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SUPPLY CHAIN ROBUSTNESS, FIRM COMPETITIVENESS AND PERFORMANCE OF SOUTH AFRICAN LOGISTICS FIRMS

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Abstract

This research explores the resilient domain, that is, supply chain robustness, which is important in the field of supply chain management. The present research aims to analyze the relationship between supply chain robustness, firm competitiveness and performance of South African logistics firms. A quantitative research methodology was employed for this study. The study used Smart PLS to analyze the data. Supply chain robustness antecedents show a strong positive relationship to firm competitiveness. Also, firm competitiveness was found to have a positive significant relationship with the performance of logistics firms. The proposed model has a high potential to secure future supply chains. This is the first study to be conducted in South African logistics firms using the dynamic capability theory to understand the relationship between the constructs. The study also provides an extensive overview of the present extent of the robustness research and it proposes a conceptual framework to further extend the knowledge in this field.

Keywords: Supply Chain, Supply Chain Robustness, Firm Competitiveness, Performance, Dynamic Capability Theory, Logistics Firms, South Africa

1. Introduction

In the past, the main objective of supply chain design was cost minimization or service optimization, but in this era, the focus is on supply chain robustness or resilience (Blackhurst *et al.* 2011; Petit *et al.* 2010). In support of this several authors have agreed that supply chain robustness has become a major strategic requisite for global supply chain chains (Ritchie and Brindley, 2007; Kwak *et al.* 2017; Revilla and Saenz, 2017), this is because greater risks and uncertainties are encountered along global supply chains. In addition to this, Kwak *et al.* (2017) also observed the emergence of a new era of turbulence in supply chains. A proactive strategy to cope with this is the supply chain robustness as identified by Durach *et al.* (2015). These authors further confirm that supply chain robustness is an option to reduce risk and uncertainty in supply chains. Supply chain robustness refers to "the ability of a supply chain to resist or avoid change" (Durach *et al.* 2015). In this study, supply chain robustness is defined as the ability of a supply chain to accommodate any certain events or unexpected developments such that the initially desired future state can still be reached. Therefore, this definition implies that

where there is robustness in the supply chain, impacts do not severely hamper the flow of the supply chain or supply network. Thus, allows continuous flow of goods and services contributing to firm competitiveness amongst others and improved the overall performance of the firm. In other words, a robust supply chain minimizes disruptions, which may affect the firm's costs and performance and may likely contribute to the tarnishing image of the firm in the long run.

Most prior research on supply chain robustness and performance have been conducted in developed countries (Durach *et al.* 2015; Kwak *et al.* 2017; Revilla and Saenz, 2017; Wieland and Wallenburg, 2012; Shamout, 2019). Further to this, across the globe, most researchers focus on why firms are vulnerable to supply chain disruptions (Blackhurst *et al.* 2011; Carvahlo *et al.* 2012; Carvahlo *et al.* 2014; Tang, 2006) and there is lack of empirical evidence of how firms improve the firm competitive advantage and overall firm performance through supply chain robustness. This view is echoed by Kwak *et al.* (2017) who state that there is a limited amount of information that deals with supply chain robustness and how they influence firm performance and competitive advantage.

Despite an avalanche of research studies focused on logistics firms and supply chain robustness, it is imperative to note that there seems to be a scarcity of studies that investigate the impact of supply chain robustness, firm competitiveness and firm performance. The fundamental motivation behind this study is to fill this void. Besides, to the best knowledge of the researcher, none or very few researchers have used the dynamic capability theory to investigate the research constructs understudy in the South African context. Thus, with the above aforementioned, the following main research objective was formulated for this study followed by the research questions.

The main aim of this study is to determine the impact of supply chain robustness and firm competitiveness on the performance of logistics firms in the Vanderbijlpark area of Gauteng province, South Africa. This study contributes to the gap in the literature on this topic by linking supply chain robustness, firm competitiveness with the performance of logistics firms in South Africa. It also contributes to the field of supply chain management by providing a quantitative study on the subject matter, the results of which may be useful to policymakers who are aware of the importance of logistics firms in this country's economy, and therefore may use the results of this study to create better policies aimed at supporting and improving the performance of logistics firms. The logistics and supply chain managers may benefit from this study by understanding and pursuing supply chain robustness, firm competitiveness to enhance the performance of their logistics firms. If the logistics firms flourish, they will able to improve their standards of living for managers and their employees and as well as contribute to South African growth through the growth domestic product (GDP) and employment creation (Badenhorst-Weiss and Waugh, 2014; Simpson and Havenga, 2012; World Bank, 2014; World Economic Forum, 2014). South Africa's economic activity lies in Gauteng province, the richest province, with many logistics firms located in this region. This study will also assist other researchers and scholars in further developing this important research field.

