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## Article

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



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# Supply chain partnership, supply chain collaboration and supply chain integration as the antecedents of supply chain performance



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**Background:** It is understood that improving performance has become an important objective of supply chains. As such, strategies have been adopted as an effort towards increasing performance. Amongst these strategies, partnership, collaboration and integration have been identified. A mutual advantage of these approaches is that they facilitate cohesion between parties where knowledge and resources are pooled together and shared with the purpose of achieving optimum results. However, it is observed that the extent to which partnership, collaboration and integration affect supply chain performance collectively is a research void.

**Objectives:** This study intended to examine the influence of partnership, collaboration and integration on supply chain performance, particularly within the small and medium enterprise (SME) sector. The theory of relational view was adopted to support the study's conceptual model.

**Method:** The study used SmartPLS to analyse the data.

**Results:** Three hypotheses were empirically substantiated using a sample of 271 SMEs situated in Gauteng.

**Conclusion:** The findings revealed that the research constructs partnership, collaboration and integration influence supply chain performance in a positive way. Implications of the study are further provided.

## Introduction

Supply chain partnerships have been identified as essential in sustaining supply chains (Goffin, Lemke, & Szwejczewski, 2006; Nyaga, Whipple, & Lynch, 2010). As such, firms have increasingly undertaken the task to improve partnerships within their supply chains (Youn, Yang, Hong, & Park, 2013). The objective is to remain sustainable not only through circumventing risk but also through the continued accumulation and exploitation of benefits derived from partnerships (Lambert, Knemeyer, & Gardner, 2004; Mentzer, Min, & Zacharia, 2000). What characterises partnerships is collaboration (Ramanathan & Gunasekaran, 2014). Research has identified cost reduction, profit, forecast accuracy and inventory control as some of the advantages of collaboration (Aviv, 2007; Gavirneni, Kapuscinski, & Tayur, 1999; Lee, So, & Tang, 2000). The foundation for this is that collaboration encourages members to engage in joint planning, forecasting and sharing with regard to information, resources and incentives (Aviv, 2007; Ramanathan & Muyltermans, 2010; Toktay, Wein, & Zenios, 2000; VICS, 2002). This joint effort resonates with integration where information and resources are exchanged, thus creating an integrated system (Fogliatto, Da Silveira, & Borenstein, 2010; Salvador, De Holan, & Piller, 2009; Zhang, Qi, Zhao, & Duray, 2015). Researchers, however, contend that quality is important in integration if performance is to be improved and that achieving quality entails the capturing of not just internal but external supply chain contexts as well (Huo, Zhao, & Lai, 2014; Lin, Chow, Madu, Kuei, & Yu, 2005; Romano & Vinelli, 2001; Sila, Ebrahimpour, & Birkholz, 2006; Yeung, 2008).

Improving performance, particularly supply chain performance, is essential, and in recent years, there has been a trend towards identifying ways in which supply chains can become more competitive (Um, Lyons, Lam, Cheng, & Dominguez-Pery, 2017). In South Africa, it can be hypothesised that this trend has been triggered by the 75% of small and medium enterprises (SMEs) that fail within 2 years of operation (Fatoki & Odeyemi, 2010). This suggests that these SMEs have the inability to be competitive. However, research has discovered that one of the core reasons why SMEs fail to compete is their disinclination to liaise with other firms

(Gumede & Rasmussen, 2002). This is unexpected given the gains that could be derived from linking with other organisations. These include partnership where information and resources are shared (Youn et al., 2013), collaboration which facilitates flexibility and the attainment of distinctive capabilities (Kumar, Banerjee, Meena, & Ganguly, 2017) and integration which brings about control in terms of response and quality with regard to demand and the provision of products or services (Lin, Parlaktürk, & Swaminathan, 2014).

The benefit of liaising with other organisations has therefore been made evident. More so, what draws together the components, that is, partnership and collaboration that embody these benefits, is the subject of compatibility. Youn et al. (2013) and Kumar and Banerjee (2012) attest to this and respectively argue that the ability to exhibit organisational compatibility relies on the presence of partnership and collaboration amongst relational members. Even more so, collectively, these components elicit integration, which the achievement relies heavily upon (Flynn, Huo, & Zhao, 2010). According to the theory of Relational View, this network between relational firms succeeds on the premise that compatibility is elicited (Kumar et al., 2017).

