Interrogating antecedents to SME supplier performance in a developing country

C. Mafini, D.R. I. Pooe & V.W. Loury-Okoumba

A B S T R A C T

The purpose of this study was to analyse the antecedents to supplier performance by examining the relationship between information sharing, information quality, institutional trust, supply chain collaboration and supplier performance in small and medium enterprises (SMEs). A quantitative design was adopted in which a survey questionnaire was administered to 400 owners and managers of SMEs based in the southern part of Gauteng, South Africa. Respondents were selected using a non-probability convenience sampling technique. Data was analysed using a combination of the Statistical Packages for the Social Sciences (SPSS version 22.0) and Analysis of Moment Structures (Amos version 22) software. The psychometric properties of the measurement scales were ascertained using confirmatory factor analysis (CFA). Hypotheses were tested using structural equation modelling (SEM). Information sharing exerted a positive influence on both institutional trust and supply chain collaboration. Information quality exerted a strong positive influence on institutional trust but had an insignificant influence on supply chain collaboration. Institutional trust was statistically insignificant, whereas supply chain collaboration was statistically significant in influencing supplier performance. The results of this study validate the roles performed by the constructs examined in facilitating the improvement of supply chain activities among SMEs and their suppliers.

Key words: SMEs, information sharing, information quality, institutional trust, supply chain collaboration, supplier performance

Introduction

The assessment of supplier performance in organisations has always been an important activity for business enterprises and other commercial organisations.

Dr C. Mafini is Head of the Logistics Department, Vaal University of Technology. Prof. D.R.I. Pooe is in the Faculty of Management, University of Johannesburg. Mr V. Welby Loury-Okoumba, is in the Faculty of Management Sciences, Vaal University of Technology. E-mail: chengedzai@hotmail.com

In order to achieve long-term and sustainable competitive advantages, these organisations regularly adopt and implement plans and policies aimed at enhancing the performance of their suppliers (Millington, Eberhardt & Wilkinson 2006). Suppliers perform a strategic role in influencing the overall performance of supply chains, particularly in competitive business environments (Stouthuysen, Slabbinck & Roodhooft 2012). Without an effective and efficient supplier base, which forms the initial source of the goods and services provided by a business enterprise, the task of satisfying the needs of the customer cannot be performed (Carr, Kaynak, Hartley & Ross 2008). This makes the monitoring of the performance and capabilities of suppliers by both small and large buying firms a critical activity (Wu, Choi & Rungtusanatham 2010). The performance of suppliers is of vital importance for small and medium enterprises (SMEs) because suppliers are primary constituencies within a relatively small stakeholder base that determines the survival of such enterprises (Sarkar & Mohapatra 2006). It thus becomes critical for SMEs to ensure sound and adequate monitoring of the capabilities of their suppliers, as this is essential to maintaining optimum performance in their operations.

The aim of this study was to conduct an analysis of the antecedents of supplier performance in SMEs. In order to achieve this aim, the following six objectives were formulated; (1) to establish the relationship between information sharing and institutional trust; (2) to determine the relationship between information quality and institutional trust; (3) to establish the relationship between information sharing and supply chain collaboration; (4) to determine the relationship between information quality and supply chain collaboration; (5) to establish the relationship between institutional trust and supplier performance; and (6) to determine the relationship between supply chain collaboration and supplier performance. These objectives were tested under the auspices of South African SMEs. There is a paucity of evidence from previous studies focusing on supplier performance among SMEs in South Africa. A few studies (e.g. Parker 2007; Piderit, Flowerday & Von Solms 2011; Pooe & Mathu 2011) have focused on supplier performance, but the samples that were used ostensibly disregarded the SME industry sector. This marginalisation of the SME industry sector is surprising, given the importance conferred on this sector by virtue of its economic and societal contributions. The aim of the current study was to address existing gaps in the literature. Furthermore, the failure rate of SMEs in South Africa is high and well documented by a number of researchers (Sawers, Pretorius & Oerlemans 2008; Fatoki & Garwe 2010; Chinomona & Pretorius 2011). Since supply chain management practices form part of the central mechanisms necessary for the sound operation of a business enterprise (Ramanathan & Gunasekaran, 2013), this study is significant in that its results could be used for decision-making and problem-

solving purposes by supply chain practitioners in the SME sector, potentially resulting in a reduction in instances of business failure among SMEs in South Africa.