This article is proceeding as follows: the next section is the literature review followed by the conceptual framework and hypothesis development. The methodology that guides this study is discussed thereafter and subsequently, the study's results and discussion followed by the conclusion and implications of the study. Lastly, the limitations of the study and future research are presented.

2. Literature review

This section reviews the literature of the study's constructs, that is, supply chain robustness, firm competitiveness and firm performance and the research theory that informs this study.

2.1. Research theory

The theory underpinning this study is the dynamic capability theory. This theory focuses on a firm's competitiveness in a dynamic market of rapid and unpredictable change (Kwak *et al.* 2017). Dynamic capability theory is an extension of the resource-based view (RBV). This theory

is a dominant paradigm for the explanation of competitive advantage as well as how firms may improve their performance. This theory is also used to theoretically ground and explain how supply chain robustness affects firm competitiveness and performance of firms. In light of the above, this study used a dynamic capability theory to explain that supply chain robustness as a distinctive capability can create a competitive advantage and improves the performance of logistics firms. Teece (2007) argues that dynamic capabilities are "the foundation of enterprise-level competitive advantage in regimes of rapid technological change". Teece (2007) further argues that dynamic capabilities "can sustain superior performance in a highly dynamic environment".

2.2. Supply chain robustness

Supply chain robustness is defined as "the extent to which the supply chain can carry out its functions despite some damage done to it" (Meepetchde and Shah, 2007). Kwak *et al.* (2017) further define supply chain robustness as the degree to which a supply chain shows an acceptable performance during and after an unexpected event that caused a disturbance in one or more logistics processes. In line with these definitions, Hove-Sibanda *et al. (*2017) concur and further suggest that it can provide sustainable value creation under all possible future scenarios. In line with the above literature, this study defines supply chain robustness as a proactive strategy done by a firm in advance for a supply chain to resist change and still achieve its acceptable performance.

2.3. Firm competitiveness

Firm competitiveness refers to the extent to which an organization can create a defensible position over others (Hove-Sibanda *et al.* 2017). Li *et al.* (2006) noted that there are many thrusts to improve competitive advantage over others such as cost, growth, reliability, quality, time to market, new product introduction, product line breadth, order fill rate, order/shipment information, increased customer service, efficient capital deployment, delivery dependability and flexibility. For this study, firm competitiveness is defined as the capabilities such as lower prices and good quality products; the firm uses to differentiate itself from others in a competitive market thus creating a competitive advantage.

2.4. Firm performance

Firm performance is defined as how well an organization achieves its market related orientated goals as well as its financial goals (Vieira, 2010). Financial metrics are usually used by many organizations to measure firm performance and to compare how other firms are doing in the market. Hove *et al.* (2014) claim that a lot of inconclusivenesses still exists on the measurement of a firm's performance. Good firm performance may be regarded as a competitive advantage over others. Prior studies have measured firm performance using both financial and market-related criteria (market share, the profit margin on sales, the growth of return on investment, the growth of sales, the growth of market share) (Kotler and Armstrong, 2011; Lee and Madhavan, 2010; Ngo and O'Class, 2012).