What the study seeks to investigate, however, is the influence that partnership, collaboration and integration have on the supply chain performance of SMEs operating in Gauteng, South Africa. To do this, the study puts forward the following three research questions:

- To what extent does supply chain partnership influence supply chain performance?
- To what extent does supply chain collaboration influence supply chain performance?
- To what extent does supply chain integration influence supply chain performance?

In addressing these questions, the reason behind SMEs' reluctance to connect with other organisations and therefore their resultant incapacity to be competitive will be to some extent understood.

The remainder of the article is organised as follows: a review on the literature is done in the 'Literature review' section. In the 'Conceptual model and research hypotheses' section, the conceptual model is illustrated and hypotheses are developed subsequently. The 'Research methods' section articulates the methodology and design, whereas the 'Discussion and conclusions' section concludes the study. Managerial implications, recommendations and suggestions for future research are given in sections 'Implications of the study' and 'Limitations and future research'.

## Literature review

### Relational view

The relational perspective draws attention to the network of firms which forms the unit of analysis (Wieland & Wallenburg, 2013). The theory argues that competitive

advantage is achieved through the inter-connections between members from which they draw unique capabilities (Dyer & Singh, 1998; Kumar et al., 2017). These unique capabilities are developed as the network allows firms to: (1) invest in relation-specific assets, (2) develop inter-firm knowledge sharing routines, (3) use effectual governance mechanisms and (4) exploit complementary capabilities (Dyer & Singh, 1998). According to Kumar et al. (2017), this network assists through the development of a culture for teamwork by which planning and sharing activities can function effectively.

In a supply chain, SMEs function collectively to facilitate the provision of product or services to the end-consumer. In order to compete effectively, their supply chain must perform at a level that is above average. In line with the theory of relational view, increased performance can be realised when SMEs engage in networking which provides the benefits aforementioned. As partnership, collaboration and integration characterise networking (Kumar et al., 2017; Lin et al., 2014; Youn et al., 2013), they are therefore prerequisite if SMEs are to improve supply chain performance as implied in the literature of relational view.

### Supply chain partnership

The business environment has developed drastically in recent years, and therefore supply chains have become complex. For this reason, the concept of supply chain partnerships has come to be perceived as particularly important (Goffin et al., 2006; Nyaga et al., 2010; Ramanathan & Gunasekaran, 2014). As there is emphasis on quality, cost reduction and, even recently in the extent literature, environmental awareness (Vahabzadeh, Asiaeim, & Zailani, 2015), supply chain partnerships have been seen as pivotal in ensuring that these outcomes are achieved (De Bakker, Fisscher, & Brack, 2002; Klassen & McLaughlin, 1996; Montabon, Sroufe, & Narasimhan, 2007). The scope and size of supply chain partnerships are determined through methodical and organisation-wide efforts that involve exchanges at both strategic and operational levels (Youn et al., 2013).

In earlier studies, Mohr and Speckman (1994) contended that partnership qualities, communication behaviour and tools for conflict resolution have been regarded as important factors of partnership success. Since then, much research on supply chain partnership has been theoretical (Ellram & Hendrick, 1995; Graham, Daugherty, & Dudley, 1994; Mentzer et al., 2000). However, recently, many empirical studies have been undertaken as well (Goffin et al., 2006; Nyaga et al., 2010; Sodhi & Son, 2009). For instance, Ramanathan and Gunasekaran (2014), Chen and Paulraj (2004), Li and Lin (2006) identified that trust plays a crucial role in supply chain relationships. The study defines supply chain partnership according to Youn et al. (2013) as 'successful long-term relationships amongst trading partners in the

supply chain that are enabled by mutual trust, organisational compatibility, top management support, and information sharing’.

### Supply chain collaboration

In the past three decades, a number of firms have established collaborations with other supply chain members (Ramanathan & Gunasekaran 2014). A number of studies have identified cost reduction, profit, forecast accuracy and inventory control as the benefits that are derived from supply chain collaborations (Aviv, 2007; Gavirneni et al., 1999; Lee et al., 2000). According to Cao and Zhang (2011), realising these benefits requires that supply chain members incorporate the seven dimensions essential to collaborative relationships, that is, information sharing, goal congruence, decision synchronisation, incentive alignment, resource sharing, communication and joint knowledge creation. However, collaborations are characterised by uncertain environments (Langroodi & Amiri, 2016; Qu & Yang, 2015), composite structural relationships (Arkhipov & Ivanov, 2011; Cheng, Chen, & Chen, 2014), inequitable information sharing (Ganesh, Raghunathan, & Rajendran, 2014) and decentralised individual decision-making (Lu, Lau, & Yiu, 2012) amongst others.