Theoretical overview

This section focuses on the research environment (SMEs) and the constructs under consideration in this study (information sharing, information quality, institutional trust, supply chain collaboration and supplier performance).

SMEs

It is difficult to find a standardised definition of SMEs, as noted by scores of scholars (e.g. Beyene 2002; Lukács 2005; Ayyagari, Beck & Demiguc-Kunt 2007; Chinomona & Pretorius 2011). In the context of South Africa, small enterprises are those with an upper limit of 50 employees, while medium enterprises employ between 100 and 200 employees and are characterised by the decentralisation of power to an additional management layer (Sanchez 2007; Abor & Quartey 2010). There are huge numbers of SMEs in South Africa, to the extent that at least 80% of all business enterprises in the country fall within this economic sector (Ladzani & Seeletse 2012). Owing to their massive presence in South Africa, SMEs contribute at least 50% of the country's annual GDP (Abor & Quartey 2010); are pivotal in employment creation (Fatoki & Garwe 2010; Kongolo 2010; Mafini & Omoruyi 2013); and are renowned for generating at least 40% of all economic activities in the country (Pellissier & Nenzhelele 2013). In order to survive in the harsh economic environment of today, many SMEs in South Africa have been compelled to adopt current best practices, including supply chain management, in their operations (Mafini & Omoruyi 2013). This makes it necessary to regularly review, from all frontiers including scientific research, how such best practices are implemented in this sector, in an effort to improve overall SME performance.

Supplier performance

Supplier performance refers to how well a supplier provides the required products to the buyer and is manifested as the operation's outcome in terms of quality, delivery, responsiveness, cost, and technical support (Wu et al. 2010). An adequate assessment of a supplier's performance is necessary for firms to ensure that the supplier has demonstrated the ability to meet the buyer's requirements in terms of cost, quality, delivery or service (Sarkar & Mohapatra 2006). Furthermore, supplier performance

is vital in that it has a massive impact on the maintenance of collaborative relationships based on product quality, operational support, service quality and delivery performance (Yilmaz, Sezen & Kabadayi 2004). Moreover, suppliers play a key role in influencing the overall performance in supply-performance networks, especially in a competitive business environment (Ho, Feng, Lee & Yen 2012). Hence monitoring the performance and capabilities of suppliers is critical from the buying organisation's perspective (Huang & Keskar 2007).

Information quality

Gorla, Somers and Wong (2010) define information quality as a concept that is related to the quality of information system outputs, which can be described in terms of outputs that are useful for business users, relevant for decision making, and easy and to understand, as well as outputs that meet users' information specifications. Quality of information also refers to the accuracy, timeliness, adequacy and credibility of the information exchanged (Moberg, Cutler, Gross & Speh 2002; Feldmann & Müller 2003). The satisfactory flow of quality information in an organisation is of prime importance as it represents a crucial value in the effectiveness of the firm's operations. As acknowledged by Li, Sikora, Shaw and Woo (2006), organisations need to view their information as a strategic asset and ensure that it flows with minimum delay and distortion. Furthermore, information quality influences the running of businesses (Gorla et al. 2012) while the provision of quality information is widely regarded as a key predictive factor contributing to the use of electronic data between organisations (Nicolaou, Ibrahim & Van Heck 2013). In addition, according to Gao, Zhang, Wang and Ba (2012), information quality plays a significant role in positively influencing customer satisfaction. Hence the quality of the information organisations share is a pre-eminent factor contributing to their overall success.

Institutional trust

Institutional trust is defined as the confidence or beliefs that exchange partners have for each other's reliability and integrity (Cavusgil, Deligonul & Zhang 2004). Trust between institutions has been identified as a key relationship variable in some studies in different fields (Krishnan, Martin & Noorderhaven 2006; Robson, Katsikeas & Bello 2008). Mutual trust between partners is a vital component of the exchange relationship because it enables the firm to exchange information and enrich the firm's opportunities to access resources (Norman 2004). Trust has been described as one of the most critical success factors of a firm's ability to establish

successful interorganisational relationships such as alliances (Robson *et al.,* 2008). Effective partnerships characterised by mutual trust between organisations and their partners may facilitate more open communication, information sharing and conflict management, which are all essential for organisational success (Seppanen, Blomqvist & Sundqvist 2007).

