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Sustainable supply chain management and organisational performance: Perception of academics and practitioners

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Abstract
Purpose: The primary objective of this study is to examine the nexus of sustainable supply chain management and the organizational performance perceptions of academics and practitioners in Awka, Anambra State, Nigeria.
Research Methodology: Data were collected using questionnaires from 122 respondents in the Awka region. Data were analyzed using descriptive, correlation, and regression analyses to test the hypotheses.
Results: The linear regression showed that the DC components of collaboration and resilience were positively related to OP, with the latter being non-significant.
Limitations: This study was limited by its sample size of 122 academics and practitioners, and restrictions on the SSCM and OP nexus. This sample size may have affected the generalizability of our results. This study does not address other dimensions of TBL, such as organizational, social, and environmental concerns.
Contribution: The analytical results of this research contribute to the body of knowledge, enabling practitioners to organize and implement sustainable supply chain efforts, as well as monitor and evaluate how these initiatives impact the operations of Nigerian enterprises in the long run.
Keywords: *Supply Chain Management, Sustainable Supply Chain Management (SSCM),Organisational Performance*
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1. Introduction

The growing sustainability awareness among consumers, the public, the media, and NGOs has led to the insurgence of sustainable business principles in managerial practices (Gong, Gao, Koh, Sutcliffe, & Cullen, 2019; M. Jia, Stevenson, & Hendry, 2023; Rehman Khan & Yu, 2021). The massive anthropogenic erosion of biodiversity and ecosystem services essential to civilization has been associated with human activities. Concerns regarding habitat loss, atmospheric pollution, natural resource depletion, and climate change are only a few of the concerns that are now being considered at the macro, meso, and micro levels of policy. According to predictions from the World Business Council for Sustainable Development (WBCSD, 2008), if unchecked, natural resource use will reach 170% of Earth's bio-capacity by 2040. According to the World Commission on Environment and Development [WCED], sustainability is defined as "meeting the needs of the present generation without compromising the ability of future generations to meet their own needs" (McChesney, 1991). Sustainability concerns have also been linked to the global supply chain (Sharma, Luthra, Joshi, &

Kumar, 2022), with a compounding effect on the social and environmental aspects of corporate activities.

Managers are currently under increasing pressure to look beyond the usual financial perspective when it comes to business. Consequently, sustainability became more than simply a trendy term; rather, it became essential to business operations (Carter & Liane Easton, 2011; Elkington, 1998). According to Elkington (1997), "the simultaneous pursuit of economic prosperity, environmental quality, and social equity" is what businesses mean when they talk about sustainable development. According to Elkington (1997), this idea is strongly related to the three elements of the triple bottom line, and businesses are currently changing their "supply chain (SC) operations to be green" (Rehman Khan & Yu, 2021). The SC is a system of interconnected organizations that strive to efficiently manage the acquisition and distribution of materials (Ricardianto et al., 2022). The goal of SCM is to connect many businesses in the chain to satisfy demand as effectively as feasible (Jemal, 2022). Thus, a "comprehensive analysis of sustainable business operations entails the simultaneous systematic consideration of all triple bottom line dimensions (Wu & Pagell, 2011).

Thus, managers and organizations alike face the tripartite issues of social, economic, and environmental considerations in business practices (Raut, Narkhede, & Gardas, 2017). According to Munny et al. (2019), the concept of a sustainable supply chain involves the incorporation of tripartite problems of economic, environmental, and social concerns into the SC. This integrative perspective offers managers the opportunity to manage SC successfully and opens doors for innovation (Forozandeh, 2021). Choudhury, Paul, Rahman, Jia, and Shukla (2020) stated that they still believe SCM research to be a new area of management research. Sustainable supply chain management (SSCM) offers numerous benefits to firms, including improved competitive advantage (Rehman Khan & Yu, 2021). For instance, Rehman Khan and Yu (2021) found that SSCM enables a firm to improve its competitiveness, economy, and environmental performance. Firms that embed sustainability into corporate marketing initiatives have a positive anticipated influence on consumer perceptions and corporate reputation (Hoejmose, Roehrich, & Grosvold, 2014).

The recent pandemic has exposed weaknesses in the current global SC in several sectors, such as healthcare, food and agriculture supply, and ICT. (Shi, Liu, & Zhang, 2023). The disruptions in the SC (Sharma et al., 2022) placed a burden on stakeholders, policymakers and the government to identify the need for embedding sustainability issues in the context of the global supply chain (Cohen, 2020; Sarkis, Cohen, Dewick, & Schröder, 2020). COVID-19 orchestrated a series of broad-spectrum macro- and micro-chain reactions, which revolutionized several business practices. In addition to its global impact, many emerging economies have witnessed a downward growth trajectory and collapse of several institutions (Lucchese & Pianta, 2020). The data published by Fortune estimated that approximately 94% of Fortune 1000 firms were directly affected by the pandemic (Sherman, 2020). The virus that originated in China (Ibn-Mohammed et al., 2021) is estimated to be present in over 200 countries, causing millions of deaths globally, thereby becoming one of the worst pandemics in global history (Pamidimukkala & Kermanshachi, 2021). The pandemic has created disruptions globally and across several sectors, leading to huge losses for several businesses (Remko, 2020; Shi et al., 2023).