Gunasekaran, Patel, and McGaughey (2004) and Danese (2007) therefore stress that it is important that firms assess their own strengths and weaknesses in order to determine the standard of collaboration that is most appropriate. Once a collaborative relationship has been established, trust and commitment will assume a critical role in the relationship’s development (Kumar et al., 2017). Nyaga et al. (2010) also confirmed that there is a correlation between trust, commitment and collaboration. Simatupang and Sridharan (2005) define collaboration as two or more supply chain firms cooperating to build a competitive edge through information sharing, joint decision-making and the sharing the benefits of greater profits resulting from satisfying customer needs. This study however adopts a definition from Kumar and Banerjee (2012) who assert that collaboration is:

to devise a set of strategies in which two or more independent external (firms) and internal (within the firm) actors with different complementary capabilities achieve their common aspirations and goals in a competitive environment that cannot be achieved individually. (p. 407)

### Supply chain integration

In today’s business environment, integration is perceived as a competitive strategy (Li & Chen, 2017). It is conceived that firms approach integration with the aim of acquiring benefits such as improved quality, decrease in production costs, increased supply chain efficiency and strategic advantage over competitors (Investopedia, 2015). As supply chains are judged with respect to value, integration has been accepted as fundamental (Huo et al., 2014). More so, it is viewed in this light given that traditional management practices such as monetary incentives, training and sharing best practices may have partial impact on reducing risk (Srinivasan & Kurey, 2014). Even more

so, it is believed that supply chain integration is indispensable for achieving economic and environmental goals as opposed to improving business practices alone.

It is supported in the supply chain integration literature that integration may affect performance outcomes in different ways (Flynn et al., 2010; Zhao, Huo, Sun, & Zhao, 2013). However, despite strengthening the competitive advantage of supply chain partners, it is contended that integration intensifies the competition between the two firms (Li & Chen, 2017). Huo et al. (2014) define supply chain integration as:

the degree to which an organization’s internal functions and external supply chain partners strategically and operationally collaborate with each other to jointly manage intra- and inter-organizational quality-related relationships, communications, processes, etc., with the objective to achieve high levels of quality-related performance at low costs. (p. 39)

For the purpose of this study, supply chain integration is defined as the extent to which a firm strategically collaborates with its supply chain members and collaboratively administers intra- and inter-organisational processes (Flynn et al., 2010).

### Supply chain performance

In recent years, there has been a growing shift for businesses to increase their product and service offerings for the objective of providing more consumer choice and creating more opportunities to outperform competitors (Um et al., 2017). This trend has therefore drawn attention to supply chain performance by both academics and practitioners. Yang and Burns (2003) argue that supply chain partners need to be in unity in order to respond to changes in customer requirements. More so, it is noted in the literature that it is significant to ascertain not only the manner in which supply chain partners are proactive but also the manner in which they strive for sustainability (Schaltegger & Burritt, 2014).

It can be accepted that supply chains are essential for generating value. Value can only be created if there is an improvement in the performance of a supply chain. When there is an increase in supply chain performance, value is created through coordination and organisation on a comprehensive scale (Yeung & Coe, 2015). Contrary to the advantages of an increase in supply chain performance, Salvador, Forza, and Rungtusanatham (2002) and Forza and Salvador (2001) argue that the production and delivery function may be affected because of higher direct labour and material cost, increased manufacturing overheads cost and prolonged delivery lead times as well increased inventory levels. Supply chain performance is defined by Srinivasan, Mukherjee, and Gaur (2011) as the performance of a selection of functions included within the supply chain. For the purpose of this study, supply chain performance will be defined as the ability of a supply chain to cost-effectively carry out its activities while minimising costs, for the main purpose of meeting the ultimate customer’s needs (Green & Inman, 2005).

