

Innovations

Supply Chain Resilience and Sustainable Competitive Advantage of Brewery Firms in South West Nigeria

Desmond Odeyovwi Otutuadum

Department of Marketing and Entrepreneurship,
Faculty of Management Sciences,
Delta State University, Abraka

&

Olannye A. Peter

Department of Marketing and Entrepreneurship,
Faculty of Management Sciences,
Delta State University, Abraka

Abstract

The study examined the effect of supply chain resilience on sustainable competitive advantage of brewery firms in South West Nigeria. This study used a cross-sectional survey research design method. A total of 342 supply chain channel members made up the study's population. A total of 181 respondents were chosen as the sample size. Stratified sampling technique was used for the study. A structured questionnaire served as the study's research instrument. A test-retest reliability technique was used to determine the instrument's reliability. Descriptive statistics, correlation and multiple regressions were used to analyze the data collected for the study. Findings showed that supply chain agility, supply chain flexibility, supply chain collaboration and supply chain digitalization had significant positive effect on sustainable competitive advantage of brewery firms in South West Nigeria. The study concluded that supply chain resilience had significant positive effect on sustainable competitive advantage of brewery firms in South West Nigeria. The study recommended amongst others that firms should create cross-functional teams dedicated to monitoring market trends and emerging risks.

Keywords: *supply chain agility, supply chain resilience, sustainable competitive advantage*

1. Introduction

The modern business environment is defined by its dynamic and unpredictable nature, which presents several challenges to organisations across various industries. The challenges involve maintaining a competitive edge and ensuring long-term, sustainable success. In the competitive brewing industry, breweries must efficiently manage complex supply chain networks and implement sustainable practices to establish and maintain their market position. Supply chain resilience is the capacity of an organisation to foresee, adjust to, and bounce back from interruptions or uncertainties in the supply chain. It is a vital component of modern business practices (Alkhatib, 2022; Eslami&Scholz, 2021). Brewery companies must possess resilience to effectively handle risks associated with raw material availability, production capacity, distribution logistics, and market demand fluctuations. Creating strong supply chains can help brewery businesses deal with unexpected events like natural disasters, supplier bankruptcies, or economic downturns, ensuring smooth operations and maintaining customer satisfaction.

Brewery companies are facing supply chain resilience issues and must also implement sustainable practices to meet evolving societal and environmental demands. The main goal of supply chain management is to maximise the efficiency of product flow and improve the profitability of the supply chain (Belhadi et al., 2021). Nevertheless, it is important to mention that every operation within a supply chain is accompanied by inherent risks, which result from the presence of ambiguous and imprecise information that may create disruptions (Pournader, Rotaru, Kach, &Hajiagha, 2016). The concept of supply chain resilience is crucial for effectively managing and containing supply chain disruptions. Every company faces different threats that could lead to data and resource disruptions. Supply chains are very susceptible to both internal and external shocks, including economic downturns, disruptions in the flow of goods, the loss of major customers, and changes in technology and infrastructure. Within the area of supply chain management, supply chain resilience (SCR) is typically regarded as the capacity of companies to remain watchful, react rapidly, and adjust to the repercussions of supply chain disruptions (Pu, Li, &Bai, 2023).

The operational performance of the supply chain may encounter potential risks across several domains. The majority of organisations act within a strongly competitive commercial milieu, consequently exposing their supply chains to a varied array of problems that might exert harmful consequences on markets, industries, and their projected growth trajectories. Certain interruptions may be more tolerable than others, and their influence on the performance of enterprises and supply chains may vary (Wamba, Dubey, Gunasekaran, &Akter, 2020). The significance of supply chain resilience (SCR) is attributed to the varied internal and

external disturbances that supply networks encounter owing to human or environmental reasons. These shocks render supply chains susceptible, particularly in light of the rising complexity that results from global interconnections (Tukamuhabwa, Stevenson, Busby, & Zorzini, 2015). Pavlov, Ivanov, Dolgui, and Sokolov (2018) have identified different potential disruptions such as environmental disasters, technology transformations, critical supplier terrorism, and political turbulences. These disruptions have the potential to inflict major monetary and operational damages or even lead to the entire shutdown of the supply chain (Tukamuhabwa et al., 2015). The "ripple effects" of supply chain disruption have been discovered to have several implications, as outlined by Kinra, Ivanov, Das, and Dolgui (2020).

Moreover, the majority of firms have identified the necessity of supply chain resilience (SCR) in their operations, pushed by the integration of digital technology. In particular, digital technologies have proven to be helpful in improving decision-making processes pertaining to the construction of supply chain operations, offering precise and timely data analysis, and enhancing the interfaces between supply chain participants. Consequently, this has resulted in greater supply chain integration and the identification of possible disruptions before they escalate (Ivanov & Dolgui, 2020). The introduction of digital technologies enables enterprises to swiftly adjust to changes, thereby lowering the unfavourable effects of disruptions on operational performance and boosting the supply chain's overall performance. Developing nations play a crucial role in the global supply chain but are vulnerable to supply chain disruptions. Various risks and disruptions faced by numerous organisations are due to the political, economic, and cultural variables in these countries (Tukamuhabwa, Stevenson, & Busby, 2017). Alkhatib (2022) pointed out that scholars in poor nations have not sufficiently addressed the topic of disruption and supply chain resilience (SCR), despite its importance. Current literature mostly focuses on how supply chain resilience (SCR) impacts operational performance in industrialised countries, with less attention given to emerging ones, specifically in the case of brewing companies in Nigeria. The objective of this research is to address the aforementioned deficiency by examining the effect of supply chain resilience on the sustainable competitive advantage of brewery firms located in South-West Nigeria.

1.2 Statement of the Problem

The absence of supply chain agility is impeding firms' capacity to promptly react to unforeseen disruptions, shifts in customer demand, or market volatility in the current business landscape. This is leading to higher expenses, delays, and customer discontent. It is crucial to pinpoint the main obstacles to supply chain agility and create methods to improve it. Many organisations are finding it challenging to strike a balance between cost efficiency and supply chain flexibility. The inflexible

systems and procedures currently in use are hindering the capacity to adjust to swiftly evolving market circumstances, leading to squandered chances and client discontent. An investigation into the issues hindering supply chain flexibility is crucial in order to enhance adaptability while maintaining cost-effectiveness. Brewery companies that effectively incorporate supply chain resilience and sustainability into their operations might gain a durable competitive edge. This advantage allows businesses to distinguish themselves in the market, appeal to environmentally sensitive consumers, and establish enduring connections with stakeholders. These organisations establish themselves as industry leaders in the brewing sector by actively managing risks and adopting sustainable practices, which in turn boosts brand loyalty, improves reputation, and drives financial performance.

Poor collaboration in the supply chain network is hindering the smooth exchange of information, resources, and products. The absence of coordination results in inefficient inventory management, longer lead times, and elevated operating expenses. It is crucial to identify the underlying reasons for inadequate supply chain collaboration and implement efficient collaboration methods across stakeholders to enhance overall supply chain performance. Many organisations are finding it challenging to successfully incorporate and utilise digital technology to enhance supply chain operations, despite their increasing significance. The lack of a defined digitization plan and obstacles with data security, interoperability, and technology acceptance are hindering advancement. It is essential to pinpoint the barriers to effective supply chain digitalization and create a plan for their execution. This article seeks to investigate the impact of supply chain resilience and sustainable competitive advantage on brewing companies. The study explored the strategies used by brewery companies to establish robust supply chains and implement sustainable methods.

