Supply chain resilience: Interconnectedness of disruptions, strategies and outcomes in the South African FMCG industry

Mr SM Magagula
*University of Pretoria*u
19286784@tuks.ac.zal
https://orcid.org /0000-0003-0429-0079

iD

Mr A Meyer*
Lecturer
Supply Chain Management & Logistics
University of Pretoria
arnom@richfld.ac.za
https://orcid.org /0000-0003-2608-0849

iD

Mr W Niemann
Lecturer
Supply Chain Management & Logistics
University of Pretoria
wesley.niemann@up.ac.za
https://orcid.org /0000-0003-3304-0159

iD

*Corresponding author

ABSTRACT

Background: Organisations face greater competition and exposure to disruptions and risks due to an increase in globalisation, and as a result, they must continuously seek strategies to improve their supply chain resilience (SCRES). However, in the pursuit to achieve effective and efficient supply chains, organisations have acted and reacted in different ways to enhance resilience, which in some cases have also increased vulnerability to other possible disruptions.

Objectives: This study investigated the predominant sources of disruptions in the fast-moving consumer goods (FMCG) industry in South Africa. Additionally, the study investigated the strategies adopted to overcome the sources of disruptions and the interconnectedness of the resulting outcomes.

Method: A generic qualitative research methodology was employed. Data was collected using semi-structured interviews with 12 participants appointed within middle and top management positions in the South African FMCG industry.

Results: The study found that regular strike actions and unionism were the predominant endogenous threats, while bad weather and political instability are the predominant exogenous disruptions to the South African FMCG industry. The findings also indicate that the majority of SCRES strategies adopted by South African FMCG retailers are mostly reactive.

Conclusion: The study suggests that it is important for the South African FMCG industry to build proactive SCRES strategies to be able to better respond to disruptions before it disrupts their supply chains. By incorporating resilient supply chain strategies, organisations can better prepare for potential supply chain disruptions but also respond to and recover from disruptions.

Keywords: Supply chain resilience, globalisation, disruptions, strategies, interconnectedness, FMCG industry, qualitative research, South Africa

INTRODUCTION

Robert Jordan, an American author, was quoted saying: "The oak fought the wind and was broken, the willow bent when it had to and survived." Likewise, some external and internal disruptions of organisational supply chains are unavoidable, however, the SCRES strategies used in understanding, predicting, preventing and managing disruptions can influence the magnitude of the outcome (Ivanov, Mason, and Hartl, 2016:2). Scholars have suggested that SCRES is about identifying disruptions and finding corresponding strategies (Adobor, 2018:1-3; Kochan & Nowicki, 2018:843-845). However, the existence of a relationship between strategies and outcomes is not always clear (Kamalahmadi & Parast, 2016:1450).

Hence, responding to unpredictable supply chain disruptions remain a major concern for organisations, and of need for further academic research (Kochan & Nowicki, 2018:842). Moreover, this limited understanding of the

interrelationship between the elements of SCRES may lead to mismatches between the disruptions, the deployed strategies and the outcomes thereof (Tukamuhabwa, Stevenson, Busby & Zorzini, 2015:5605). Mismatches between disruptions, strategies and outcomes waste resources and may cause further disruptions to the supply chain.

Concomitantly, the purpose of this qualitative study is to investigate SCRES in the South African FMCG industry to improve the understanding of the interconnectedness between supply chain disruptions, the strategies used to mitigate those disruptions and the outcomes thereof. The research specifically focusses on the South African FMCG industry. The South African FMCG industry sources raw materials and finished products both locally and globally, which makes their supply chains more vulnerable and exposed to disruptions (Singh, Shukla & Mishra, 2018:398). As such, the local FMCG industry presents an appropriate setting to examine the interconnectedness of supply chain disruptions, strategies and outcomes of a developing country perspective. The research aimed to answer the following questions:

- What are the predominant sources of disruptions in the South African FMCG industry?
- Which strategies do South African FMCG organisations use to build SCRES to mitigate disruptions?
- How are disruptions, strategies and outcomes interconnected in the South African FMCG industry?

LITERATURE REVIEW

South African FMCG industry overview

The global FMCG industry manufactures and provides products that are highly in-demand, quickly sold, and affordable to the society (Mvubu & Naude, 2016:274; Christ & Ferrantino, 2011:20). The FMCG industry has become an area of focus for driving economic growth, not only in South Africa but also the African continent at large, leading high volumes of consumer demand (Syed & Siddiqui, 2019:9386). However, the volatility of the South African Rand has led to increased prices on many goods and services, placing the FMCG industry in a situation where it should find a balance between sustaining desired profits while making products affordable to financially disadvantaged consumers (Bala, Prakash & Kumar, 2010:25).

Due to such high volatility in consumer demand, the FMCG industry in South Africa has become vulnerable to disruptions, including economic instability (Simba, Niemann, Kotzé & Agigi 2017:14). Furthermore, the South African FMCG industry is heavily affected by challenges such as poor infrastructure, unreliable power and poor technological systems (Meyer, Niemann, van Pletzen & Smit, 2019:2). Despite the threatening challenges faced by South African FMCG organisations, the industry's supply chains are deemed to drive economic growth and bring stability to the country's economy at large (Sanchez Rodrigues & Potter, 2013:290).

Global sourcing

Organisations pursue different global supply chain approaches to respond to the new global market changes (Ibrahim, Zailani & Tan, 2015:1430). However, the growth of global sourcing has been influenced by two main factors. Firstly, organisations will globalise operations to achieve reduced production cost and take advantage of advanced technologies (Jabbour, 2010:507-524). For example, global sourcing obtains products such as raw materials and manufactured products from different countries. The products are then transported across borders of other countries for further packaging, processing and sale (Holweg, Reichhart & Hong, 2011:333-341). This reduces costs because obtaining products from other countries may be cheaper than buying them from local suppliers (Asree, 2010:1).

Secondly, the increasing competition in today's turbulent environment has led to organisations concentrating more on core business activities while outsourcing other business needs (Kiessling, Harvey & Akdeniz, 2014:670). This has created strong cooperation between several organisations and formed global networks along the supply chain. Kiessling et al. (2014:676) state that many organisations see the globalisation of supply chains as an instrument that enables them to react to the strategies adopted by competitors. However, these two factors have resulted in complexities along the supply chain, making the supply chains vulnerable and exposed to disruptions of disruptions such as financial failure (Agigi, Niemann & Kotzé, 2016:2).