Supply chain collaboration

Ang (2008) defines supply chain collaboration as a working relationship between organisations, which involves the exchange, sharing of information and joint development of products, technology and services. Osarenkhoe (2010) also defines supply chain collaboration as similar, complementary, coordinated activities performed by firms in a business relationship in order to produce superior mutual outcomes. Supply chain collaboration is characterised by the level of interdependence and complementarity between a firm's partners in order to establish and develop effective collaboration which may potentially result in the reduction of product costs and the improvement of technology in the supply chain (Ranganathan, Teo & Dhaliwal 2011). Effective supply chain collaboration can be reflected in a strategic supplier partnership, which is the long-term relationship between the organisation and its suppliers (Hsu, Kannan, Tan & Leong 2008). It is designed to influence the strategic and operational capabilities of individual participating organisations to help them enjoy significant ongoing benefits (Li et al. 2006). According to Hoegl and Wagner (2005), collaboration has a positive effect on the firm's ability to provide quality products to its customers. This indicates the importance of coordinated work between firms and their suppliers for the competitiveness of a firm's supply chain.

Information sharing

Information sharing is the extent to which a firm openly communicates important and sensitive information to its partners (Shou, Yang, Zhang & Su 2012). Li, Ragu-Nathan, Ragu-Nathan and Subba Rao (2006) also define information sharing as the extent to which critical and proprietary information is communicated to one's supply chain partner. Information sharing is a key factor in that supply chain management (SCM) depends on what information is shared, when and how it is shared and with whom, since this determines the degree of relevance and usefulness to organisations' supply chain members (Holmberg 2000). Furthermore, its relevance has also been underscored in in the findings of several scholars (Childhouse & Towill 2003; Li & Lin 2006) who suggest that the key to smooth supply chain effectiveness resides in

making available undistorted and up-to-date marketing data at every node in the supply chain.

Theoretical framework and hypotheses development

The theoretical framework illustrated in Figure 1 below was conceptualised, highlighting the causal relationships under investigation. This framework essentially comprises two distinct predictor constructs, namely information sharing and information quality, with supplier performance being the outcome construct, while institutional trust and supply chain collaboration act as antecedents to supplier performance.

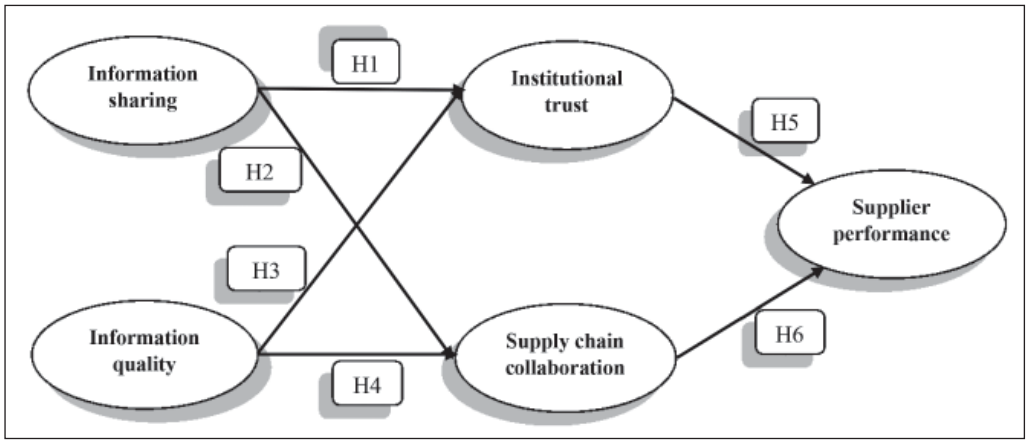


Figure 1: Theoretical framework

In the formulation of hypotheses, Ho indicates the 'null hypothesis' and Ha the 'alternative hypothesis'. Accordingly, a null hypothesis and an alternative hypothesis were formulated for each relationship.