1.3 Objectives of the Study

The main objective of the study is to examine the effect of supply chain resilience on sustainable competitive advantage of brewery firms in South West Nigeria. The specific objectives are to:

- i. Determine the effects of supply chain agility on sustainable competitive advantage of brewery firms in South West Nigeria.
- ii. Ascertain the effects of supply chain flexibility on sustainable competitive advantage of brewery firms in South West Nigeria.
- iii. Evaluate the effect of supply chain collaboration on sustainable competitive advantage of brewery firms in South West Nigeria.

- iv. Determine the effect of supply chain digitalization on sustainable competitive advantage of brewery firms in South West Nigeria.

1.4 Statement of Hypotheses

H₁: Supply chain agility has significant effect on sustainable competitive advantage of brewery firms in South West Nigeria.

H₂: Supply chain flexibility has significant effect on sustainable competitive advantage of brewery firms in South West Nigeria.

H₃: Supply chain collaboration has significant effect on sustainable competitive advantage of brewery firms in South West Nigeria.

H₄: Supply chain digitalization has significant effect on sustainable competitive advantage of brewery firms in South West Nigeria.

2. Review of Related Literature

2.1 Supply Chain Resilience

Resilience is defined as an adaptive and evolving phenomenon. Resilience is the ability of supply chains to adapt and recover promptly from supply chain disturbances, returning to their original or even enhanced form. Resilience is the capacity to proactively reduce the effects of risk, particularly in an unpredictable supply chain environment (Hasani&Khosrojerdi 2016). Chowdhury and Quaddus (2016) described supply chain resilience (SCR) as the ability of a supply chain to avoid disruptions by enhancing flexibility and promptly reacting to and recovering from disruptions. Sand (2021) outlined three strategies for supply chains to enhance their resilience: Tracking technology, an artificial intelligence tool, is suitable for the dangers and pressures faced by the SC and aids in learning from previous experiences. Secondly, establishing trust and creating shared value among all SC members. Thirdly, pinpoint supply chain flaws, as vulnerabilities might arise at any stage within the supply chain. Zhuo et al. (2020) identified three characteristics of supply chain resilience (SCR) that enhance the dynamic process of the supply chain system in handling risks through preparedness, response, adaptation, and recovery. Other companies participate in supply chain integration (SCI) operations for financial purposes in order to minimise supply chain risks and prevent interruptions (Jajja et al. 2018).

Supply chain resilience (SCR) is crucial for minimising unexpected disruptions, preventing their spread, recovering from them, and swiftly implementing effective plans to restore stable operations. This is anticipated to significantly enhance firms'

operational performance. Alkalha et al. (2021) identified SCR as the intermediary connecting absorptive ability and operational effectiveness in global enterprises. The findings indicated that SCR partially mediates the relationship between absorptive capacity and operational performance, exerting a significant influence on operational performance. Supply chain resilience is crucial for businesses to thrive in uncertain environments where unexpected events can have a quick detrimental impact on operations due to increasing environmental unpredictability (Ali, Mahfouz, & Arisha, 2017). By implementing supply chain resilience (SCR), businesses can effectively handle supply chain disruptions, restore their initial operational capacity, or even enhance it within a specific timeframe. This helps enhance collaboration between supply chain partners and achieve supply chain agility (SCA) (Hohenstein, Feisel, Hartmann, & Giunipero, 2015).

2.2 Supply Chain Agility (SCA)

Supply chain agility refers to the speed at which a supply chain adapts to shifts in customer preferences, market conditions, and competition (Kumar, Bak, Guo, Shaw, Colicchia, Garza-Reyes, & Kumari, 2018). Agility is the ability of organisations to adjust their supply networks to changes efficiently and promptly. Global supply chain agility refers to a company's ability to effectively and lucratively adapt to fluctuations in international markets within the framework of dynamic capability and contingency theory (Nandi, Sarkis, Hervani, & Helms, 2021). Smith, Ruamsook, and Tracey (2021) highlighted that SCA can affect different performance aspects, such as market, financial, and operational performance. Developing an agile supply chain may require involvement from several manufacturing organisations, including raw material suppliers, manufacturers, and distributors. A firm's supply chain agility is its ability to quickly meet consumer demands while controlling costs, which can only be accomplished through the use of modern digital technology (Golgeci, Bouguerra, & Rofcanin, 2019). Supply chain agility (SCA) is a crucial capability for maintaining competitiveness in the current unpredictable business landscape (Sharma, Sahay, Shankar, & Sarma, 2017). Supply chain agility refers to a company's capacity to accurately predict and promptly react to fluctuations in demand (Yıldız & Çetindaş 2019). Supply chain analytics (SCA) is perceived as a strategic instrument that enables organisations to achieve a competitive edge (Kuo-Jui, Tseng, Chiu, & Lim, 2017). Manufacturing organisations have long acknowledged that qualities like flexibility and agility are crucial for enhancing competitiveness.

Companies attain competitiveness by promptly and effectively addressing diverse client demands across several markets. The ability of organisations to apply agility in the supply chain determines their competitive edge. Lyons, Lam, Cheng, and Dominguez-Pery (2017) found that supply chain agility significantly impacts cost efficiency and customer service. In Güner's (2018) study, the impact of agility and

technology uncertainty on firm performance in supply chain management was examined. The results indicated that supply chain agility positively influences firm performance. Supply chain agility refers to a company's capacity to react swiftly to anticipate changes in external markets and alter its supply chain operations accordingly. An agile reaction necessitates swift adjustments in delivery time, design, product enhancements, product launch, and production capabilities to efficiently satisfy consumer demand at a low cost (Al-Shboul, 2017). Supply chain agility is viewed as a key factor for long-term success in operational performance when companies operate in unpredictable marketplaces. Shin, Lee, Kim, and Rhim (2015) define supply chain agility as a strategic element that incorporates agile business principles into operational processes, goods, services, technologies, and management strategies. Supply chain agility, as a comprehensive strategy, enhances responsiveness to consumer demands by enhancing delivery reliability and speeding up product launches (Al-Shboul, 2017; Giannakis & Louis, 2016). This leads to a competitive edge that guarantees the sustainability of businesses in unpredictable marketplaces (Wu, Tseng, Chiu, & Lim, 2017).