Supply chain resilience

Background to SCRES

The concept of resilience has attracted interest from scholars of different disciplines (Ma, Xiao & Yin, 2018:2). Regardless of its origins, resilience is considered a multidisciplinary and multidimensional concept (Adobor, 2018:1). The concept has been applied in different subjects such as economics, engineering, entrepreneurship, organisational management, psychology and supply chain management (Ma et al., 2018:5; Mandal, Sarathy, Korasiga, Bhattacharya & Dastidar, 2016:627). Management scholars find that at the organisational level, resilience is not only considered to be the capability to recover from unexpected shocks, but also the ability to turn challenges to opportunities while enhancing performance (Jüttner & Maklan, 2011:246).

Lengnick-Hall, Beck and Lengnick-Hall (2011:244) argue that organisational resilience is "a firm's ability to effectively absorb, develop situation-specific responses to, and ultimately engage in transformative activities to capitalise on disruptive surprises that potentially threaten organisation survival". The concept of SCRES has become an area of focus within the supply chain discipline because of the rise of undesirable disruptions to global supply chains (Chowdhury & Quaddus, 2016:713). Early definitions, such as that of Christopher and Peck (2004:1), highlights that SCRES is the capacity of a system to rebound from disruptions.

Furthermore, scholars, including Ponomarov and Holcomb (2009:131), defined SCRES as the ability of a supply chain to prepare, adapt to unforeseen events and react to disturbances while upholding operations at the required level. More recently, Pettit, Croxton and Fiksel (2019:56-65), defined SCRES as a system's ability to prepare, respond and recover from a disturbance while achieving competitive advantage. Regardless of the definition, SCRES is used to addresses vulnerabilities, ambiguities and unexpected disruptions faced by global supply chains (Ali, Mahfouz & Arisha, 2017:16).

Disruptions

Supply chain disruptions are any threat to the flow of information, products or materials from the manufacturer to the end consumer (Jüttner & Maklan, 2011:248). The trends of outsourcing and the use of just-in-time practices have drastically reduced production costs (Chakravarty, 2013:39). However, such practices have resulted in more complex supply chains which are more vulnerable to disruptions (Pfohl, Gallus & Thomas, 2011:840). Many organisations today are aware of events that may disrupt their supply chains, such as strikes, bad weather conditions and transport breakdowns (Scholten, Sharkey Scott & Fynes, 2014:212). Disruptions to supply chains lead to discontinuity, low profitability and poor productivity for organisations (Marley, Ward & Hill, 2014:142).

Supply chain disruptions can be categorised into two types, namely endogenous (internal) disruptions and exogenous (external) disruptions (Hohenstein, Feisel, Hartmann & Giunipero, 2015:90). Nel, De Goede and Niemann (2018:3) use a tripartite classification of supply chain disruptions, namely inter, intra- and extra-organisational disruptions. Despite the differences in terminology and categorisation, scholars largely agree that there is a distinction between disruptions emanating from within the supply chain and those emanating outside of the supply chain.

Endogenous disruptions may negatively impact the supply chain causing several organisations within the supply chain network to shut down. In other cases, the whole supply chain may close (Jüttner & Maklan, 2011:246). Subsequently, endogenous disruptions may lead to inefficiencies and poor relationships, a long the supply chain network (Durach, Glasen & Straube, 2017:845). Table 1 summarises the differences between endogenous and exogenous disruptions.

Strategies for mitigating disruptions to supply chains

Strategies for building SCRES are categorised as being either proactive or reactive depending on when they are applied relative to a threat or actual disrupting event (Adobor & McMullen, 2018:1452). Proactive strategies, such as collaboration, flexibility and visibility encourage supply chain readiness (Pettit, Fiksel & Croxton, 2010:1-25).

TABLE 1
ENDOGENOUS AND EXOGENOUS DISRUPTIONS

Endogenous Disruptions	Exogenous Disruptions
Cultural differences	Political instabilities
Infrastructure disruptions	Weak legal systems
Payment disruptions	Corruption
Dishonest Suppliers	Natural disasters
Raw material delays	Informal Sector
Financial difficulties of suppliers	Unstable taxation
Limited local supply market	Geographical location
Order cancellations	Power shortages
Poor customer delivery performance	Communication barriers
Long-distance sourcing triggered disruptions	Legal uncertainty

Source: Adopted from Tukamuhabwa, Stevenson, Busby & Zorzini (2017:493)

Collaboration refers to organisations within the supply chain networks aligning their activities and thus enhancing the network's adaptive capacity (Duong & Chong, 2020:2). Adobor and McMullen (2018: 1464), however, argue that collaboration may inadvertently increase the risks of inter-organisational conflicts in the supply chain networks.

Flexibility refers to an organisation's ability to react to disruptions while avoiding significant increases in operational costs (Agigi et al., 2016:8). Jüttner and Maklan (2011:254) highlight increasing flexibility as a key threat containment strategy. Supply chain flexibility protects organisations' revenue and cost targets while enhancing their capacity to meet customer demands in unpredictable conditions. Organisations can ensure supply chain design flexibility by implementing strategies such as multi-sourcing, production, distribution, and contract flexibility, as well as customisation and by employing a multi-tasked workforce (Chowdhury & Quaddus, 2016:712).

Visibility is facilitated by information sharing, business intelligence and tracking information on operations. This allows organisations to identify vulnerable areas along the supply chain and to formulate contingency plans (Jüttner & Maklan, 2011:254). Adobor and McMullen (2018:1456) point to the implementation of business continuity planning (BCP) as a key monitoring strategy to promote visibility by having prevention and recovery strategies in place in the event of a potential threat. Velocity is the capacity to complete tasks in the minimum time possible. Jüttner and Maklan (2011:248) mention that visibility, flexibility and velocity can be collectively referred to as agility.

In contrast to proactive strategies, reactive strategies are utilised to respond to or help, the supply chain to recover from disruptions, or to achieve a better operational state following a disruption (Scholten & Schilder, 2015:471). Many reactive strategies are similar to proactive ones, the key difference being that they are only put in place after the disruption has taken place. For example, reactive strategies include measures such as building logistics capabilities, contingency re-routing, creating redundancy, demand management and increasing visibility and collaboration. Some scholars, such as Chowdhury and Quaddus (2016:712), link redundancy to flexibility, thereby categorising is as a proactive strategy.