# Conceptual model and research hypotheses

## Conceptual model

Deducing from the review of supply chain literature and the theory of relational view, a research model is conceptualised. Hereafter, hypothesised relationships will be developed. With regard to the conceptualised research model, supply chain partnership, supply chain collaboration and supply chain integration are the predictors, whereas supply chain performance is the outcome. The model is developed to explain the relationship between the constructs in the context of SMEs. Three hypotheses are examined. Figure 1 illustrates the proposed conceptual model.

## Hypotheses development

### Supply chain partnership and supply chain performance

In general, there is much admiration for supply chain partnerships for the reason that they provide the lift for organisations to improve supply chain performance. One of the objectives of establishing a supply chain partnership is for organisations to increase supply chain performance, thereby complying with the standards of the industry (Youn et al., 2013). A supply chain partnership has been found to elicit benefits including business symmetry, top management support and information sharing (Youn et al., 2013). However, for these benefits to be realised, studies advocate that there needs to be trust between partnering firms (Chen & Paulraj, 2004; Li & Lin, 2006). Johnston et al. (2004) further concur and affirm that trust is an important antecedent of supply chain partnership. The implication therefore is that if a supply chain partnership is to improve supply chain performance, there needs to be trust between partnering firms.

The study therefore proposes that there is a relationship between supply chain partnership and supply chain performance. In particular, the study proposes that SME partnerships in the supply chain will have a positive influence

on SME supply chain performance. Therefore, it is hypothesised that:

**H1:** Supply chain partnership has a positive influence on the supply chain performance of small and medium enterprises.

### Supply chain collaboration and supply chain performance

According to Simchi-Levi, Simchi-Levi, and Kaminsky (1999), supply chain collaborations have become one of the vital norms of many companies around the world. It is written in the literature that the benefits of supply chain collaboration include cost reduction, profit, forecast accuracy and inventory control (Aviv, 2007; Gavirneni et al., 1999; Lee et al., 2000). Naturally, it can therefore be accepted that supply chain collaboration plays a positive role in supply chain performance. Kumar et al. (2017) concur and further add that supply chain collaborations produce benefits including reduced lead time, reduced bullwhip effect, development of distinctive capabilities, increased flexibility and increased end-customer satisfaction, market share and profits. However, few firms have realised genuine collaboration (Fawcett, Wallin, Allred, & Magnan, 2009; Frohlich & Westbrook, 2001). Perhaps failure begins with their reluctance to share information, apply effort and bring in investment (Ramanathan & Gunasekaran 2014). This resistance therefore suppresses the trust and commitment that is essential in supply chain collaboration and therefore supply chain performance.

This implies that trust and commitment are important in supply chain collaborations if supply chain performance is to be improved (Ramanathan & Gunasekaran 2014). Accordingly, the study proposes a similar notion. In particular, the study proposes that SME collaboration in the supply chain will have a positive influence on supply chain performance. Thus, the hypothesis pertaining to the above is stated as follows:

**H2:** Supply chain collaboration has a positive influence on the supply chain performance of small and medium enterprises.

### Supply chain integration and supply chain performance

Supply chain integration can be conceived as a rightful antecedent of supply chain performance given that it is identified as an important competitive strategy (Li & Chen, 2017). The advantages of supply chain integration include, amongst others, improved quality, and reduced manufacturing costs, efficiency and competitiveness (Investopedia, 2015). An important question faced by many organisations with respect to integration is 'which are the partners an organisation should integrate with?' (Li & Chen, 2017). The answer to this often comes back to the question of what control does the organisation seek, that is, is it on price or quality (cf. Lin et al., 2014)? Careful response to this question will allow an organisation to adopt an approach that is appropriate while indecision could impede progression.

The implication therefore is that supply chain integration can be beneficial to supply chain performance only if it is done in

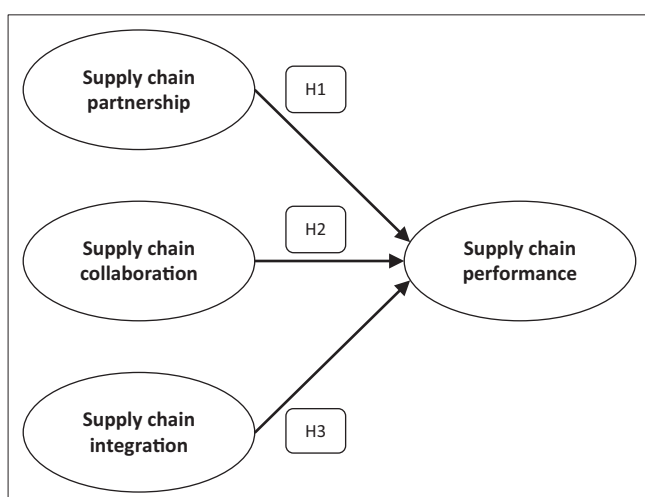


FIGURE 1: Conceptual model.