2.3 Supply Chain Flexibility (SCF)

Supply chain flexibility refers to the capacity of the supply chain to adapt to environmental uncertainties and fulfil a wide range of customer demands without incurring significant expenditures, time delays, organisational disturbances, or performance setbacks. Flexibility is a dynamic and adaptive ability that enables a supply chain to adjust to changing and unpredictable demands, ultimately enhancing customer satisfaction. It encompasses five dimensions: product flexibility (customisation), volume flexibility, launch flexibility (new product introduction), access flexibility (distribution channels), and responsiveness to target markets, all aimed at improving customer satisfaction. Flexibility is attained by robust supply chain relationships, adaptable contracts allowing for changes in delivery dates, manufacturing facilities capable of creating various goods, and a versatile workforce. SCF in a relevant study refers to a system's capacity, such as that of a manufacturing firm, to adapt to unwanted changes within the system, such as equipment failures, inventory management, fluctuating task durations, and reworkings (Huo, Gu, & Wang, 2018). The firm's capacity to adapt to or react to unpredictability. SCF is described by Yu, Luo, Feng, and Liu (2018) as a company's ability to get, handle, and convey information to facilitate effective and prosperous supply chain activities. SCF refers to a company's ability to adapt its supply chain processes in reaction to changes in the environment in order to enhance performance (Shukor, Newaz, Rahman, & Taha, 2020). Several companies have utilised supply chain finance (SCF) to develop skills and adjust to market demands

in order to gain a competitive edge and enhance corporate performance (Centobelli, Cerchione, & Ertz, 2020).

Eltawy and Gallea (2017) state that the objective of SCF is to enhance mass production and ensure items are manufactured accurately on the first attempt, following the correct procedures without any mistakes. Supply chain finance (SCF) can lower expenses, boost inventory turnover, decrease lead times, and minimise errors, motivating companies to enhance their supply chain. SCF is categorised in different ways in the literature, such as flexibility in supply chain activities from upstream to downstream, volume flexibility, and process flexibility (Singh, Gunasekaran, Khalili, & Shirouyehzad, 2019). Upstream flexibility refers to the manufacturing and operational adaptability that encompasses processes, scale, variety, and the involvement of workers and suppliers (Luo & Yu 2016). Volume flexibility is a company's capacity to adjust its production levels in response to changes in consumer demand (Fayezi & Zomorodi, 2015). Downstream flexibility is achieved through logistics operations that manage the distribution of finished goods inventory, warehouse operations, and transportation to meet customer demands (Rojo, Stevenson, Montes, & Perez-Arostegui, 2018). SCF enables an organisation to adjust to changes in an unpredictable environment. It is a type of SCR that provides the capacity to quickly respond to dynamic situations and restore normalcy in the presence of disruptions (Rajesh 2020).

2.4 Supply Chain Collaboration (SCC)

Collaboration refers to the capacity to address supply chain disruptions by working with partners through joint planning, sharing knowledge, and exchanging information to coordinate a prompt reaction (Scholten & Schilder 2015). SCC refers to the collaboration of two or more independent enterprises to organise and carry out supply chain operations (Jimenez-Jimenez, Martinez-Costa, & Rodriguez, 2018). For the SCC to achieve its goals, pertinent and significant data must be exchanged among the SCs. Supply chain cooperation refers to the establishment of strong, enduring connections that allow supply chain partners to cooperate, share resources, knowledge, and risks to achieve shared goals and objectives (Baah, Acquah, & Ofori, 2021). Collaboration is essential for effectively managing the supply chain and is a key competence in today's global economy, leading to sustainable competitive advantage (Banchuen, Sadler, & Shee, 2017). Supply chain collaboration refers to a firm's intentional collaboration with other members of its supply chain to improve its ability to manage internal and external operations effectively and efficiently in the transportation of goods, services, information, and decisions. The collaboration established by the company with suppliers is a strategic alliance aimed at sharing common goals, pursuing mutual benefits, and acknowledging a significant level of interdependence (Tanuwijaya, Tarigan, & Siagian, 2021). The

partnership process entails collaboration between a company and its suppliers to strategize and execute supply chain operations related to sourcing raw materials, ensuring their quality, and coordinating timelines effectively to achieve shared objectives and mutual advantages (Tarigan&Siagian, 2021).

Collaboration refers to the cooperation between separate yet interconnected firms to combine resources and abilities in order to address exceptional or rapidly evolving client requirements. The company's cooperation with suppliers in the supply chain involves the capacity to operate beyond organisational limits to establish and oversee value-enhancing procedures for both parties to fulfil customer requirements (Cao & Zhang, 2011). Mohammed, Aboalghanam, Awad, and Alhanatleh (2021) investigated the correlation between supply chain coordination (SCC) and operational performance in Oman, considering the moderating influence of supply chain complexity. The study found that information-sharing, goal congruence, and knowledge-sharing within the Supply Chain Collaboration (SCC) dimensions positively influence operational performance. The metrics for assessing collaboration with suppliers involve information sharing, collaborative knowledge, communication for problem-solving, resource sharing, and decision synchronisation.

2.5. Supply Chain Digitalization

Digital services and analytical algorithms have emerged as the primary competitive variables in the supply chain industry in the digital era (Dolgui&Ivanov, 2021). Supply Chain Digitalization (SCD) involves incorporating digital technologies like big data, cloud computing, blockchain, the Internet of Things, and artificial intelligence into supply chain operations to create a process centred around data-driven decision-making. Digitalizing traditional supply chain processes results in the generation of a significant volume of data and information. Applying the findings of data analysis to improve the effectiveness of particular business operations can greatly benefit the supply chain. Zhou, Zhu, and Xu (2023) suggest that employing digital technologies like smart contracts, digital storage, and intelligent labels allows for traceability across the full product lifetime, from raw material production to final product distribution. This service offers digital traceability and enhances the transparency and integrity of the supply chain. SCD focuses on the change in supply chain business processes and decision-making processes due to digital technology applications, distinguishing it from notions like digital transformation and digital technology adoption (Ageron, Bentahar, &Gunasekaran, 2020).

2.6 Sustainable Competitive Advantage

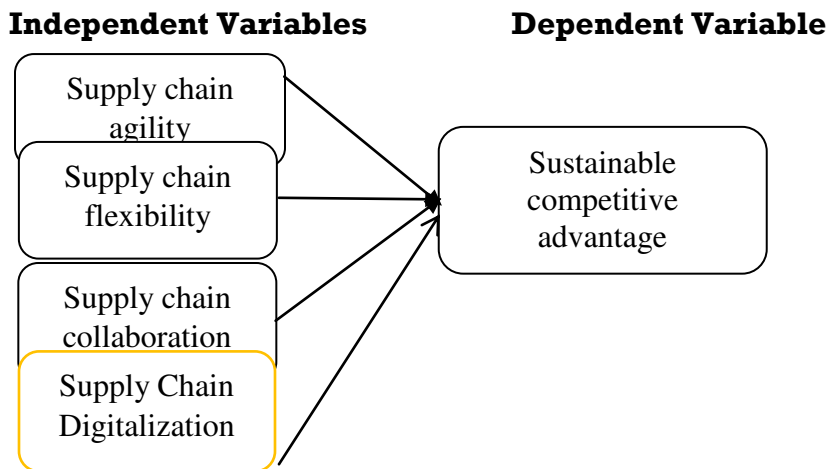
Sustainable competitive advantage is achieved when a company invests in and implements methods to gain long-term operational advantages that its competitors

are not utilising or would not achieve the same benefits if they did. A company's competitive advantage comprises the origin of the advantage, such as market position or resources, and the outcome of the advantage, such as profitable performance. Research has recently concentrated on how organisations deal with dynamic and fast-changing contexts, drawing from the concept of dynamic capability. Various studies have utilised market performance as a nonfinancial indicator to investigate factors influencing competitive advantages, including sales growth, customer sustainability, net profit, and the capitalization rate (Cao et al. 2018). A sustainable competitive advantage is a distinctive and enduring edge that a company possesses over its rivals, enabling it to continually surpass them and sustain profitability in the long run (Thongsri& Chang, 2019). This enduring advantage is challenging for competitors to imitate or diminish, and it can establish a strong basis for long-term success in the market. The study focuses on cost leadership and access to distribution channels as the primary sources of sustained competitive advantage.