Other scholars classify redundancy as a reactive strategy. Tukamuhabwa et al. (2017:488) align the different classifications by noting that redundant suppliers can be identified before a threat emerging, implying proactiveness. A review of the literature indicates that the classification of proactive versus reactive supply chain resilience strategies is not clear-cut in several instances. For instance, Jüttner and Maklan (2011:254) place multi-carrier transportation under flexibility as a proactive strategy, while Colicchia, Dallari and Melacini (2010:680) classify multi-carrier transportation under reactive strategies. This may be due to the different contexts in which the studies were conducted. However, this also indicates how the interconnectedness and embeddedness of strategies and disruptions prevents a simple categorisation thereof.

Interconnectedness of disruptions, strategies and outcomes

Interconnectedness refers to the linkages between disruptions, strategies and outcomes. Kim, Chen and Linderman (2015:49-59) demonstrated the non-linear relationship between disruptions, strategies and outcomes in supply chains and observed that because of this interconnectedness, mitigating strategies could inadvertently trigger other disruptions along the supply chain, a term they call, risk migration. Interdependency in the supply chain network means that a disruption in one organisation can negatively impact other organisations in the network (Pereira, Christopher & Lago Da Silva, 2014:626). Any failure of one organisation along the supply chain network can lead to failure of other organisations, and in some cases can lead to the whole supply chain closing (Hohenstein et al., 2015:90-99).

Although some scholars consider SCRES strategies as independent, this study argues that the SCRES strategies are indeed related. The relationships between reactive strategies in SCRES during the global financial crisis are demonstrated in the work of Johnson, Elliott and Drake (2013:490). Their study found that relationships exist between SCRES strategies, such as flexibility, velocity, visibility and collaboration. Even though the strategies in the studies as mentioned above proved to be complementary, the risk of further disruptions may exist. This is because SCRES strategies adopted by organisations do not always produce outcomes that they desired.

For instance, Soni, Jain & Kumar (2014:18) found that the strategy of collaboration can conflict with flexibility. This observation is critical in the current research because it demonstrates the need to systematically examine supply chain behaviour to formulate effective interventions that carry minimal risks. Gligor and Autry (2012:10-11) use the term embeddedness, to refer to the set of unique political, cultural and geographical aspects and differences that influence the resilience of the supply chains. Examples of cultural influences included corruption, strike action, dishonest suppliers and a reduced customer base and financial difficulties. Geographical factors include long distances from suppliers and limited access to ports and distribution nodes (Gligor & Autry 2012:41-55). The concept of embeddedness is employed in this study to provide the local contextual 'interconnectedness' which influences SCRES in the South African FMCG industry.

METHODOLOGY

Research Design

A generic qualitative research design was employed for this study. A generic qualitative approach seeks to examine people's experiences or beliefs pertaining to a certain phenomenon (Percy, Kostere & Kostere 2015:78). This research approach draws concepts and insight from data as opposed to using data to test a preconceived hypothesis (Taylor, Bogdan & DeVault, 2015:7). The generic qualitative approach was therefore employed as this was the most appropriate research technique for this study.

Sampling

The units of analysis for this study were supply chain practitioners in the South African FMCG industry. This study utilised purposive homogenous sampling to select organisations in the South African FMCG industry. According to Daniel (2011:100), a homogeneous sampling helps researchers to do meaningful data comparisons across data collected across organisations and is better suited for studies that require the participation of practitioners who are directly implicated by the topic being investigated. The selected participants in this study were middle to top management that works in the South African FMCG industry. The selection of middle to top management enabled the researcher to access critical information based on their experience and seniority within the organisation. Table 2 below outlines the profiles of the participants involved in the study:

Boddy (2016:426) states that in a qualitative study conducted in a single industry, country or a homogeneous population, a sample size of twelve interviews is deemed large and justifiable. Moreover, Mason (2010:20) stated that six to twelve in-depth interviews are appropriate in qualitative research to reach data saturation. The concept of data saturation refers to the point whereby further data collection yields little additional viewpoints, insights or information about the topic being investigated in the research (Hennink, Kaiser & Marconi 2017:591). Following scholars such as Guest and Prévost (2006:22-25) who indicated that data saturation begins to be seen at the intervals of six to twelve in-depth interviews, saturation point in this study was deemed to be reached during the ninth interview. Three additional interviews were conducted to ensure saturation after which the data collection was terminated as no new themes emerged.

TABLE 2
PROFILE OF PARTICIPANTS

Participants ID	Job Title	Organisation ID	Interview Duration (minutes)
P1	CEO	01	68min
P2	Procurement Manager	02	35min
P3	Managing Director	03	42min
P4	Logistics Performance Improvement Manager	04	30min
P5	FBH Transport Operations Manager	05	13min
P6	Group Logistics Executive	06	18min
P7	National Portfolio Manager	07	41min
P8	Sustainability Manager	08	16min
P9	Africa Zone Compliance Manager	08	23min
P10	Planning Manager	10	17min
P11	Account Manager	11	26min
P12	Distribution Manager	12	23min
Average interview duration:			30min

Source: Authors own compilation

Data collection

Data collection for this study was conducted through twelve semi-structured interviews. This data collection method uses open-ended questions which allowed for a greater understanding of the participant's perspective and reasoning (Taylor et al., 2015:10). The use of semi-structured interviews gave participants enough room to express themselves beyond the questions being asked (McIntosh & Morse, 2015:2). The literature review undertaken by the researchers formed the basis of the discussion guide that was developed for this study. The discussion guide was first pre-tested with a supply chain executive in the South African FMCG industry. After the pre-test, no significant changes were needed to be made to the discussion guide. During the interview, participants provided a signed consent form, and the researchers obtained verbal consent from the participants at the onset of the interviews to record each interview. After completion of the data collection, the researchers transcribed all interviews and ensured that they were in verbatim by reading over the transcripts while listening to the audio-recordings to check for any errors in the transcriptions.

Data analysis

Thematic analysis was used to guide the study. Thematic analysis is an approach that describes the method employed to identify, analyse and report themes within the data collected (Daniel, 2011:140). Thematic analysis was done in five phases, namely data familiarisation, generating initial codes, identifying themes, constructing thematic networks and integration and interpretation (Robinson, 2011:476). This research utilised a computer-assisted qualitative data analysis (CAQDAS) software package called Atlas.ti (version 8) to efficiently analyse the large amounts of data from the interviews. Atlas.ti is specifically developed to generate and manage codes as well as identify the relationship between codes and themes. Following this process, the researchers generated the codes in code groups to identify the main themes of the study.