Information sharing and institutional trust

A number of scholars (Mohr & Spekman 1994; Kulp, Lee & Ofek 2004; Devaraj, Krajewski & Wei 2007) consider information sharing to be a key driver of effective supply chain activities. In their study on the role of trust in improving supply chain competitiveness, Handfield and Bechtel (2002) advocate that sound and adequate trusting relationships between supply chain partners, contribute significantly to their ability to exchange key and vital information. The linkage between information

sharing and trust was further extended by Nyaga, Whipple and Lynch (2010) who postulate that the existence of these two concepts plays a decisive role in enhancing buyer-supplier relationships. On the basis of the aforementioned empirical evidence, the following hypotheses were formulated:

Ho_1: There is no relationship between information sharing and institutional trust among SMEs and their suppliers.

Ha_1: There is a positive and significant relationship between information sharing and institutional trust among SMEs and their suppliers.

Information sharing and supply chain collaboration

The literature (e.g. Daugherty, Richey, Genchev & Chen 2005; Whipple & Russel 2007) describes the adequate sharing of critical information between business partners as the backbone of operational efficiency and success. Moreover, supply chain systems characterised by the effective exchange of sensitive and up-to-date information, are widely regarded as efficient in achieving proper collaboration attributes within their chain of activities (Yu, Yan & Cheng 2001; Sandberg 2007). This view is further supported by Derocher and Kilpatrick (2000) and Mentzer, Foggin and Golic (2000) who posit that the greater the volume of information shared among supply chain partners, the more likely the partners will be inclined to synergistically coordinate their activities in a collaborative manner. On the basis the aforementioned literature, the following hypotheses were formulated:

Ho_2: There is no relationship between information sharing and supply chain collaboration among SMEs and their suppliers.

Ha_2: The sharing of information among SMEs and their suppliers has a positive influence on supply chain collaboration between SMEs and their suppliers.

Information quality and institutional trust

Organisations that are engaged in collaborative supply chain activities and strategies require a significant level of quality information to be processed across each unit of activities (Chen, Yen, Rajkumar & Tomochko 2011). This emphasises the key role of information quality in contributing to the optimum functioning of supply chain activities within firms. As mentioned by Fawcett, Osterhaus, Magnan, Brau and McCarter (2007), the ability of business partners to build and establish an acceptable degree of trust resides in their willingness to share critical, sensitive and crucial strategic information. Furthermore, Nicolaou et al. (2013) suggest that an

increase in the quality of information exchanged between organisational members has a positive effect on enhancing the level of trust that business associates have with one another. This highlights the critical role that quality information exchanged in a firm's supply chain environment plays in its overall productivity. Kwon and Suh (2004) add that inconsistencies in the provision of quality information may impair the production process in firms, thus negatively affecting buyer-supplier trusting relationships. On the basis of the aforementioned information, the following hypotheses were formulated:

Ho_3: There is no relationship between information quality and institutional trust among SMEs and their suppliers

Ha_3: The quality of information exchanged between SMEs and their suppliers positively influences the institutional trust existing between them.

Information quality and supply chain collaboration

Information quality is a major factor impacting on the overall performance of supply chains (Wiengarten, Humphreys, Cao, Fynes & McKittrick 2010). This implies that the effective exchange and transfer of up-to-date customer information in all sections of a firm's supply chain units may enable each link to better coordinate its strategic actions and respond to customers' final orders more effectively. In his study on economic satisfaction, Sahadev (2008) suggests that collaborative communication built through the efficient sharing of quality information may result in the establishment of trust and sound cooperation between each member of a supply chain network. This describes the major role that the transfer of quality information may fulfil in contributing to the smooth operation of a business. In addition, supply chain parties' abilities and capabilities to continuously exchange strategic decisions and key information may result in developing a certain level of trust, which ultimately enables supplier partners to collaborate synergistically (Zhou, Shou, Zhai, Li, Wood & Wu 2014). Moreover, according to Li and Lin (2006), buyer-supplier relationships characterised by attributes such as trust, commitment and shared vision through collaborative practices, enable firms to successfully engage in sharing quality information with their business partners. Based on the above-mentioned evidence, the following hypotheses were formulated:

Ho_4: There is no relationship between the quality of information and supply chain collaboration.

Ha_4: The quality of information shared between SMEs and their suppliers has a positive influence on supply chain collaboration.