Cost Leadership: A company can get a durable competitive advantage by being the industry's lowest-cost producer. This can be achieved by streamlined production methods, making use of economies of scale, or having access to inexpensive resources (Kang & Na, 2020). Reduced expenses enable a corporation to provide competitive pricing while sustaining profitable margins.

Access to Distribution Channels: Having exclusive or preferred access to distribution channels can provide a substantial benefit. This may include robust partnerships with retailers, a prominent online platform, or an extensive physical distribution system (Klaprabchone, Chengseng, Prapho, Lissani, &Sangsawang, 2019).

Figure 2.1 Conceptual Framework



Source: Researcher's Model (2024)

Supply chain agility and sustainable competitive advantage

An adaptable and enduring supply chain is developed in reaction to swiftly evolving segmented markets (Mukhsin, Taufik, Ridwan, &Suryanto, 2022). Companies must proactively respond to risks in order to maintain supply chain agility (Rehman, Al-Zabidi, Al-Kahtani, Umer, &Usmani, 2020). Integration allows business stakeholders to engage in the necessary skills to successfully deliver. Supply chain agility enables quick adaptation to changes (Sharma, Raut, Mangla, Narkhede, Luthra, &Gokhale, 2021).

Supply chain flexibility and a sustainable competitive advantage

Supply chain flexibility refers to a firm's ability to adapt and respond to changes in market demand, as well as its resilience to unexpected events (Delic&Eyers, 2020). Supply chain flexibility offers advantages in adapting to and fulfilling demand fluctuations including seasonality, production challenges, supplier and delivery issues, and introducing new products or entering new markets (Katsaliaki et al., 2021). Supply chain flexibility allows companies to quickly adapt to unexpected disruptions and changes (Shekarian et al., 2020).

Supply Chain Collaboration and Sustainable Competitive Advantage

Supply chain collaboration (SCC) offers various benefits in terms of efficiency, effectiveness, resource utilisation, productivity, supply chain visibility, stakeholder satisfaction, and trust (Yang, Jia, F., &Xu, 2018). Engaging in SCC practices is crucial for developing uniform abilities and hence enhancing performance. Collaborative methods aid in establishing robust partnerships with supply chain partners by utilising precise and timely information from all parties involved (Wamba et al. 2020).

Supply Chain Digitalizationand Sustainable Competitive Advantage

Digital supply chain enhances product quality, productivity, and reduces production costs, leading to improved supply chain performance. It integrates digital procurement, production, sales, and logistics operations to extend product life cycle and achieve sustainable performance enhancement. Using blockchain and other digital technologies in production and distribution increases product information transparency, builds consumer trust, boosts purchase intent, and enhances consumer surplus, thereby improving supply chain performance.

2. Theoretical Review

2.1 Contingency Theory

This research is grounded in contingency theory. Contingency theory suggests that there is no single universally effective method for managing organisations or making choices. The most effective management practices or decision-making procedures depend on the specific conditions or contingencies of a given situation. Organisations should assess their environment, goals, structure, and resources to choose the most appropriate management style or strategy. Contingency theory posits that uncertainty is inherent in all aspects, such as supply chain processes and organisations (Dubey et al., 2021a). The notion acknowledges that the most effective modifications are implemented based on individual situations (Chatterjee&Chaudhuri, 2021). Thus, when unexpected events like COVID-19 occur, the state of being the most efficient in terms of procedures and operations might quickly shift (Parajuli et al., 2020). Contingency theory helps explain the conditions under which innovation can be attained in GSCs (Chatterjee&Chaudhuri, 2021). This approach guarantees that adjustments or modifications can be implemented in operations based on current processes and conditions, enhancing the agility, flexibility, and responsiveness of GSCs (Dubey et al., 2021a; Thakur, 2021). These theories aim to guarantee the resilience and sustainability of supply chains, particularly when faced with abrupt interruptions like COVID-19 (Abdelilah et al., 2021). Dynamic capability and contingency theory form the foundation for creating flexible, agile, and responsive supply chains (Manzoor, Baig, Hashim, Sami, Rehman, &Sajjad, 2021).

3. Methodology

3.1 Research Design

A research design is a structured plan for investigating the necessary steps and procedures involved in conducting and overseeing a study. The study employed a cross-sectional survey research approach. The technique was selected to make it easier for the researcher to employ a questionnaire to assess public opinion at a certain time.

3.2 Population and Sample Size

The study's population consisted of the supply chain channel members from three chosen breweries in South West Nigeria. The study's population consisted of 342 supply chain channel members to whom the research findings were applied. The sample size determination table by Krejcie and Morgan (1970) was employed to calculate the sample size that was a representative of the study population rather than the entire population. There were 181 responses selected as the sample size.

3.3 Sampling Technique

The study used stratified sampling approach. This sampling technique is beneficial when the population shows heterogeneity or when researchers need to guarantee proper representation of specific subgroups in the sample.

3.4 Research Instrument

Structured questionnaires were used to obtain data from the respondents. The questionnaire was split into two sections: A and B. Section A focused on respondents' profiles, while section B covered questions related to supply chain resilience dimensions. A Likert scale with 5 points was used ranging from 5 for Strongly Agree (SA) to 1 for Strongly Disagree (SD). The test-retest reliability method was employed to assess the instrument's reliability. The Cronbach Alpha Index was utilised to assess the questionnaire's reliability. All items in Table 1 received reliable ratings over 0.6, indicating good results. A research tool is regarded very dependable if its reliability coefficient, or alpha, exceeds 0.6 (Martono, 2016).

Table 1 Reliability test for all items in the Questionnaire

S/N	Dimensions	Number of items	Alpha (α) Value
1	Supply chain agility	5	0.776
2	Supply chain flexibility	5	0.771
3	Supply chain collaboration	5	0.778
4	Supply chain digitalization	5	0.779
5	Sustainable competitive advantage	5	0.774

Source: output of pilot survey data, 2024.

3.5 Methods of Data Analyses

Analysed the data collected from the respondents using descriptive and inferential statistical methods. Basic percentages were used in the descriptive statistics to examine the characteristics of the respondents. Correlation and multiple regression analyses were used to evaluate the relationships' strength among the variables. Regression analysis was used to assess the statistical significance of different variables. This study used SPSS version 25 for Windows.

