



SMEs COVID-19 supply chain resilience strategies in South Africa

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ABSTRACT

Purpose of the study: The outbreak of COVID-19 has brought disruption in the supply chain (SC) and crippled the South African economy. The economic and business disruption brought about by COVID-19 restrictions has negatively impacted all business growth and sustainability, from which small and medium-sized enterprises (SMEs) are not exempted. The research focus is based on SMEs COVID-19 supply chain (SC) resilient strategies.

Design/methodology/approach: This quantitative study employed a SMART PLS 3.0 to assess the significance of the hypothesised relationships.

Findings: The findings revealed that SMEs whose main business strategy and goals are based on trust, commitment and product quality might be in a better position for success in the COVID-19 era if strategic communication systems are integrated and implemented effectively. **Recommendations/value:** Furthermore, based on the research findings, it is recommended that SMEs should rather focus more on improving their relationship communication strategies to enhance relationship trust and commitment to both consumers and suppliers. By so doing, product quality may gain all-around business chain appreciation. SMEs whose main business strategy and goals are based on trust, commitment, communication, and product quality might be in a better position for success in the COVID-19 era if strategic means of communication systems are integrated and implemented effectively.

Recommendations/value: To aid communication between buying and supplying organisations and customer relationships during COVID-19 lockdown restrictions, it is recommended that SMEs adopt social media usage, virtual meetings through an online communication platform as well as the connection of softphones on laptops.

Managerial implications: The facilitation of appropriate training for these SMEs is necessary for developing new business strategies to deliver enhanced product and service quality and business performance through digital technology and a higher level of commitment to product and service. Consequently, product quality may



gain all-around business chain appreciation. Also, this research discovered that there are limited studies about SC resilience strategies in South African SMEs. Therefore, this study is one of the first empirical studies in SA to explore and design approaches for COVID-19 restrictions SC resilience strategies for SMEs.

Keywords

Buyer supplier communication flexibility; COVID-19; Product quality and commitment flexibility; Supply chain (SC) resilience; Small and medium-sized enterprises (SMES); SMES competitive performance; Trust flexibility

JEL Classification: E3

1. INTRODUCTION

The outbreak of COVID-19 has brought disruption in the supply chain (SC) and crippled the South African economy. Since the outbreak, researchers in this field have been conducting studies in the hope of finding solutions to combat the challenges and risks pertaining to the pandemic (Effendi *et al.*, 2020; Golan *et al.*, 2020; Meyer *et al.*, 2022). According to Singh *et al.* (2020), the outbreak has been described as a pandemic that has a malicious effect globally because of the interruption of almost all the manufacturing and logistics activities. However, the economic and business disruption brought about by COVID-19 restrictions has impacted negatively all business growth and sustainability, from which small and medium-sized enterprises (SMEs) are not exempted. According to Businessstech (2020) and McKinsey and Business (2020), about 60 percent of SMEs in South Africa (SA) will experience business failure due to the COVID-19 lockdown restrictions. The increasing failure of both larger organisations and SMEs in SA has a deepening negative effect on the gross domestic product (GDP), for example, an increase in the unemployment rate from 28.7 percent to 35.8 percent which, therefore, calls for active responses from both government and practitioners (Hadi & Supardi, 2020; OECDa, 2020).

SC is a network of organisations working together and managing their activities to deliver goods and services to customers (Hugos, 2018). This network plays an essential role in the success of a business, particularly SMEs. Bianchi and Saleh (2020) explain that in the last few decades, SMEs have been noted as key players in the economic growth of developing economies. While the government is revisiting policy to mitigate SMEs' failure, SMEs on a business level also need to re-strategise their business activities to remain in business. These strategies may involve the need for more resilience and flexible tactics, such as network collaboration with a private organisation to enhance a higher level of digitalisation, developing strategic partnerships and long-term relationship commitment among customers and other surviving SMEs (Liguori & Pittz, 2020; OECDb, 2020). A resilient SC can further assist SMEs

in recovering from the negative effects of unexpected interruptions and acclimatise to ambiguous future events (Golan *et al.*, 2020). SMEs depend upon their SC to deliver what is required to survive and thrive (Hugos, 2018). This research analyses different business resilient strategies in which SMEs could invest to keep their businesses afloat. The main purpose of this quantitative study is to determine possible SC resilient strategies for SMEs amidst COVID-19 restrictions, which can work towards their achieving competitive advantage.

Therefore, this study aims to answer the following research questions:

- What are the predominant COVID-19 SC resilience strategies for SMEs in SA?
- How do these COVID-19 SC resilience strategies influence the success of SMEs in SA?
- How can these COVID-19 SC resilience strategies lead SMEs towards a competitive advantage?

According to Centobelli *et al.* (2020), literature on SC resilience has grown extensively in many disciplines beyond SC management and it has addressed new topics and challenges. Although the literature on SC resilience has grown and received scholarly attention and policy interest, empirical research examining its causes and results remains insufficient, especially in the context of COVID19 related strategies and SMEs.