This scenario heightened competition globally, as nations mounted barriers with a nationalist objective to survive in the near term (Ibn-Mohammed et al., 2021). These challenges have forced 'sustainability' to become axiomatic for long-term survival (Karmaker et al., 2021) and manage potential future impacts (Remko, 2020). SCs remain the 'backbone of several national economies and society' (Ivanov, 2020). They exhibit complex interactions and interrelationships with society and nature, and are triggered by feedback between SCs, the economy, and society (Ivanov, 2020). Therefore, SSCM has been popularized in strategic management literature and industry practice (J. Li, Pan, Kim, Linn, & Chiang, 2015; Silvestre, 2015a, 2015b). SSCM is the broad integration of 'economic, environmental, and social bottom lines into the SCM function (Carter & Rogers, 2008; Dubey et al., 2017; Sharma et al., 2022). SSCM popularity is linked to the current dynamism in consumer markets, coupled with growing consumerism and regulatory pressure (Matthews, Stamford, & Shapira, 2019) towards social and

environmental issues (Karmaker et al., 2021); thus, the production of goods or services that lack a sustainable supply chain is non-sustainable (Bag, Wood, Xu, Dhamija, & Kayikci, 2020).

The broad integrative SSCM approach requires firms to adapt and redesign their functions to include managing broad stakeholder relationships through collaboration and risk-mitigating strategies (Ivanov, 2020; Sharma et al., 2022). In the end, this kind of cooperation can strengthen ties among a wide range of partners and guarantee that consumers receive goods or services that will last (Alghababsheh & Gallear, 2021; Badraoui, Van der Vorst, & Boulaksil, 2020). According to Scavarda, Daú, Scavarda, and Korzenowski (2019) and Munny et al. (2019), the need to embed sustainability initiatives based on the tripartite dimensions of social, economic, and environmental perspectives has never been pronounced in emerging economies. Moreover, the threat posed by the pandemic forced managers to re-adapt their SCs to social, economic, and environmental issues, which presented themselves in various national economies (Cohen, 2020; Sarkis et al., 2020). A company's reputation may be harmed if its SC is not managed in a socially and environmentally responsible manner (Hoejmose et al., 2014). However, relatively little attention has been paid to sustainability performance in the context of SCM in emerging economies (Karmaker et al., 2021; Munny et al., 2019).

Firms must recognize the mutual nexus of supply chain management and sustainability in the COVID-19 era to treat them as complementary (Juergensen, Guimón, & Narula, 2020). Many firms cannot withstand the disruption of their SCs induced by COVID-19, particularly in developing nations (Karmaker et al., 2021). One significant deterrence to the dynamic business environment is disruption, which leads to imbalances in supply and demand and affects sustainability (Prakash et al., 2020; Sharma & Joshi, 2019). Firms must experiment with a larger range of novel tactics and processes for long-term survivability and risk management techniques in the COVID-19 environment (Yang, Xie, Yu, & Liu, 2021). M. Jia et al. (2023) claim that there hasn't been much empirical study done from the standpoint of emerging economies. According to Shi et al. (2023), quantitative studies should emphasize the importance of analyzing distinctive components of SSCM. SSCM is constantly evolving with changes in focus, methods, and types of analysis (Barata et al., 2024). This study focused on two components of SSCM: collaboration and resilience. Based on Fan et al.Fan, Stevenson, and Li (2020), supplier collaboration can lead to supply side resilience. Dolgui, Ivanov, and Rozhkov (2020) conducted a simulation study of the structural dynamics of SC. The empirical results found support for information sharing and coordination as risk-mitigating strategies to curb both the 'ripple' and 'bullwhip' effects. SC resilience is the ability of the SC 'to withstand a disruption (or a series of disruptions)' (Hosseini, Ivanov, & Dolgui, 2019; Zhao, Zuo, & Blackhurst, 2019). Afterwards, the SC can return to a pre-disturbance state and ensure continuity (Demirel, MacCarthy, Ritterskamp, Champneys, & Gross, 2019). It ensures internal flexibility based on a variety of disruption management techniques (Singh, Kumar, Panchal, & Tiwari, 2021). Manufacturing firms must build momentum through sound and suitable procedures that guarantee long-term supply chain operations to satisfy their post-pandemic business needs (Joshi & Sharma, 2022). Against this backdrop, this study examines the nexus between SSCM and organizational performance in Nigeria.

1.1. Research Questions

This study aimed to address the following research questions:

RQ_1: To what extent do SCM collaboration affect manufacturing firms' business performance post-COVID-19?

RQ_2: To what extent does SCM resilience enhance manufacturing firms' performance post-COVID-19?

