it is unsurprising that they would be driven to achieve this goal despite engaging in activities that are environmentally and socially irresponsible if left unchallenged [9]. Activities such as depositing toxic waste into the environment, as well as compromising on product quality and safety throughout the supply chain are rampant among non-service sector business, particularly those with extended supply chain lines, and business-2-business that hardly works in collaboration [2]. While some businesses pursue profits at the expense of their other stakeholders, other businesses prioritise stakeholder interests over immediate financial gains [10]. The latter aligns with the tenets of corporate social responsibility (CSR) which holds that organisations have societal obligations which transcend profit maximisation. In addition, businesses are expected to undertake initiatives that benefit stakeholders, even when such actions do not maximise their immediate profits [11]. From a practical standpoint, many businesses operate between these two extremes, only engaging in environmentally responsible supply chain management practices to a certain degree.

Recent studies (2020–2025) suggest that the adoption of SSCM practices enhances firm performance, resilience and long-term competitiveness, particularly when sustainability is entrenched in organisational culture and supported by collaborative supply chain relationships [12–14]. In addition, a study by Li et al. showed that stakeholder pressure has a positive moderating effect on the relationship between sustainable supply management and performance, while sustainable process management was reported to mediate the same relationship fully [15]. More so, in Ghana, another study found out that SSCM practices affect firm performance positively and significantly [12], with firm capabilities mediating the relationship between SSCM practices and firm performance significantly.

Notwithstanding these advances, the adoption of SSCM remains uneven across regions, with developing economies, particularly in Africa, facing distinct structural and institutional challenges. For instance, evidence from Kenya showed that while SSCM practices are increasingly embedded in Communications Authority operations, their maturity varies, with green procurement and ethical sourcing emerging as key drivers of efficiency, transparency, and institutional credibility, whereas waste management and resource efficiency remain less developed in the country [16]. In Ghana, evidence from a study by Nsowah and Phiri revealed some key policy gaps in promoting SSCM adoption in the manufacturing industry [17] and emphasised the need for sustainability frameworks that can integrate resource efficiency, standardised eco-design, circularity (e.g., reuse, recycling, and recovery), lifecycle optimisation, and institutionalised environmentally responsible production practices. Thus, although the extant literature indicates increasing awareness

of sustainability and CSR among African firms, there is still limited practical adoption as a result of inadequate financial and technological resources, fragmented supply chain networks, and weak institutional frameworks [14,18]). Studies in South Africa, Kenya, and Nigeria further reveal that inadequate inter-organisational collaboration, low levels of trust among supply chain partners, and insufficient managerial commitment hinder the effective adoption of socially sustainable practices [16]. These challenges are especially more pronounced in the retail sector, where complex supplier networks and cost pressures often incentivise short-term decision-making over long-term sustainability.

In light of these points of view and varying practices, it is vital to explore why businesses across Africa, particularly small and medium enterprises, engage in SSCM practices. Could it be that SSCM can actually benefit these businesses or is its value rooted in addressing the interests of multiple stakeholders? Alternatively, can small enterprises in Africa be motivated to adopt and implement SSCM simply because they perceive it as the right course of action ethically? An enquiry that brings answers to these questions will be illuminating. Although a number of conceptual papers have investigated the conditions in which firms would adopt sustainable practices or behave in environmentally responsible ways [9], an empirical investigation that is directed towards the motives for adopting SSCM practices and that cuts across countries, focusing specifically on small businesses operating in related industries and with similar issues, is scarce. Moreover, SMEs constitute a large proportion of businesses in Africa and sustainability along with supply chain management-related issues is often more pronounced in the non-service sector industries [19]. Therefore, this study sought to interrogate this phenomenon by clarifying why non-service sector SMEs in selected countries engage in SSCM practices. The remainder of the paper covers materials and methods which encompass a literature review and hypothesis development, as well as research design and methods. This is followed by sections on results, discussion, and conclusions.

2. Materials and Methods

This section discusses the materials and methods underpinning the study. It first discusses the literature review and hypothesis development, which is followed by the research design and methodological approach used in this study.

2.1. Literature Review

This study used the stakeholder theory and the utilitarianism theory as the theoretical lenses to understand SSCM adoption motives among non-service sector SMEs. According to Harrison et al., the stakeholder theory assumes that firms are deeply rooted in a network of co-dependent actors [20]. It postulates that firm survival and performance depend on the effective identification and response to key stakeholder pressures and interests [21]. This study applied the stakeholder theory as a premise to understand how instrumental, relational and moral SSCM adoption motives arise from the interactions of non-service SMEs with their customers, suppliers, competitors, local community, regulators, and NGOs.

This study also used the utilitarianism theory to complement the stakeholder theory. It posits that ethical decision-making is guided by a firm's ability to maximise the overall good/welfare of its stakeholders [22]. The theory holds that firms will adopt practices that generate the greatest net benefits across stakeholder groups [22]. As such, the utilitarianism theory provides the theoretical premise and ethical rationale for what motivates firms including SMEs to adopt and implement SSCM practices, by evaluating the trade-offs between economic costs and the broader social and environmental benefits. The assumption made in this study is that, ultimately, SMEs will be motivated to adopt and implement SSCM practices that yield the greatest net positive welfare impact across the SME stake-

holder groups. These two theories, when considered together, offer a comprehensive explanation of SSCM adoption motives among SMEs by linking the compelling external stakeholder pressures with internal ethical (welfare-maximising) reasoning.

2.2. Hypothesis Development

Figure 1 presents the three hypothesised relationships between the research variables, namely: instrumental motives, relational motives, moral motives, and SSCM practices. The study formulated three research hypotheses (H1, H2, and H3), the development of which hypotheses is discussed below.

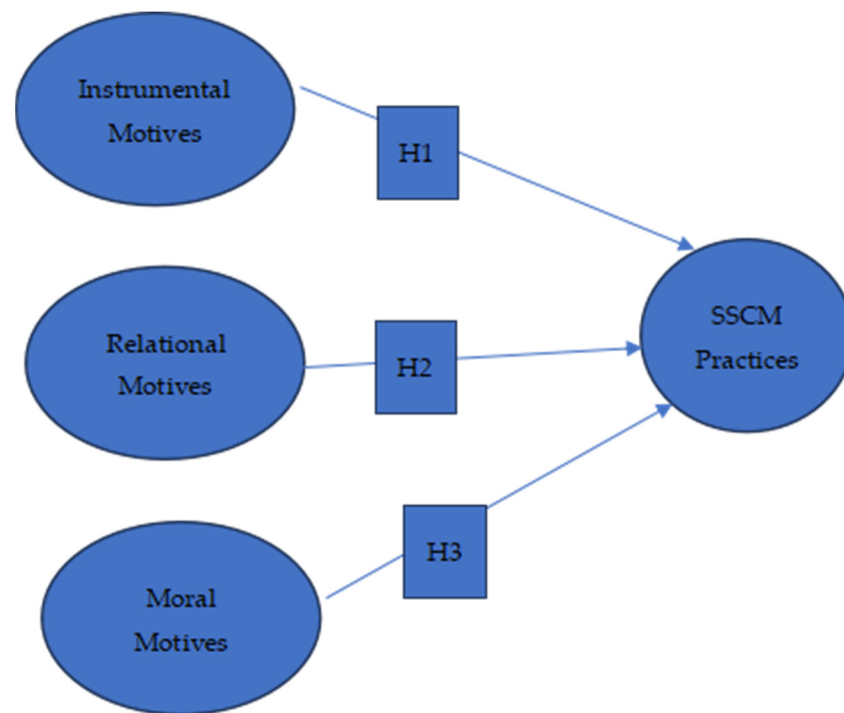


Figure 1. Hypothesised model.

2.2.1. Motives for Sustainable Supply Chain Management Practices Adoption

Actions are triggered by motives, and behavioural patterns often have an underlying motive [23,24]. In sustainability behaviour research, it has been observed that the motive to conduct environmentally responsible behaviour can be either egoistic or altruistic [25]. According to Sajjad et al., the motives behind organisational responsible initiatives, such as SSCM, can be more complex [26]. This is because SSCM is a socially responsible initiative, which can be viewed as a CSR, but can also result in gaining competitive advantages and the development of business opportunities. On the one hand, competitive advantages can be gained by businesses engaging in sustainability-oriented supply chain management. Indeed, SSCM practices in businesses can minimise resource consumption and waste, and improve operational efficiency, which engenders a competitive advantage and gives a boost to financial performance in the long run [27], and that could be the motive. On the other hand, it could be compelled as a way to fulfil corporate social responsibility, because adopting SSCM can be a means of avoiding penalties, a strategy to improve brand image and reputation, expand consumer base and market share, and obtain societal legitimacy or to deepen further the relationships with stakeholders [28]. Hence, the motives to adopt SSCM is wide-ranging and can be considered from different points of view. This study argues that businesses have three motives for adopting SSCM practices with sustainability orientation. Consistent with the precedent laid by Lado et al., it assumes that non-service

sector SMEs could be incentivised towards sustainable practices by either instrumental, relational, or moral motives [27].

2.2.2. Instrumental Motives and SSCM Practices

From a broad perspective, in the extant sustainability literature, the term “instrumental” is used to denote the strategic orientation of an organisation towards profit maximisation, addressing institutional pressures and mitigating operational, regulatory, as well as reputational risks [10,29]). Put simply, instrumental motives are motivated largely by what affects the economic bottom line [12–15,30]. Instrumental motives refer to extrinsic motives for engaging in an activity based on its perceived utility in achieving valued outcomes that are separate from the activity itself [30]. In fact, some previous studies have been able to associate the adoption of sustainable practices with indicators of a firm’s financial well-being. For example, using a sample of 100 Saudi-listed non-financial firms within the framework of Saudi Vision 2030, and applying the panel data from 2019–2023, a study by Sumarno et al. [31] assessed the effect of environmental, social, and governance (ESG) assessment on firm value with profitability as a mediating variable. Their results reported a significant and positive influence of ESG disclosure on return on assets (ROA). Likewise, a study by Acquah et al. [32] examined how the interaction between green human resources management and green supply chain management practices influence the various dimensions of performance, namely market, operational, financial, and environmental performance. Their study results showed that firms can yield optimal enhanced operational performance outcomes through the interaction between its green human resources management and green supply chain management practices. Their results further show that such an interaction of these variables can also yield value in market performance outcomes, financial performance outcomes, social performance outcomes, and environmental performance outcomes. Thus, it is without doubt that the sustainability related initiatives benefits can drive supply chain and firm managers to adopt such sustainability practices in their firms.