2. LITERATURE REVIEW

Recently, there has been a rise in the literature regarding SC resilience within the context of SMEs, but there is no in-depth literature specifically in the context of COVID-19. According to Kamalahmadi and Parast (2016), most previous studies have focused on defining and conceptualising SC resilience. Therefore, this study addresses some of the gaps noted in Golan *et al.* (2020), in which the authors explain that there is a rise in the SC resilience literature owing to multiple literature reviews being published from 2017 to 2019 – however, in SA there has not been any study specifically focusing on SMEs and the recent upsurge of COVID-9. Also, Ivanov and Dolgui (2020) discussed the concept of viability in the SC regarding long-term impacts due to pandemics such as COVID-19 that defined viability on three perspectives: sustainable practices, the resiliency of SC and agility. Furthermore, damage induced during the COVID-19 pandemic can be correlated with the concept of the SC resilience triangle (SCRT) (Bevilacqua *et al.*, 2017). In addition, Asamoah *et al.* (2019) study on social network relationships, SC resilience, and customer-oriented performance of SMEs in a developing economy, indicated a further need for a valid empirical study that will explore SC resilience among SMEs. This gap will be addressed in this study.

The literature section consists of five sub-sections, namely: resilience theory, buyer supplier trust flexibility, buyer supplier communication flexibility, buyer supplier commitment flexibility, and buyer supplier product quality flexibility. This review is followed by a discussion of the method of data collection employed in carrying out this research study and the presentation of the results. Lastly, limitations and implications are discussed, and a conclusion and recommendations provided.

2.1 Resilience theory

The COVID-19 pandemic displays a lack of resilience in SCs and the power that the disruption may have on a global system when individual SC nodes and networks fail (Golan *et al.*, 2020). According to various researchers (Golan *et al.*, 2020; Ivanov and Dolgui, 2020; Sharma *et al.*, 2020; Singh *et al.*, 2020), the pandemic has disrupted numerous SCs globally, which has had a negative impact on all countries. This disruption underscores the need for COVID-19 SC resilience strategies for SMEs. Over the past few years, SC resilience has received much attention, however, according to Asamoah *et al.* (2019), research examining SC resilience causes and results remains insufficient, mainly in the context of SMEs.

There are different accepted definitions of the term resilience with the constructs broadly recognised (Fatoki, 2018). Fatoki (2018) mentions that resistance of materials to a powerful shock and the capability of the material to captivate the shock without breaking is resilience. According to Golan *et al.* (2020), “supply chain resilience measures the ability to prepare for and provide essential functions during a disruption, and then to recover from and adapt post-disruption into a form that is better suited to the new present”. Nyaga and Whipple (2011) researched trust flexibility in SC; Fynes and Voss (2002) researched communication flexibility in SC; Hall *et al.* (2016) explored product quality flexibility in SC; Ulaga and Eggert (2006) studied commitment flexibility in SC and Mafini and Loury-Okoumba (2016) researched SMEs’ competitive performance. Therefore, the predominant COVID-19 SC strategies that have been identified through this study’s literature review are the following forms of buyer supplier flexibility: trust flexibility, communication flexibility, commitment flexibility and product quality flexibility. These concepts were chosen because they are some of the predominant COVID-19 resilience strategies for SA’s SMEs. SMEs play an essential role in sustainable socio-economic development in Africa, where their operations are mostly centred within the informal sectors (Fatoki, 2018; Asamoah *et al.*, 2019). SMEs are prominent drivers of economic growth in developing economies such as SA (Omoruyi & Mafini, 2016). Furthermore, SMEs are more exposed to disruptions because they operate with considerably less resources and capabilities than larger firms (Asamoah *et al.*, 2019). SA’s SMEs are already coping with a shrinking economy and COVID-19 restrictions are putting additional pressure on their operations

(Mckinsey & Bussiness, 2020). The support from suppliers and the government is key to stimulating SMEs post-COVID-19 (Mckinsey & Bussiness, 2020) and this action could be further enhanced by adopting the COVID-19 SC resilience strategies to help mitigate some of the challenges faced by SMEs. The COVID-19 resilience strategies require having a good relationship with supply chain partners, which allows SMEs to be more competitive in the market to achieve their set goals and, furthermore, will require strategies such as trust and commitment (Ngouapegne & Chinoma, 2018). It is important, therefore, that efforts are made to protect SMEs, not only to counteract negative impacts such as COVID-19 upon their livelihoods but also to help guarantee a swifter recovery for the economy at large (Mckinsey & Bussiness, 2020).

2.2 Buyer-supplier trust flexibility

The success of a firm is influenced by the level of trust amongst all stakeholders in the SMEs' SC (Nadali *et al.*, 2016) because no real partnership can develop in SC relationships without meaningful trust and communication (Bowersox *et al.*, 2020). Thus, the firm's capability to repeatedly offer product quality and value for its customers in the face of disruptions is dependent on the degree of its resilience (Asamoah *et al.*, 2019). SMEs that have communication and trust in their relationship with suppliers are anticipated to undertake relevant activities capably and, thus, become more dedicated to this relationship (Bianchi & Saleh, 2020). According to Bowersox *et al.* (2020), building communication and trust first requires a firm to demonstrate reliability in its operations, continuously executing its tasks as promised and meeting expectations.