2. Literature review

2.1. Supply Chain Management (SCM)

A supply chain is 'the culmination of all activities involved in the flow of goods from raw materials to finished products' (V. F. Yu & Tseng, 2014). SCM is the orderly transfer of goods, data, and funds between industry partners (Turken & Geda, 2020). SCM ensures the 'fast and reliable supply transformation of raw materials and finished products to customers' (Sánchez-Flores, Cruz-Sotelo, Ojeda-Benitez, & Ramírez-Barreto, 2020). Authors have classified the SC into several typologies; for

instance, Mentzer et al. (2001) classification created three typologies: direct supply chain, extended supply chain, and ultimate supply chain. SCM is an integrated approach for managing the total flow of a distribution channel from the supplier to the ultimate customer. According to Anderson (2004), it is a process that 'incorporates the acquisition of all physical (and increasingly informational) inputs as well as the efficiency and effectiveness with which they are transformed into customer solutions. The three levels in SCM are as follows (Dumitru & Căescu, 2013):

1. The strategic level defines the network of the SC that covers the selection of suppliers, transport routes, production facilities, warehousing, etc..
2. The tactical level deals with planning and programming the SC to meet the actual demand, while
3. The operational level refers to the actual enforcement of planning performed at the tactical level.

The goal of the supply chain is to link all activities between suppliers and customers in a timely and efficient manner (Felea, 2008). Supply chain networks mainly focus on physical material flows and deal with decisions on the number, location, and capacity of facilities, such as production plants, distribution centers, and supplier selections (Varsei & Polyakovskiy, 2017).

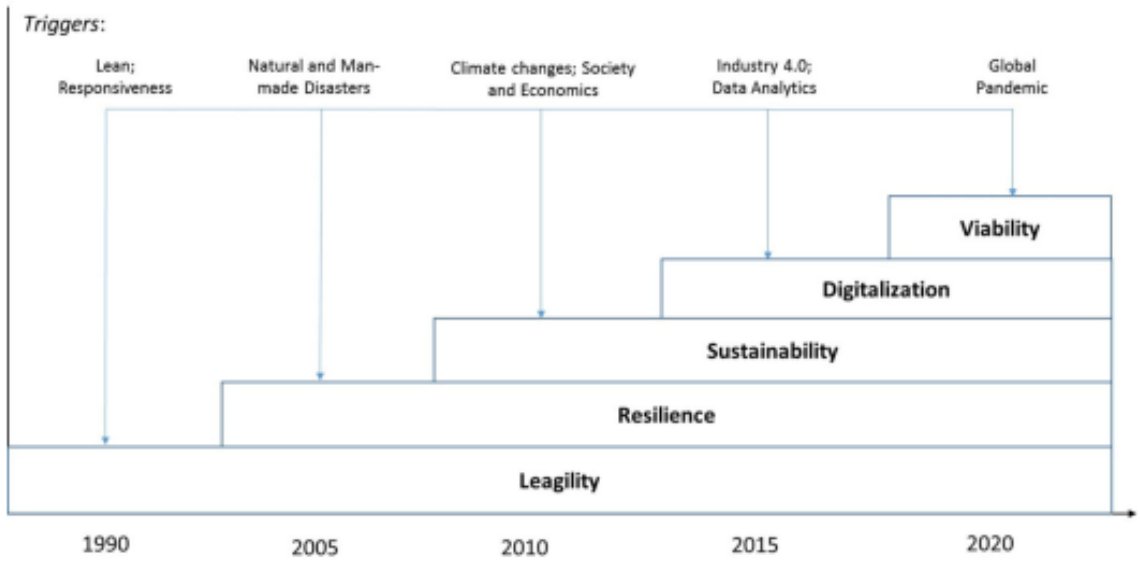

Figure 1: Transformation of SCM research over time
Source: Ivanov (2020)

2.2. Sustainable Supply Chain Management (SSCM)

SSCM is a nonlinear expansion of the traditional SC to a broader integrative focus on the social and natural environment (Silvestre, 2015a, 2015b). SSCM is essentially the amalgamation of SCM and principles of sustainability (Barata et al., 2024). It is the systematic integration of the three facets of sustainability, that is, environmental, social, and economic bottom lines, in a synergistic manner, synonymous with improved transparency into the SCM domain. The SSCM trajectory 'consists of a series of learning loops along a non-linear and multi-directional journey' (Silvestre, 2015a, 2015b). The SSCM is "the one that performs well on both traditional measures of profit and loss, as well as on an expanded conceptualization of performance that includes social and natural dimensions" (Pagell & Wu, 2009). This definition is consistent with Schaltegger and Wagner (2006), who state that "sustainability performance can be defined as the performance of a company in all dimensions and for all drivers of corporate sustainability."

According to Carter and Rogers (2008), SSCM is "a strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key inter-organizational business processes for improving the long-term economic performance of the individual company and its supply chains". Seuring and Müller (2008) opined that SSCM involves the management of material, information, and capital flows, as well as cooperation among companies along the supply chain, while considering all three dimensions of sustainable development. SSCM is a process

that satisfies several stakeholders through the cumulative integration of economic, environmental, and social dimensions into business functions and processes (Dubey et al., 2017).

To obtain a competitive advantage post-COVID-19 firms require the SC to be sustainable (Joshi, Sharma, & Singh, 2020; Joshi, Singh, & Sharma, 2023). The drivers of SSCM from a systematic literature review by Bag et al. (2020), Gong et al. (2019), Dubey et al. (2017), Ivanov (2020), Karmaker et al. (2021), Majumdar, Shaw, and Sinha (2020) includes as follows:

1. consumer awareness;
2. Supply Chain Collaboration
3. Sustainable Procurement Practices
4. Green Products and Warehousing
5. conservation of nature and the environment
6. Resilient transportation and logistics optimization
7. continuous improvement;
8. enabling ICT frameworks, data analytics, and blockchain technologies.
9. Supply chain digitalization
10. internal pressures;
11. Institutional and regulatory pressure
12. social values & ethics;
13. corporate strategy & commitment; and,
14. economic stability.