3.6 Model Specification

The general form of the equation to predict SCA is depicted as follows:

$$SCA = F(SCA, SCF, SCC, SCD) \dots \dots \dots i$$

$$SCA = \beta_0 + \beta_1SCA + \beta_2SCF + \beta_3SCC + \beta_4SCD + \varepsilon \dots \dots \dots ii$$

Where:

SCA = Sustainable Competitive Advantage

SCA = Supply Chain Agility

SCF = Supply Chain Flexibility

SCC = Supply Chain Collaboration

SCD = Supply Chain Digitalization

4. Results and Discussion

Table 2: Response Rate

Pattern focused	Number administered	Number returned	Unused copy	Number used	Response rate
Employees	181	181	1	180	99%

Source: Distributed Questionnaire

A grand total of 181 copies of the questionnaire were distributed and subsequently collected. One instance of the questionnaire was not adequately completed, but the remaining 180 copies possess potential utility. Consequently, the analyses conducted in this chapter were based on a sample size that aimed to achieve a response rate of 99%.

Table 3: Analysis of Respondents Profile

S/N	Variables	Frequency	Percentage (%)
1	Gender:		
	Male	137	76
	Female	43	24
	Total	180	100
2	Age Range:		
	Below 30 years	20	11
	31-40 years	65	36
	41years and above	95	53
	Total	180	100

3	Marital Status:		
	Single	61	34
	Married	112	62
	Divorced	7	4
	Total	180	100
4	Educational Qualification		
	OND/NCE	74	41
	HND/B.Sc	90	50
	Postgraduate Degree	16	9
	Total	180	100
5	Years of Job Experience		
	Below 5years	58	32
	5-10years	68	38
	11 years and above	54	30
	Total	180	100

Source: Field Survey, 2024.

Table 3 exhibits the background characteristics of the various respondents. It revealed on the gender composition of the respondents representing 76% of the sample were males while 24% were females. The age bracket of the respondents indicated that 11% of the respondents were below 30 years of age; 36% of the respondents' falls within the age bracket of 31-40 years of age, while 53% of the respondents were above 41 years of age and above. The marital composition of the respondents indicated that; 34% of the sample respondents were single, 62% other respondents were married, while 4% other respondents were divorced. On the educational background of the sample, it was revealed that 41% of the respondents were OND/NCE holders, result showed that 50% of the respondents were HND/B.Sc holders, while 9% of the other respondent were postgraduate degree holders. On the years of job experience by staff, it was shown that 32% of the respondents have below 5years working experience, 38% of the respondents have 5-10 years working experience and lastly 30% of the other respondents have above 11years working experience.

Table 4: Inter-Correlations of Study Variables

S/N	Variables	1	2	3	4	5
1.	Supply chain agility	1				
2.	Supply chain flexibility	0.378**	1			
3.	Supply chain collaboration	0.634**	0.312**	1		
4.	Supply chain digitalization	0.542**	0.352**	0.522**	1	
5.	Sustainable competitive advantage	0.639**	0.604**	0.587**	0.607**	1

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

*. Correlation is significant at the 0.05 level (1-tailed).

Table 4 showed the inter-correlations for study variables. The result indicated that supply chain agility ($r=0.639$), supply chain flexibility ($r=0.604$), supply chain collaboration ($r=0.587$) and supply chain digitalization ($r=0.607$) has a positive correlation with sustainable competitive advantage.

Table 5: Supply chain resilience and sustainable competitive advantage

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.420	1.354		.310	.757		
	Supply chain agility	.237	.060	.250	3.965	.000	.519	1.929
	Supply chain flexibility	.319	.044	.365	7.289	.000	.824	1.214
	Supply chain collaboration	.191	.062	.187	3.054	.003	.552	1.813
	Supply chain digitalization	.252	.059	.245	4.298	.000	.634	1.577

a. Dependent Variable: Sustainable competitive advantage

Table 5 indicated that supply chain agility ($\beta = 0.250$, $p < 0.05$), supply chain flexibility ($\beta = 0.365$, $p < 0.05$), supply chain collaboration ($\beta = 0.187$, $p < 0.05$) and supply chain digitalization ($\beta = 0.245$, $p < 0.05$) had significant positive effect on sustainable competitive advantage. The dimensions of supply chain resilience have no multicollinearity because the VIF of supply chain agility (1.929), supply chain flexibility (1.214), supply chain collaboration (1.813), and supply chain

digitalization(1.577) towards sustainable competitive advantage are below 10. Besides, the tolerance level is more than 0.1 where supply chain agility has 0.519, supply chain flexibility has 0.824, supply chain collaboration has 0.552 and supply chain digitalization has 0.634.

Table 6 Fitness of the Model

ANOVA^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	379.798	4	94.950	77.374	.000 ^b
	Residual	214.752	175	1.227		
	Total	594.550	179			
a. Dependent Variable: Sustainable competitive advantage						
b. Predictors: (Constant), Supply chain digitalization , Supply chain flexibility , Supply chain collaboration , Supply chain agility						

The *F*-ratio in table 6 showed that the dimensions of supply chain resilience significantly predict sustainable competitive advantage, $F = 77.374$, $p < 0.05$. The implication of this is that the regression model is a good fit of the data.

Table 7 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.799 ^a	.639	.631	1.108
a. Predictors: (Constant), Supply chain digitalization , Supply chain flexibility , Supply chain collaboration , Supply chain agility				

Table 7 showed the extent to which the components of supply chain resilience accounted for change in sustainable competitive advantage as indicated by the R Square value, which showed that 64% (0.639) of the change in sustainable competitive advantage was brought about by components of supply chain resilience.

4.1 Discussion of Results

Table 4 indicated that supply chain agility showed a strong positive correlation with sustainable competitive advantage ($r=0.639$). Table 5 showed that supply chain

agility had significant positive effect on sustainable competitive advantage ($\beta = 0.250, p < 0.05$). Test of hypothesis one showed that supply chain agility has significant positive effect on sustainable competitive advantage of brewery firms in South West Nigeria ($0.000 < 0.05$). Smith, et al. (2021) highlighted that SCA can have significant effects on different performance aspects such as market, financial, and operational performance. Sharma, et al. (2017) suggested that supply chain agility (SCA) is a crucial quality for maintaining competitiveness in an unpredictable business environment. The outcome suggested that supply chain agility speeds up the fulfilment of the customer's evolving requirements by enhancing delivery reliability and expediting product introduction.

Table 4 indicated that supply chain flexibility has a strong positive correlation with sustainable competitive advantage ($r=0.604$). Table 5 showed that supply chain flexibility had significant positive effect on sustainable competitive advantage ($\beta = 0.365, p < 0.05$). Test of hypothesis two showed that supply chain flexibility has significant positive effect on sustainable competitive advantage of brewery firms in South West Nigeria ($0.000 < 0.05$). Centobelli et al. (2020) discovered that numerous companies used supply chain flexibility to develop skills and adjust to market demands, aiming to gain a competitive edge and enhance business performance. Supply Chain Flexibility (SCF) enables a company to adjust to changes in an unpredictable environment. It is a type of Supply Chain Resilience (SCR) that provides the capacity to quickly react to changing environments and restore regular operations in the presence of disruptions (Rajesh 2020). Supply chain flexibility is the capacity of supply chains to adjust to shifting market conditions and the needs of customers.