Institutional trust and supplier performance

Organisations that demonstrate effective trusting behaviour are able to improve their overall supply chain's activities and performance. Trust between buyer-supplier institutions is essential to achieve supply chain proximity, which is characterised by strategic practices such as just in time (JIT) (Narasimhan & Nair 2005). Furthermore, supply chain partners' abilities and willingness to collaborate in a trusting environment are regarded as a key factor that enables them to maintain and enhance their performance through sound and effective supplier integration (Al-Abdallah, Abdallah & Hamdan 2014). Trust also has a positive and significant influence on organisations' competitive performance and is a central predictor factor promoting supply chain performance (Ireland & Webb 2007). In terms of the above-mentioned literature, the following hypotheses were formulated:

Ho_5: There is no relationship between institutional trust and supplier performance.
Ha_5: The institutional trust existing between SMEs and their suppliers has a positive influence on supplier performance.

Supply chain collaboration and supplier performance

Supply chain collaboration has a major influence on improving buyer-supplier relationships (Sheu, Yen & Chae 2006). Effective collaborative practices among business partners has a significant impact on increasing profitability, reducing costs and improving technical cooperation (Ailawadi, Farris & Parry 1997). Moreover, sound and efficient supply chain collaboration between buyer-supplier parties results in better inventory reduction, improved quality and delivery, costs and lead time reduction, higher flexibility, faster product-to-market cycle times, increased responsiveness to market demands and customer service (McLaren, Head & Yuan 2002). In addition, Cao and Zhang (2011) posit that efficient and effective collaborative practices are a fundamental determinant of performance enhancement among suppliers. In the light of the aforementioned discussion, the following hypotheses were formulated:

$Ho_{6:}$ There is no relationship between supply chain collaboration and supplier performance.
Ha_6: Supply chain collaboration among SMEs has a positive influence on supplier performance.

Research methodology

Research design

A quantitative approach was applied in this study, since the study was intended to test the relationships between various constructs. The cross-sectional survey technique, which refers to the collection of data or information for a specific investigation or study from any given sample of population elements (Moutinho & Hutcheson 2011), was used to collect data from the population in this investigation. The cross-sectional survey technique was chosen because it affords the researcher the opportunity to include a larger number of relevant respondents, which helps to obtain accurate and reliable results (Creswell 2009).

Participants

The targeted population for this study consisted of the managers and owners of SMEs based in the towns of Vereeniging, Vanderbijlpark and Sasolburg in the southern part of Gauteng Province, South Africa. From this population, a sample size of 400 SME managers or owners was selected using the convenience sampling technique. The justification for selecting this sample size was a similar study conducted by Inayatullah, Narain and Singh (2012) which had a sample size of 425. Furthermore, as recommended by Wolf, Harrington, Clark and Miller (2013), larger samples are preferable when conducting structural equation modelling. In convenience sampling, respondents are selected on the basis of their accessibility (Bryman & Bell 2007). This technique was suitable because of its cost-saving attributes, which facilitated the collection of data from the nearest and most accessible SMEs. The actual collection of data involved the physical distribution of questionnaires in which the researchers, with the assistance of a trained assistant, personally distributed the questionnaires and explained some of the questions where necessary. Respondents were given a week to complete the questionnaire. Initially, a total of 550 questionnaires were distributed, of which 530 were returned with 400 correctly completed. This provided an acceptable response rate of 73%.

Measurement scales and procedures for data collection

Measurement scales were operationalised by means of previously validated instruments. Information sharing was measured using a six-item scale adapted from Li et al. (2006). Information quality was measured using five items, also adapted from Li et al. (2006). Institutional trust was measured using six items

adapted from Ketkar, Kock, Parente and Verville (2012). Supply chain collaboration was measured using four items adapted from Ranganathan et al. (2011). Supplier performance was measured using a five items adapted from Prajogo, Chowdhury, Yeung and Cheng (2012). All the measurement items were measured on five-point Likert-type scales that were anchored by 1= strongly disagree to 5= strongly agree to express the degree of agreement.

Data analysis

The data analysis procedure involved the use of the Statistical Packages for Social Sciences (SPSS version 22.0) to ascertain the reliability and validity of the instruments and confirmatory factor analysis (CFA) as well as structural equation modelling analysis using Analysis of Moment Structures (AMOS version 22) statistical software.