2.5. Conceptual model and research hypotheses
2.5.1. Conceptual model

Deducing from the literature of review of supply chain robustness and the theory of dynamic capability, the research model is conceptualized (see Figure 1). Thereafter, the hypothesized relationships are developed. Concerning the conceptualized research model, supply chain robustness is the predictor variable, firm competitiveness is the mediator variable whereas firm performance is the outcome variable. The model is developed to explain the relationships between the constructs in the context of logistics firms. Figure 1 illustrates the proposed conceptual model.
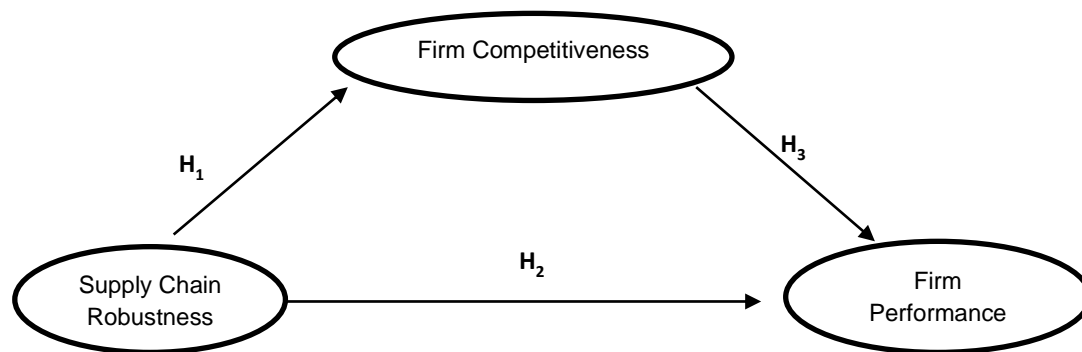
Figure 1. The conceptual model
Source: Author's work

2.5.2. Hypotheses development
2.5.2.1. Supply chain robustness and firm competitiveness

Supply chain robustness influences the competitive position of any firm. In other words, firms with strong supply chain robustness capability can lead to both cost reduction and differentiation to better compete in the volatile business environment (Colicchia and Strozzi, 2012). There are many ways for a firm to gain competitiveness in the market. A study conducted by Tang (2006) on robust strategies for mitigating supply chain disruptions conclude that firms with robust supply chains have a competitive advantage leading to firm competitiveness in the market. This study describes supply chain robustness as one of the sources for firm competitive advantage. It contends that a firm with strong supply chain robustness may create a distinctive capability for the logistics firms, minimize firm costs, enable them to acquire a competitive advantage over their competitors and enhance their firm competitiveness (Hove *et al.* 2014). Thus, leading to the first hypothesis:

H_1: Supply chain robustness has a positive relationship on firm competitiveness in South African logistics firms.

2.5.2.2. Supply chain robustness and firm performance

Wieland and Wallenurg (2012) analyzed data from 270 manufacturing managers to identify the effect of supply chain robustness on business performance. They found supply chain robustness has a directly strong positive effect on business performance. In another study by Lavastre *et al.* (2012), they analyzed data collected from 142 general and supply chain managers and found out that there is a positive correlation between supply chain robustness and firm performance. A study also conducted by Shohaie and Hanafy (2017) on the effect of supply chain robustness on its performance among 90 manufacturing automobile firms, conclude that supply chain robustness has a strong positive and significant relationship to the firm performance of manufacturing firms. There is little empirical evidence that exists in this area about logistics firms in South Africa. Given the dynamic capability theory that explains that supply chain robustness as a distinct capability of a firm, as well as the aforementioned empirical evidence, this study hypothesis that implementation of robust supply chain applicable to logistics firms positively impacts firm performance of logistics firms in Vanderbijlpark, Gauteng province, South Africa. Considering the above, the second hypothesis can be stated as follows:

H_2: There is a positive relationship between supply chain robustness and firm performance in South African logistics firms.

2.5.2.3. Firm competitiveness and firm performance

Firm competitiveness is defined as "the ability of a firm to outweigh their rivals because of certain competitive advantages that accrue to them in the form of minimized costs and

maximized business opportunities" (Hove *et al.* 2014, p. 167). For a firm to attain competitiveness in the market, it is essential that a firm first achieves a competitive advantage (Hove-Sibanda *et al.* 2017). For a firm to be regarded as having a competitive advantage, most researchers concur that the following capabilities should be met: lower prices, rapid product innovation, higher quality, higher dependability and shorter delivery time (Hove-Sibanda *et al.* 2017; Kotler and Armstrong, 2011; Lee and Madhavan, 2010; Mentzer *et al.* 2000). These researchers also claim that these capabilities, in turn, enhance the firm overall performance (Lin *et al.* 2002). This means that a firm offering high-quality products can charge premium prices and thus increase the profit margin on sales and return on investment. A firm having a shorter time to market, and rapid product development and innovation can be the first in the market thus enjoying a higher market and sales volume. The above arguments lead to the third and last hypothesis stated as follows:

H₃: There is a positive relationship between firm competitiveness and firm performance in South African logistics firms.