From a practical and operational point of view, when firms design products and processes in accordance with sustainability guidelines, they can achieve cost reductions by minimising material and energy waste. As a result, these practices often attract additional investments from shareholders, lead to enhanced corporate reputation, and greater organisational goodwill [33,34]. Therefore, it is not surprising that business from a self-serving motive will most likely adopt SSCM to fulfil their instrumental objectives. Furthermore, given the increasingly dispersed and complex nature of modern supply chains, firms are increasingly compelled to collaborate closely with stakeholders such as suppliers and customers to achieve their organisational goals. Since a supply chain cannot be more sustainable than its weakest link, businesses are unable to generate economic gains consistently because sustainable practices are aligned across the entire supply chain. Achieving this alignment typically requires effective external collaboration, most often pursued with strategic intent. Hence, it is tenable that instrumental motives are a key driver for the SSCM efforts of firms, so this study proposes that among non-service sector SMEs:

H1. *Instrumental motives have a positive relationship with SSCM practices.*

2.2.3. Relational Motives and SSCM Practices

The relational motives of an organisation for engaging in responsible initiatives, such as SSCM practices, can be examined through the theoretical lens of the stakeholder theory [35,36]. Taking into account the heterogeneity of stakeholder interests, stakeholder theory posits that firms undertake actions to safeguard the well-being of the various groups with which they maintain relationships. In the context of SSCM, supply chain organisations are often required to meet the expectations and demands of stakeholders who may have

limited or no direct interest in strategic performance outcomes. Moreover, as firms are embedded in broader economic and political institutional environments, they must secure social legitimacy to ensure organisational survival. This need for social legitimacy represents a relational motive, as it reflects how firms and their actions are perceived by current and potential stakeholders. Thus, it is not uncommon that businesses are motivated by relational intents in adopting SSCM practices in order to be perceived as legitimate through compliance with stakeholder norms [37]. According to Ofori and Sackey [38], social capital plays a critical role in firms, as it fosters trust-based collaboration, enhances information flow, and facilitates the operationalisation of sustainable supply chain practices.

Relational motive reflects the business ethics theory of utilitarianism. According to the utilitarianism theory, an action is right if it results in the happiness of the greatest number of people in a society. Therefore, firms should be attuned to promoting the interests of different stakeholders such as customers, suppliers, employees, and government and environment groups. For example, such practices include offering environmentally friendly products, utilising non-toxic materials, providing environmental training, and reducing instances of non-compliance. This study focuses attention on the proactive sustainability responses of businesses to two most dominant players: customers and competitors.

According to Scott [39], the customer base of a business, particularly its increasing expectations regarding compliance, can constitute a key source of normative pressure encouraging the adoption of SSCM practices. This happens when customers share similar sustainability concerns, are organised in networks, and possess the capacity to influence corporate image in the pursuit of broader societal interests. Then they are likely to push the firm to engage in SSCM [40]. In addition, organisations may experience pressure to imitate or align with the practices of successful competitors in order to maintain competitiveness or to achieve parity or superiority [41,42]). According to Zhu et al. [43], imitation among businesses does play a significant role in implementing SSCM-related practices in both developed and developing countries, as analysis of top 100 global companies by Tate et al. [6] reveal that competitive pressure is the foremost driving force behind environmental strategy development. Moreover, studies by Okeke [29] and Adebayo et al. [44] reported that decarbonisation in Nigerian firms is constrained by three main factors, namely, fragmented regulatory structures and inconsistent enforcement mechanisms; limited adoption of ESG practices owing to financial constraints despite growing institutional pressures; and restricted digital transformation arising from infrastructural deficits and technological gaps.

With increasing awareness about sustainability among stakeholders, businesses that deliver value to them by providing more sustainable and environmentally responsible products stand to benefit significantly. Accordingly, firms that pursue SSCM practices to maximise stakeholder utility must prioritise the needs and expectations of customers, suppliers, regulatory authorities, and other relevant stakeholder interest groups [44]. In doing so, firms can enhance their corporate image and enlarge their market. Consequently, this often results in a differentiation strategy, leading to a competitive advantage [27,45]. In deference to the preceding arguments on stakeholder interests and competitive pressures, this study proposes that, among non-service sector SMEs:

H2. *Relational motives have a positive relationship with SSCM practices.*

2.2.4. Moral Motives and SSCM Practices

So far, in reviewing the literature on the motives for adopting SSCM practices, it is proposed that these activities are driven typically either by the pursuit of business benefits or by relational reciprocity. However, business ethics and organisational justice research indicate that, in addition to instrumental and relational motives, morality-based

motives have a significant influence on sustainability-oriented supply chain practices in organisations [37]. As such, even in their pursuit of economic value creation, enterprises portray a human side characterised by intrinsic moral complexity [46].

In addition, previous studies [47,48] reported irregularities in the association between sustainable practices and financial performance, which reveal that instrumental motives alone may fail to explain SSCM adoption fully. According to Vanpoucke et al. [49] and Chipimo et al. [50], several enterprises implement SSCM practices voluntarily, and are mainly driven by moral motives instead of being driven only by their need for financial self-gain or because of pressure from stakeholders. This concurs with the notion that enterprises have a moral obligation towards the environment and society, which extends beyond their need to maximise profits [51]. Such obligations compel these enterprises to act responsibly in their business operations.

A study by Kitsis and Chen [52] used a sample of 205 US supply chain firms to assess the role of motives in driving SSCM practices and sustainable performance. Their study found that moral motives influence the adoption of SSCM practices significantly and enhance economic, environmental, and social performance. Likewise, Lado et al. [27] used a sample of 259 Germany firms to evaluate the associations among corporate motives, SSCM practices, and firm performance. Their study findings cited moral motives as one of the main drivers of the adoption of sustainable practices and highlighted that enterprises which exhibit high levels of moral obligations tend to outperform those driven primarily by moral motives. This is parallel to the findings of Chen and Chen [53], whose study used 281 supply businesses in China to ascertain how sustainability-related motives influence compliance, commitment, and sustainable performance in response to the sustainable supplier management programmes of buyers, and found that, while instrumental and moral motives contribute similarly to compliance, moral motives exert a stronger influence on the commitment of firms to sustainable practices.

Sustainability, particularly in terms of the legacy left for future generations, is fundamentally a moral issue, yet it has rarely been addressed as such in supply chain research [53]. Thus, assessing the role of moral motives can provide a deeper understanding of sustainable practices, as external pressures alone only partially explain variations in organisational responses [54]. Grounded in organisational justice, deontological ethics, and virtue ethics, moral motives have been recognised recently as powerful drivers of sustainable practices [27,55]. In essence, firms guided by moral motives act sustainably according to their sense of duty, values, and genuine care for society and the environment [56]. Against this background, this study posits that among non-service sector SMEs.

H3. *Moral motives have a positive relationship with SSCM practices.*

2.3. Research Design and Methods

This section describes the research design, sampling, measurement instruments, and data analysis procedures. A quantitative research approach was employed to allow for objective measurement of the study variables and to examine the relationships among them [57]. The cross-sectional survey design was used to obtain the data needed for statistical testing, as questionnaires were administered once within a specific period to the sample of respondents.

2.3.1. Sampling

A non-probability sampling method was employed owing to the practical challenges of obtaining a representative sample of SMEs across the countries studied. In fact, there is no harmonised database of non-service sector business known to the researchers from which a sample can be obtained readily. Also, the representation of these businesses in

comparison with the population (all businesses in the economy) may be extremely difficult to ascertain.

Furthermore, this study employed a combination of convenience and purposive sampling strategies to address the sample access challenges in order to enhance analytical relevance. While convenience sampling facilitated access to respondents based on availability, it did not yield participants aligned with the study objective [57]. Consequently, purposive sampling was employed concurrently with convenience sampling to select cases deliberately that possess characteristics relevant to the research study. This combined approach ensured that the final sample adequately met the requirements of the study. More so, using this dual sampling strategy was justified as a realistically controlled approach which enabled the researchers to recruit the target respondents without compromising the relevance of insights. Given the limitations of this dual sampling strategy, such as potential selection bias and limited generalisability, this study used clearly defined inclusion criteria and systematic screening procedures to ensure that the final sample remained theoretically appropriate and empirically defensible. To minimise potential bias, and to enhance generalisability, the study screened the target respondents rigorously, and used a relatively larger final sample size of 378 SME owners/managers. This study selected respondents based precisely on their job occupation as an owner or having a senior managerial position with direct involvement in supply chain or operational decision-making of non-service sector SMEs and operating in a registered non-service sector SME in Ghana, Kenya, South Africa, or Nigeria, with a minimum of 3.5 years of business activity to ensure sufficient experiential insight.

2.3.2. Delimitation of Study

Based on the judgement (purposive) approach to sampling in this study, certain delimitations had to be stipulated. Consequently, the following inclusion criteria served as guidelines for data collection.