Communication and trust are important for suppliers and buyers since any relationship built and based upon common communication and trust is expected to achieve success (Ariesty, 2016; Makhitha, 2017). This fact, therefore, means that partners in the SMEs must have communication and trust flexibility since it is impossible to have a true relationship without trust. Consequently, buyer-supplier trust flexibility is the key feature of continuity in a relationship and an essential COVID-19 strategy. Trust within SMEs' buyer-supplier relationships relates to the assurance a party has concerning the dependability and honesty of its partner which is based upon supportive prospects (Gualandris & Kalchschmidt, 2016). Extant literature defines trust as the ability of the buyer to accept vulnerability from the supplier because of the benevolent prospect of the honest intent and actions of the supplier (Ahimbisibwe, 2014; Bozionelos, 2016). Trust is operational in a buyer-supplier relationship when a cooperating partner believes in the partner's truthfulness and magnanimity which reduces the chances of the partner acting opportunistically in tentative situations (Ahimbisibwe, 2014). In an exchange relationship such as the SC, trust is the foundation for

engagements, hence exchanges with the potential to cost more than the expected benefits are necessarily avoided by an exchange partner (Ahimbisibwe, 2014).

For this reason, Voigt and Inderfurth (2012) emphasise trust as having an important link with communication and honesty because the propensity to trust an honest partner is higher when compared to trusting a dishonest partner. The trust construct plays the lead role in exchange relations because of its ability to ensure the dependability of the exchange partner's capability to deliver according to promises (Winchester & Huston, 2017). This role includes, but is not limited to, the establishment of borderline situations in the SMEs' buyer-supplier relationship (Bozionelos, 2016). In this study, communication and trust are seen as the symbols of the unity that exists, as a result of confidence, integrity and the willingness of the SMEs' SC, to engage in an exchange transaction towards providing quality products/services amidst COVID-19 consequences. Based upon this practice, it is logical to predict a positive relationship between buyer trust flexibility and communication flexibility and trusting the suppliers to provide quality products. This situation leads to the following hypotheses:

H_{1a}: Buyer-supplier trust flexibility has a positive impact on communication flexibility.

H_{1b}: Buyer-supplier trust flexibility has a positive impact on product quality flexibility.

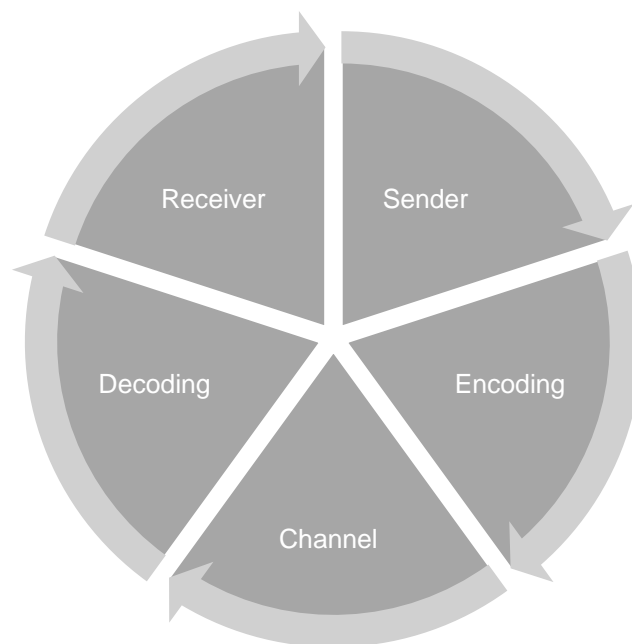
2.3 Buyer-supplier communication flexibility

Altogether 89 percent of a typical leader's week is spent communicating; therefore, management functions cannot be completed without effective communication and commitment (Grossman, 2017). According to Botha (2019), communication is defined as a process for transferring information and meaning. Furthermore, Bianchi and Saleh (2020) mention that communication is important in conducting business with partners. Therefore, effective collaboration and commitment among managers and functional departments serve as the essential foundation of resources and capabilities that drive performance (Asamoah *et al.*, 2019). Through regular communication exchanges, members in the SC can achieve coordination by sharing valuable information (Bianchi & Saleh, 2020). Communication, commitment and information, thus, have been highlighted as the foundation for efficient and effective collaboration between firms (Bowersox *et al.*, 2020). The significance and benefits of intra- and inter-firm network relationships lie in their capacity to pool resources, effectively manage efforts and actions through cooperative planning, deliver visibility by sharing information, and developing a sense of shared responsibilities among individual actors (Asamoah *et al.*, 2019).

Communication with customers is very important and information can be communicated through personal contact, information system linkages, media platforms and e-communication

(Horn, 2018). Effective communication further raises confidence in the strength of a trustworthy relationship and commitment and decreases dysfunctional conflict between business partners (Bianchi & Saleh, 2020). Amidst COVID-19 disruptions, such network relationships and commitment are particularly important for SMEs in order to maintain constant and appropriate customer service levels through flexibility, product/service quality and availability and timely delivery of products and services to customers, thereby spreading market share and stimulating profitability and growth. The various stages of the communication process are illustrated in Figure 1:

Figure 1: Communication flexibility



Source: Adapted from Botha (2019)

Communication takes place between the sender and the receiver, whereby the sender could be management in the SMEs conveying messages to a supplier of the product. Communication will be initiated by the sender and encoding will thus take place. The channel for transmitting the message can be face-to-face contact, e-mails or the telephone – and will be decided by the seller. The supplier will then receive the sender's message and interpret it (decoding). Buyer-supplier communication flexibility is an important COVID-19 SC resilience strategy. This fact leads to the following hypotheses:

H_{2a}: Buyer supplier communication flexibility has a positive impact on commitment flexibility.