view of the organisation's context. Sila et al. (2006) further concur that integration should capture the supply chain contexts for it to be meaningful. Thus, the study proposes that supply chain integration has a positive influence on supply chain performance. Specifically, the study proposes that SME integration within the supply chain will have a positive influence on supply chain performance. Therefore, it is hypothesised that:

**H3:** Supply chain integration has a positive influence on the supply chain performance of small and medium enterprises.

## Research methods

### Measurement instruments

Measures for all constructs, that is, supply chain partnership, supply chain collaboration, supply chain integration and supply chain performance (see Appendix 1), were adopted from Gallear, Ghobadian, and Chen (2012:59), Cao and Zhang (2011:65) and Flynn et al. (2010:354), respectively. They were tailored to suit the study's context and purpose. All items were measured on a five-point Likert scale. As a general rule to increasing the reliability of a measurement scale with respect to a particular construct, some measurement items have to be eliminated (Bryman & Cramer, 2003). As such, item 'Our company views our major suppliers as suppliers of capabilities (SCP5)' which was intended to measure supply chain partnership, had to be eradicated for the purpose of increasing the reliability associated with the construct's measurement scale. All other respective measurement scales were found to be reliable on the whole.

## Data analysis and results

### Sample description

Of the 700 questionnaires distributed, 271 questionnaires were usable and represented a response rate of 38.7%. Logically, this response rate is inadequate to be deemed representative of the entire sample. However, research argues that it is expected that a study much like the current study, which has employed a self-administered questionnaire as a method of collecting data, will yield a low response because of constrictions (e.g. non-response) (Fatoki & Asah, 2011). It is, however, argued that results obtained from the response rate speak to some extent the influence that partnership, collaboration and integration have on the supply chain performance of 700 SMEs operating in Gauteng, South Africa. Gauteng is a prominent province which contributes significantly to the South African economy. Small and medium enterprises operating strictly within the province were therefore sampled. The primary aim was to extract results which are therefore impelling and, to some extent, speaking the reality of the SME sector embedded in the economy of South Africa.

Results pertaining to the profile of respondents are provided as follows. From the sample of 271 SMEs, 106 SMEs collectively were sole proprietors and close cooperations, while the least (5) were private companies. A hundred

responses were from the retail division, while 78 SMEs had a number of employees that is within the range of 26–35.

### Structural equation modelling using SmartPLS

Structural equation modelling (SEM), applying SmartPLS statistical software (Ringle, Wende, & Will, 2005), was undertaken to examine the study's data with respect to its conceptualised research model. A two-stage procedure of SEM that is compulsory was carried out for analysis (Anderson & Gerbing, 1988). Initially, measurement model assessment was conducted where convergent and discriminant validity was examined. In the second stage, structural modelling was undertaken to evaluate causal relationships. Results from this procedure are explained in detail below. The results from the scale accuracy analysis are exhibited in Table 1.

### Measurement model assessment

To assess convergent validity, it was observed if items loaded well on their respective (a priori) constructs, that is, if the value is  $\geq 0.600$ , while discriminant validity was evaluated by making certain that there were no significant inter-research variable cross-loadings (Chin, 1998). As can be seen in Table 1, all items have loadings  $\geq 0.500$ , with no correlation between constructs that are greater than 0.754 (see Table 2). These results therefore confirmed convergent and discriminant validity, respectively. According to Chin (1998), research constructs must have an average variance extracted (AVE) of  $\geq 0.500$  and a composite reliability (CR) of  $\geq 0.700$  (convergent validity). As can be seen in Table 1, all constructs meet these