- Responding businesses were classified as a small or medium enterprise, as specified in the definition of a small business in Ghana, Nigeria, Kenya, and South Africa. Hence, as primary requirements for inclusion in the study, SMEs in Ghana must have a total asset value between USD 10,000 and USD 1 million and have from 6 to 99 full-time employees. In Kenya, they must have a total annual turnover above Ksh 500,000 and have from 10 to 100 full-time employees; in Nigeria they must have total assets (excluding land and buildings) above 10 million Naira and have more than 10 full-time employees; while in South Africa they must have a total annual turnover above 10 million ZAR and have more than 10 full-time employees.
- Responding businesses had to identify as operating in the non-service sector, namely agriculture, mining and quarrying, manufacturing, electricity, gas and water, and construction. Realising that businesses across a wide range of sectors are diverse in their attributes, so focusing on non-service sector businesses establishes homogeneity of the sample characteristics in this study. Moreover, issues related to environmental and social sustainability are more prevalent in these industries as compared to in the service sector.
- Responding businesses had to have been in operation for at least 3.5 years. This confirms established business ownership and follows the precedent of the Global Entrepreneurship Monitor (GEM) conceptual framework. In addition, it enhances the attainment of the objective of this study since the study used respondents from enterprises that had survived beyond the first 3 years in which most new start up SMEs are reported to fail in. The assumption made in this study was, therefore, that SMEs that have been in operation for more than 3 years will be more knowledgeable about the SSCM practices as well as the motives that drive the SSCM adoption in these enterprises.

2.3.3. Measurement Instrument and Data Collection

In this study, the questionnaire used to measure the theoretical constructs of the study was adapted from validated instruments reported in the supply chain management literature. A reflective measurement model was used where the observable variables (measurement items) are reflective of the latent variables (the constructs being examined). Instrumental, relational, and moral motives were examined using a total of 13 measurement items, respectively, similar to a preceding study by Chen and Chen [53]. SSCM practices were assessed using 28 items addressing issues relating to sustainable product design, sustainable process design, supply-side sustainability collaboration, and demand-side sustainability collaboration, following the pattern of Lado et al. [27].

To enhance transparency and contextual validity, this study first reviewed the measurement items for conceptual equivalence and relevance to the African context (Ghana, Kenya, South Africa, and Nigeria), with minor wording modifications made to reflect local non-service sector SME business and supply chain realities. The study also assessed content validity through expert evaluation involving senior academics to ensure clarity, representativeness, and contextual appropriateness of the questionnaire items. Moreover, a pilot study was conducted with a subset of 31 SME owners and managers to test instrument reliability and comprehension, leading to further refinement where necessary. The study further ascertained the reliability of the research variables using Cronbach Alpha values and composite reliability values between 0.6 and 0.7, while EFA values were used to measure construct validity. All measurements items were measured on a five-point Likert scale with anchors such as 1 “strongly disagree” and 5 “strongly agree”.

In this study, collection of data from the targeted respondents was conducted through a combination of face-to-face surveys using trained research assistants and online surveys deployed through Survey Monkey. Certain governmental organisations in the participating countries were instrumental in this process as they provided the list of enterprises that was explored in this study. This includes Ghana Enterprise Agency (GEA) in Ghana; Small and Medium Enterprise Development Agency (SMEDAN) in Nigeria and Micro and Small Enterprise Authority (MSEA) in Kenya. In South Africa, a private research consulting firm was consulted with a database of local business.

The quantitative data gathered were then captured and cleaned in Excel spreadsheets. To clean the data, the researchers removed any duplicate and incomplete responses to minimise bias. More so, numeric standardised codes were assigned to promote reliability and easy comparability of responses across questionnaire items and the surveyed four African countries, particularly given the multi-country SME sample; thus, minimising measurement error. The coded data were then imported from Excel to SPSS version 25. In SPSS 25, the univariate and multivariate outliers were detected and identified using standardised z-scores and Mahalanobis distance. After the assessment of normality, the prepared data were then imported to AMOS 25 statistical software.

2.3.4. Data Analysis

Data analysis in this study entailed descriptive and inferential statistical techniques. Exploratory factor analysis (EFA) was conducted to assess the underlying factor structure of the measurement scales and to evaluate their reliability. To test the hypothesised relationships, this study used a covariance-based structural equation modelling (SEM) approach performed in AMOS version 25. A confirmatory factor analysis was performed to assess the structural model fitness, while an SEM path analysis was performed to test the posited hypotheses between study variables. SEM is regarded as a second-generation multivariate technique that enables the simultaneous analysis of multiple relationships in a model by integrating factor analysis and multiple regression [58]. This approach allowed for the

validation of construct indicators while concurrently examining the structural relationships among the constructs. The analyses were performed using the Statistical Package for the Social Sciences (SPSS) Version 28 and Analysis of Moment Structures (AMOS) version 25.

2.3.5. Ethical Considerations

Permission to conduct this study was received from the Research Ethics Committee of the Faculty of Business and Economic Science, Nelson Mandela University [H21-BES-LOG-095/Amendment].

3. Results

This section presents the results relating to the descriptive analysis of responses of participating SMEs. It details the results and reliabilities of the EFA and the outcomes of hypotheses tests using SEM analysis.

3.1. Descriptive Statistics Results

Table 1 presents the profile of the surveyed SMEs in the four selected African countries, South Africa, Kenya, Ghana, and Nigeria.

Table 1. Profile of participating SMEs in selected countries across Africa.

Country	Variable	Categories	Number (<i>n</i> = 101)	Percentages (%)
Ghana	Economic Sector	Agriculture Mining and Quarrying	14	13.86
		Mining and Quarrying	1	0.99
		Manufacturing	71	70.30
		Electricity, Gas, and Water	11	10.89
		Construction	4	3.96
	Total Annual Turnover	USD 10,000–USD 99,000	36	35.63
		USD 100,000–USD 399,000	41	40.58
		USD 400,000–USD 699,000	21	20.79
		USD 700,000–USD 1,000,000	3	3
	Total Full-Time Paid Employees	6–9 employees	3	2.97
		10–29 employees	45	44.55
		30–49 employees	32	31.68
		50–69 employees	16	15.84
		70–89 employees	3	2.98
		90–99 employees	2	1.98
	Years in Operations	3.5–9 years	74	73.27
		10–19 years	20	19.80
		20+ years	7	6.93
Country	Variable	Categories	Number (<i>n</i> = 100)	Percentages (%)
Nigeria	Economic Sector	Agriculture Mining and Quarrying	25	25
		Mining and Quarrying	5	5
		Oil and Gas	25	25
		Telecommunications	5	5
		Manufacturing	25	25
		Electricity, Gas, and Water	5	5
		Construction	10	10
	Total Annual Turnover	N10 million–N100 million	43	43
		N101 million–N250 million	20	20
		N251 million–N500 million	13	13
		N501 million–N750 million	7	7
		N751 million–N1 billion	8	8
		Above N1 billion	9	9

Table 1. Cont.

Country	Variable	Categories	Number (n = 101)	Percentages (%)
Nigeria	Total Full-Time Paid Employees	10–49 employees	60	60
		50–99 employees	17	17
		100–149 employees	11	11
		Above 199 employees	12	12
	Years in Operations	3.5–9 years	34	34
		10–19 years	38	38
		20–29 years	17	17
		30+ years	11	11
Country	Variable	Categories	Number (n = 114)	Percentages (%)
Kenya	Economic Sector	Agriculture Mining and Quarrying	45	39.39
		Mining and Quarrying	10	8.81
		Manufacturing	16	14.05
		Electricity, Gas, and Water	21	18.44
		Construction	22	19.31
	Total Annual Turnover	70 million Ksh–95 million Ksh	56	49.12
		96 million Ksh–120 million Ksh	39	34.21
		121 million Ksh–145 million Ksh	2	1.76
		146 million Ksh–170 million Ksh	9	7.89
		171 million Ksh–195 million Ksh	4	3.51
		>196 million Ksh	4	3.51
	Total Full-Time Paid Employees	10–29 employees	4	3.51
		30–49 employees	10	8.78
		50–69 employees	35	30.70
		70–89 employees	31	27.19
		90–99 employees	34	29.82
	Years in Operations	3.5–9 years	77	67.54
		10+ years	37	32.46
Country	Variable	Categories	Number (n = 63)	Percentages (%)
South Africa	Economic Sector	Agriculture Mining and Quarrying	11	17.5
		Mining and Quarrying	6	9.5
		Manufacturing	32	50.8
		Electricity, Gas, and Water	3	4.8
		Construction	11	17.5
	Total Annual Turnover	10 million ZAR–40 million ZAR	27	42.9
		41 million ZAR–70 million ZAR	14	22.2
		71 million ZAR–100 million ZAR	3	4.8
		101 million ZAR–130 million ZAR	4	6.3
		131 million ZAR–160 million ZAR	2	3.2
		>170 million ZAR	13	20.6
	Total Full-Time Paid Employees	10–50 employees	31	49.2
		51–100 employees	14	22.2
		101–150 employees	6	9.5
		151–200 employees	2	3.2
		201–250 employees	10	15.9
	Years in Operations	3.5–20 years	22	34.9
		21–30 years	13	20.7
		31–40 years	14	22.2
		41+ years	14	22.2

ZAR = South African Rand currency; Ksh = Kenyan Shillings.

The sample collected for analysis in this study consisted of 101, 100, 114, and 63 SMEs owners/managers from Ghana, Nigeria, Kenya, and South Africa, respectively, making up a total of 378 respondents. Based on numbers and percentages, this sample is clarified in Table 1 on the basis of economic sector, total annual turnover, total full-time paid employees, and years of business operation. In Ghana, most of the SMEs that participated in the study were drawn from manufacturing and agricultural, mining and quarrying, which accounts for 70.30% and 13.86% of businesses from this country, respectively. Many of these enterprises have a total annual turnover of USD 100,000 to USD 399,000, which is unsurprising as these industrial sectors are quite capital intensive, and they are largely established businesses. As shown in Table 1, most of the business from Ghana have been in operation for between 3.5 and 9 years, as this accounts for 73.27% of them. The participating SMEs drawn from Nigeria are equally composed of businesses from agriculture, mining and quarrying, oil and gas; and manufacturing making a total of 75% of the sample. However, 43% of them have a total annual turnover of N10 million–N100 million, and 20% have a turnover of N101 million–N250 million. Of the SMEs from Nigeria, 60% employ from 10 to 49 employees, while most of them, 38%, have been in business for 10 to 19 years; comparably, another 34% have been operating for between 3.5 years and 9 years.