H_{2b}: Buyer supplier communication has an impact on product quality flexibility.

2.4 Buyer supplier commitment flexibility

Boateng (2016:129) defines commitment as a “*negotiated agreement between two parties to produce a defined outcome and accept it if produced within stated conditions of satisfaction, which is an intention to continue a course of action*”. Ngouapegne and Chinoma (2018) explain that commitment is the basis of the longevity of any relationship. They continue to say that commitment comprises a requirement, a desire and a need to influence the durability of a relationship. Thus, the SC’s ability to constantly generate value for its customers in disruptive environments (such as COVID-19) is contingent on its ability to marshal resources to build resilience (Asamoah *et al.*, 2019). This aptitude is imperative for SMEs to maintain firm competitiveness. Based upon this fact, it is logical to predict a positive relationship between buyer supplier commitment and SME competitive performance and so leads to the following hypothesis:

H_{3a}: Buyer-supplier commitment impacts significantly on SMEs’ competitive performance.

2.5 Buyer-supplier Product quality flexibility

Purchasing the right quality of products and services is important for filling the needs of the end-user (Badenhorst-Weiss *et al.*, 2018) and maintaining commitment from suppliers as well as customers. Ensuring quality, reliability and flexibility of prompt delivery to customers is crucial to SC success (Asamoah *et al.*, 2019) because such behaviour can lead to achieving firm competitiveness for SMEs. Moreover, much of the service importance in SC management and the maintenance of competitive advantage is to commit, constantly physically deliver undamaged products timeously and with all the attributes necessary to conform to customer service requirements. This practice should be a huge concern for all SMEs. Defining quality may be controversial because quality, like beauty, is usually in the eye of the beholder and, consequently, partly subjective (Badenhorst-Weiss *et al.*, 2018). According to Horn (2018), quality within the business world refers to quantifiable qualities, a characteristic of goods or services typically expressed according to grade, class, brand or specifications.

According to Boateng (2016:454), “*quality refers to the characteristics of an item or process that indicates its performance to designated parameters, and its degree of perceived customer acceptance or satisfaction*”. Furthermore, Badenhorst-Weiss *et al.* (2018) define quality as the total combination of features through which a product or service, when used, will meet or exceed the expectations of the customer by being able to satisfy a specific need. Bowersox *et al.* (2020) append that the quality of a product is viewed in eight relative dimensions, namely perceived quality, durability, reliability, features, performance, serviceability, conformance, and aesthetics. Nowadays, low value-added activities are outsourced by firms to focus on core activities, whereby this action is a strategic decision to help firms focus more on core business,

which increases the quality of their products (Nadali *et al.*, 2016). Figure 2 depicts how SMEs can focus on customers to ensure product quality flexibility.

Figure 2: Product quality flexibility based on customers



Source: Authors' own compilation based on Nadali *et al.* (2016)

Figure 2 depicts how product quality flexibility can be attained through customer focus. This condition can be achieved through customer relationship management, finding out the customer needs, customer service management, and marketing products through the internet (for example e-tailing, a process that limits contact and enhances the customer's experience, especially during the current COVID-19 pandemic). The livelihood of a firm and the rest of the SC lies with customers and the income that they generate (Horn, 2018). Nadali *et al.* (2016) opine that a high level of trust and commitment between managers in different levels yields better quality products that can lead to the firm's competitiveness. It is important to control the quality of incoming materials and purchased services (Hugos, 2018) in the SC as a COVID-19 resilience strategy. This requirement leads to the following hypotheses:

H_{4a}: Buyer-supplier product quality flexibility influences commitment flexibility.

H_{4b}: Buyer-supplier product quality has a positive impact on SMEs' competitive performance.

Disruptions can occur unexpectedly without warning signals and, in extreme cases, causing some SMEs to fail and exit the business environment owing to their inability to recover from disruptive events (Asamoah *et al.*, 2019). Thus, the question of how SMEs can endure the

effects of the current COVID-19 pandemic has never been as prominent as it is at the time of conducting this study. As a result of the impact of COVID-19 all businesses and SMEs should have learnt that it is crucial for them to adopt resilience strategies (trust-, communication-, commitment- and product quality flexibility) to help a crippled economy. The strength of this research, thus, lies in the recency of the topic for researchers to understand that SC resilience during the COVID-19 pandemic in SMEs is both essential and required.