Research results

The results section discusses the profile of the participating SMEs, the psychometric properties of measurement scales, the correlations between constructs, model fit analysis and the structural equation modelling results.

Profile of participating SMEs

The profile of SMEs that participated in the study is indicated in Table 1.

An analysis of the profile of SMEs as reported in Table 1 indicates that most of the SMEs were either sole proprietors (25%: n = 100) or private companies (34%; n = 136). In terms of the nature of business conducted, the largest number of participating SMEs (39%; n = 156) were in the retail sector. With reference to the number of people employed, it emerged that a majority of the SMEs employed fewer than 100 individuals (58%; n = 232). With regard to the number of years in business, the majority of SMEs (78%: n = 312) had been in operation for less than five years.

Psychometric properties of measurement scales

The psychometric properties of scales were ascertained using confirmatory factor analysis (CFA). The results of the CFA are reported in Table 2.

Table 1: Profile of participating SMEs

Variable	Category	n	%
Type of business	Cooperative	24	6
	Sole proprietor	100	25
	Close corporation	60	15
	Private company	136	34
	Partnership	80	20
	Total	400	100
Nature of business	Mining/quarrying	28	7
	Manufacturing	68	17
	Retail	156	39
	Construction	32	8
	Transport	44	11
	Community/personal service	36	9
	Tourism	8	2
	Finance/tourism	28	7
	Total	400	100
Number of employees	21–50	132	33
	51–100	100	25
	101–200	92	23
	201–500	76	19
	Total	400	100
Number of years in business	< 2 years	136	34
	2–5 years	176	44
	5–10 years	52	13
	>10 years	36	9
	Total	400	100

Table 2: Accuracy analysis statistics

Research constructs Mean		Descriptive statistics		Cronbach's test		CR	AVE	Factor loading
		SD	Item-total	α Value				
Information sharing	I_{S-1}	4.251	0.797	0.838	0.910	0.91	0.89	0.80
	I_{S-2}			0.845				0.82
	I_{S-3}			0.852				0.84
	I_{S-4}			0.861				0.89
	I_{S-5}			0.855				0.90
	I_{S-6}			0.864				0.81
Information quality	I_{Q-1}	4.240	0.986	0.862	0. 900	0.90	0.87	0.87
	I_{Q-2}			0. 861				0.86
	I_{Q-3}			0. 876				0.90
	I_{Q-4}			0. 847				0.87
	I_{Q-5}			0.811				0.70
Institutional trust	It_{-1}	4.287	1.034	0. 828	0. 916	0.8	0.79	0.93
	It_{-2}			0. 882				0. 89
	It_{-3}			0. 812				0.90
	It_{-4}			0. 916				0.81
	It_{-5}			0. 820				0.80
	It_{-6}			0. 792				0.91
Supply chain collaboration	Scc_{-1}	4.291	1.022	0. 798	0.920	0.86	0.83	0.92
	Scc_{-2}			0. 987				0.89
	Scc_{-3}			0. 891				0.90
	Scc_{-4}			0. 902				0.91
Supplier performance	S_{p-1}	4.333	1.019	0. 804	0.950	0.86	0.82	0.87
	S_{p-2}			0. 863				0.80
	S_{p-3}			0. 815				0.91
	S_{p-4}			0. 846				0.93
	S_{p-5}			0. 832				0.84

Note: IS = information sharing; IQ = information quality; ST = institutional trust; SSY= supply chain collaboration; SP = supplier performance; CR: composite reliability; AVE: average variance extracted
Scale: 1 = strongly disagree; 2 = disagree; 3 = no opinion; 4 = agree; 5 = strongly agree

The reliability (internal consistency) of the measurement scales for all constructs was measured using three indicators, namely the Cronbach alpha, composite reliability (CR) and average value extracted (AVE). Regarding the Cronbach alpha, the minimum threshold of 0.7 was used (Bagozzi & Yi 1988; Nunnally & Bernstein 1994). As resported in Table 2, all the constructs (IS = 0.91; IQ = 90; IT = 0.91; SSC = 0.92 and SP = 0.95) had reliability values above the recommended threshold of 0.7, which attests to their internal consistency. Likewise, the minimum threshold of 0.7 was used to determine the composite reliability (CR) index value (Nunnally 1978; Hair, Anderson, Tatham & Black 2006). Table 2 shows that all the average values of the respective constructs (IS, IQ, IS, SCC and SP) met this prescription, since they were beyond the 0.7 mark. Furthermore, greater values of the AVE estimate (greater than 0.40) showed that the indicators adequately represented the latent construct (Fraering & Minor 2006; Chinomona 2011). All AVE values in the scales were above the recommended threshold of 0.40, thereby confirming the acceptability of the reliability of all individual scales.