In Kenya, most of the responding business were drawn from agriculture, mining, and quarrying; almost 40% of this cohort. However, enterprises from electricity, gas, and water, along with construction-based businesses are represented significantly in this group, as they comprise approximately 18.44% and 19.31%, respectively. Almost half of the SMEs from Kenya have a total annual turnover of between 70 million Ksh and 95 million Ksh. Considering the economic sector that mostly responded to this study in Kenya, it is logical that the businesses have a relative higher number of employees, as shown in Table 1. Of the SMEs from this country, 30.70%, 27.19%, and 29.82% have between 50 and 60 employees, 70 and 80 employees, and 90 and 99 employees, respectively. In South Africa, most of the SMEs were drawn from the manufacturing sector, followed by agriculture, mining and quarrying, and then construction. However, they seem to be more small than medium-sized as they mainly have a turnover of 10 million ZAR–40 million ZAR and have 10–50 full-time paid employees constituting 42.9% and 49.2%, respectively. With regard to the years of business operations, the respondents from South Africa are more evenly spread, ranging from 3.5 years to 41 years and above.

3.2. Inferential Statistics Results

Validation of the Measurement Model

In this research, data analysis commenced with an initial pilot study of 31 respondents to ensure reliability of the measurement scale. Only one item in the questionnaire created concern and, with minor adjustment, internal consistency of the measurement items was ascertained before proceeding with the main study. In the main study, the measures can be considered reliable as Cronbach's Alpha values for the items measuring instrumental motives, relational motives, moral motives, and sustainable supply chain management practices were 0.799, 0.762, 0.835, and 0.892, respectively.

This study used the principal axis factoring (PAF) and varimax rotation from the measurement model performed in EFA to extract factors from the questionnaire responses. Factor extraction identifies the smallest number of factors that adequately represent the interrelationships among variables, while rotation clarifies the underlying loading patterns [59]. Prior to extraction, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were conducted to assess data suitability for factor analysis [59]. In this study, the KMO value was 0.802, and Bartlett's test statistic was 2161.535 ($p < 0.001$), indicating that the data were appropriate for EFA.

As shown in Table 2, the extracted items measuring motives loaded onto three factors (Factors 1–3; Table 2), while items measuring sustainable supply chain management practices loaded onto four factors (Table 3), confirming the sub-dimensionality of these constructs. Overall, the EFA results suggest that respondents were able to distinguish between the variables as conceptualised in this study. This is consistent with the theory that there are distinct differences in motives towards sustainable practices. Indeed, this finding is consistent with studies by Chen and Chen [53], and Lado et al. [27], who found similar results.

Table 2. EFA rotated factor matrix for corporate motives measure.

	Pattern Matrix		
	Factor		
	1	2	3
Q2.1		0.675	
Q2.2		0.714	
Q2.3		0.589	
Q2.4		0.776	
Q2.5		0.675	
Q2.6			0.663
Q2.7			0.847
Q2.8			0.654
Q2.9	0.574		
Q2.10	0.744		
Q2.11	0.71		
Q2.12	0.803		
Q2.13	0.787		

Table 3. EFA rotated factor matrix for SSCM measure.

	Pattern Matrix			
	Factor			
	1	2	3	4
Q3.1				
Q3.2		0.66		
Q3.3		0.816		
Q3.4		0.839		
Q3.5		0.77		
Q3.6				
Q3.7		0.542		
Q3.8			0.518	
Q3.9				
Q3.10				0.559
Q3.11				0.697

Table 3. *Cont.*

	Pattern Matrix			
	Factor			
	1	2	3	4
Q3.12				0.582
Q3.13			0.647	
Q3.14			0.6	
Q3.15				0.638
Q3.16				
Q3.17			0.556	
Q3.18			0.54	
Q3.19			0.552	
Q3.20	0.693			
Q3.21	0.782			
Q3.22	0.719			
Q3.23	0.762			
Q3.24	0.736			
Q3.25	0.719			
Q3.26	0.58			
Q3.27	0.606			
Q3.28	0.665			

3.3. Validation of the Structural Model

After confirming the validity of the measurement model, validation of the hypothesised structural model was carried out through CFA to establish the factor model fit; in other words, to test whether the sample data fit supported the hypothesised research factor model. In this study, the structural model fitness was evaluated using absolute, incremental, and parsimonious model fit indices to ensure a balanced assessment. The CFA absolute fit indices showed a chi-square p -value of 0.000; RMSEA of 0.074, GFI of 0.798, RMR of 0.049, which indicate a moderately acceptable level of approximation error and residuals within the model fit recommended bounds [60]. The parsimonious fit index Chisq/df was 3.244, which is above the threshold; and incremental fit AGFI of 0.765, CFI of 0.825, TLI of 0.807, and NFI of 0.767, which are all below the acceptable threshold of 0.9, according to Back et al. [61]. Hence, this model is judged to be a partially acceptable fit, which indicates that the SEM measurement model used in this study may partially capture the underlying data structure and fitness. The partial SEM model fitness may suggest potential model misspecification or model complexity sensitivity. As such, the SEM path analysis results derived from this measurement model should be interpreted as indicative as well as exploratory insights rather than conclusive, and their implications are further discussed in the limitations section.

In addition, the CFA incremental fit indices presented mixed evidence, reporting an AGFI value of 0.765, CFI of 0.825, TLI of 0.807, and NFI of 0.767, which fell below the conventional threshold value of 0.90, while the RFI of 0.925 and IFI value of 0.979 were above the acceptable threshold values, signifying strong relative improvement over the null model. More so, the CFA parsimonious model fit indices enhanced model adequacy, with χ^2 /df of 3.244, PNFI value of 0.487, and PCFI value of 0.490, which signify an acceptable

trade-off between model fit and complexity. Even though some of the model fit indices were below the traditionally accepted thresholds (CFI = 0.825; TLI = 0.807; NFI = 0.767), the measurement model demonstrates acceptable model fit when evaluated holistically. For instance, the RMSEA (0.074) and χ^2/df (3.244), commonly considered to be more informative and less sensitive to sample size, shows a reasonable model fit [61], while the significant chi-square is expected, especially in large samples and should not be interpreted in isolation.

Moreover, the strong performance of IFI and RFI indicates that the structural model provides significant improvements over a baseline model; thus, supporting its explanatory adequacy. In addition, the measurement model maintains strong theoretical basis, construct convergence and divergence validity, as well as statistically significant structural paths. Although an alternative refinement method, such as the removal of items with low factor loading, was explored in this study, it did not yield meaningful results to improve model fit without compromising its theoretical logic. As such, the current retained measurement model though with partial fitness, was considered to be theoretically coherent and empirically sound.

3.4. Assessment of the Posited Relationships

This study conducted the Levene's test to assess the homogeneity of variances across groups, the results of which are presented in Table 4.

Table 4. Tests of homogeneity of variances.

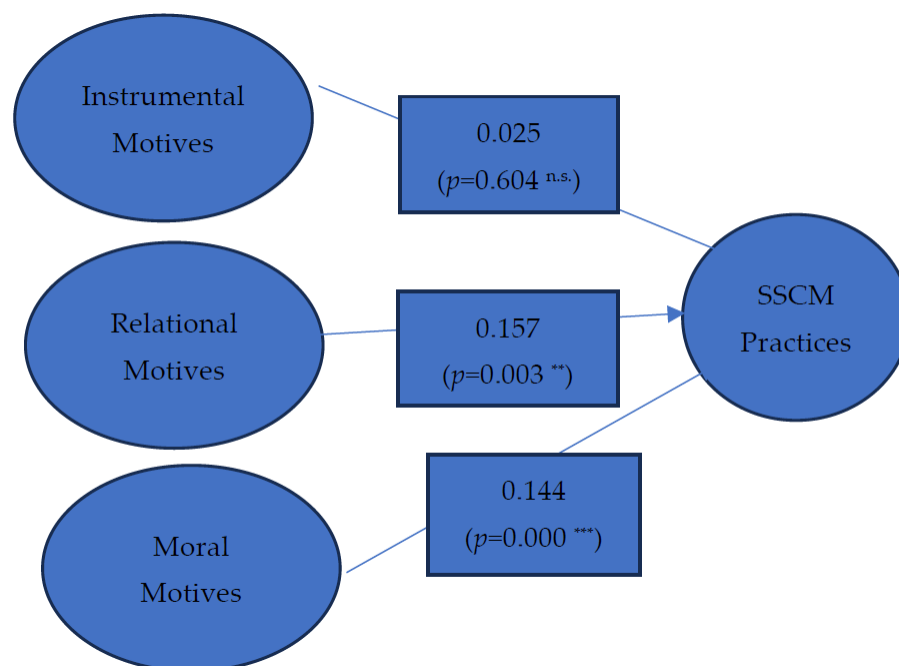
Tests of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Moral Motives	Based on Mean	28.066	3	404	<0.001
Relational Motives	Based on Mean	30.001	3	404	<0.001
Instrumental Motives	Based on Mean	2.178	3	404	0.09
Corporate Motives	Based on Mean	10.878	3	404	<0.001
Sustainable Supply Chain Management	Based on Mean	10.151	3	404	<0.001
Product Design	Based on Mean	3.832	3	404	0.01
Process Design	Based on Mean	28.128	3	404	<0.001

As shown in Table 4, the Levene's test results ranged between 2.178 for instrumental motives and 28.128 for process design, with significance values ranging from 0.09 to <0.001. These results indicate that instrumental motives show homogeneous variances, whereas process design and other variables exhibit heterogeneity. While SEM is generally robust, these findings suggested caution in multi-group analyses; as such, robust estimation methods were applied in the SEM path analysis to account for unequal variances.