3. METHODOLOGY

The positivism research theory underpins the research investigation because the research conceptual framework is quantitative in nature. Within this approach, deductive reasoning is applied because the research hypotheses had been developed and deduced from existing theory (Quinlan *et al.*, 2019). The method of data collection was greatly influenced by the availability of SMEs. However, to determine the appropriate SME sample frame for the research, the Gauteng Enterprise Propeller (GEP) and the Small Business Directory within Southern Gauteng (South Africa) were consulted. The particulars of approximately 10 000 registered SMEs were drawn from this database comprising the SMEs' physical addresses and contact details. Quantitatively, the researchers chose to rely on the non-probability convenient data collection method due to affordability and proximity for easy access of SMEs. Quantitative research is known to test hypotheses and make predictions while using randomisation to be able to generalise the study (Salvador, 2016). Based upon the reasons of easy access and acceptable sample size for structural equation modelling (SEM), the research sample size of 450 SMEs was identified and the questionnaire was distributed accordingly.

Conveniently through the help of two field workers, the research data was self-administered. Out of 450 questionnaires distributed to the SMEs' owners or managers, a suitably substantial total of 395 questionnaires were collected and used for the data analysis. All questions were coded in a five-point Likert scale arrangement, except for the demographic section.

All measurement items for all the research variables (trust, communication, product quality, and commitment) were adopted from previous studies. For example, trust flexibility in SC measures was taken from Nyaga and Whipple (2011), communication flexibility in SC measurement items from Fynes and Voss (2002), product quality flexibility in SC adapted from Hall *et al.* (2016), commitment flexibility in SC measurement items from Ulaga and Eggert (2006) and lastly, SMEs' competitive performance was measured using an item from Mafini and Loury-Okoumba (2016). All the measurement items are reliably valid as indicated in Table 1.

4. RESULTS

According to Dunn (2009:281), “statistical analysis is the process of testing hypotheses about and drawing inferences from data using mathematically based rules”. SMART PLS 3.0 was used to assess the significance of the hypothesised relationships. The following sequential process was adopted: (1) the description of the SMEs’ demographic profile, (2) the assessment of the research variables’ accuracy and consistency measurements, (3) the significant level of the relationship and (4) the discussion of the research findings.

4.1 Demographic description

Out of the 396 questionnaires used for the study, about (n=175; 44.2%) SMEs have been in operation between two to four years and about (n=118; 29.8%) have been operating five to seven years. More than half of the total number of SME participants have physical assets of less than R4 million (n=214; 54.04%) with annual sales of less than (n=179; 49.8%). The majority of participating SMEs were among the essential organisations whose operations were exempted from the most extreme COVID-19 lockdown restrictions in South Africa. For example, the wholesale, distribution centres and retail organisations amount to (n=120; 31.2%), while manufacturing, storage and transportation amount to (n=68; 17.2%). Agriculture represents approximately (n=30; 7.6%) and electricity, gas and water supply have the least percentage of (n=25; 6.3%). The majority of SME owners or managers either have a university degree or a national diploma as their highest academic qualification. Table 1 depicts the research variable consistency and accuracy statistics.

Table 1: The research variable consistency and accuracy statistics

Research constructs	Cronbach's alpha	Dillon-Goldstein's rho (rho_A)	Composite reliability	Average variance extracted (AVE)
Buyer-supplier commitment	0,771	0,786	0,868	0,688
Buyer-supplier communication	0,815	0,821	0,878	0,645
Buyer -supplier product quality	0,839	0,839	0,893	0,675
Buyer-supplier trust	0,840	0,842	0,887	0,611
SMEs' competitive performance	0,850	0,852	0,909	0,77

Scores: 1=strongly disagree; 2=disagree; 3=slightly agree; 4=agree; 5=strongly agree

Source: Authors' own compilation based on survey results

For this research, the Cronbach's alpha coefficient values, Dillon-Goldstein's rho values and the composite reliability (CR) values were used to determine the internal accuracy and

consistency of the research constructs. According to Table 1, Cronbach's alpha ranges from (0.771 to 0.850), Dillon-Goldstein's value ranges from (0.786 to 0.852) and the CR value ranges from (0.868 to 0.909), indicating that the research item measurements are reliable because the values exceed the acceptable threshold of 0.70 (Franzen, 2000; Hair *et al.*, 2011; Johnson & Christensen, 2012). Furthermore, according to Fraering and Minor (2006) and Rosenan *et al.* (2018), the AVE value greater than 0.5 is considered acceptable. As is evident from Table 1, the AVE reliability value ranges from (0.688 to 0.77). In Figures 3 and 4, it can be observed that the factor loadings are greater than 0.5. All these values indicate acceptable convergent validity. The statistical result in Table 2 indicates the presence of discriminant validity among the research variables.

Table 2: Discriminant validity

	Buyer supplier commitment	Buyer supplier communication	Buyer supplier product quality	Buyer supplier trust	SMEs competitive performance
Buyer-supplier commitment	$\sqrt{0,829}$				
Buyer-supplier communication	0,551	$\sqrt{0,803}$			
Buyer-supplier product quality	0,562	0,552	$\sqrt{0,822}$		
Buyer-supplier trust	0,537	0,654	0,569	$\sqrt{0,781}$	
SMEs competitive performance	0,562	0,494	0,524	0,469	$\sqrt{0,878}$

Scores: 1=strongly disagree; 2=disagree; 3=slightly agree; 4=agree; 5=strongly agree

Source: Authors' own compilation based on survey results

Convergent validity assesses whether the items measuring each of the research variables load highly on their respective factors while discriminant validity helps to validate that the research variables are not related to each other (Zikmund, 1999; Henseler *et al.*, 2015). The discriminant validity of this research was assessed by ensuring that the inter-correlation statistics for the research components are less than 1.0. Further validation of this discriminant validity was performed by assessing whether the square root of average variance (AVE) coefficients is greater than the correlation statistics for all the research variables. For this research, Table 3 shows that all proposed variable relationships indicate strong relationship significance because all the t-values for the research constructs are greater than ($< 1.96\%$) and range from (4.264 to 6.948) and the p-values are less than (> 0.05).