Trustworthiness

The trustworthiness of the study is vested in the credibility, dependability, confirmability and transferability of the results (Gunawan, 2015:4). Credibility is concerned about the reality of the information obtained from the view of the

participants who provided data (Gunawan, 2015:4). Credibility was ensured by using purposeful sampling, using a well-established data collection method, and by ensuring that the data collected was analysed, interpreted and reported accurately and objectively. Dependability refers to the extent to which a study can be replicated (Given, 2008:209). To ensure dependability, the study outlined and utilised a well-documented research design and methodology. Confirmability refers to the extent to which the study's findings can be corroborated by other researchers' findings (Lichtman, 2013:386). The study ensured confirmability through ensuring that the findings accurately represented the perspectives of the participants (Lichtman, 2013:386). To ensure that data collected did not include the influence of the researchers and only reflected the true opinions of the participants (Polit & Beck, 2012:585), the recordings from the interview were transcribed in verbatim. Transferability ensures that the findings obtained from the study can provide meaningful lessons in other similar studies (Given, 2008:189). Transferability was achieved by providing a detailed description of the context in which the study was undertaken (Pilot & Beck, 2012:585).

Ethical considerations

Ethical clearance was granted by the relevant Research Ethics Committee of the University of Pretoria. All participants signed an informed consent form before commencing with the interview. The identity of the participants and the organisations which they represent were kept anonymous and confidential by using pseudonyms.

FINDINGS

Three main themes were identified and extracted from the data collected. These were: (1) Sources of disruptions, (2) SCRES strategies, (3) Interconnectedness.

Theme 1 - Sources of disruptions

Two sub-themes were identified under Theme 1, which in line with Hohenstein et al. (2015:90), are endogenous and exogenous disruptions.

Endogenous Disruptions

According to Durach et al. (2017:845), endogenous disruptions are threats that emerge from within the supply chain. Refer to Figure 1.

All participants indicated that unions pose major threats to their functioning because workforce strikes emerge when negotiations with the unions fail. The following quotes support this:

"The creation of labour unrest where management is not prepared to engage or just ignore employees leads them to go to a trade union, which then becomes a major issue…" (P1, CEO)

"The only way you can deal with such things is to engage the union first, because the labour whether you like it or not, only works with unions present, they don't trust management." (P11, Account Manager)

FIGURE 1
ENDOGENOUS DISRUPTIONS
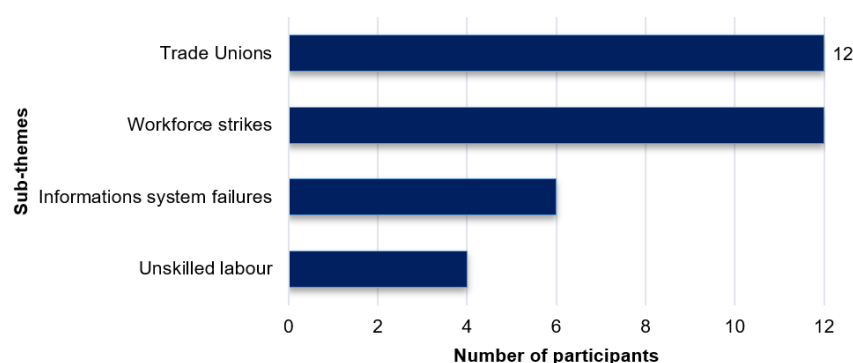
Source: Authors own compilation

Workforce strikes, referrers to the partial or complete concerted denial to work. All participants stated that their organisations were affected by strikes arising from within the organisation. Refer to the explanatory quotes below:

"I've had strikes for weeks, people just didn't come to work…" (P2, Groceries Supply Chain Executive)

"Often, our customers are experiencing strikes at their locations, at their distribution centres and that also under pressured now and we can't deliver." (P4, Logistics Performance Improvement Manager)

Systems refer to the technology implemented by business to run their day-to-day activities. Six participants stated that information system failures were one of their predominant threats. This is demonstrated in the following quotes:

"Another one is technology because you have got your system flaws which creates major disruptions to your chain" (P6, Group Logistics Executive)

"Issues that happened regarding our systems, we weren't able to invoice and that impacted the running of our actual system and day-to-day business…" (P10, Planning Manager)

Unskilled labour refers to inadequate capacity and skills, or a mismatch between skills and job specifications. Four participants noted the threat emanating from the unskilled labour force. Refer to the quotes below:

"A shortage of skilled labour, you would have a reduction in productivity. You also have a brain drain in key positions…" (P12, Distribution Manager)

"Because if we leave it up to the stores to order the stock in the stock then goes through the roof because people at floor level are not educated or it is the wrong people in positions…" (P7, National Portfolio Manager)

The findings are in line with those of Agigi et al. (2016:14) whose research findings of South African FMCG grocery manufacturers also found that trade unionism presents a unique challenge to organisations particularly during strike season when unions organise workplace strikes across different sectors. These findings also correspond with Scholten et al. (2014:212) which argued that strikes present a significant internal threat to supply chains. The findings agree with whole Marley et al. (2014:142) who highlighted that internal threat such as information systems failures negatively impact the supply chain network as a whole. These findings support Nel et al. (2018:4), that identified that the lack of skills and brain drain present significant threats to organisations in South Africa.

Exogenous Disruptions

External disruptions originate from outside the supply chain (Hohenstein et al., 2015:90). Refer to Figure 2.

Bad weather conditions were found to be a significant threat. Nine participants indicated that bad weather conditions negatively impact their supply chains. Refer to the explanatory quote below:

"Back to external factors we look at the weather, hail or all of a sudden, the maize crop isn't in because there has been a drought of years…" (P7, National Portfolio Manager)

FIGURE 2
EXOGENOUS DISRUPTIONS
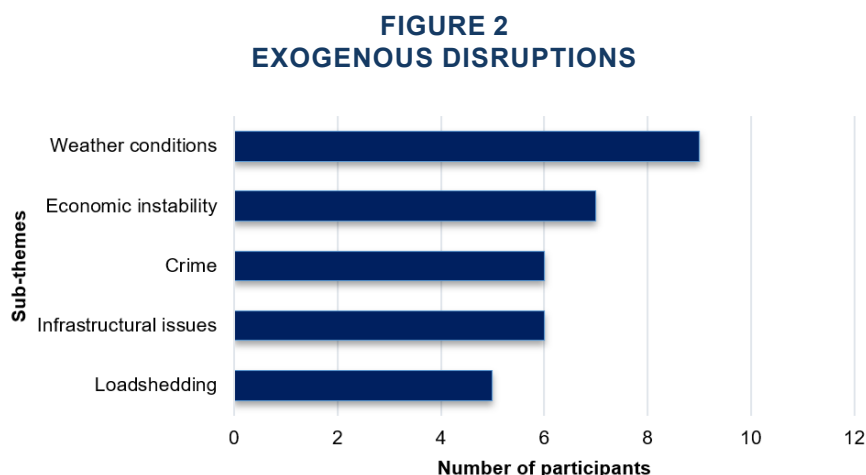
Source: Authors own compilation