After the homogeneity assumption assessment was completed, the study further performed the SEM path analysis to assess the posited relationships between instrumental motives and SSCM practices (H1); relational motives and SSCM practices (H2); moral motives and SSCM practices (H3). Table 5 and Figure 2 present the results. However, considering the partial SEM model fit results obtained in this study, it is important to note that the SEM path analysis results that follow should be interpreted as indicative and suggestive rather than conclusive. For instance, although a number of the model fit indices indicated an acceptable level of fitness (e.g., RMSEA and χ^2/df), the other fit indices (such as CFI, TLI, NFI) were below the minimum acceptable thresholds, which indicates that the SEM measurement model may partially capture the underlying data structure and fitness.

Table 5. SEM path analysis results.

Hypothesised Relationship	Associated Hypothesis	E	SE	CR	<i>p</i> -Value	Hypothesis Supported or Not
IM-SSCM Practices	H1	0.025	0.048	0.518	0.604	Not Supported
RM-SSCM Practices	H2	0.157	0.053	2.979	0.003	Supported
MM-SSCM Practices	H3	0.144	0.033	4.299	0.000	Supported

**Figure 2.** SEM path analysis results. Notes: *** = $p < 0.001$; ** = $p < 0.01$; n.s. = not significant.

Examining the relationship between instrumental motives, relational motives, moral motives, and SSCM practices, the SEM path analysis estimates were found to be 0.025, 0.157, and 0.144, respectively (see Table 5 and Figure 2). Correspondingly, the p -values were found to be 0.604, 0.003, and 0.000, respectively. However, as noted earlier, these results should be interpreted with caution because of the SEM model fitness limitations. The SEM path analysis results of the study suggest that instrumental motives have an insignificant influence on sustainable supply chain management adoption ($\beta = 0.025$, $p = 0.604$), which invalidates H1. However, for H2 and H3, because their p -values are less than 0.05 ($p < 0.05$), statistical significance is supported for those relationships. In fact, H2 and H3 were found to be supported, given the SEM path analysis estimates and the statistical significance. On the basis of the empirical evidence, this study indicates that, among established non-service sector-based SMEs, relational and moral motives have a positive relationship with SSCM practices.

For a comparative analysis among the four countries studied, this study further performed post-hoc analyses using Games-Howell and Tukey HSD tests, the findings of which are presented in Tables 6 and 7, as well as in Table A1 in Appendix A. The post-hoc analyses comparisons were selected based on variance homogeneity. For instance, in this study, the Tukey HSD test was applied whenever the Levene's test showed equal variances, whereas the Games-Howell test was used in cases where there were unequal variances to account for heteroscedasticity and unequal group sizes.

Table 6. Cross-country differences in SSCM motives and adoption (Post-Hoc analysis).

Motive/Practice	Ghana	Nigeria	South Africa	Kenya	Test Used
Moral Motive	High	High	Moderate	Low	Games-Howell
Relational Motive	Highest	Low	Moderate	Moderate	Games-Howell
Instrumental Motive	Low	Moderate	Highest	Moderate	Tukey HSD
Corporate Motive	Highest	Low	Moderate	Moderate	Games-Howell
Overall SSCM Adoption	Moderate	Moderate	Moderate	Highest	Games-Howell
Sustainable Product Design	Moderate	Low	Moderate	Moderate	Games-Howell
Sustainable Process Design	Highest	Moderate	Intermediate	Lowest	Games-Howell

Table 7. Summary of Post-Hoc multiple comparisons analysis: cross-country differences in SSCM motives and adoption.

Construct	Significant Country Differences (Higher → Lower)	Mean Difference	p-Value
Moral Motives	Ghana, Nigeria > South Africa	0.43–0.48	<0.001
	South Africa > Kenya	0.36	0.009
	Ghana, Nigeria > Kenya	0.78–0.84	<0.001
Relational Motives	Nigeria > South Africa, Kenya, Ghana	0.99–1.63	<0.001
	Ghana > South Africa, Kenya	0.42–0.64	<0.001
Instrumental Motives	South Africa > Kenya, Nigeria, Ghana	0.42–0.77	<0.01
	Ghana > Kenya	0.35	0.016
Corporate Motive	Ghana > South Africa, Kenya, Nigeria	0.56–0.84	<0.001
	South Africa, Kenya > Nigeria	0.21–0.28	<0.05
SSCM Adoption	Kenya > South Africa, Nigeria, Ghana	0.34–0.69	<0.001
Product Design	South Africa, Kenya > Nigeria	0.72–0.83	<0.001
	Ghana > Nigeria	0.64	<0.001
Process Design	Ghana > South Africa	0.35	0.004
	Nigeria > Kenya	0.42	<0.001
	Ghana > Kenya, Nigeria	0.16–0.59	<0.05

The findings in Tables 6, 7 and A1 in Appendix A revealed pronounced cross-country variation in motives supporting the adoption of SSCM among established non-service sector enterprises, highlighting the context-dependent nature of sustainability behaviour. Games-Howell tests were employed where variance heterogeneity was detected, ensuring robust comparisons across unequal group sizes, while Tukey HSD was applied for comparisons with equal variances.

The Games-Howell findings in Tables 6 and 7, as well as Table A1 in Appendix A show that SSCM moral motives are strongest in Ghana and Nigeria, with no significant difference between them, which reflects shared ethical orientations and communitarian sustainability values in West Africa. South Africa occupies an intermediate position, while Kenya consistently records the lowest moral motives, suggesting that societal norms and informal institutions shape SSCM adoption critically. These results signify the need for geographically tailored sustainability policies and managerial strategies. In addition, the Games-Howell findings show that relational motives exhibit a distinct hierarchy. Based on the results in Tables 6 and 7 as well as Table A1 in Appendix A, Ghana leads, demonstrating

the centrality of trust, social capital, and long-term inter-firm relationships in driving SSCM. Instrumental motives, economic, competitive, and market-oriented drivers, were analysed using Tukey HSD, and the findings in Tables 6 and 7 revealed that South Africa exhibits the strongest instrumental orientation, Kenya and Nigeria show moderate, pragmatically oriented motives, while Ghana records the weakest instrumental motives. More so, as shown in Tables 7 and A1 in Appendix A, Kenya leads in SSCM adoption, followed by Nigeria and South Africa, with Ghana lagging despite high moral and corporate motives. In addition, the results in Tables 7 and A1 in Appendix A highlight that sustainable product design shows moderate adoption in South Africa, Kenya, and Ghana, but is significantly lower in Nigeria. The results show further that sustainable process design motives are strongest in Ghana, intermediate in South Africa and Nigeria, and weakest in Kenya.

4. Discussion

Researchers in corporate social responsibility and business ethics suggest that enterprises which implement responsible initiatives are driven by diverse motives. Building on established theoretical frameworks, this study posits that instrumental, relational, and moral motives can each motivate enterprises to implement SSCM practices. Again, considering the partial SEM model fit results obtained in this study, the SEM path analysis results discussed here should be considered as results that provide indicative and suggestive rather than conclusive evidence of the posited relationships among the study variables. On the basis of empirical evidence from this inquiry, this study indicates that, among established non-service sector-based SMEs, relational and moral motives have a positive relationship with SSCM practices.

The SEM path analysis results of this study suggest that instrumental motives have an insignificant influence on sustainable supply chain management adoption. While previous studies [12–15,31–34] largely assumes that firms are motivated by economic and efficiency gains when adopting sustainability practices. For instance, a study by Sumarno et al. [31] found out that ESG disclosure has a positive and significant influence on return on assets. Acquah et al. [32]’s study also confirmed that the synergy between green human resource management and green supply chain management creates the highest value in financial performance, which can impel supply chain managers to implement such SSCM practices. However, the current study’s findings which suggest that instrumental motives have an insignificant influence on sustainable supply chain management adoption challenges the dominant assumption that firms adopt sustainability practices mainly for economic and efficiency gains. This may be because of the contextual nuances in African SMEs, where decision-making is often shaped more by relational, normative, or survival-oriented considerations than by purely instrumental reasoning. Although the measurement items were drawn from validated scales, it is possible that they capture instrumental intent in general contexts but less so in the specific socio-economic and cultural environment of African SMEs. As such, these findings are interpreted as a theoretical anomaly.

Drawing on the institutional theory, these findings indicating that instrumental motives have an insignificant influence on SSCM practices adoption suggests that there are other primary motives other than financial gains driving African SMEs to adopt SSCM practices. Instead, in environments characterised by institutional voids, weak and fragmented regulatory enforcement, as well as high levels of informality, firms often prioritise normative legitimacy, relational ties, and survival-oriented decision-making over economic and efficiency-seeking rationality. In such cases, SSCM practices may then be mainly adopted for maintaining social acceptance, alignment with key stakeholder’s expectations, or for ensuring long-term continuity, rather than to achieve immediate financial gain.

These findings deviate from the extant body of empirical studies [31,32], particularly in developed and more institutionally stable emerging economies, which report a positive and significant relationship between instrumental motives and sustainability adoption. In such contexts, well-operational markets, adequate regulatory incentives, and competitive pressures tend to promote the economic rationality case for sustainability adoption. However, the current study's findings indicating that instrumental motives have an insignificant influence on SSCM practices adoption, supports emergent empirical evidence from developing and informal economy settings, where resource constraints, fragmented supply chain systems, inadequate and fragmented regulatory enforcement, as well as the socio-cultural dynamics reduce the salience of purely instrumental motives [14,16–18].

This study, therefore, contributes to the SSCM body of literature by highlighting the context-dependent nature of SSCM motives and by questioning the universal application of instrumental motives as a key SSCM adoption driver. The study findings suggest that theoretical SSCM adoption models should clearly account for institutional pressures and the role of informal economic structures in shaping firm's sustainability behaviours.