Firms have utilized by firms to manage risks and signal sustainable behavior to customers (Hoejmose et al., 2014). Failure to manage the supply chain in a sustainable (i.e., socially and environmentally responsible) manner can directly harm business contracts, marketing, and sub-sourcing and damage the corporation's brands and the trust they have established with their business customers. This is evident with corporate scandals involving large Multinational Corporations such as Nike (Wang, 2005), Primark (Jones, Temperley, & Lima, 2009), and Adidas (Winstanley, Clark, & Leeson, 2002).

Emerging economies are faced with a diverse set of challenges that defines the characteristic of such economies (Geng, Mansouri, & Aktas, 2017; F. Jia, Zuluaga-Cardona, Bailey, & Rueda, 2018). The pandemic has created huge deficits in the SC of emerging economies (Karmaker et al., 2021). Carter and Rogers (2008), define 'risk as to the probability of variation surrounding an anticipated outcome'. SC risk may be defined as any 'occurrence of an inbound supply related incident that temporarily or permanently disrupts supplies and consequent failure to meet customer demand. Therefore, SC risk may be caused by unanticipated events such as COVID-19, natural disasters, and the changing regulatory environment, among several other factors. An example is the occurrence of the virus in Wuhan, thereby ceasing exports from the city and causing huge deficits in firms reliant on such exports at both tier 1 and tier 2 levels (Karmaker et al., 2021).

The pandemic created a chain reaction that caused severe disruptions in global supply chain architecture (Govindan, Mina, & Alavi, 2020; Remko, 2020). Remko (2020) interviewed supply chain executives and found that the pandemic clamped the supply chain with 'textbook supply and demand disruptions. Developing economies, with their peculiarities, often face several challenges (Karmaker et al., 2021; Majumdar et al., 2020). Firstly, emerging economies are characterized by 'institutional voids' (Rahman, Ali, Moktadir, & Kusi-Sarpong, 2020). According to Silvestre (2015b), an institutional void is created by weak institutions in a country. The presence of such institutional voids increases the level of uncertainty in the operating environment. The SLR conducted by Rehman, Jajja, Khalid, and Seuring (2020), found that institutional voids pose a risk in the base of pyramids market and supply chains. Second, Silvestre (2015b) found that the operating environment of businesses in developing economies is more volatile than that in developed countries. The degree of environmental turbulence also affects SC performance in such economies (Silvestre, 2015b). A highly volatile business environment may lead to organizational inertia.

The current uncertainties and dynamism experienced in the global SC (Allaoui, Guo, & Sarkis, 2019) are increasingly forcing firms to collaborate in a manner that enhances information sharing among cooperating partners as a risk reduction and mitigation strategy (B. Li & Jiang, 2019; Madsen & Petermans, 2020).

2.3. SCM Dynamic Capabilities and Organisational Performance

2.3.1. SSCM Collaboration and Organisational Performance

SCM collaboration is a strategic approach that involves active cooperation and coordination between various stakeholders within a supply chain network. It aims to improve efficiency, reduce costs, enhance customer satisfaction, and drive the overall supply chain performance. Based on Fan et al. (2020), supply side resilience). Dolgui et al. (2020) conducted a simulation study of the structural dynamics of a supply chain. The empirical results found support for information sharing and coordination as risk-mitigating strategies to curb both the 'ripple' and 'bullwhip' effects. Using empirical survey data from 215 food manufacturing firms in Thailand, Pakdeechoho and Sukhotu (2018), analysed using hierarchical regression and cluster analysis found a link between sustainable supply chain collaboration (SSCC) and improved economic and social performance. This relationship does not necessarily hold for the environmental performance dimension. Collaboration can enhance the outcome of the SCM function (Sharma et al., 2022), thereby mitigating risk, reducing costs, and enhancing the cash flow of the firm (Dolgui et al., 2020). According to Pankowska (2019), commonly shared resources include both 'tangibles and intangibles, ' which drive the alliance between suppliers and recipients on the other end.

This leads to the following hypothesis.

H_1: There has a positive and significant effect on manufacturing firms' business performance after post-COVID-19.

2.3.2. SSCM Resilience and Organisational Performance

Resilience is the ability of the SC 'to withstand a disruption (or a series of disruptions) and recover the performance' (Hosseini et al., 2019; Zhao et al., 2019). It is the ability of an SC to endure and bounce back from shocks such as natural catastrophes, pandemics, geopolitical events, and technological malfunctions. It entails putting strong plans, procedures, and mechanisms in place to assist organizations in overcoming unforeseen difficulties and reducing the effect on their daily operations. According to Hosseini et al. (2019), a common feature of SC resilience is its ability to withstand disruptions and breakdowns, thereby creating a state of recovery that results in the transition to the initial state of performance. According to W. Yu, Jacobs, Chavez, and Yang (2019), resilience is a company's operational capacity to modify demafluctuationsier to achieve long-term growth and enhance business performance. It is the ability of an SC to withstand a disruption (or a series of disruptions) to maintain planned performance (Simchi-Levi, Wang, & Wei, 2018).