Table 4 indicated that supply chain collaboration has a strong positive correlation with sustainable competitive advantage ($r=0.587$). Table 5 showed that supply chain collaboration had significant positive effect on sustainable competitive advantage ($\beta = 0.187, p < 0.05$). Test of hypothesis three showed that supply chain collaboration had significant positive effect on sustainable competitive advantage of brewery firms in South West Nigeria ($0.003 < 0.05$). The outcome supported Salam's (2017) research, indicating that Supply Chain Coordination (SCC) is crucial for attaining excellent operational performance. Shahbaz et al. (2018) discovered that Supply Chain Collaboration (SCC) has a notable impact on operational performance related to information sharing and shared decision-making. In contrast, Electronic Data Interchange (EDI) does not show a significant effect. This implies that a company's partnership with suppliers in the supply chain involves the capacity to operate beyond organisational limits to establish and oversee value-enhancing procedures for both parties to fulfil customer demands.

Table 4 indicated that supply chain digitalization has a positive correlation with sustainable competitive advantage ($r=0.607$). Table 5 showed that supply chain digitalization had significant positive effect on sustainable competitive advantage ($\beta = 0.245, p < 0.05$). Test of hypothesis four showed that supply chain digitalization had significant positive effect on sustainable competitive advantage of brewery firms in South West Nigeria ($0.000 < 0.05$). Papanagnou et al. (2022) highlight that predictive analytics, a new digital technology, can assist supply chains in promptly anticipating and addressing disruption risks, facilitating timely risk management decisions, and promoting the transition to a comprehensive and resilient structure. Zhang et al. (2022) shown that expanding digital capabilities can enhance information exchange and relationship transparency between buyer organisations and supplier firms. This can mitigate opportunistic and unethical behaviour from suppliers and enhance the buyer-supplier interaction.

5. Conclusion

The study concluded that supply chain resilience had significant positive effect on sustainable competitive advantage of brewery firms in South West Nigeria. Supply chain agility, supply chain flexibility, supply chain collaboration and supply chain digitalization had significant positive effect on sustainable competitive advantage of brewery firms in South West Nigeria. Supply chain agility provides rapid response to change. Supply chain agility depends on companies proactively responding to risks. Moreover, supply chain agility increases firm responsiveness. Sustainable supply chain flexibility enables the firm to be responsive to sudden disruptions and changes by considering contingency theory. Firms benefit from collaborative connections for a variety of reasons, the most important of which are risk and information sharing and access to complementary resources, both of which contribute to improving financial performance and competitive advantages. Digitalization can integrate data from the supply chain system as well as platform and user through the strong ability of data analysis and accurate market analysis. This will accelerate the efficiency of product innovation, speed up the development of new products and services, and help enterprises occupy a larger market share, thus maintaining a leading market position and ultimately achieving a higher level of performance in a dynamic competitive environment.

6. Recommendations

- i. Firms should create cross-functional teams dedicated to monitoring market trends and emerging risks. These teams should work collaboratively to develop agile responses to potential disruptions.

- ii. Firms should reduce dependency on a single source by diversifying your supplier base. This ensures a more robust supply chain and minimizes the impact of disruptions.
- iii. Firms should foster strong, long-term relationships with suppliers built on trust and open communication. This can lead to better collaboration during challenging times.
- iv. Firms should embrace digital technologies such as IoT, AI, blockchain, and cloud computing to optimize supply chain processes, enhance visibility, and improve decision-making.

References

1. Abdelilah, B., El Korchi, A., & Amine B., M., (2021). *Agility as a combination of lean and supply chain integration: how to achieve a better performance. International Journal of Logistics Research Application, 1–29.*
2. Ageron, B., Bentahar, O., & Gunasekaran, A., (2020). *Digital supply chain: challenges and future directions. Supply Chain Forum International Journal 21 (3), 133–138.*
3. Ali A, Mahfouz A, & Arisha A (2017). *Analysing supply chain resilience: integrating the constructs in a concept mapping framework via a systematic literature review. Supply Chain Manag 22:16–39.*
4. Alkalha, Ziad, Zu'bi M. Al-Zu'bi, F. & Zighan, S. (2021). *Investigating the impact of absorptive capacity on operational performance: The mediating role of supply chain resilience. International Journal of Integrated Supply Management, 14: 306–29.*
5. Alkhatib, S. (2022). *An Advanced Fuzzy Approach for Assessing Supply Chain Resilience in Developing Economies. International Journal of Operational Research in press, 21: 17–25.*
6. Al-Shboul, M. (2017). *Infrastructure framework and manufacturing supply chain agility: The role of delivery dependability and time to market. Supply Chain Management: An International Journal, 22: 172–85.*
7. Arvitrida, N.I., Robinson, S., Tako, A.A., & Robertson, D.A. (2016). *An agent-based model of supply chain collaboration: Investigating manufacturer loyalty. In A. Anagnostou, K. Hoad, & M. Kunc, (Eds.), Proceedings of the 2016 8th operational research society simulation workshop (SW16) Stratford, Warks, 35–44.*
8. Baah, C. Acquah, I. S. K. & Ofori. D. (2021). *Exploring the influence of supply chain collaboration on supply chain visibility, stakeholder trust, environmental and financial performances: A partial least square approach. Benchmarking: An International Journal 29: 172–93.*

9. Belhadi, A. Kamble, S. Jabbour, C. J. C. Gunasekaran, A. Ndubisi, N.O. & Venkatesh, M. (2021). *Manufacturing and service supply chain resilience to the COVID-19 outbreak: Lessons learned from the automobile and airline industries. Technological Forecasting and Social Change* 163: 120447.
10. Cao G, Duan Y, & El Banna A (2018). *A dynamic capability view of marketing analytics: evidence from UK firms. Industrial Marketing Management*, 76:72–83.
11. Centobelli, P. Cerchione, R. & Ertz, M. (2020). *Agile supply chain management: Where did it come from and where will it go in the era of digital transformation? Industrial Marketing Management* 90: 324–45.
12. Chatterjee, S., & Chaudhuri, R., (2021). *Supply chain sustainability during turbulent environment: examining the role of firm capabilities and government regulation. Operational Management Research*, 1–15.
13. Choi, T.-M., Feng, L., & Li, R., (2020). *Information disclosure structure in supply chains with rental service platforms in the blockchain technology era. International Journal of Production Economics*, 221, 107473
14. Colombari, R., Geuna, A., Helper, S., Martins, R., Paolucci, E., Ricci, R., & Seamans, R., (2022). *The interplay between data-driven decision-making and digitalization: a firm-level survey of the Italian and US automotive industries. International Journal of Production Economics*, 255, 108718
15. Delic, M., & Evers, D.R., (2020). *The effect of additive manufacturing adoption on supply chain flexibility and performance: an empirical analysis from the automotive industry. International Journal of Production Economics*, 228, 107689.
16. Dolgui, A., & Ivanov, D., (2021). *5G in digital supply chain and operations management: fostering flexibility, end-to-end connectivity and real-time visibility through internet-of-everything. International Journal Production Research*, 60 (2), 442–451.
17. Dubey, R., Bryde, D.J., Foropon, C., Tiwari, M., Dwivedi, Y., & Schiffing, S., (2021a). *An investigation of information alignment and collaboration as complements to supply chain agility in humanitarian supply chain. International Journal of Production Research*, 59 (5), 1586–1605.
18. Eckstein, D., Goellner, M., Blome, C., & Henke, M. (2015). *The performance impact of supply chain agility and supply chain adaptability: the moderating effect of product complexity. International Journal of Production Research*, 53(10), 3028-3046.
19. Eltawy, N. & Gallear, D. (2017). *Leanness and agility: A comparative theoretical view. Industrial Management and Data Systems*, 117: 149–65.
20. Eslami, M. & Scholz, A.L. (2021). *Capabilities and consequences of supply chain resilience: The moderating role of digital technologies. Jonkoping: Jonkoping University, Business School Press*