In this study, validity was determined by considering the values of convergent as well as discriminant validities. Convergent validity was ascertained by assessing the factor loadings (Table 2) of the constructs to determine if they were above the recommended threshold of 0.5 (Anderson & Gerbing 1988). The factor loadings for all measurement scale items were above the recommended 0.5, which indicates that the instruments were acceptable and valid and converged well on the respective constructs they were supposed to measure. In addition, more than 50% of each item's variance was shared with its respective construct. This indicates the adequacy of the convergent validity of all scale items. Discriminant validity was ascertained by confirming that the average variance extracted (AVE) for each multi-item construct was larger than the shared variance between constructs, as prescribed by Fornell and Larcker (1981). This was indeed the case, as indicated in Table 2, which shows that all the pairs of constructs had an adequate level of discriminant validity.

Model fit analysis

The acceptability of the model fit was measured by calculating the chi-square value divided by the degrees of freedom (χ^2/df), of which the resultant value should lie between 1 and 3 (Schreiber, Stage, King, Nora & Barlow 2006); the values of the goodness-of-fit index (GFI), comparative fit index (CFI), incremental fit index (IFI) and Tucker-Lewis index (TLI) should be superior or equal to 0.90 (Bollen 1990; Hu & Bentler 1995; Chinomona 2012); and the root mean square error of approximation (RMSEA) value to be equal to or below 0.08 (Browne & Cudeck 1993). The results of the model fit assessment provided the following values: the chi-square value over degree of freedom of was 2.864 (x^2/df = 670.126/234) and the GFI, CFI, IFI, NFI and RMSEA were 0.932, 0.967, 0.967, 0.951 and 0.078

respectively. All of the values in these indicators met the recommended thresholds, which indicates that the data was able to fit the structural model.

Structural equation modelling results

In order to ascertain that the data was suitable for the hypothesis tests, model fit analysis for the structural model was conducted. As previously mentioned, the measurement of model fit in this study was conducted using the following indices; chi-square value over degree-of-freedom, GFI, CFI, IFI, NFI and RMSEA. Regarding the chi-square over degree-of-freedom, the value was below the required upper threshold of 3 ($x^2/df = 600.210/234 = 2.565$). Furthermore, the GFI, CFI, IFI, NFI and RMSEA provided respective ratios of 0.91, 0.95, 0.94, 0.911 and 0.07, which indicates that all the indicators met the acceptable thresholds of equal to or greater than 0.9 for the GFI, CFI, IFI, NFI and equal to or less than 0.08 for RMSEA. The data therefore confirmed the acceptability of the model fit, which ascertained that it was appropriate to test all hypotheses proposed in the study. The results of the hypotheses tests are reported in Table 3.

Table 3: Results of structural equation model analysis

Path coefficients	Null hypothesis	Alternative hypothesis	Factor loading	Decision
Information sharing → Institutional trust	Ho_1	Ha_1	0.345***	Reject null hypothesis
Information sharing → Supply chain collaboration	Ho_2	Ha_2	0.662***	Reject null hypothesis
Information quality → Institutional trust	Ho_3	Ha_3	0.740***	Reject null hypothesis
Information quality → Supply chain collaboration	Ho_4	Ha_4	0.135	Accept null hypothesis
Institutional trust → Supplier performance	Ho_5	Ha_5	0.124	Accept null accepted
Supply chain collaboration → Supplier performance	Ho_6	Ha_6	0.896***	Reject null hypothesis
Structural model fits: $\chi^2/df = 2.56$; GFI = 0.91; IFI = 0.94; CFI = 0.95; NFI = 0.91; RMSEA = 0.07 Significance level < 0.05; * significance level < 0.01;*** significance level < 0.001**				