In the midst of Covid-19, the effectiveness of firms' DC determines their capacity to sustain sustainable SC in developing nations. According to recent research, in the post-COVID-19 era, resilience can provide firms with a competitive edge by fostering flexibility, integration, and agility (Ramos, Patrucco, & Chavez, 2023). Moreover, resilience can ensure that the SC returns to a pre-disturbance state and continuity (Demirel et al., 2019). The authors offered different definitions in the literature. These principles are based on the structural adaptability of open systems. The defining characteristics of this are: 'control, self-adaptation, and self-organization'. According to Ivanov (2020), a resilient supply chain is a dynamically adaptable and structurally changeable value-adding network able to (i) react agilely to positive changes, (ii) absorb negative events and recover after disruptions, and (iii) survive long-term, global disruptions by adjusting capacity utilization and their allocations to demands in response to internal and external changes in line with sustainable developments to secure the provision of society and markets with goods and services from a long-term perspective."

H_2: SCM resilience positively affects the business performance of manufacturing firms post-COVID-19.

2.4. SSCM Best Practices in Emerging Economies

Authors, such as Ivanov (2020); Queiroz, Ivanov, Dolgui, and Fosso Wamba (2022); Sarkis et al. (2020); Scavarda et al. (2019); Shi et al. (2023); Sharma et al. (2022); Remko (2020); van Hoek (2020); Z. Yu and Rehman Khan (2022) conceptualized different configurations and strategies for SC survival more especially in the recent COVID-19 pandemic. The study by (Gouda & Saranga, 2018)Gouda and Saranga (2018) using empirical data from 21 countries inclusive of emerging economies found that implementing sustainability efforts in addition to risk mitigation strategies reduces SC risk, especially in emerging markets.

First, the adoption of healthy working practices has been exposed to the COVID-19 pandemic. Using expert views and opinions, Karmaker et al. (2021) identified the need to develop healthy practices across all stakeholders in the SC. The authors found that this factor was present in an independent cluster and was vital to ensuring the sustainability of the SC in emerging economies. Health and safety protocols should be guided by WHO suggestions and cover from manufacturing to logistics and distribution. Munny et al. (2019), using the best-worst method to analyze sustainability enablers in the footwear supply chain of Bangladesh, found that workplace health and safety practices were the most important enablers of social sustainability.

Second, there is a need for financing and funding along the broad spectrum of SC. This is because the COVID-19 pandemic has created many economic disruptions in several economies. Karmaker et al. (2021) argue that financial support from stakeholders, partners and government can be sustainable in SCs. Firms currently incur huge financial outlays in securing the purchase of goods and services from suppliers (Rashidi & Saen, 2018). The government can provide incentives in the form of tax reductions and low-interest loans. This is consistent with Saeed and Kersten (2019), who found that financial support can enable supply chains to achieve sustainability. Policy frameworks that support such transitions are also needed, especially in emerging economies (Karmaker et al., 2021).

Sustainability-focused supplier development (M. Jia et al., 2023). This is based on embedding sustainability principles along the supply chain, which is driven by the buyer's angle. Sustainable supplier development seeks to expand the monolithic focus of traditional supplier development, ensuring efficiency and operational performance, to inculcate a sustainable development perspective by meeting the tripartite composition of the TBL (Kumar & Rahman, 2016). The adoption of sustainable supplier development can mitigate the negative impact of competitive pressure. Sustainability-oriented supplier development is based on the twin concepts of 'sustainability-oriented supplier assessment' and 'sustainability-oriented supplier collaboration' (Grimm, Hofstetter, & Sarkis, 2014; M. Jia et al., 2023). The assessment involves evaluating and monitoring a supplier's posture concerning sustainability, which culminates in ensuring compliance (Grimm et al., 2014) and collaboration between buyers and suppliers in the broad sustainability spectrum (Grimm et al., 2014; Ni & Sun, 2018).

Fourth, there is also a need to reevaluate current supplier decisions, as exposed by the recent pandemic. Remko (2020) identified the need to close stop gaps in supply chain disruption by utilizing local sourcing in global sourcing practices as a strategy to de-risk the supply chain. This can further mitigate the negative impacts of unanticipated events that cause disruptions in production.

Fifth, the big data era has called for the use of digital tools for data analysis and information processing (Bag et al., 2020). As stated by Bag et al. (2020), big data analytics can help firms transition to a sustainable supply chain management task. Using a sample of mining executives in South Africa, Bag et al. (2020) analyzed the data using PLS-SEM and found that BDA had a strong significant effect on 'innovative green product development and sustainable supply chain outcomes.'

Lastly, the pandemic has exposed vulnerabilities and weaknesses in the supply chains of emerging economies. Karmaker et al. (2021) suggest the need for supply chains to maintain agility to achieve sustainability from the dramatic changes in the environment and market flux caused by the pandemic. Supply chain agility enables a firm to respond immediately to changes (Gouda & Saranga, 2018). The concept has also been referred to as viability in other studies, which depicts the ability to survive in a

disruptive circumstance. According to Ivanov and Dolgui (2020), "viability is a behaviour-driven property of a system with structural dynamics."