"The weather is also a big threat for us and that's related to the ports. You know like the weather in Durban, quite often you will get like wind and issues at the port and then the port shut down because it's not safe for them to operate." (P4, Logistics Performance Improvement Manager)

Economic instability refers to a volatile economic rate, leading to higher uncertainty about the future economic cycle (Choi & Kim, 2008:5). Seven participants indicated that economic conditions negatively affected their supply chains. Refer to the explanatory quotes below:

"You can't control economic conditions. It's not something that's within your control…" (P8, Sustainability Manager)

"The uncertain and unstable economic environment that we operate in makes it difficult to implement…" (P4, Logistics Performance Improvement Manager)

South Africa continues to struggle with high crime rates, which have negative impacts on the country's social and economic development. Six participants noted criminal acts such as hijackings and theft as posing severe threats to their supply chain. Refer to the quotes below:

"…Also, what is a big problem is hijacking and theft of our stocks so the trucks say we have got long country routes, or we've got trucks that's got cash on them, there are always three trucks a day or a week that got hit by criminals…" (P3, Managing Director)

"…Crime, riots, and hijacking those are external factors that will influence the store not getting the stock or getting half the stock delivered. Crime is both internal and external..." (P7, National Portfolio Manager)

Infrastructure refers to assets such as buildings, vehicles, trucks and computers. Six participants indicated that infrastructure issues threatened their supply chain. This can be demonstrated by the explanatory quotes below:

"If you don't have trucks to supply your other depots and duties, essentially your supply chain is done…" (P10, Planning Manager)

"If we start having issues where trucks start having a breakdown with our products on them, in the news, it's going to have a negative effect on our company as a brand…" (P4, Logistics Performance Improvement Manager)

Loadshedding has increasingly become a significant threat to organisations in South Africa as the power utility organisation Eskom struggles to meet the country's growing power demand. Five participants noted that load shedding had cross-cutting negative impacts on their supply chains. Refer to the quotes below:

"If you look at loadshedding for example. You cannot run your services if you have a refrigeration you may need to rent it somewhere else or buy generators" (P2, Grocery Supply Chain Executive)

"We saw a few years ago that when we had loadshedding, our insurance premium the following year just shot high up…" (P2, Procurement Manager)

These findings echo Scholten et al. (2014:212) who found that extreme weather conditions were in the top five exogenous threats to supply chains. These findings are in agreement with the study of Behdani (2013:10-13) which identified economic instability as an external threat faced by supply chains. Nel et al. (2018:7) also found that crime is one of the main inter-organisational threats faced by organisations in South Africa. These responses correspond with Steyn, Bean, King & Komba (2011:100) findings which highlighted that poor transportation infrastructure caused a negative impact, in particular trucks, on supply chain operations.

Theme 2: SCRES strategies

Scholars have categorised strategies for building SCRES into proactive and reactive strategies (Adobor & McMullen, 2018:1452). The sub-themes in Theme 2 transpired from the data analysis process. Refer to Figure 3.

FIGURE 3
SCRES STRATEGIES
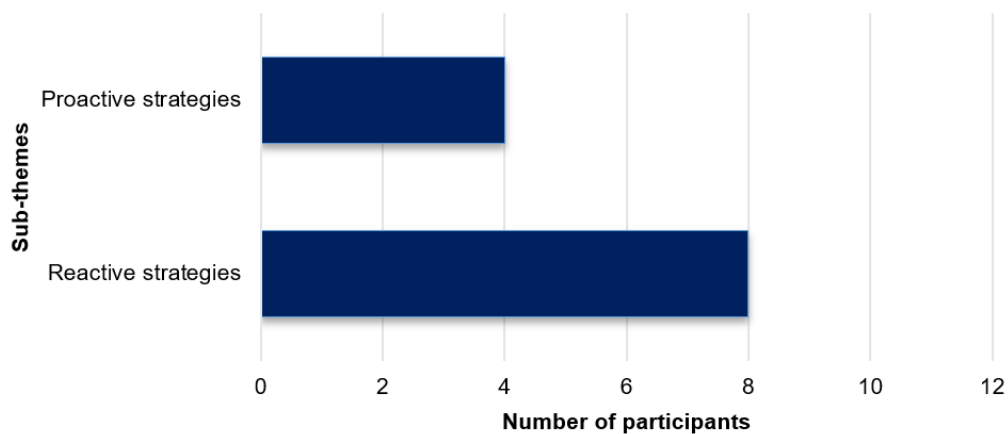
Proactive Strategies

Proactive strategies are deployed before the emergence of a potential threat to reduce the impact of that threat (Ponomarov & Holcomb, 2009:124). Only four participants indicated that they were more proactive than reactive in their approach to SCRES. Refer to the explanatory quotes below:

> "The strategies that we employ working in conjunction with the manufacturer and supplier…" (P7, National Portfolio Manager)

> "We partner with vendors, with capable vendors that can give more responses in times of these crises…" (P4, Logistics Performance Improvement Manager)

> "You put in a proactive strategy which could be strictly deliver direct to stores, or hold enough inventory that your customer needs beforehand…" (P8, Sustainability manager)

These findings support those of Duong and Chong (2020:2) who stated that collaboration between organisations, such as providing raw materials to each other, enables them to mitigate disruptions such as raw material shortages. These findings correspond with those of Adobor and McMullen (2018:1464) who stated that inventory management is an important proactive strategy and is the best way to buffer against disruptions that threaten an organisation's ability to meet demand.