Table 3: Significant strength

Relationships	Original sample (O)	T statistics (O/STDEV)	P values
Buyer-supplier commitment -> SMEs competitive performance	0,391	6,948	0.000
Buyer-supplier communication -> commitment	0,257	4,630	0.000
Buyer-supplier communication -> product quality	0,315	5,328	0.000
Buyer-supplier product quality -> commitment	0,289	4,593	0.000
Buyer-supplier product quality -> SMEs competitive performance	0,305	5,988	0.000
Buyer-supplier trust -> communication	0,654	17,144	0.000
Buyer-supplier trust -> product quality	0,363	6,492	0.000

Scores: 1=strongly disagree; 2=disagree; 3=slightly agree; 4=agree; 5=strongly agree

Source: Authors' own compilation based on survey results

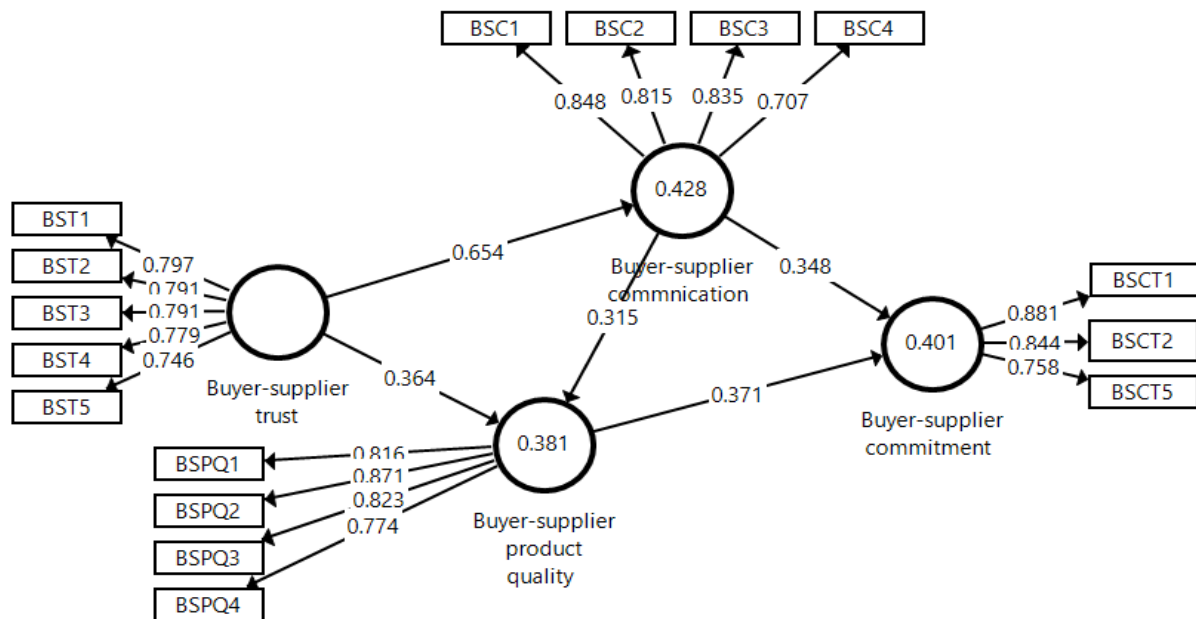
To determine the significant strength of the research variables, a bootstrapping analysis was conducted because, according to Gravetter and Wallnau (2016), the significant value (t-statistics) should be at least more than 1.96 percent to be accepted as significant. The next section will discuss these findings.

5. DISCUSSION OF FINDINGS

5.1 Trust, communication and product quality flexibility

The research proposed that a higher level of trust and commitment flexibility among the SMEs SC relationship is attributed to a higher level of communication during the COVID-19 disruptions. A winning collaboration and customer relationship effort in which communication plays a vital role has been hailed among SMEs and larger organisations as a strategic move for competitive advantage amidst COVID-19 lockdown restrictions (Anthony & Petersen, 2020; Crick & Crick, 2020; Tandelilin *et al.*, 2020). Effective communication technology adoption and integration are highly motivated by this research for SMEs' enhancement of product quality and commitment to customers/suppliers. According to the research results shown in Table 3 and Figure 3, trust and communication are significant at the t-statistics value of (17.144), while communication and commitment have the second-largest t-statistics value of (6.948). The higher significant value indicates that buyer-supplier trust is better enhanced by a higher level of communication amidst COVID-19 with (part estimate = 0.654; $p=0.000<0.05$). The assumption is motivated further by looking at the extent to which trust explains and complements communication and commitment. Trust explained about (43% with $R^2 = 0.428$) to communication and (40% with $R^2 = 0.401$) to commitment. Figure 3 reflects the model.