21. Fayezi, S., & Zomorodi, M. (2015). *The role of relationship integration in supply chain agility and flexibility development: an Australian perspective. Journal of Manufacturing Technology Management, 26(8), 1126-1157.*
22. Giannakis, M., & Louis, M. (2016). *A multi-agent based system with big data processing for enhanced supply chain agility. Journal of Enterprise Information Management, 29(5), 706-727.*
23. Gligor, D., Bozkurt, S., Gölgeci, I., & Maloni, M.J., (2020). *Does supply chain agility create customer value and satisfaction for loyal B2B business and B2C end-customers? International Journal of Physical Distribution and Logistics Management, 50 (7/8), 721–743.*
24. Golgeci, I. Bouguerra, A. & Rofcanin. Y. (2019). *The human impact on the emergence of firm supply chain agility: A multilevel framework. Personnel Review 49: 733–54.*
25. Güner, H.M. (2018). *“Tedarik Zinciri Çevikliğinin Firma Performansı Üzerine Etkisi Ve Teknoloji Belirsizliği.” T.C. İstanbul Ticaret Üniversitesi Sosyal Bilimler Enstitüsü, Lojistik Yönetimi Anabilim Dalı, Lojistik Yönetimi Yüksek Lisans Programı 78*
26. Hasani, A. & Khosrojerdi, A. (2016). *Robust global supply chain network design under disruption and uncertainty considering resilience strategies: A parallel memetic algorithm for a real-life case study. Transportation Research Part E: Logistics and Transportation Review, 87: 20–52.*
27. Hohenstein, N. O., Feisel, E., Hartmann, E., & Giunipero, L. (2015). *Research on the phenomenon of supply chain resilience: a systematic review and paths for further investigation. International Journal of Physical Distribution and Logistics Management, 45(1-2), 90-117.*
28. Holmström, J., & Partanen, J., (2014). *Digital manufacturing-driven transformations of service supply chains for complex products. Supply Chain Management: International Journal 19 (4), 421–430.*
29. Huo, B, Gu, M. & Wang, Z. (2018). *Supply chain flexibility concepts, dimensions and outcomes: An organizational capability perspective. International Journal of Production Research, 56: 5883–903.*
30. Ivanov, D. & Dolgui, A. (2020). *Viability of intertwined supply networks: Extending the supply chain resilience angles towards survivability. A position paper motivated by covid-19 outbreak. International Journal of Production Research 58: 2904–15.*
31. Jimenez-Jimenez, D. Martínez-Costa, M. & Rodriguez, C.S. (2018). *The mediating role of supply chain collaboration on the relationship between information technology and innovation. Journal of Knowledge Management, 23: 548–67.*

32. Kamalahmadi, M. & Parast, M.M. (2016). A review of the literature on the principles of enterprise and SC resilience: Major findings and directions for future research. *International Journal of Production Economics* 171: 116–33.
33. Kang, S. & Na, Y.K. (2020). Effects of strategy characteristics for sustainable competitive advantage in sharing economy businesses on creating shared value and performance. *Sustainability*, 12, 1397;
34. Katsaliaki, K., Galetsi, P., & Kumar, S., (2021). Supply chain disruptions and resilience: a major review and future research agenda. *Annual Operational Research*, 1–38.
35. Kinra, A. Ivanov, D. Das, A & Dolgui, A. (2020). Ripple effect quantification by supplier risk exposure assessment. *International Journal of Production Research*, 58, 5559–5578.
36. Klaprabchone, K. Chengseng, S. Prapho, T. Lissani, S. & Sangsawang, B. (2019). External factors affecting sustainable competitive-advantage of community enterprises. *Asian Administration and Management Review*, 2(2), 126 -135
37. Kumar, V., Bak, O., Guo, R., Shaw, S.L., Colicchia, C., Garza-Reyes, J.A., & Kumari, A., (2018). An empirical analysis of supply and manufacturing risk and business performance: a Chinese manufacturing supply chain perspective. *Supply Chain Management*, 23 (6), 461–479.
38. Kuo-Jui, W., Tseng, M.-L. Chiu, A. S. F. & Lim, M. K (2017). Achieving competitive advantage through supply chain agility under uncertainty: A Novel multi-criteria decision-making Structure. *International Journal of Production Economics*, 190 (3): 96–107.
39. Luo, B. N. & Yu, K. (2016). Fits and misfits of supply chain flexibility to environmental uncertainty: Two types of asymmetric effects on performance. *The International Journal of Logistics Management* 27: 862–85
40. Manzoor, U., Baig, S.A., Hashim, M., Sami, A., Rehman, H.U., & Sajjad, I., (2021). The effect of supply chain agility and lean practices on operational performance: a resource-based view and dynamic capabilities perspective. *Total Quality Management Journal*,
41. Mohammed N. A. Z. Aboalghanam, K. Awad, H. & Alhanatleh, H. (2021). The impact of supply chain collaboration on operational performance: The moderation role of supply chain complexity. *International Journal of Entrepreneurship* 25. Available online: www.abacademies.org (accessed on 20 June 2023).
42. Mukhsin, M., Taufik, H., Ridwan, A., & Suryanto, T., (2022). The mediation role of supply chain agility on supply chain orientation-supply chain performance link. *Uncertainty Supply Chain Management*, 10 (1), 197–204.