2.2. Theoretical Framework

This study adopts stakeholder theory to explain sustainability within a supply chain management framework. The theory was propounded by Edward Freeman in 1984; stakeholders are defined as any group within or outside an organization that has a stake. The definition was further extended by Boselie (2010), who opined that they are capable of influencing 'strategic decision-making within the organization.' Neglecting these stakeholder groups would harm the performance of the organization and, ultimately, the financial bottom line. The theory has been broadly explained from several perspectives, such as descriptive, normative, managerial, and instrumental. Increased and sustained pressure from a variety of stakeholders has driven companies to adopt SSCM. A wide range of parties are involved in SCM, including national and international governmental organizations, suppliers, manufacturers, retailers, logistics service providers, and infrastructure providers such as port authorities. Furthermore, Co and Barro (2009) categorized stakeholder management strategies into aggressive and cooperative strategies. Aggressive strategies are characterized by some form of forceful attitude or behavior, while cooperative strategies are characterized by supportive attitudes or behaviors towards stakeholders. Both are geared toward altering other stakeholders' behavior.

Sustainability introduces 'less quantifiable considerations' usually related to environmental and social issues (Linton, Klassen, & Jayaraman, 2007). Therefore, sustainability requires meeting the needs of different stakeholders with different interests and demands. The importance of stakeholder theory is that it enables managers to determine the individual importance of each group and its effect on firm value creation. In the SLR conducted by Meixell and Luoma (2015), the authors made three key findings concerning stakeholder influence on supply chain management. First, stakeholder pressure in supply chain management creates sustainability awareness and the adoption and implementation of sustainability practices. Second, different stakeholder categories have different effects on supply chain networks. Third, the influence of each stakeholder group depends on whether the contention is an environmental or social issue.

2.3. Empirical Review

Joshi and Sharma (2022) analysed the impact of SSCM on performance in India. Data were gathered from 153 SMEs using a survey. SEM was used to analyze the primary data. The SEM showed evidence that SSCMP positively affected TBL components, that is, people, planet, and profit. A positive association was also confirmed between the SSCMP and DC of firms.

Using data from 210 textile firms, Rasheed, Zaheer, Hassan, Junaid, and Majeed (2023) analysed the effect of SSCM on organisational performance. The authors found evidence to support that SSCM practices can enhance organizational and environmental performance. In addition, SSCM enhances firms' operational efficiency.

Shi et al. (2023), analysed primary data from the Indian textile industry using PLS-SEM. The study revealed that business performance is directly influenced by internal sustainability practices and demand-side sustainability activities. Additionally, it was discovered that the sustainability actions of suppliers directly and favorably affected the company's internal sustainability, which in turn positively and directly affected demand-side sustainability in the Indian textile sector.

Hong, Zhang, and Ding (2018) using a sample of 209 Chinese manufacturing firms found a significant positive effect of SSCM on the economic performance, environmental and social performance of the firms. The Structural Equation Model shows that supply chain dynamic capabilities partially mediate this relationship.

Others, such as Z. Yu and Rehman Khan (2022) identified financial constraints in the study concerning green agricultural product SCM. Karmaker et al. (2021) observed the need for collaborative financing

among different tiers of the supply chain to improve resilience and agility. With financial support from the government, the highest crisp value was recorded.

Rahman et al. (2020), from another emerging economy case. From an analysis of managerial opinions in the Bangladeshi plastic industry, the authors identified the following barriers to green supply chain management: inadequate knowledge and support', 'insufficient technology and infrastructure, financial constraints, and unsupportive organizational and 'operational policies.'

3. Research methodology

The methodology is a crucial aspect of any empirical research, as it defines the various processes and approaches a researcher utilizes to collect and analyze the data to address the research aims and objectives. According to Al-Ababneh (2020), "methodology provides a rationale for the choice of methods and the particular forms in which the methods are employed." Quantitative methodologies focus on the collection and conversion of data into numerical forms and the subsequent statistical calculations performed on them (Barata et al., 2024). The quantitative approach is closely linked to the use of Likert scale formats (with options as follows: Strongly Agree [5], agree [4], neutral [3], disagree [2], Strongly Disagree [1]) to enable the gathering of field survey data.

3.1. Research Design

The research design adopted in this study was a survey. Survey research designs are well suited when a researcher seeks to obtain information on the attitudes, opinions, and perceptions of respondents on a particular issue, in this case, SSCM dynamic capabilities. The study utilized an analytical survey procedure (Al-Ababneh, 2020) conducted in a non-contrived setting.

3.2. Data Collection

The study used primary data generated from a structured questionnaire, which allowed more respondents to participate in the study. However, similar to the approach used in several recent studies as a result of the pandemic, the researcher used an online questionnaire created using Google Docs. The questionnaire comprised close-ended questions designed using a Likert-scale format with five options. Online questionnaires are more cost-effective, collect data automatically, and are easier to administer. The questionnaire was designed into subsections to provide relevant answers to issues of interest in the study, answer the research questions, and test the formulated hypotheses. The survey instrument was designed using both nominal and interval scales. The nominal scale was used to collect bio-data (i.e., demographic information), while the interval scale (i.e., Likert scale) was used to collect information on aspects that answer the research questions.