Reactive Strategies

Reactive strategies are utilised to respond to or help, the supply chain to recover from disruptions, or to achieve a better operational state than before the disruption (Scholten & Schilder, 2015:471). Eight participants responded to having a SCRES reactive strategy. Refer to the explanatory quotes below:

> "One strategy was flexibility, we focused more on the localisation of our raw materials to help quell the disruptions after they occurred" (P9, Zone Compliance Manager)

> "We need to come up with a contingency plan. We see how to get products to our customers despite strikes happening…" (P4, Logistics Performance Improvement Manager)

> "…so, we're doing that right now and then we've also put in place, contingencies, find another alternate supplier who can supply the same product." (P2, Procurement Manager)

These findings are in line with Colicchia et al. (2010:680), which noted that flexibility is a key strategy in reacting to disruptions after their occurrence. Additionally, the finding supports that of Jüttner and Maklan (2011:254), that

stated that contingency plans allow organisations to identify vulnerable areas along the supply chain and to formulate contingency plans to mitigate possible disruptions before they occur.

Theme 3: Interconnectedness

The relationship between disruptions, strategies and outcomes is complex and not linear. Furthermore, the unique challenges embedded in the South African business environment add another dimension of interconnectedness between disruptions, strategies and outcomes.

Figure 4: Interconnectedness

FIGURE 4
INTERCONNECTEDNESS
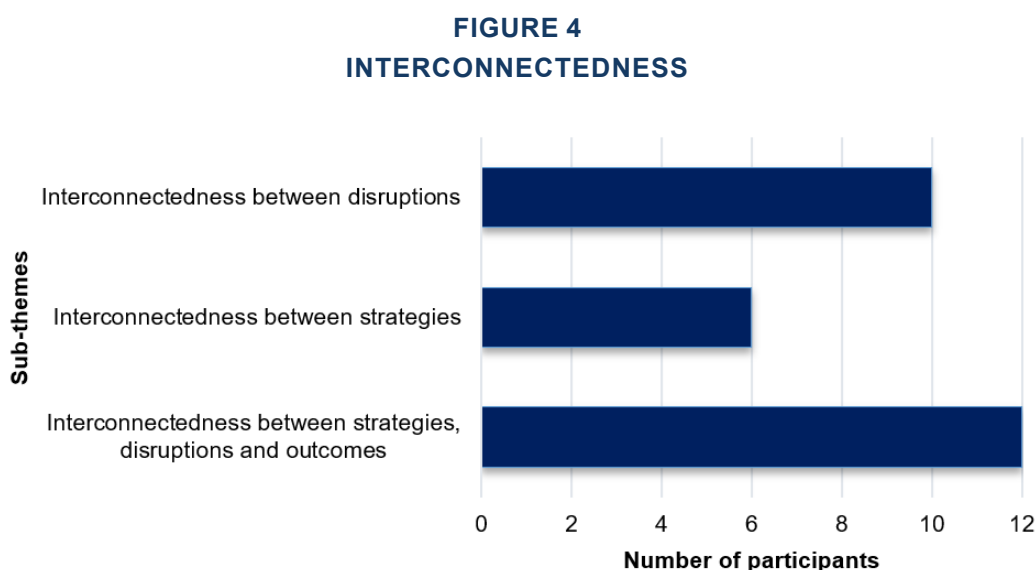
Source: Authors own compilation

Interconnectedness between disruptions

Ten participants noted that they perceive disruptions to their supply chain to be interconnected. The following quotes demonstrate the interconnectedness of South African disruptions to the FMCG industry:

> *"It is a bit difficult because what we've always found is that today's solutions are tomorrow's problem" (P3, Managing Director)*

> *"There is a loop and effect so the strikes happen, and our stock doesn't move, we can't meet demand with our customers or inventory…" (P4, Logistics Performance Improvement Manager)*

Interconnectedness between strategies

Six participants noted the interconnectedness of strategies. Refer to the explanatory quote below:

> *"We tried to find a better strategy to get our raw material from the current supplier in terms of selling them a business strategy, more of partnership, which failed because they weren't looking at the bigger picture." (P6, Group Logistics Executive)*

> *"We found an alternative supplier as a strategy, and they were local. They were only slightly more expensive, but they didn't produce at the capacity we wanted, and our business suffered as a result." (P2, Groceries Supply Chain Executive)*

The interconnectedness between strategies, disruptions and outcomes

All participants agreed on the interconnectedness between disruptions, the strategies introduced to mitigate against them, and the resulting outcomes. However, some used this knowledge to deal proactively with the potential problem, while others adopted a reactive approach. The following quotes demonstrate this:

"You know that there is a possibility of a strike coming up, you put in a strategy beforehand, before the strike action. The outcome of that is you still have disruptions but don't lose as much money as you would have if you had not put a strategic plan in place, so the three elements are definitely related." (P4, Logistics Performance Improvement Manager)

"You try to introduce new strategies, but supply partners don't always like change, they will retaliate, some will be influenced by others factors and as a result, you will find that your production process suffers…" (P11, Account Manager)

The findings corroborate the findings of Stevenson and Busby (2015:344), which also found that disruptions and strategies are interconnected. Moreover, the findings correspond with Tukamuhabwa et al. (2017:496), who noted the interconnectedness of disruptions due to one disruption triggering disruptions further along the supply chain.

CONCLUSION

Summary of findings

This study contributes to SCRES literature by demonstrating how South African FMCG organisations perceive the interlinkages between the disruptions they face, the strategies they implement in response to those disruptions, and the outcomes of those interventions. The study also considers some of the unique embedded issues that impact South African SCRES strategies and outcomes. In doing so, it provides a deeper understanding of the context in which supply chains in the South African FMCG industry operate and the unique challenges they face. The first research question of this study was aimed at establishing what organisations in the South African FMCG industry perceive to be the predominant disruptions to their supply chains. The study found that disruptions to supply chains can arise from within the supply chain (endogenous disruptions) and from outside the supply chain (exogenous disruptions). The study found that the predominant endogenous disruptions were unions, workforce strikes, information system failures and unskilled labour. The predominant exogenous disruptions were weather conditions, economic instability, crime, infrastructure issues and loadshedding.

The second research question was aimed at establishing the strategies adopted by supply chains to build resilience to disruptions. In line with the findings of Tukamuhabwa et al. (2017:486), the strategies employed by FMCG organisations in South Africa are either proactive or reactive strategies. Furthermore, the study found that in implementing strategies, most organisations in the South African FMCG industry apply reactive strategies rather than proactive strategies. This finding corroborates that of Simba et al. (2017), who found that South African companies tend to be reactive when dealing with supply chain threat.

The third question was aimed at examining the extent to which organisations operating in the FMCG industry in South Africa understand the interconnectedness of disruptions, strategies and outcomes. Furthermore, the study found that the interconnectedness between disruptions, strategies and outcomes influences the way participants to respond to other disruptions to their supply chains. Moreover, such interconnectedness has led to organisations establishing more reactive strategies to respond to disruptions, for example, by establishing contingency plans, creating redundancy and through collaboration with different stakeholders in the supply chain.