**TABLE 1:** Scale accuracy analysis.

Research construct	Descriptive statistics		Cronbach's test		CR value	AVE value	Factor loading
	Mean (scores <sup>†</sup> )	SD	Item-total correlation	$\alpha$ value			
SCP1	2.97	1.156	0.635				0.585
SCP2	2.74	1.157	0.634				0.594
SCP3	3.78	1.065	0.575	0.714	0.787	0.500	0.811
SCP4	3.13	1.066	0.504				0.767
SCC1	3.28	1.213	0.562				0.721
SCC2	3.34	1.089	0.560				0.594
SCC3	2.75	1.172	0.660	0.784	0.852	0.537	0.787
SCC4	2.80	1.069	0.712				0.811
SCC5	2.82	1.082	0.622				0.733
SCI1	3.92	0.944	0.554				0.663
SCI2	3.24	1.079	0.561				0.552
SCI3	2.96	1.106	0.604				0.708
SCI4	2.80	1.245	0.568	0.814	0.867	0.525	0.697
SCI5	3.77	1.048	0.682				0.833
SCI6	3.36	1.182	0.722				0.853
SCPe1	3.69	1.103	0.664				0.750
SCPe2	3.73	1.096	0.736				0.814
SCPe3	3.17	1.246	0.550				0.663
SCPe4	3.93	1.042	0.534	0.844	0.885	0.563	0.677
SCPe5	3.29	1.214	0.685				0.833
SCPe6	3.44	1.189	0.576				0.749

SCP, supply chain partnership; SCC, supply chain collaboration; SCI, supply chain integration; SCPe, supply chain performance; SD, standard deviation; CR, composite reliability; AVE, average variance extracted.

<sup>†</sup>, Scores: 1, strongly disagree; 3, moderately agree; 5, strongly agree.

**TABLE 2:** Correlation between the constructs.

Research constructs	Construct correlation			
	SCC	SCI	SCP	SCP
SCC	1	-	-	-
SCI	0.604	1	-	-
SCP	0.754	0.604	1	-
SCP	0.544	0.652	0.544	1

SCP, supply chain partnership; SCC, supply chain collaboration; SCI, supply chain integration; SCPe, supply chain performance.

criteria, with AVE and CR by and large equal to or greater than 0.500 and 0.700, respectively. These results therefore validate internal consistency (reliability) and a good account of the latent variable by items (validity).

**Structural model results**

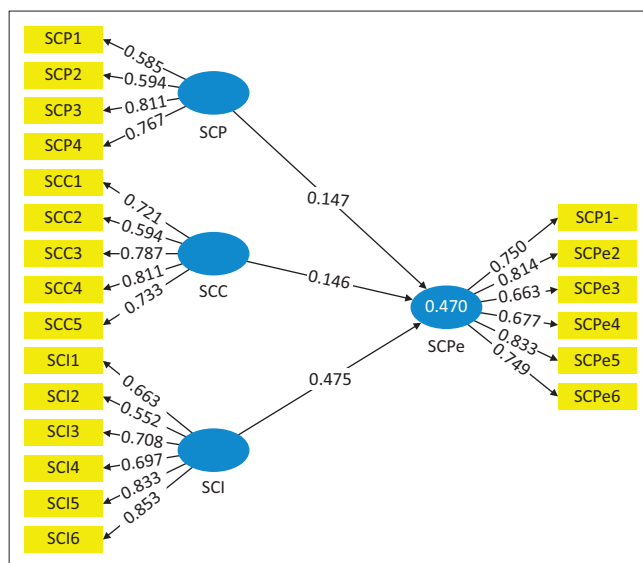
Figure 2 and Table 3 provide results from the PLS analysis. It is expected that the standardised path coefficients are to be at least 0.200 and preferably greater than 0.300 (Chin, 1998). Bootstrapping (300 re-samples) was utilised to examine the reliability of each coefficient. The results provide support for the hypothesised relationship, that is, H3. The testing of H1 and H2 elicited results that do not comply with the recommended threshold. As indicated in Figure 2 and Table 3, the beta coefficients are 0.147 ( $p = 0.310$ ), 0.146 ( $p = 0.170$ ) and 0.475 ( $p = 0.001$ ) for hypothesis 1, hypothesis 2 and hypothesis 3, respectively. Table 3 also indicates the  $t$ -statistics for the study's hypothesis. The maximum  $t$ -statistic is 3.415 and thus exceeds the recommended threshold of 2. This validates the statistical significance and the support of the hypothesised relationship, that is, H3.