3.3. Sample Size and Sampling Technique

Researchers purposively sampled practitioners across several fields, including academics and practitioners in the field of marketing and management. To ensure a manageable sample size after due consideration of time and budget constraints, which are sufficient to enable data analysis and appropriate to address the objectives of the study (O'reilly & Parker, 2013). Therefore, the researcher employed a purposive sampling technique, and a final sample of 125 respondents, comprising 45 academics and 77 practitioners, was selected. This sampling technique was used in a similar study by Zahedi, Abbasi, and Khanachah (2020). Purposive sampling is useful for selecting respondents in either a quantitative or qualitative study to yield the required data and provide researchers with valuable information on the research focus (Elo et al., 2014). According to Karmaker et al. (2021), the on 'purposive or judgemental sampling method relies on the judgement of the researcher when choosing the members of the population to be included in the study. This sampling is also consistent with that used in prior SSCM research (Karmaker et al. (2021)).

3.3.1. Pilot Test

Pilot tests are useful in surveys to improve the content validity of an instrument, enhance participation, and reduce the incidence of nonresponse bias. The survey instrument was pilot-tested on 15 respondents, comprising five (5) SCM professionals; five (5) management lecturers, and five (5) post-graduate students of Nnamdi Azikiwe University who provided feedback regarding content, structure,

and wording. The questionnaire was designed according to British English standards. The suggestions and modifications suggested by the pilot sample were incorporated into the final questionnaire, which was then administered to respondents for use in the study.

3.4. Ethical Consideration

Ethics in research refers to an expected level of conduct or social behavior during the research process. Ethics in social science research often involve the twin issues of confidentiality and anonymity, and a researcher must ensure this (Gibson, Benson, & Brand, 2013; Pillai & Kaushal, 2020). The author utilized a coding strategy to ensure confidentiality and anonymity of the subjects, and the data were stored on a personal encrypted laptop (Gibson et al., 2013). The consent of respondents in the study was obtained before administration of the actual instrument via an informed consent letter sent before instrument administration, and those who responded were sent the survey link for research purposes.

3.4.1. Validity of the Instrument

The instrument was presented to five (5) SCM professionals for observation and suggestions regarding language and content (Kar, 2020). Suggestions and language modifications were incorporated into the final questionnaire before it was distributed.

3.4.2. Reliability of the Instrument

The reliability of the instrument was evaluated using Cronbach's alpha coefficient (α), a measure of the internal consistency of an instrument (Tavakol & Dennick, 2011). Scholars have suggested a minimum benchmark for this statistic (α) in the range of 0.60 – 0.90. Cronbach (α), values above 0.70 are deemed acceptable (Hair, Hult, Ringle, Sarstedt, & Thiele, 2017).

Table 1. Cronbach result of model variables

Variable	N	□
SCM Collaboration	5	.761
SCM Resilience	5	.723
Organisational Performance	10	.889

Source: SPSS ver. 25

Based on the above, following George and Mallery (2003), '*rule of thumb*': "_ > .9: Excellent, _ > .8: Good, _ > .7: Acceptable, _ > .6: Questionable, _ > .5: Poor, and _ < .5: Unacceptable" (p. 231); we consider SCM Collaboration and SCM Resilience-Acceptable; while, Organisational Performance-Good.

3.5. Methods of Data Analysis

Data analysis is a vital aspect of any empirical study that requires a hypothetical validation. Yin (2014) suggests five basic steps involved in empirical data analysis are as follows: (a) data compilation and codification; (b) disintegrating and integrating the data; (c) data imputation; (d) performing relevant statistical analysis; and, (e) interpreting the data (Yin, 2014). This sequence also formed the foundational steps of the data analysis procedure employed in this study. The researcher employed The Statistical Package for Social Sciences (SPSS) version 25 was used for the analysis of the primary data. The researchers employed descriptive statistics, correlations, and linear regression to analyze the data.

The model is as follows:

$$ORGP = \alpha_0 + SCMC + SCMR + \mu$$

Where:

ORGP - Organisational Performance
SCMC - SCM Collaboration
SCMR - SCM Resilience
α_0 - Constant
μ - Error term

4. Results and discussions

An online method was used to collect data. After the removal of incomplete responses, 122 completed responses were recorded.

Table 2. Gender distribution of respondents

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	56	45.9	45.9	45.9
	Male	66	54.1	54.1	100.0
	Total	122	100.0	100.0	

Source: SPSS ver. 25

Table 3. Age distribution of respondents

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	31 – 45 years	81	66.4	66.4	66.4
	46 – 55 years	28	23.0	23.0	89.3
	55 & Above	13	10.7	10.7	100.0
	Total	122	100.0	100.0	

Source: SPSS ver. 25

Of the respondents, 45.9% were female and 54.1% were male. Of the respondents were between 31-45 years; while 23.0% were in the age category–46-55 years; lastly, and 10.7% were 55 years and above.

Table 4. Academic qualification of respondents

Highest academic qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	HND/BSc	80	65.6	65.6	65.6
	MSc/PhD	42	34.4	34.4	100.0
	Total	122	100.0	100.0	

Source: SPSS ver. 25

The academic qualification of the respondents showed that 65.6% of the respondents had an HND or BSc qualification and 34.4% had postgraduate qualifications (MSc or PhD).