Managerial implications

Findings of the study demonstrated that disruptions could happen unexpectedly. Hence, it is, therefore, advisable for managers to also implement proactive strategies such as supply chain risk management to better detect potential disruptions to their supply chains before they occur. Such an approach would enable supply chains to be prepared and to eliminate or minimise the impact of such disruptions. It is therefore vital for managers within this industry to consider the likelihood of occurrence of such disruptions when conducting their day-to-day operations. The study further established that strategies adopted by supply chains in mitigating disruptions might cause disruptions to other parts of the supply chains. Supply chain managers should, therefore, establish methods of preventing this from occurring. This could be achieved through establishing proactive contingency plans, increasing visibility and through collaborations with all stakeholders, including suppliers, across the supply chain.

LIMITATIONS AND FUTURE RESEARCH

This research was conducted with organisations operating in the FMCG industry in South Africa. As such, the findings obtained may be limited and unique to the industry and country perspective. Other industries or developing country perspectives should also be investigated to provide further insights. Moreover, the study only examined the viewpoints of participants operating from middle to top management levels in FMCG supply chains. Future research could focus on a triadic approach in the FMCG industry to collect the perspectives of all stakeholders along the supply chain. Additionally, this study was a qualitative study. Future studies could employ a quantitative methodology and examine a larger scale of participants to assess the strength of the relationships between specific disruptions, resilience strategies and outcomes. This would enable more detailed findings and develop a holistic perspective from participants across the country to generalise the findings of this study.

LIST OF REFERENCES

Adobor, H. 2018. 'Supply chain resilience: a multi-level framework', International Journal of Logistics Research and Applications, 22(6): 1-24.

Adobor, H. & McMullen, R.S. 2018. 'Supply chain resilience: A dynamic and multidimensional approach', The International Journal of Logistics Management, 29(4): 1451-1471.

Agigi, A., Niemann, W. & Kotzé, T. 2016. 'Supply chain design approaches for supply chain resilience : A qualitative study of South African fastmoving consumer goods grocery manufacturers', Journal of Transport and Supply Chain Management, 10(1): 1-15.

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 Management, 22(1): 16-39.

Asree, S. 2010. 'Challenges in the global supply chain: Exploitation versus exploration strategy', Management: An International Journal, 22(1): 16-39.

Bala, M., Prakash, S. & Kumar, D. 2010. 'Risk management in the FMCG industry: Supply chain & logistics', Transport World Africa, 8(6): 28-33.

Behdani, B. 2013. Handling disruptions in supply chains: An integrated framework and an agent-based model. Masters dissertation. Sharif University of Technology.

Boddy, C.R. 2016. 'Sample size for qualitative research', Qualitative Market Research: An International Journal, 19(4): 426-432.

Choi, T.Y. & Kim, Y. 2008. 'Structural embeddedness and supplier management: A network perspective', Journal of Supply Chain Management, 44(4): 5-13.

Colicchia, C., Dallari, F. & Melacini, M. 2010. 'Increasing supply chain resilience in a global sourcing context', Production Planning & Control, 21(7): 680-694.

Chakravarty, V. 2013. 'Managing a supply chain's web of risk', Strategy & Leadership, 41(2): 39-45.

Chowdhury, M.M.H. & Quaddus, M. 2016. 'Supply chain readiness, response and recovery for resilience', Supply Chain Management: An International Journal, 21(6): 709-731.

Christ, N. & Ferrantino, M.J. 2011. 'Land transport for export: The effects of cost, time, and uncertainty in sub-Saharan Africa', World Development, 39(10): 1749-1759.

Christopher, M. & Peck, H. 2004. 'Building the resilient supply chain', The international journal of logistics management, 15(2):1-14.

Daniel, J. 2011. Sampling essentials: Practical guidelines for making sampling choices. SAGE Publications, NY.

Durach, C.F., Glasen, P.C. & Straube, F. 2017. 'Disruption causes and disruption management in supply chains with Chinese suppliers: Managing cultural differences', International Journal of Physical Distribution & Logistics Management,

47(9): 843-863.

Duong, L. N. K., & Chong, J. 2020. 'Supply chain collaboration in the presence of disruptions: A literature review', International Journal of Production Research, 58(1): 1-20.

Given, L.M. ed., 2008. The Sage encyclopedia of qualitative research methods. SAGE Publications, NY.

Gligor, D.M. & Autry, C.W. 2012. 'The role of personal relationships in facilitating supply chain communications: A qualitative study', Journal of Supply Chain Management, 48(1): 24-43.

Guest, J.K. & Prévost, J.H. 2006. 'Optimizing multifunctional materials: Design of microstructures for maximized stiffness and fluid permeability', International Journal of Solids and Structures, 43(22-23): 7028-7047.

Gunawan, J., 2015. 'Ensuring trustworthiness in qualitative research', Belitung Nursing Journal, 1(1): 10-11.

Hennink, M.M., Kaiser, B.N. and Marconi, V.C., 2017. 'Code saturation versus meaning saturation: How many interviews are enough?', Qualitative health research, 27(4): 591-608.

Holweg, M., Reichhart, A. & Hong, E. 2011. 'On risk and cost in global sourcing', International Journal of Production Economics, 131(1): 333-341.

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 & Logistics Management, 45(1/2): 90-117.

Ibrahim, H.W., Zailani, S. & Tan, K.C. 2015. 'A content analysis of global supply chain research', Benchmarking: An International Journal, 22(7): 1429-1462.

Ivanov, D., Mason, S.J. & Hartl, R. 2016. 'Supply chain dynamics, control and disruption management', International Journal of Production Research, 54(1):1-7.

Jabbour, L. 2010. 'Offshoring and firm performance: Evidence from French manufacturing industry', World Economy, 33(3): 507-524.

Johnson, N., Elliott, D. & Drake, P. 2013. 'Exploring the role of social capital in facilitating supply chain resilience', Supply Chain Management: An International Journal, 18(3): 324-336.

Jüttner, U. & Maklan, S. 2011. 'Supply chain resilience in the global financial crisis: An empirical study', Supply Chain Management: An International Journal, 16(4): 246-259.

Kamalahmadi, M. & Parast, M.M. 2016. 'A review of the literature on the principles of enterprise and supply chain resilience: Major findings and directions for future research', International Journal of Production Economics, 171: 116-133.