3. Research methodology

This section comprises of the research methodology used in this study, measuring instrument and operationalization, the procedure for data collection, statistical analyses as well as ethical consideration statement.

3.1. Research method, approach, sampling and data collection

This study adopted a quantitative methodology coupled with a cross-sectional survey design because data for this study was collected once without a follow-up study. The quantitative study was adopted because testing relationships or variables were deemed fit for this method as it allows analyzing data numerically. A quantitative research technique was also used because the researcher wanted to obtain the logistics and supply chain managers' experiences of how supply chain robustness influences their firm's competitiveness and performance in Vanderbijlpark. The convenience sampling method was used for this study because it appeals to time and financial constraints. This method also allows a lot of respondents to be interviewed over a short space of time (Maziriri and Chivandi, 2020).

Data was collected from logistics and supply chain managers in Gauteng province. Gauteng province is the richest province in South Africa and hosts majority of logistics firms. The Gauteng province has Pretoria city which is the capital of South Africa. This province is considered as the main contributor of GDP in the country. The logistics firms comprise of small, medium and larger firms. Data were collected from all logistics firms irrespective of size. The Gauteng province was selected for this study because it is regarded as one of the richest provinces in South Africa with a lot of logistics firms (small, medium and large firms) and contribute immensely to the national GDP (Mofokeng and Chinomona, 2019; Govuzela and Mafini, 2019).

3.2. Measurement instrument and operationalization

A total of 220 questionnaires were distributed and 134 were usable representing a 60.9% response rate, which was considered fair for this study. The questionnaires were self-administered, assisted by three trained research assistants. The distribution of the structured questionnaire occurred between November 2019 and February 2020.

The questionnaire used in this study consisted of four sections which were adopted from previous studies. Section A consists of a profile of respondents and profile firms. Section B consisted of a supply chain robustness construct with four items adapted and modified to suit the needs of this study. This section was adapted from Durach *et al.* (2015); Shamout (2019); Kwak *et al.* (2017); Wieland and Wallenburd (2012). Section C consisted of four items for firm competitiveness adapted from Kwak *et al.* (2017); Hove (2012); Hove-Sibanda *et al.* (2017).

Section D comprised firm performance and the four items were adapted from Hove (2012); Avlontis and Gounaris, (1997); Narver and Slater, (1990); Santos and Brito (2012). All the items were tailored to suit the study's context and purpose. All the items of the three constructs were measured on a 5-point Likert scale ranging from 1 strongly agree to 5 strongly disagree. Likert scales were chosen for this particular study because they are adaptable to statistical analysis (Al-Ansari, 2014). The measurement scales were selected because they had managed to attain acceptable reliability of more than 0.7 Cronbach Alpha value (Zikmund *et al.* 2013) and have been found to have satisfactory levels of face, content, convergent and discriminatory validities in previous studies indicated above.

3.3. Statistical analysis

Descriptive statistics were used to analyze the demographic details of participating logistics firms. Structural equation modeling was performed using SmartPLS software. This method was used because validity and reliability form part of the study (Hove-Sibanda *et al.* 2017). Apart from that, according to Hove (2012), a sample of less than 200 is known to produce robust results with this kind of analysis. This study had fewer than 200 respondents which further suggest that this method was the best to use for this study. More statistical analyses are thoroughly explained in the results section.

4. Results

Table 1 depicts the profile of respondents.

Table 1. Sample demographics of a profile of respondents

Variables	Categories	*N*	%
Gender	Male	121	90
	Female	13	10
Total		134	100
Age	Less than 30years	14	10
	Between 30 and 40 years	26	19
	Between 40 and 50 years	32	24
	Between 50 and 60 years	18	14
	60 years and above	44	33
Total		134	100
Number of years in the industry	Less than 1 year	4	3
	Between 1 and 5 years	23	17
	Between 5 and 10 years	32	24
	Between 10 and 15 years	27	20
	15 years and above	48	36
Total		134	100
Educational qualifications	Matric/no qualifications	2	2
	Certificate/diploma		
	Degree/masters	28	20
	Ph.D./post graduate	102	76
	qualification	2	2
Total		134	100