4.1. Correlation Analysis

Table 5. Pearson correlation matrix of the variables

Correlations

		Resilience	Collaboration	Organisational Performance
Resilience	Pearson Correlation	1	.543**	.545**
	Sig. (2-tailed)		.000	.000
	N	122	122	122
Collaboration	Pearson Correlation	.543**	1	.881**
	Sig. (2-tailed)	.000		.000
	N	122	122	122
Organisational Performance	Pearson Correlation	.545**	.881**	1
	Sig. (2-tailed)	.000	.000	
	N	122	122	122

**. Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS ver. 25

The correlation matrix showed that resilience was positively correlated with collaboration (.543) and organizational performance (.545). However, collaboration had a stronger correlation with organizational performance at .543. All correlation coefficients were significant at the 1%, 5%, and 10% levels.

4.2. Test of Hypotheses

The following hypotheses were tested in this study.

H_1: Therhasis has a positive and significant effect on manufacturing firms' business performance after post-COVID-19.

H_2: SCM resilience positively affects the business performance of manufacturing firms post-COVID-19.

Table 6. Model summary of research hypothese

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.885[a]	.783	.779	.28169

a. Predictors: (Constant), Collaboration, Resilience

Source: SPSS ver. 25

The summary statistics shown in the table above show that the model had R^2 =.783 (Adjusted R^2 =.779). This implies that our explanatory variables account for approximately 77.9% of the variation in the dependent variable, which is the organizational performance metric. The high R^2 value shows that the model is highly significant in this context, which the study attempts to explain.

Table 7. ANOVA summary of research hypotheses

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.001	2	17.001	214.248	.000[b]
	Residual	9.443	119	.079		
	Total	43.444	121			

a. Dependent Variable: Organisational Performance

b. Predictors: (Constant), Collaboration, Resilience

Source: SPSS ver. 25

The F-stat. which is used to test the statistical significance of the model shows a high F value=214.25; with a p-value <.05=.000 this confirms the statistical significance of the multiple linear regression model.

Table 8. Coefficients output of research hypotheses

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.361	.212		1.702	.091
	Resilience	.077	.041	.094	1.848	.067
	Collaboration	.853	.052	.830	16.309	.000

a. Dependent Variable: Organisational Performance
Source: SPSS ver. 25

The first hypothesis showed a t-stat of 16.309 with a p-value<.05=.000, which suggests that there has a positive significant effect on manufacturing firms' business performance post-Covid 19. The second hypothesis showed that the t-stat of resilience was 1.848 with a p-value >.05=.067, which suggests that SCM resilience positively and non-significantly affects the business performance of manufacturing firms post-COVID-19. These findings are consistent with those of several studies in various contexts, such as Hosseini et al. (2019); Zhao et al. (2019). The positive effect of SCM collaboration confirms that it ensures business performance during turbulent periods. This perspective is confirmed by authors such as Ivanov (2020), Karmaker et al. (2021), and Majumdar et al. (2020) on the implications of collaboration. This supports the study by Joshi and Sharma (2022) in India, which showed evidence that SSCMP positively affects TBL components, that is, people, planet, and profit. A positive association was also confirmed between the SSCMP and DC of firms. Shi et al. (2023) analyzed primary data from the Indian textile industry using PLS-SEM. The study revealed that business performance is directly influenced by internal sustainability practices and demand-side sustainability activities. Additionally, it was discovered that the sustainability actions of suppliers directly and favorably affected the company's internal sustainability, which in turn positively and directly affected demand-side sustainability in the Indian textile sector. Moreover, SSCM focuses on the overall improvement of an organizational bottom line (Carter & Liane Easton, 2011).

The positive effect of resilience confirms that an SC's resilience is its capacity to recover in the face of an interruption, e.g., Covid-19 or other forms of disturbances. This is supported by Rasheed et al. (2023), who use data from 210 textile firms and find evidence to support that SSCM practices can enhance organizational and environmental performance. Resilience enables firms to tolerate shocks and malfunctions, leading to a condition of recovery that facilitates return to the initial performance level (Simchi-Levi et al., 2018). According to Ramos et al. (2023) research, in the post-COVID-19 era, resilience can provide an SME with a competitive edge by fostering flexibility, integration, and agility.

5. Conclusions

The study concludes that a nexus exists between SSCM and the organizational performance of manufacturing firms in Nigeria. The study specifically finds that the SSCM dynamic capability components of collaboration and resilience positively affect organizational performance. This study has implications for policymakers and academics on the implications of external environmental factors on long-term business growth and survival. The study recommends among others that

1. Improved SCM Collaboration: This fosters strong relationships with key suppliers, customers, and partners. To grow in an expanding market, managers need open communication channels that enable the sharing of information and early detection of potential disruptions. Organizations need to monitor their operational and organizational performance and adjust to meet unforeseen conditions. Collaboration such as information exchange among suppliers should be enhanced, supplier diversification, among others; and,
2. Managers should develop SCM resilience by conducting a thorough evaluation of potential risks and vulnerabilities in the SC. Managers should adopt robust risk management practices in the face of challenges to support firm performance during turbulence, such as that witnessed during COVID-19. In today's environment, maximizing profitability through the identification of areas for improvement and comprehension of target attainment can maximize operations. In this era of data explosion, resilience can be improved by effectively utilizing technology; thus, managers need to acquire the necessary skills to handle the information flow in today's environment.

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