Figure 3: Trust, communication and product quality flexibility



Scores: 1=strongly disagree; 2=disagree; 3=slightly agree; 4=agree; 5=strongly agree

Source: Authors' own compilation based on survey results

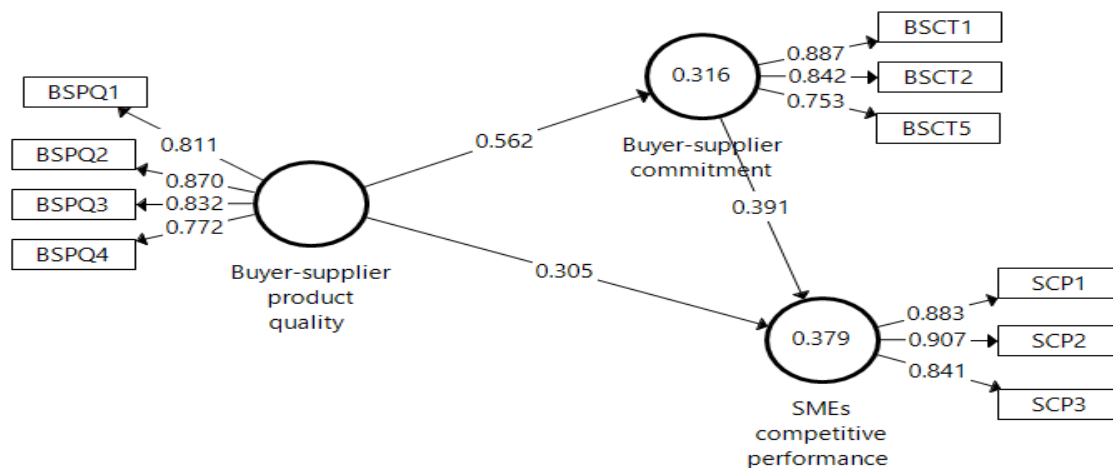
The results of this research indicate that SMEs should focus on improving the relationship communication strategy to enhance relationship trust and commitment to both consumers and suppliers (Obal & Gao, 2020). By so doing, product quality may gain all-around business chain appreciation. SMEs whose main business strategy and goals are based on trust, commitment and product quality might be in a better position for success in the COVID-19 era if strategic communication systems are integrated and implemented effectively. In line with larger organisations, SMEs' social media adoption, virtual meetings through an online communication platform, as well as the connection of soft-phones on laptops, to aid communication between buying and supplying organisations and customer relationships during COVID-19 lockdown restrictions are invaluable essentials (Anthony & Petersen, 2020; Waizenegger *et al.*, 2020).

The research results support the findings of Effendi *et al.* (2020) that a strategic communication platform through the adoption of necessary information technology should enable organisations to effectively customise both product and service offerings through open innovation and learning approaches that accommodate flexibility. Due to the COVID-19 lockdown restrictions, communication of accurate proprietary information among SMEs buyer-supplier has taken a new turn, making strategic relationships within a supply chain more significant. Therefore, the imperative of communicating effectively necessitates the need for SMEs to integrate and learn new communication technology.

5.2 Product quality, commitment and performance

SMEs' competitive performance is preceded by a higher level of product quality and commitment. This second assumption takes the research further to determine the mediating effect of commitment between product quality flexibility and SMEs' performance during the COVID-19 era. Commitment to product and service quality is another competitive strategy SMEs can invest in during the COVID-19 pandemic to achieve competitive performance. The effect of the COVID-19 pandemic on organisational performance may imply a drop-in product or service offerings due to SMEs' liquidity position and business performance, as well as an economic crisis (Tandelilin *et al.*, 2020). From Figure 4 it can be noted that, despite the relationships path coefficient that is significant, SMEs' product and service quality is greatly improved by a higher level of commitment to product and service with (part estimate = 0.562) and explained about (32% with $R^2 = 0.316$), yielding to a higher business performance level with (part estimate = 0.391) and explanatory power of (38%; $R^2 = 0.379$).

Figure 4: Product quality, commitment and performance



Scores: 1=strongly disagree; 2=disagree; 3=slightly agree; 4=agree; 5=strongly agree

Source: Authors' own compilation based on survey results

The decrease in SMEs' level of commitment to the product and service delivery promises is also attributed to the COVID-19 restrictions of working from home, coupled with the unanticipated disruptions in supply and demand (Lu *et al.*, 2020). However, some determined SMEs are surviving due to their inherent capability to embrace and implement new business strategies to deliver enhanced product and service quality and business performance through digital technology (Priyono *et al.*, 2020). The increasing pressure on demand and supply as well as the need to balance supply and demand at the SMEs' business level have not been favourable due to the COVID-19 pandemic. These research findings are in support of Morgan *et al.* (2020) and Mwiinga *et al.* (2020), both of whom opine that to enhance commitment and business performance, SMEs must innovatively embrace and adapt flexible business

strategies against emerging business challenges and opportunities brought about by the disruptive nature of the COVID-19 pandemic. Therefore, SMEs' buyer-supplier commitment to technology-, competitive price-, customised product-, convenience- and responsiveness flexibility will influence products and service quality positively and also aid competitive performance during and after the COVID-19 pandemic. Maintaining buyer-supplier relationship commitment to flexible product and service offerings will enable SMEs to survive disruptions brought about by COVID-19 restrictions.