Moreover, the non-significant result for instrumental motives may also reflect measurement limitations, since the existing measurement scales for instrumental motives, which were mostly developed in developed contexts, may fail to optimally capture the context-specific expressions of economic rationality in African SMEs, mainly due to structural differences. Future studies should, therefore, refine these research variables, adapt measurement items to reflect locally salient drivers of strategic behaviour better, and explore how hybrid motives, combining economic, social, and survival rationality, influence SSCM adoption in similar settings.

In addition, the SEM path analysis results suggest that relational motives have a positive and significant relationship with SSCM practices concurs with both the utilitarianism and stakeholder theory, and suggests that multiple stakeholders, such as customers and competitors, can act as key drivers of sustainability practices such as SSCM. In addition, the findings suggest that these businesses are guided by moral motives rooted in deontological or virtue ethics, rather than by self-interest or ethical egoism. In fact, the finding of this study is consistent with that of Pagell and Wu [62], which analyses the relationship between instrumental, relational, and moral motives of organisations on environmental, social, and financial performance with the involvement of SSCM. In the same manner, they confirm a positive association between relational and moral motives and SSCM, but their research found no relationship between instrumental motives and SSCM.

In contrast, a recent study by Gao et al. [63] indicates that internal motives, which are essentially instrumental by their definition, do have a significantly positive effect on SSCM. In addition, the study of Sajjad et al. [64] draws a contrast to the results of this enquiry, as they provide support for both instrumental logics for SSCM adoption. A plausible explanation for this might be that, although self-interest is often assumed to be central to most enterprises, this may not hold true in the business environment examined in this study. In addition, this non-finding might indicate that the scales used for measuring this self-interest construct might not be the most suitable in the context of these countries.

A plausible explanation is that, although self-interest is often assumed to be central to most enterprises, this may not hold true in the business environment examined in this study. This could be because the surveyed firms in Kenya, Ghana, Nigeria, and South Africa may operate in business environments where moral, relational, or institutional factors play a stronger role [29,38]. While this might be the case, it could also be that the owners and managers of SMEs across Africa might not have realised fully how SSCM practices can generate immense economic benefits. Indeed, this misperception may be attributed to the relative novelty of these SSCM practices, which may result in limited awareness of their

effectiveness. Thus, in the absence of strong instrumental incentives and interests, moral motives emerge as a compelling driver for firms to implement SSCM practices.

With reference to moral motives, this study's SEM path analysis results suggest that among established non-service sector-based SMEs, moral motives have a positive relationship with SSCM practices. These findings are in line with Kitsis and Chen [52]'s study which highlighted the key links between moral motives and triple-bottom-line (TBL) performance, suggesting that managers should pay greater attention to moral motives in decision-making. This contrasts with Hahn et al. [51], whose study found moral motives less relevant to the engagement of firms in social initiatives compared to strategic or self-interest considerations. Thus, although social desirability bias can affect self-reported measures, it appears to have had minimal impact in this study. This is because the questionnaire used in this study was anonymous, which reduced the incentives to present overly favourable responses, and respondents were willing to acknowledge self-serving motives.

Given that many environmental and social challenges cannot be addressed through regulation alone, it is encouraging that the majority of enterprises in this cross-country sample went beyond mere compliance to engage in SSCM guided by strong moral motives. Prior research also indicates that firms with high moral motives or strong virtues outperform those driven primarily by instrumental or relational motives [27,53]. These findings align with the limited empirical literature on moral motives, which shows that moral commitment fosters greater involvement in sustainable practices and is positively correlated with performance [46].

Furthermore, the SEM path analysis results provide empirical support for positive organisational scholarship (POS), suggesting that organisational virtuousness is associated with higher performance through its amplifying effect, which generates escalating positive outcomes, and its buffering effect, which protects against negative influences [12]. Organisations guided by high moral standards strive not merely to "do no harm" but rather to pursue the highest aspirations for unconditional societal and environmental advancement [12].

In addition, the comparative analysis results further suggest that relational motives exhibit a distinct hierarchy, with Ghana having the strongest relational motives, which demonstrates the centrality of trust, social capital, and long-term inter-firm relationships in driving SSCM. According to Ofori and Sackey [38], social capital plays a critical role in Ghanaian firms, facilitating trust-based collaboration, enhancing information flow, and supporting the achievement of organisational goals. South Africa and Kenya show comparable, moderate relational motives, indicating hybrid contexts where relational governance complements formal mechanisms. Nigeria consistently records the lowest relational drive, reflecting fragmented supply chains as well as regulatory systems, inconsistent enforcement mechanisms, and reliance on external coercive pressures [29]. The results also highlight substitution dynamics between relational and institutional governance, emphasising the importance of context-specific SSCM strategies.

Moreover, the comparative results indicate that South Africa exhibits the strongest instrumental orientation, reflecting global value chain integration and market competitiveness. Kenya and Nigeria show moderate, pragmatically oriented motives, while Ghana records the weakest instrumental motives, suggesting that economic payoff is less central in contexts where moral and relational drivers predominate [27,55]. These results show that instrumental drivers are context sensitive, particularly in market-oriented environments, requiring differentiated incentives aligned with local economic structures.

Corporate motives, also evaluated via Games-Howell, follow a similar pattern. As shown in Table 6, Ghana indicates the highest internalisation of sustainability in organisational governance, while South Africa and Kenya occupy intermediate positions, and

Nigeria consistently shows the weakest corporate alignment. Ghana's strong sustainability integration reflects robust governance and proactive institutionalisation, whereas South Africa and Kenya exhibit partial alignment, and Nigeria's weak alignment reflects structural and regulatory constraints [29,44]. These results highlight the pivotal role of leadership, governance, and organisational embedding in translating sustainability intent into practice.

Despite strong motives drivers, the overall SSCM adoption, assessed with Games-Howell, shows an asymmetric landscape. The results also showed that Kenya leads in SSCM adoption, followed by Nigeria and South Africa, with Ghana lagging despite high moral and corporate motives. This indicates a motive-adoption disconnection, where ethical or corporate intent alone is insufficient without institutional capacity, operational capability, and enforcement mechanisms [50].

At the practice level, sustainable product design shows moderate adoption in South Africa, Kenya, and Ghana, but is significantly lower in Nigeria, reflecting technological, cost, and regulatory constraints. These results align with a study by Nwamekwe et al. [33], which showed that SMEs in Nigeria face substantial barriers, such as prohibitive capital requirements, limited technical expertise, outdated machinery, and weak regulatory enforcement, reflecting both institutional constraints and resource-based limitations that hinder their capacity to adopt sustainable practices. Sustainable process design is strongest in Ghana, intermediate in South Africa and Nigeria, and weakest in Kenya, suggesting that operational integration depends more on investment capacity and technological capability rather than on the motive alone [34].

All in all, these findings indicate that SSCM motives and adoption are highly context dependent across African economies, with moral, relational, instrumental, and corporate drivers interacting with institutional, socio-cultural, and operational factors. For instance, the comparative results signify a crucial misalignment between the motive factors and adoption capacity, especially in Ghana and Nigeria, where strong relational and moral orientations failed to translate into commensurate SSCM adoption. The eminence of moral and relational motives in these two countries can be attributed to strong communitarian norms, and high reliance on informal networks, where firms depend on trust-based relationships and social legitimacy to navigate institutional voids [29]. However, constant challenges such as technological inadequacy, limited access to finance, weak fragmented regulatory enforcement, and inadequate infrastructure hinder the translation of these motives into SSCM practice [29,44,65]. This contests the main traditional assumptions that pro-sustainability motives intrinsically yield greater sustainability outcomes and instead places SSCM as an institutionally dependent process shaped by the interactions between formal and informal governance mechanisms. In such contexts, moral and relational motives, therefore, function as necessary but insufficient conditions, which need to be complemented by institutional strengthening and capability development to foster tangible adoption, while in more formalised environments such as South Africa, instrumental motives may be more effective though promoting risk compliance-driven rather than substantive SSCM practices adoption.

South Africa's evidence of stronger instrumental orientation indicates its relatively advanced institutional environment, which is characterised by stricter environmental regulations, established sustainability reporting frameworks, and deeper integration into global supply and value chains. This incentivises firms to adopt and implement SSCM practices to enhance their supply chain competitiveness, compliance, and reputational gains, even though this may at times encourage compliance-driven SSCM adoption [45,66]. The comparative results for Kenya present a different trajectory where SMEs were reported to implement SSCM greatly despite the presence of weaker relational and moral motives. This can be linked to Kenya's growing policy to advance green innovation, rapid digitalisation,

a dynamic entrepreneurial ecosystem, and increasing participation in export-oriented sectors, all of which enact sustainability standards; however, resource limitations and fragmented regulatory enforcement still compromise the extent of SSCM adoption [67]. All of the country-specific examples discussed reveal a serious misalignment between SSCM adoption motive and execution, which challenges the traditional assumptions in SSCM scholarship. The given examples also highlight that successful SSCM adoption is dependent on the interaction between the level of market maturity, institutional quality, firm level capabilities, and infrastructure development.

Therefore, beyond confirming and validating previous empirical findings, this study contributes to the body of SSSCM literature through the advancing of a more nuanced theoretical insight which indicates that SSCM motives operate within a context-dependent configuration, rather than as universally applicable SSCM adoption drivers. The results reveal that instrumental, relational, and corporate motives interrelate in complementary and substitutive ways, though contingent on the market and institutional conditions. For example, the strong relational motives reported in Ghana might suggest the crucial role played by social capital, trust, and long-term inter-organisational relationships in driving SSCM adoption, while the case of South Africa and Kenya may point to hybrid contexts wherein relational motives complements formal institutional mechanisms. Contrarily, the weaker relational motives reported in Nigeria may point to the country's fragmented and inadequate regulatory enforcement, and fragmented supply chains. These patterns indicate a functional substitution dynamic in Nigeria, wherein relational motives mechanisms compensate for weak and inadequate formal institutions, which extends the institutional theory by demonstrating how informal mechanisms can partially replace formal regulatory structures in shaping SSCM adoption especially in informal economies where micro enterprises operate in.