Source: Authors' work

Table 1 shows that the majority of the respondents were male (90%) whilst females were 10% of the sample. Table 1 further shows that the age of respondents was more evenly

distributed across all different age groups with the lowest age (less than 30) representing 10% whilst the highest age (over 65), were having many in numbers representing 33% of the sample. This study confirms that the majority of logistics/supply chain managers still hold their position even up to retirement age. The respondents who were in the industry for less than 1 year constitute 3% whilst those with over 15 years in operation constitute about 36% of the sample. Finally, regarding the educational qualifications of logistics and supply chain managers, it was found out that only 2 people possess a matric or no qualifications at all. About 20% had either a diploma or certificate qualification. The majority of the sample (76%) had either a degree or masters whilst only 2 respondents had a Ph.D. or a postgraduate qualification. These results imply that the sample selected was highly qualified.

4.1. Data analysis and results

The structural equation modeling (SEM), applying the Smart Partial Least Squares (PLS) was undertaken for this study to examine the impact of supply chain robustness on firm competitive and firm performance of logistics firms concerning the conceptualized research model. The SEM approach was considered to be more suitable because the factor structure of the constructs used in this study was already known, established and validated through previous studies (Hair *et al.* 2014). The Smart PLS was adopted for this study because it requires few observations. In this case, 134 respondents were considered few and less than 200 as suggested by Hove-Sibanda *et al.* (2017). According to Anderson and Gerbing (1988), a two-stage procedure of SEM must be performed for analysis to obtain better results. The first procedure is to ascertain convergent and discriminant validities. The second stage involves the evaluation of the causal relationships under study. All these two stages were performed in this study and are explained in the next section.

4.2. Measurement model assessment

To measure convergent validity, items with over 0.5 loadings on their respective loadings were checked. To check for discriminant validity, the researcher made sure that there were no significant inter-research variable cross-loadings (Chin, 1998). As can be seen in Table 2, all factor loadings were greater than 0.5 with no correlation between constructs that are greater than 0.585 (Table 3).

Table 2. Accuracy analysis statistics

Research construct		Descriptive statistics		Cronbach's test		CR	AVE	Factor loading	Highest SV
		Mean	SD	Item total	Alpha value				
SCR	-	4.33	0.60	-	0.71	0.88	0.60	-	0.64
	SCR 1	-	-	0.56	-	-	-	0.57	-
	SCR 2	-	-	0.63	-	-	-	0.78	-
	SCR 3	-	-	0.52	-	-	-	0.74	-
	SCR 4	-	-	0.63	-	-	-	0.79	-
FC	-	4.19	0.55	-	0.75	0.94	0.79	-	0.72
	FC 1	-	-	0.55	-	-	-	0.61	-
	FC 2	-	-	0.69	-	-	-	0.73	-
	FC 3	-	-	0.72	-	-	-	0.69	-
	FC 4	-	-	0.79	-	-	-	0.61	-
FP	-	4.55	0.61	-	0.72	0.88	0.84	-	0.78
	FP 1	-	-	0.61	-	-	-	0.73	-
	FP 2	-	-	0.56	-	-	-	0.79	-
	FP3	-	-	0.75	-	-	-	0.68	-
	FP4	-	-	0.65	-	-	-	0.85	-

Note: SD: standard deviation, CR: composite reliability, AVE: average variance extracted, SV: shared variance, FP: firm performance, FC: firm competitiveness, SCR: supply chain robustness.
Source: Authors' source

Another method of checking discriminant validity as suggested by Anderson and Gerbing (1988) was applied. They suggest that connection amongst latent variables must be below 0.6. The inter-construct correlation estimates as shown in Table 3 run from 0.490 to 0.585, which is below the guideline proposed by Anderson and Gerbing (1988). Over and above, these results, therefore, confirm the convergent and discriminant validities.

To assess the reliability, composite reliability (CR) and Cronbach alpha values were used. The CR and Cronbach alpha values were all above 0.7 (Table 2) meeting the recommended requirement (Anderson and Gerbing, 1988). Therefore, all in all, these results confirm the reliability of the construct measurements used.