Overall,  $R^2$  indicates that the research model explains more than 50% of the variance in the endogenous variables. With the employment of the formulae provided by Tenenhaus, Vinzi, Chatelin, and Lauro (2005), the global goodness-of-fit (GoF) statistic for the research model was examined and identified at 0.38, which exceeds the threshold of  $> 0.36$  suggested by Wetzels, Odekerken-Schröder, and Van Oppen (2009). Thus, this study concludes that the research model has a good overall fit.

**Discussion and conclusions**

The primary objective of the study was to examine the influence of supply chain partnership, supply chain collaboration and supply chain integration on supply chain performance. The theory of relational view was adopted to provide a theoretical grounding for the conceptualised research model. In particular, three relationships were hypothesised. To test the hypotheses, data were collected from SMEs in Gauteng Province of South Africa. Drawing from the empirical results, H3 was supported and found to be significant. In contrast, H1 and H2 were rejected.

It is apparent that, singularly, supply chain integration strongly influenced SME supply chain performance as indicated by the beta coefficient, that is, 0.475. In contrast, both supply chain partnership and supply chain collaboration



SCP, supply chain partnership; SCC, supply chain collaboration; SCI, supply chain integration; SCPe, supply chain performance.

**FIGURE 2:** Structural model.

**TABLE 3:** Results of structural equation model analysis.

Path	Hypothesis	Beta coefficients ( $\beta$ )	$T$ -statistics	$p$
SCP $\rightarrow$ SCPe	H1	0.147	1.020	0.310
SCC $\rightarrow$ SCPe	H2	0.146	1.382	0.170
SCI $\rightarrow$ SCPe	H3	0.475	3.415	0.001

SCP, supply chain partnership; SCC, supply chain collaboration; SCI, supply chain integration; SCPe, supply chain performance.

appeared to have a weaker relationship with supply chain performance with correlations exhibiting a beta coefficient of 0.147 and 0.146, respectively. This result is alarming as it is understood that supply chain partnerships and supply chain collaboration allow firms to be synchronised and function cohesively through sharing and pooling resources which provide value. Perhaps the motive behind this is that like many organisations, SMEs are hesitant to engage in partnerships and share their resources because of the susceptibility and exposure of company methods and procedures.

It is contradictory that supply chain integration ( $\beta$ :0.475) singularly has a significant effect on supply chain performance given that logically partnership and collaboration would have a positive impact on supply chain performance as well. This may be difficult to understand because it may also be accepted that partnership and collaboration possess qualities that are integrative by nature. A reason may be that while partnership, collaboration and integration are related on the basis of synchronisation, integration is to some extent different. Deducing from the literature, it is observed that while partnership and collaboration are embraced with the aim of achieving objectives which otherwise cannot be met individually (Kumar & Banerjee 2012; cf. Youn et al., 2013), integration provides a similar advantage with the exception that it brings about intense competition between relational firms (Li & Chen, 2017) as opposed to conventional team work. For this reason, it is therefore proposed that supply chain integration has a more significant relationship with

supply chain performance given that relational firms exhibit intense competition which in general intensifies the aggression of the entire supply chain in relation to another.

## Implications of the study

This study is the first to test these relationships with the use of data collected from Gauteng Province of South Africa. Findings from this study provide implications for both practitioners and academicians. On the academic side, the study contributes considerably to the supply chain literature with respect to SMEs. In essence, findings provide authentic support for the proposition that supply chain integration has a more effectual influence on supply chain performance than does supply chain partnership and supply chain collaboration. Additionally, the study made an effort to adopt the theory of relational view which has relevance in supply chain research. Drawing from the results, it can therefore be put forward that the theory of relational view remains insufficient to ground alone some research within the supply chain literature. The current research, however, is expected to further enhance our comprehension of supply chain performance within the SME sector.

From the practitioners' perspective, the important dominant role of supply chain integration on supply chain performance is highlighted. Small and medium enterprise owners and their managers could obtain benefits from these findings. Given that empirical evidence has shown that supply chain integration is important with respect to supply chain performance, it is important that firms, particularly SMEs, embrace this activity given that competition is not between individual companies anymore but between supply chains. In order to consistently increase supply chain performance, the SME owners or managers should always direct efforts towards integrating their resources and processes, thus also ensuring consistent fluidity with the functioning of the value chain. A cursory observation indicates that a number of SMEs in South Africa do not have the will to network or collaborate and therefore understand the right ways of doing business. In brief, this study puts forward that if SME owners and their managers can successfully embrace partnership and collaboration, they could turn their companies into successful companies with strengths that cannot be imitated.