Likewise, the comparative analysis results of instrumental motives exhibit clear context sensitivity and dependency. These results expose the deficiency of universal policy and managerial prescriptions, thus highlighting the urgent need for context-specific strategies that associate SSCM initiatives with the institutional realities of a specific country, while also integrating the sense-making insights of the managers and local sustainability to promote a more distinct globally relevant SSCM discourse. For instance, South Africa reported the strongest instrumental motives, which points to a deeper enterprise governance integration into global value chains and competitive market pressures, while the findings for Kenya and Nigeria suggest moderate, pragmatically driven motives, and Ghana records relatively weaker instrumental motives. Corporate motives follow a comparable pattern, with Ghana recording the highest internalisation of sustainability within enterprise governance structures, while the findings for South Africa and Kenya suggest partial alignment, and Nigeria records weaker organisational integration due to regulatory and structural constraints. Thus, all these findings indicate that the effectiveness of different SSCM adoption motive types is dependent on their alignment with the broader institutional and economic environments.

A key theoretical contribution of this study lies in the identification and conceptualisation of a motives-adoption gap in SSCM. Though previous studies have often assumed that stronger sustainability motives directly lead to higher sustainability adoption levels, this study's findings challenge this traditionally dominant assumption. The findings indicate an asymmetric pattern wherein African countries such as Ghana demonstrate strong moral and corporate motives, yet this is accompanied by relatively lower SSCM adoption levels, whereas Kenya records higher SSCM adoption levels despite having more moderate SSCM adoption motives drivers. This indicates that the presence of SSCM motives does not automatically translate into adoption.

This study, thus, conceptualises the SSCM motives-adoption gap as a capability-mediated phenomenon, which we define as the misalignment between SSCM adoption motive and the actual SSCM adoption. This gap arises from institutional capacity, enforcement mechanisms, and organisational readiness constraints. In this case, SSCM adoption motives thus function as necessary yet insufficient conditions, that require complementary operational capabilities and enabling institutional environments in order for them to be translated effectively into meaningful and tangible SSCM adoption outcome. This logic extends the extant SSCM empirical literature by shifting the focus from identifying the key motives to rather understanding the conditions under which these SSCM adoption motives are activated or constrained.

All in all, these findings contribute to both stakeholder and institutional theory by demonstrating that SSCM adoption motives are not universally effective, but that they are rather shaped by the interaction between formal institutions, informal relational mechanisms, and enterprise-level capabilities. This study, therefore, advances a more context-dependent and configurational understanding of SSCM adoption and the motives driving it, particularly within African economy settings. As such, effective SSCM strategies require nuanced, country-specific approaches that bridge motives and adoption, leveraging leadership, trust networks, and policy instruments to convert ethical intent into measurable sustainability outcomes. Thus, to bridge this practice gap, this study suggests that policy makers in African countries should consider developing targeted green financing mechanisms such as the SME-focused sustainability funds, utilising blended SME finance models, and applying incentive-based tax credits to alleviate SME funding challenges and minimise to risks associated with SSCM investments.

5. Conclusions

This study has examined the relationships between corporate motives and SSCM practices among SMEs across Africa. The findings demonstrate that corporate motives play a pivotal role in driving SSCM practices among SMEs in Africa, providing novel theoretical insights and reinforcing the centrality of ethical and strategic drivers in SSCM. This is because, first, the prevalence of existing models on SSCM have considered the outcomes of the SSCM practices rather than the antecedents. Second, this study makes a unique contribution to the SSCM literature by addressing a notable gap in the literature, in which prior studies have been predominantly qualitative and large-scale quantitative evidence remains scarce. This study extends prior qualitative research by showing empirically, using quantitative techniques, how moral, relational, and instrumental motives drive SSCM practices among SMEs in Africa, offering novel insights for both SSCM and business ethics scholarship. In addition, it does this by aggregating responses of SMEs in the non-service sector across four countries.

From a practical point of view, the results of this study indicate that regarding sustainability-oriented practices, businesses are not motivated entirely by their own interests. They are driven by the interests of key stakeholders, such as their customers, suppliers, employees, and government and environment groups, in order to gain social literacy. In addition, businesses are concerned about the ethics of their operations and are compelled to act responsibly for the common good.

This study revealed further how moral, relational, instrumental, and corporate motives interact with institutional and operational contexts to shape sustainable supply chain adoption across African economies. It uncovered a critical SSCM motive-adoption gap and substitution dynamics between relational and formal governance mechanisms, which advances SSCM theory. To bridge this gap, non-service SMEs should implement targeted capacity-building programmes alongside process-level interventions, such as resource

efficiency measures (e.g., minimising material waste and optimising inventory), cleaner production practices (e.g., recycling process waste, using low-impact inputs), and eco-design initiatives (e.g., recyclable packaging, material-light product design). More so, these SMEs can also implement energy and water efficiency improvements, simple monitoring and feedback systems, and stakeholder (e.g., supplier) collaboration for shared sustainability practices, all of which are aimed at translating sustainability intent into measurable operational adoption.

The results of this study present key implications for both SME owners/managers as well as for policy makers, by showing how each of the unique SSCM motive profiles can be leveraged strategically to fast-track SSCM adoption. For policy makers, the study recommends that policy interventions should be aligned explicitly with the country's most prominent and dominant SSCM motives. For example, in African countries like Ghana and Nigeria, characterised by strong moral and relational SSCM motives, policy makers should establish policy frameworks that embed sustainability in normative and community-based mechanisms, such as industry-led codes of conduct, public recognition schemes, and cluster-based sustainability initiatives, while simultaneously strengthening enforcement consistency and expanding access to green finance to convert ethical SSCM intent into practice. In South Africa, where instrumental motives prevail, policy makers should prioritise market-based incentives, including tax rebates, preferential procurement policies, and export support tied to sustainability compliance, to reinforce the business case for SSCM while discouraging superficial, compliance-driven adoption. In Kenya, where adoption is relatively strong, but motives are more pragmatic, policies should focus on scaling innovation through digital platforms, SME incubation, and integration into global sustainable value chains.

For SME owners/managers, the study results highlight the need to internalise and operationalise these SSCM adoption motives. For instance, SMEs in high moral-relational contexts such as Ghana and Nigeria should formalise trust-based SSCM practices into structured supplier development and monitoring systems, while those in more instrumentally driven environments like South Africa should embed sustainability into performance metrics, cost-efficiency strategies, and competitive positioning. More so, there is a need to establish multi-stakeholder platforms that actively support the engagement and collaboration of SME owners/managers, customers, regulators, suppliers, industry associations, and local communities. Such collaborations will enable the co-creation of context-sensitive and relevant standards, promote effective sharing of knowledge, and reinforce accountability among stakeholders. Again, SME owners and managers, together with policy makers, should also consider implementing capacity-building initiatives, such as technical training, digital tools for SSCM tracking, and supplier development programmes, in order to translate SSCM motives and intent into SSCM operational capability.

6. Limitations and Suggestions for Future Research

Despite its contributions, this research has several limitations that also present opportunities for future study. For instance, data were collected from 378 non-service sector SME owners/managers based in four African countries, namely Ghana, Kenya, Nigeria, and South Africa. As such, caution is warranted when generalising the study results to other contexts, particularly those with different levels of economic development. This is because, although the sample size of 378 respondents is adequate for the applied SEM path analysis, it limits the statistical power of the structural model for more robust country-level comparisons. Again, the model may have inadequately captured the divergence of institutional and sectoral conditions across the African continent. Again, although the study used both convenience and purposive sampling techniques to select the targeted

SME owners/managers, disparities in sample composition across countries in and beyond Africa may affect comparability and may pose the risk of selection bias.

Importantly, although this study provides useful insights, it has the partial measurement model fit limitation. As such, the SEM path analysis results and the comparative analysis results' interpretation and discussion are subject to the partial fit of the SEM measurement model, since a number of the other fit indices were below the minimum recommended threshold values. For instance, while some absolute and parsimonious model fit indices, such as RMSEA (0.074), RMR (0.049), and χ^2/df (3.244), indicated a reasonable model fit, a number of the other incremental model fit indices, such as CFI = 0.825, TLI = 0.807, and NFI = 0.767, were below the minimum acceptable threshold value of 0.90. This partial model fitness suggests that the SEM measurement model proposed and tested in this study partially captures the underlying data structure and fitness, but it does not fully achieve optimal model fit in accordance with the conventional model fitness criteria.

These partial model fitness results may be ascribed to several factors. For example, these results could be as a result of the measurement model complexity which incorporates various latent variables and observed variables, which could have adversely influence incremental model fit indices. The results could also be due to the sample size and data characteristics which may have affected the sensitivity of model fit indices, such as CFI and TLI, that are known to not work well with complex models that are heavier. Moreover, unobserved heterogeneity might have had been introduced through the cross-country nature of the dataset which covered four African countries (Ghana, Kenya, Nigeria, and South Africa).

Thus, considering the above, the SEM measurement model is interpreted as partially fit, and its derived SEM path analysis results were interpreted and discussed as indicative exploratory insights rather than conclusive empirical evidence. While the obtained SEM path analysis results remain theoretically informative and consistent with the prior literature, they may not fully capture the underlying covariance structure.

As such, future studies should replicate the study, with the aim to improve the measurement model fit through model respecification, such as refining measurement items, removing poorly performing indicators, or re-examining construct dimensionality. In addition, they should consider using other alternative estimation techniques and employ alternative robustness checks for the validation of the study results.