4.3. Assessment of the goodness of fit

Overall, R-squared for firm competitiveness and firm performance in Figure 2 indicate that the research model explains 67.3% and 65.1%, respectively, of the variance in the endogenous variables. Using the formulae given by Tenenhaus *et al.* (2005), the global goodness of fit (GoF) was calculated. The calculated GoF was 0.54 exceeding the minimum threshold of 0.36 suggested by Wetzels *et al.* (2009). Therefore, it can be concluded that the research model has a good overall fit.

Table 3. Inter-construct correlation matrix

Research constructs	SCR	FC	FP
SCR	1.00	-	-
FC	0.490	1.00	-
FP	0.585	0.533	1.00

Note: FP, firm performance; FC, firm competitiveness; SCR, supply chain robustness.

4.4. Structural model results

Figure 2 and Table 4 provide results of PLS analysis. According to Chin (1998), path coefficients need to be at least 2.0 and preferably greater than 0.3, and the t-statistic greater than 0.2, demonstrating the strength of the relationships in the model.

Table 4. Results of SEM analysis

Proposed hypothesis relationships	Hypothesis	Path coefficient	t-statistic	Outcome
SCP → FC	H$_1$	0.733	11.891	Accepted
SCP → FP	H$_2$	0.525	8.632	Accepted
FC → FP	H$_3$	0.621	4.981	Accepted

Note: FP, firm performance; FC, firm competitiveness; SCR, supply chain robustness.

The first hypothesis expresses that supply chain robustness emphatically impacts on firm competitiveness. In the examination, this speculation was bolstered. It can be seen in Table 4 and Figure 2 that supply chain robustness applied a positive impact (beta=0.733) and was statistically significant (t=11.891) in foreseeing firm competitiveness. Therefore, this study proposes that the higher level of supply chain robustness the higher competitive advantage in logistics firms. Along this line, the first hypothesis in this study that supply chain robustness has a positive impact on firm competitiveness is supported and accepted. It is important to mention that these outcomes are following the research of Tang (2006) on robust strategies for mitigating supply chain disruptions, conclude that firms with robust supply chains have a

competitive advantage leading to firm competitiveness in the market. As such investment in robust supply chains such as leadership commitment and human capital is advocated.

The second hypothesis expresses that supply chain robustness emphatically impacts on firm performance. In the examination, this speculation was bolstered. It can be seen in Table 4 and Figure 2 that supply chain robustness applied a positive impact (beta=0.621) and was statistically significant (t=8.632) in foreseeing firm performance. Therefore, this study proposes that the higher level of supply chain robustness, the higher performance in logistics firms. Along this line, the second hypothesis in this study that supply chain robustness has a positive impact on firm performance is supported and accepted. It is important to mention that these outcomes are in accordance with Shohaieb and Hanafy (2017) on the effect of supply chain robustness on its performance among 90 manufacturing automobile firms, conclude that supply chain robustness has a strong positive and significant relationship to the firm performance of manufacturing firms.

The third and last hypothesis expresses that firm competitiveness emphatically impacts on firm performance. In the examination, this speculation was bolstered. It can be seen in Table 4 and Figure 2 that firm competitiveness applied a positive impact (beta=0.525) and was statistically significant (t=4.981) in foreseeing firm performance. Therefore, this study proposes that the higher level of competitiveness, the higher performance in logistics firms. Along this line, the last hypothesis in this study is accepted and supported. Similar findings are reported and conducted by Hove (2012) who finds out that there was a positive and significant effect of firm competitiveness on firm performance of SMEs.
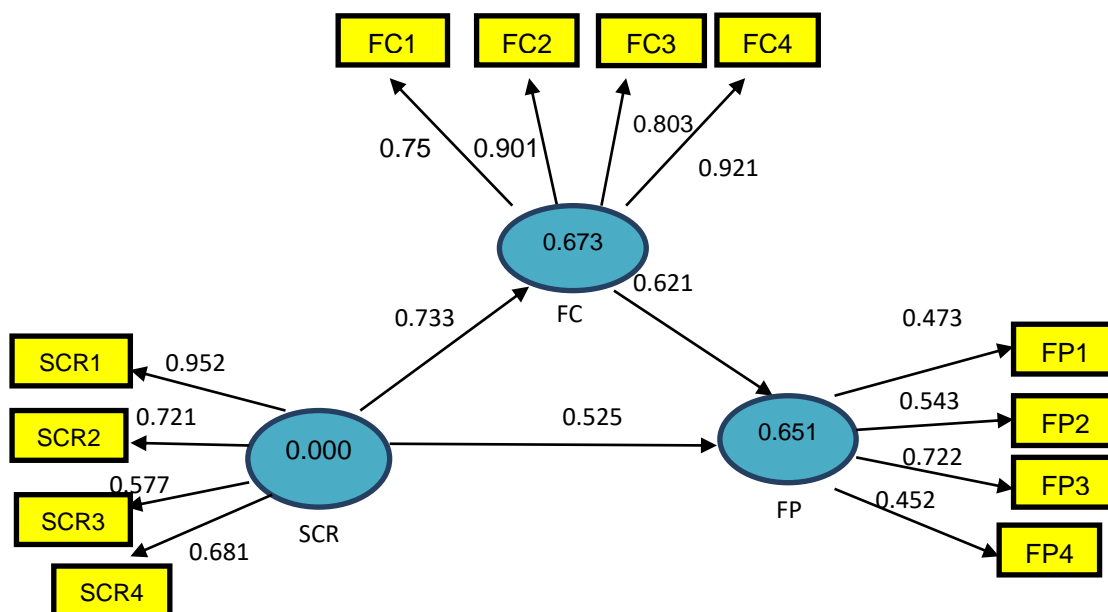