43. Nandi, S., Sarkis, J., Hervani, A.A., & Helms, M.M., (2021). Redesigning supply chains using blockchain-enabled circular economy and COVID-19 experiences. *Sustainable Production Consumer*, 27, 10–22.
44. Nils-Ole Hohenstein, Feisel, E., Hartmann, E. & Giunipero, L. (2015). Research on the phenomenon of supply chain resilience, *International Journal of Physical Distribution and Logistics Management*, 45(1), 90-117.
45. Papanagnou, C., Seiler, A., Spanaki, K., Papadopoulos, T., Bourlakis, M., (2022). Data-driven digital transformation for emergency situations: the case of the UK retail sector. *International Journal of Production Economics*, 250, 108628
46. Parajuli, S.B., Kuikel, J., Lama, S., & Heera, K.C., (2020). Efforts and Challenges in the COVID-19 Mitigation in Nepal. *Europasian J. Med. Sci.* 2 (2), 132–134.
47. Pavlov, A. Ivanov, D. Dolgui, A. & Sokolov, B. (2018). Hybrid Fuzzy-Probabilistic Approach to Supply Chain Resilience Assessment. *Transactions on Engineering Management* 65: 303–15.
48. Pournader, M. Rotaru, K. Kach, A.P. & Hajiagha. S.H.R. (2016). An analytical model for system-wide and tier-specific assessment of resilience to supply chain risks. *Supply Chain Management: An International Journal*, 21: 589.
49. Pu, G. Li, S. & Bai, J. (2023). Effect of supply chain resilience on firm's sustainable competitive advantage: a dynamic capability perspective. *Environmental Science and Pollution Research*, 30, 4881–4898.
50. Rajesh, R. (2020). Flexible business strategies to enhance resilience in manufacturing supply chains: An empirical study. *Journal of Manufacturing Systems* 60: 903–19.
51. Rehman, A.U., Al-Zabidi, A., AlKahtani, M., Umer, U., & Usmani, Y.S., (2020). Assessment of supply chain agility to foster sustainability: fuzzy-DSS for a Saudi manufacturing organization. *Processes* 8 (5), 577.
52. Rojo, A. Stevenson, M. Montes, F. J. L. & Perez-Arostegui. M.N. (2018). Supply chain flexibility in dynamic environments: The enabling role of operational absorptive capacity and organizational learning. *International Journal of Operations & Production Management* 38: 636–66.
53. Salam, M. A. (2017). The mediating role of supply chain collaboration on the relationship between technology, trust and operational performance: An empirical investigation. *Benchmarking: An International Journal* 24: 298–317.
54. Sand, C. (2021). Three solutions to ensure supply chain resiliency. *Packaging Digest*. Available online: www.packagingdigest.com (accessed on 12 June 2023).
55. Saryatmo, M.A., & Sukhotu, V., (2021). The influence of the digital supply chain on operational performance: a study of the food and beverage industry in Indonesia. *Sustainability*, 13 (9), 5109.

56. Scholten, K. & Schilder, S. (2015). *The role of collaboration in supply chain resilience. Supply Chain Management: An International Journal* 20: 471–84.
57. Shahbaz, M.S. Rasi, R. Z. R. Ahmad, M. F. B. & Sohu, S. (2018). *The impact of supply chain collaboration on operational performance: Empirical evidence from the manufacturing of Malaysia. International Journal of Advanced and Applied Sciences* 5: 64–71.
58. Shahin, A. Gunasekaran, A. Khalili, A. & Shirouyehzad. H. (2016). *A new approach for estimating leagile decoupling point using data envelopment analysis. Assembly Automation* 36: 233–45.
59. Sharma, N., Sahay, B. S. Shankar, R. & Sarma, P. R. S. (2017). *Supply chain agility: Review, classification and synthesis. International Journal of Logistics Research and Applications* 20 (6): 532–559.
60. Sharma, V., Raut, R.D., Mangla, S.K., Narkhede, B.E., Luthra, S., & Gokhale, R., (2021). *A systematic literature review to integrate lean, agile, resilient, green and sustainable paradigms in the supply chain management. Business Strategy and Environment*, 30 (2), 1191–1212.
61. Shekarian, M., Nooraie, S.V.R., & Parast, M.M., (2020). *An examination of the impact of flexibility and agility on mitigating supply chain disruptions. International Journal of Production Economics*, 220, 107438.
62. Shin, H., Lee, J.-N., Kim, D., & Rhim, H. (2015). *Strategic agility of Korean small and medium enterprises and its influence on operational and firm performance. International Journal of Production Economics*, 181-196.
63. Shukor, A.A.A. Newaz, M.S. Rahman, M.K. & Taha, A.Z. (2020). *Supply chain integration and its impact on supply chain agility and organizational flexibility in manufacturing firms. International Journal of Emerging Markets*, 16: 1721–44.
64. Smith, G. Ruamsook, K. & Tracey, S. (2021). *The Spectrum of Supply Chain Agility. University Park: The Center for Supply Chain Research, Smeal College of Business, The Pennsylvania State University, in collaboration with IBM [Online].*
65. Tanuwijaya, N. C., Tarigan, Z. J. H., & Siagian, H. (2021). *The effect of top management commitment on firm performance through the green purchasing and supplier relationship management in 3-Star Hotel Industry in Surabaya. Petra International Journal of Business Studies*, 4(2), 169-181.
66. Tarigan, Z. J. H. & Siagian, H. (2021). *The effects of strategic planning, purchasing strategy and strategic partnership on operational performance. Uncertain Supply Chain Management*, 9(2), 363-372,
67. Thakur, V., (2021). *Framework for PESTEL dimensions of sustainable healthcare waste management: learnings from COVID-19 outbreak. J. Clean. Prod.* 287, 125562.

68. Thongsri, N. & Chang, A.K.H. (2019). Sustainable competitive advantage in creative industry small and medium enterprises: The Context of Thailand. *Saudi Journal of Business and Management Studies*, 397-405.
69. Tukamuhabwa, B. R., Stevenson, M., Busby J., & Bell, M. (2015). Supply Chain Resilience: Definition, Review and Theoretical Foundations for Further Study. *International Journal of Production Research*, 53 (18), 5592-5523.
70. Tukamuhabwa, B. Stevenson, M. & Busby, J. (2017). Supply chain resilience in a developing country context: A case study on the interconnectedness of threats, strategies and outcomes. *Supply Chain Management: An International Journal*, 22, 486–505.
71. Um, J., Lyons, A. Lam, H. K. S. Cheng, T. C. E. & Dominguez-Pery. C. (2017). Product variety management and supply chain performance: A capability perspective on their relationships and competitiveness implications. *International Journal of Production Economics*, 187: 15–26.
72. Wamba, S. Dubey, R. Gunasekaran, A. & Akter. S. (2020). The performance effects of big data analytics and supply chain ambidexterity: The moderating effect of environmental dynamism. *International Journal of Production Economics* 222: 1–14.
73. Wang, X., Tiwari, P., & Chen, X. (2017). Communicating supply chain risks and mitigation strategies: a comprehensive framework. *Production Planning and Control*, 28(3), 1023-1036.
74. Wu, K.-J., Tseng, M.-L., Chiu, A., & Lim, M. (2017). Achieving competitive advantage through supply chain agility under uncertainty: A novel multi-criteria decision-making structure. *International Journal of Production Economics*, 96-107.
75. Yang, Y. Jia, F. & Xu, Z. (2018). Towards an integrated conceptual model of supply chain learning: An extended resource-based view. *Supply Chain Management: An International Journal*, 24: 189–214.
76. Yıldız, B., & Çetindaş, A. (2019). Stratejik Kaynak Kullanımının Firma Performans Üzerindeki Etkisinde Tedarik Zinciri Çevikliğinin Aracı Rolü.” *Business and Management Studies: An International Journal* 6: 4.
77. Yu, K. Luo, B.N. Feng, X. & Liu, J. (2018). Supply chain information integration, flexibility, and operational performance: An archival search and content analysis. *The International Journal of Logistics Management* 29: 340–64.
78. Zhang, Y., Huo, B., Haney, M.H., & Kang, M., (2022). The effect of buyer digital capability advantage on supplier unethical behavior: a moderated mediation model of relationship transparency and relational capital. *International Journal of Production Economics*, 253, 108603

79. Zhou, X., Zhu, Q., & Xu, Z., (2023). *The role of contractual and relational governance for the success of digital traceability: evidence from Chinese food producers. Int. J. Prod. Econ.* 255, 108659