Beyond the partial measurement model fit limitation discussed above, this study is subject to empirical methodological limitations. First, the study used self-reported, cross-sectional survey data which may have introduced the possibility of common method bias and thus limit causal inference. Again, using a cross-sectional research design only captured the short-term effects, and failed to capture the long-term effects, as well as the dynamic relationships between SSCM adoption motives, in turn failing to capture how these motives evolve over time. Second, conducting a cross-country comparative study based on four African countries (Ghana, Kenya, Nigeria, and South Africa) with varying sample composition, these varying sample compositions and cross-country differences may affect the generalisability of these study findings. Lastly, as discussed above, the measurement model fit indices (e.g., CFI, TLI, NFI) reported to be below the minimum recommended thresholds reflect potential misspecification, which may have affected the robustness of parameter estimates due to context-specific dynamics or limited statistical power rather than the absence of theoretical effects. As such, the SEM path analysis and comparative analysis results derived from this partially fit model should be considered as indicative exploratory insights rather than conclusive empirical evidence.

Moreso, to strengthen generalisability, future research should replicate this study using a longitudinal study that employs a larger sample, with more African countries representing

all the regions of Africa and incorporating all firm sizes including those from service sectors. In addition, future studies could explore the role of corporate motives in SSCM across diverse settings, including other developing markets or developed economies. Future research could explore whether moral motives are more prominent among small businesses in developing countries, while instrumental considerations dominate in larger firms in emerging and developed economies. These queries are unanswered in this disquisition and could be the objective driving future studies.

Author Contributions: Conceptualization, O.J.D.-I. and P.H.-S.; Methodology, O.J.D.-I. and P.H.-S.; Validation, O.J.D.-I.; Formal analysis, O.J.D.-I.; Investigation, O.J.D.-I.; Writing—original draft, O.J.D.-I.; Writing—review and editing, P.H.-S.; Supervision, P.H.-S. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Nelson Mandela University Research Office Post doctoral fellowship fund, The APC was funded by Nelson Mandela University PHS research account.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Research Ethics Committee (Human) of Nelson Mandela University (H21-BES-LOG-095) on [11 March 2022].

Informed Consent Statement: Informed consent for participation was obtained from all subjects involved in the study.

Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Post-Hoc Multiple Comparisons Analysis: Cross-Country Differences in SSCM Motives and Adoption.

Multiple Comparisons							
Dependent Variable	(I) Country	(J) Country	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Moral Motives	South Africa	Kenya	0.35778 *	0.11216	0.009	0.0673	0.6483
		Nigeria	−0.42664 *	0.08565	<0.001	−0.6495	−0.2037
		Ghana	−0.48264 *	0.09371	<0.001	−0.7259	−0.2394
	Kenya	South Africa	−0.35778 *	0.11216	0.009	−0.6483	−0.0673
		Nigeria	−0.78442 *	0.08827	<0.001	−1.0137	−0.5552
		Ghana	−0.84042 *	0.09611	<0.001	−1.0895	−0.5913
	Nigeria	South Africa	0.42664 *	0.08565	<0.001	0.2037	0.6495
		Kenya	0.78442 *	0.08827	<0.001	0.5552	1.0137
		Ghana	−0.056	0.06319	0.812	−0.2199	0.1079
	Ghana	South Africa	0.48264 *	0.09371	<0.001	0.2394	0.7259
		Kenya	0.84042 *	0.09611	<0.001	0.5913	1.0895
		Nigeria	0.056	0.06319	0.812	−0.1079	0.2199

Table A1. Cont.

		Multiple Comparisons					
Dependent Variable	(I) Country	(J) Country	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Relational Motives	South Africa	Kenya	−0.22126	0.11702	0.236	−0.5254	0.0828
		Nigeria	0.98633 *	0.14906	<0.001	0.6	1.3727
		Ghana	−0.64117 *	0.11678	<0.001	−0.9447	−0.3376
	Kenya	South Africa	0.22126	0.11702	0.236	−0.0828	0.5254
		Nigeria	1.20759 *	0.12196	<0.001	0.8907	1.5244
		Ghana	−0.41991 *	0.07932	<0.001	−0.6253	−0.2145
	Nigeria	South Africa	−0.98633 *	0.14906	<0.001	−1.3727	−0.6
		Kenya	−1.20759 *	0.12196	<0.001	−1.5244	−0.8907
		Ghana	−1.62750 *	0.12173	<0.001	−1.9438	−1.3112
	Ghana	South Africa	0.64117 *	0.11678	<0.001	0.3376	0.9447
		Kenya	0.41991 *	0.07932	<0.001	0.2145	0.6253
		Nigeria	1.62750 *	0.12173	<0.001	1.3112	1.9438
Instrumental Motives	South Africa	Kenya	0.77069 *	0.11875	<0.001	0.4643	1.077
		Nigeria	0.69624 *	0.12245	<0.001	0.3803	1.0121
		Ghana	0.42291 *	0.12245	0.003	0.107	0.7388
	Kenya	South Africa	−0.77069 *	0.11875	<0.001	−1.077	−0.4643
		Nigeria	−0.07444	0.11678	0.92	−0.3757	0.2268
		Ghana	−0.34778 *	0.11678	0.016	−0.6491	−0.0465
	Nigeria	South Africa	−0.69624 *	0.12245	<0.001	−1.0121	−0.3803
		Kenya	0.07444	0.11678	0.92	−0.2268	0.3757
		Ghana	−0.27333	0.12054	0.107	−0.5843	0.0376
	Ghana	South Africa	−0.42291 *	0.12245	0.003	−0.7388	−0.107
		Kenya	0.34778 *	0.11678	0.016	0.0465	0.6491
		Nigeria	0.27333	0.12054	0.107	−0.0376	0.5843
Corporate Motives	South Africa	Kenya	0.06826	0.09415	0.887	−0.176	0.3126
		Nigeria	0.27985 *	0.0975	0.024	0.0269	0.5327
		Ghana	−0.56190 *	0.08799	<0.001	−0.7907	−0.3331
	Kenya	South Africa	−0.06826	0.09415	0.887	−0.3126	0.176
		Nigeria	0.21158 *	0.07894	0.039	0.0071	0.416
		Ghana	−0.63017 *	0.06684	<0.001	−0.8033	−0.457
	Nigeria	South Africa	−0.27985 *	0.0975	0.024	−0.5327	−0.0269
		Kenya	−0.21158 *	0.07894	0.039	−0.416	−0.0071
		Ghana	−0.84175 *	0.07148	<0.001	−1.0271	−0.6564
	Ghana	South Africa	0.56190 *	0.08799	<0.001	0.3331	0.7907
		Kenya	0.63017 *	0.06684	<0.001	0.457	0.8033
		Nigeria	0.84175 *	0.07148	<0.001	0.6564	1.0271

Table A1. Cont.

Multiple Comparisons							
Dependent Variable	(I) Country	(J) Country	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Sustainable Supply Chain Management	South Africa	Kenya	−0.68564 *	0.10004	<0.001	−0.9455	−0.4258
		Nigeria	−0.034371 *	0.10495	0.007	−0.6161	−0.0713
		Ghana	−0.17816	0.10369	0.318	−0.4473	0.091
	Kenya	South Africa	0.68564 *	0.10004	<0.001	0.4258	0.9455
		Nigeria	0.34193 *	0.07813	<0.001	0.1395	0.5443
		Ghana	0.50749 *	0.07642	<0.001	0.3095	0.7054
	Nigeria	South Africa	0.34371 *	0.10495	0.007	0.0713	0.6161
		Kenya	−0.34193 *	0.07813	<0.001	−0.5443	−0.1395
		Ghana	0.16556	0.08275	0.191	−0.0488	0.38
	Ghana	South Africa	0.17816	0.10369	0.318	−0.091	0.4473
		Kenya	−0.50749 *	0.07642	<0.001	−0.7054	−0.3095
		Nigeria	−0.16556	0.08275	0.191	−0.38	0.0488
Product Design	South Africa	Kenya	0.11351	0.11787	0.771	−0.1918	0.4188
		Nigeria	0.83102 *	0.10815	<0.001	0.5507	1.1113
		Ghana	0.18702	0.10097	0.253	−0.0748	0.4489
	Kenya	South Africa	−0.11351	0.11787	0.771	−0.4188	0.1918
		Nigeria	0.71751 *	0.11365	<0.001	0.4232	1.0118
		Ghana	0.07351	0.10684	0.902	−0.2033	0.3503
	Nigeria	South Africa	−0.83102 *	0.10815	<0.001	−1.1113	−0.5507
		Kenya	−0.71751 *	0.11365	<0.001	−1.0118	−0.4232
		Ghana	−0.64400 *	0.09601	<0.001	−0.8928	−0.3952
	Ghana	South Africa	−0.18702	0.10097	0.253	−0.4489	0.0748
		Kenya	−0.07351	0.10684	0.902	−0.3503	0.2033
		Nigeria	0.64400 *	0.09601	<0.001	0.3952	0.8928
Process Design	South Africa	Kenya	0.24123	0.09962	0.078	−0.0178	0.5002
		Nigeria	−0.181	0.09582	0.238	−0.4305	0.0685
		Ghana	−0.34500 *	0.10037	0.004	−0.6059	−0.0841
	Kenya	South Africa	−0.24123	0.09962	0.078	−0.5002	0.0178
		Nigeria	−0.42223 *	0.05814	<0.001	−0.5728	−0.2717
		Ghana	−0.58623 *	0.06536	<0.001	−0.7555	−0.417
	Nigeria	South Africa	0.181	0.09582	0.238	−0.0685	0.4305
		Kenya	0.42223 *	0.05814	<0.001	0.2717	0.5728
		Ghana	−0.16400 *	0.05941	0.032	−0.318	−0.01
	Ghana	South Africa	0.34500 *	0.10037	0.004	0.0841	0.6059
		Kenya	0.58623 *	0.06536	<0.001	0.417	0.7555
		Nigeria	0.16400 *	0.05941	0.032	0.01	0.318

* The mean difference is significant at the 0.05 level.

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