Kiessling, T., Harvey, M. & Akdeniz, L. 2014. 'The evolving role of supply chain managers in global channels of distribution and logistics systems', International Journal of Physical Distribution & Logistics Management, 44(8/9): 671-688.

Kochan, C.G. & Nowicki, D.R. 2018. 'Supply chain resilience: a systematic literature review and typological framework', International Journal of Physical Distribution & Logistics Management, 48(8): 842-865.

Kim, Y., Chen, Y.-S. & Linderman, K. 2015. 'Supply network disruption and resilience: A network structural perspective', Journal of operations Management, 33: 43-59.

Lengnick-Hall, C.A., Beck, T.E. & Lengnick-Hall, M.L. 2011. 'Developing a capacity for organizational resilience through strategic human resource management', Human Resource Management Review, 21(3): 243-255.

Lichtman, M. 2014. Qualitative research for the social sciences, London: SAGE Publications, NY.

Mason, M. 2010. 'Sample size and saturation in PhD studies using qualitative interviews', Forum qualitative Sozialforschung/ Forum: qualitative social research, 11(3): 1-19..

Ma, Z., Xiao, L. & Yin, J. 2018. 'Toward a dynamic model of organizational resilience', Nankai Business Review International, 9(3): 246-263.

Mandal, S., Sarathy, R., Korasiga, V.R., Bhattacharya, S. & Dastidar, S.G. 2016. 'Achieving supply chain resilience:

The contribution of logistics and supply chain capabilities', International Journal of Disaster Resilience in the Built Environment, 7(5): 544-562.

Marley, A., Ward, P. & Hill, J. 2014. 'Mitigating supply chain disruptions – a normal accident perspective', Supply Chain Management: An International Journal, 19(2): 142-152.

McIntosh, M. J., & Morse, J. M. 2015. 'Situating and Constructing Diversity in Semi-Structured Interviews', Global Qualitative Nursing Research, 2(1): 1-12.

Meyer, A., Niemann, W., van Pletzen, P.R. and Smit, D., 2019. 'Environmental initiatives: A study of dyadic buyer and supplier relationships in the South African Fast-Moving Consumer Goods industry', Journal of Transport and Supply Chain Management, 13(1):1-10.

Mvubu, M. & Naude, M.J. 2016. 'Green supply chain management constraints in the South African fast-moving consumer goods industry: A case study', Journal of Contemporary Management, 13(1): 271-297.

Nel, J., De Goede, E. & Niemann, W. 2018. 'Supply chain disruptions: Insights from South African third-party logistics service providers and clients', Journal of Transport and Supply Chain Management, 12(1): 1-12.

Pettit, T.J., Fiksel, J. & Croxton, K.L. 2010. 'Ensuring supply chain resilience: Development of a conceptual framework', Journal of business logistics, 31(1): 1-21.

Pettit, T. J., Croxton, K. L., & Fiksel, J. 2019. 'The evolution of resilience in supply chain management: A retrospective on ensuring supply chain resilience', Journal of Business Logistics, 40(1): 56-65.

Percy, W.H., Kostere, K. & Kostere, S. 2015. 'Generic qualitative research in psychology', The Qualitative Report, 20(2): 76-85.

Pereira, C., Christopher, M. & Lago Da Silva, A. 2014. 'Achieving supply chain resilience: The role of procurement', Supply Chain Management: An International Journal, 19(5/6): 626-642

Pfohl, H.C., Gallus, P. & Thomas, D. 2011. 'Interpretive structural modeling of supply chain risks', International Journal of Physical Distribution & Logistics Management, 41(9): 839-859.

Polit, D.F. and Beck, C.T. 2012. 'Sampling in qualitative research', Nursing research: Generating and Assessing Evidence for Nursing Practice, 9: 515-528.

Ponomarov, S.Y. & Holcomb, M.C. 2009. 'Understanding the concept of supply chain resilience', The International Journal of Logistics Management, 20(1): 124-143.

Robinson, J. 2011. 'Cities in a world of cities: The comparative gesture', International Journal of Urban and Regional Research, 35(1): 1-23.

Sanchez Rodrigues, V. & Potter, A. 2013. 'A comparison of FMCG logistics operations in the UK and South Africa', European Business Review, 25(4): 351-364.

Scholten, K. & Schilder, S. 2015. 'The role of collaboration in supply chain resilience', Supply Chain Management: An International Journal, 20(4): 471-484.

Scholten, K., Sharkey Scott, P. & Fynes, B. 2014. 'Mitigation processes–antecedents for building supply chain resilience', Supply Chain Management: An International Journal, 19(2): 211-228.

Simba, S., Niemann, W., Kotzé, T. & Agigi, A. 2017. 'Supply chain risk management processes for resilience: A study of South African grocery manufacturers', Journal of Transport and Supply Chain Management, 11(1): 1-13.

Singh, A., Shukla, N., & Mishra, N. 2018. 'Social media data analytics to improve supply chain management in food industries', Transportation Research Part E: Logistics and Transportation Review, 114: 398-415.

Soni, U., Jain, V. & Kumar, S. 2014. 'Measuring supply chain resilience using a deterministic modeling approach', Computers & Industrial Engineering, 74: 11-25.

Stevenson, M. & Busby, J. 2015. 'An exploratory analysis of counterfeiting strategies: Towards counterfeit-resilient supply

chains', International Journal of Operations & Production Management, 35(1): 110-144.

Steyn, W.J.v., Bean, W., King, D. & Komba, J. 2011. 'Evaluation of selected efects of pavement riding quality on logistics costs in South Africa', Transportation Research Record, 2227(1): 138-145.

Syed, D., & Siddiqui, D.A. 2019. 'Impact of Outsourcing and Other Factors on Logistics Performance In FMCG Sector of Pakistan', Asian Journal of Science and Technology, 10(2), 9386-9390

Taylor, S.J., Bogdan, R. & DeVault, M. 2015. Introduction to qualitative research methods: A guidebook and resource. John Wiley & Sons.

Tukamuhabwa, B., Stevenson, M. & Busby, J. 2017. 'Supply chain resilience in a developing country context: A case study on the interconnectedness of disruptions, strategies and outcomes', Supply Chain Management: An International Journal, 22(6): 486-505.

Tukamuhabwa, B.R., Stevenson, M., Busby, J. & Zorzini, M. 2015. 'Supply chain resilience: Definition, review and theoretical foundations for further study', International Journal of Production Research, 53(18): 5592-5623.