6. THEORETICAL IMPLICATIONS

This research explored SMEs' COVID-19 SC resilience strategies in SA. Research on the effect of COVID-19 SC resilience on SMEs is limited. The main objective of this study was to examine COVID-19 SC resilience strategies in SMEs in SA. This approach was adopted because SMEs have an important role to play in a country's sustainable development. The COVID-19 resilience strategies are all important, however, the human behaviour issues related to trust and communication are much more difficult issues to solve. Pandemics such as COVID-19 present an inimitable threat to SCs because they are unpredictable, have a delayed impact, and are immeasurably spread with the various COVID-19 related waves continuing for months and even years. A well-managed SMEs' buyer-supplier SC, thus, is one of the enduring resources to enhance SMEs' competitive strength. Resilience is evolving as an essential area within SC literature but methodical studies on how it is defined and modelled are still limited. Innovative resilience analytics, thus, are required to ensure SC networks remain operational during global disruptions such as COVID-19.

7. MANAGERIAL IMPLICATIONS

The need for SMEs to invest in a communication strategy and a commitment to product quality as a capable resilience strategy within their SC relationship during the COVID-19 pandemic is important. Resilience is the ability of an organisation to cope and compete under pressure during a period of SC disruptions and uncertainties. For many SMEs, coping with agility to devise and implement a contingency plan of action to operate smoothly was almost impossible due to the un-anticipated nature of the COVID-19 disruption. It is evident in both local and international contexts that SMEs not only lack managerial skills but also the necessary resources to adequately manage, integrate and implement SC resilience strategies, such as the introduction of effective communication technology to enhance SC product/service components (transit time, reliability, accessibility, capability and security). Most SMEs' SC product/service components fulfilment operations came to a standstill during the COVID-19

pandemic which, in turn, impacted negatively on SMEs' customer and SC relationships in terms of product-service quality flexibility and commitment to promise.

This research's proposed model indicates possible resilience strategies for SMEs to cope with business challenges brought about by COVID-19 disruptions. However, due to SMEs' managerial constraints, the South African Government has the responsibility to help SMEs enhance the most prominent COVID-19 resilience strategies for effective SMEs business performance levels as outlined in the research findings. The facilitation of appropriate training for these SMEs is necessary for developing new business strategies to deliver enhanced product and service quality and business performance through digital technology and a higher level of commitment to product and service.

8. LIMITATIONS

Based upon this study's review and statistics, the following limitations were noted:

This study only focused on buyer supplier relationships, commitment, trust-, communication- and product quality flexibility, as well as COVID-19 resilience strategies. Future scholars should include other constructs such as technology, information sharing, cost reduction and joint problem solving. This study focused only on SMEs in the Gauteng province to explain the antecedents of COVID-19 resilience strategies, future scholars can extend the search to other industries within other provinces or outside of South Africa. Furthermore, this study employed the use of the quantitative method, thus other researchers may make use of the qualitative method. This practice might help researchers to compare their results with the current study and to find different or maybe more vigorous results.

9. CONCLUSION AND RECOMMENDATIONS

The findings of this study contribute to literature on COVID-19 resilience strategies, SC resilience, and the success of SMEs. The empirical findings, thus, can assist SMEs and scholars to better understand how COVID-19 resilience impacts SCs and SMEs' success. For example, given the positive and substantial relationship between COVID-19 resilience and SC resilience, buyer supplier relationship, commitment, trust-, communication- and product quality flexibility will improve the performance of South African SMEs.

Based on the research findings, it is recommended that SMEs should focus more on improving relationship communication strategies to enhance relationship trust and commitment to both consumers and suppliers. By so doing, product quality may gain all-around business chain appreciation. SMEs whose main business strategy and goals are based on trust, commitment, communication and product quality might be in a better position to succeed in the COVID-19

era if strategic communication systems are integrated and implemented effectively. Due to the COVID-19 lockdown restrictions, the communication of accurate proprietary information among SMEs' buyer-supplier relationships has changed, making strategic relationships within a supply chain more important. Therefore, the need to communicate effectively necessitates SMEs learning how to integrate new communication technology within their business operations. Furthermore, to aid communication between buying and supplying organisations and customer relationships during COVID-19 lockdown restrictions, it is recommended that SMEs adopt social media usage, virtual meetings through an online communication platform as well as the connection of softphones on laptops.

This study has confirmed the research's hypothesis of a higher level of trust and commitment flexibility among SMEs' SC relationships which is attributable to a higher level of communication during the COVID-19 pandemic. Furthermore, SMEs' competitive performance is preceded by a higher level of product quality and commitment. The authors of this study hope that the research has delivered an effective reference for SMEs, scholars and experts operating in the field of COVID-19 restrictions, SMEs and SC resilience, as well as provided guidelines for future research.

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