## Limitations and future research

The study had its limitations. Firstly, the study is confined to the respondents only in Gauteng; therefore, the findings will only be prejudiced with respect to that province in South Africa. The results would be more informative if data from all the provinces are collected, examined and compared. Additionally, while this study focused on South Africa, extending this study to other African countries is also another possible future research direction which may create a different perspective. Secondly, future research could also expand this study's conceptual framework by examining the effects of a larger set of variables, for instance, the effects of the study's antecedents on not only supply chain performance,

but also on firm performance and competitive advantage as well. Given that this study did not check the common method bias, it is recommended that future researchers attend to this. The study used the theory of relational view to ground it. However, future studies may perhaps employ other theories such as partnership theory, for instance. This would contribute considerably to generating new knowledge with respect to supply chain performance and SMEs.

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## Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

## Authors' contributions

T.M.M was responsible for the preparation and interpretation of results. T.M.M. also made the conceptual contribution for the general part of study including drawing conclusions from the results and making comparative assessments with the study's objectives and hypotheses. R.C was responsible for administering the experimentation using SmartPLS.

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Appendix starts on the next page→

# Appendix 1

## Measurement items

### BOX 1-A1: Supply chain partnership.

- SCP1: Our company benefits from problem-solving with our major suppliers.
- SCP2: Our company involves our major suppliers in new product or service development.
- SCP3: Our company shares important or technical information with our major suppliers.
- SCP4: Our company wants to make long-term commitment with our major suppliers to achieve mutually acceptable outcomes.
- SCP5: Our company views our major suppliers as suppliers of capabilities.

Source: Gallear, D., Ghobadian, A. & Chen, W., 2012, 'Corporate responsibility, supply chain partnership and performance: An empirical examination', *International Journal of Production Economics* 140(1), 83–91. <https://doi.org/10.1016/j.ijpe.2012.01.016>

### BOX 2-A1: Supply chain collaboration.

- SCC1: Our company and our major suppliers have agreed on the goals of the company.
- SCC2: Our company and our major suppliers have agreed on the importance of collaboration across the company.
- SCC3: Our company and our major suppliers have agreed on the importance of improvements that benefit the company as a whole.
- SCC4: Our company and our major suppliers are working together to achieve the goal of the company.
- SCC5: Our company and our major suppliers implement collaboration plans to achieve the goals of the company.

Source: Cao, M. & Zhang, Q., 2011, 'Supply chain collaboration: Impact on collaborative advantage and firm performance', *Journal of Operations Management* 29(3), 163–180. <https://doi.org/10.1016/j.jom.2010.12.008>

### BOX 3-A1: Supply chain integration.

- SCI1: Our company exchanges information with our major suppliers through information networks.
- SCI2: Our company maintains stable procurement through networks with our major suppliers.
- SCI3: Our company and our major suppliers share information on available inventory.
- SCI4: Our company and our major suppliers share production schedules.
- SCI5: Our company and our major suppliers share their production capacity.
- SCI6: Our company helps our major supplier to improve their process to better meet the needs of our company.

Source: Flynn, B.B., Huo, B. & Zhao, X., 2010, 'The impact of supply chain integration on performance: A contingency and configuration approach', *Journal of Operations Management* 28(1), 58–71. <https://doi.org/10.1016/j.jom.2009.06.001>

### BOX 4-A1: Supply chain performance.

- SCPe1: Our company can quickly modify products to meet our major customer's requirements.
- SCPe2: Our company can quickly introduce new products into the market.
- SCPe3: Our company can quickly respond to change in the market demand.
- SCPe4: Our company has an outstanding on-time delivery record to our major customer.
- SCPe5: Our company's lead time for fulfilling customer orders is short.
- SCPe6: Our company provides a high level of customer service to our major customer.

Source: Flynn, B.B., Huo, B. & Zhao, X., 2010, 'The impact of supply chain integration on performance: A contingency and configuration approach', *Journal of Operations Management* 28(1), 58–71. <https://doi.org/10.1016/j.jom.2009.06.001>