Figure 2. Measurement and structural model results
Note: FP: firm performance, FC: firm competitiveness, SCR: supply chain robustness.

5. Conclusion

This research was undertaken to investigate the impact of supply chain robustness on firm competitiveness and firm performance in South Africa. The study confirms that supply chain robustness is instrumental in stimulation firm competitiveness and firm performance. Also, this study confirms that firm competitiveness has a robust influence on firm performance.

The findings imply that logistics firms are required to put more effort into building supply chain robustness to gain a competitive advantage that will lead to firm competitiveness and the overall performance. The findings indicated that the overall performance of logistics firms is not

only determined by supply chain robustness capabilities but also the effort of building a competitive advantage over others and gain firm competitiveness in the dynamic market.

This study also provides a tested research model on how supply chain robustness influences firm competitiveness and performance in Gauteng, South Africa. This model will serve as a guide for further research on the South African logistics firm's supply chain robustness capability and how it impacts on firm competitiveness and performance. This is crucial because there is currently a dearth of literature that focuses on supply chain robustness in the South African context. In other words, this study is one of the pioneering studies on supply chain robustness, firm competitiveness and performance of logistics firms in South Africa.

With this in mind, it is suggested that supply chain managers/logistics managers should differentiate their firms from rivals by retaining stronger supply chain robustness capabilities such as visibility, strong human capital and network complexity so that there can provide more customer value and grow faster in a more complex global logistics markets. Elahi (2013), pointed out that if a firm takes a better position towards disruptions or risks, the defense automatically turns into an offence (differentiation) to the competition. These results are also in line with other researchers who argue that firms who are undertaking proactive risk management capability such as robustness have become a vital means of enhancing competitive advantage and improved firm performance (Henke, 2009; Elahi, 2013; Colicchia and Strozz, 2012).

Although this work contributes immensely to the literature of the supply chain and gives insights for academia and practitioners, some limitations can be addressed in future research. A cross-sectional approach was adopted in this study. However, the impact of supply chain robustness on competitive advantage and firm performance might take a long time, in reality, to become apparent. Hence, future research may consider adopting a longitudinal study.

This study was conducted in Vanderbijlpark, Gauteng province. Therefore, the study makes it impossible to generalize findings to other regions of South Africa. Future research may include other provinces of South Africa or even go beyond this country to other African countries especially in sub-Saharan regions for comparison purposes.

This study focused on supply chain robustness without considering its antecedents such as node criticality, visibility, bargaining power, network complexity, human capital, among others and how they influence firm competitiveness and performance of logistics firms. Further studies can go deeper into these antecedents and supply chain robustness dimensions such as resistance and avoidance as to how they influence firm competitive advantage and firm performance.

Although this study used a quantitative research methodology, future research could employ a triangulation approach which involves a mixed-method to get deeper nuisances. Lastly, this study focused on logistics firms, it is suggested that other firms such as wholesale, retail, automotive, agriculture, mining, construction, among other industries, be studied in the future as they may reveal interesting results.

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