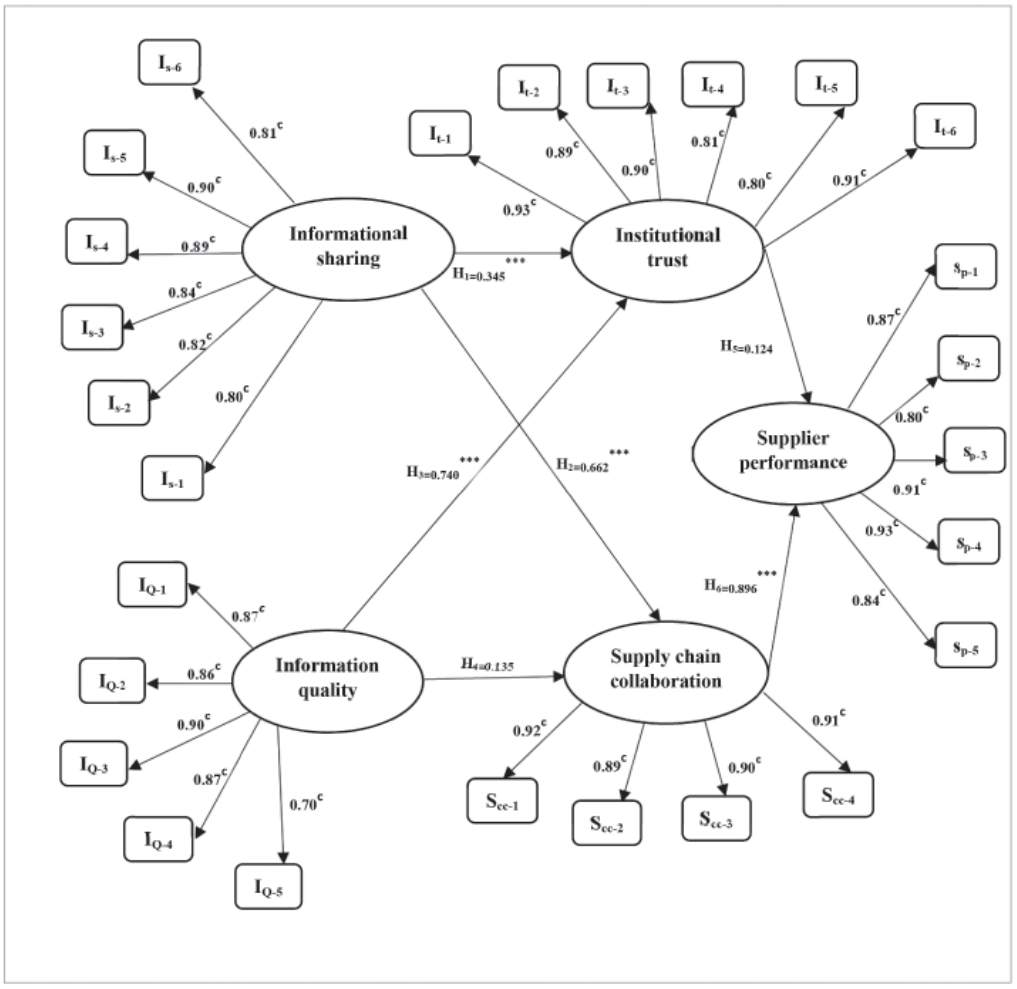
Table 3 indicates that the path coefficients for all the hypotheses were statistically significant at a level of $p < 0.01$, with the expection of Ho_4 and Ho_5, which were statistically insignificant. These two were subsequently accepted, while four null hypotheses (Ho_1, Ho_2, Ho_3 and Ho_6) were rejected. A discussion of the above results is provided in the discussion and conclusion section.

In addition to the above-mentioned, a structural model (Figure 2) was developed after testing the hypothesis. The model shows the strength and the significance levels of the relationships that existed between the five constructs. Information sharing had a moderate but significant association ($r = 0.3345$; $p < 0.01$), with institutional trust and a weak positive but significant association ($r = 0.262$; $p<0.01$) with supply chain collaboration. The model also indicates that information quality had a strong positive and significant relationship ($r = 0.740$; $p < 0.01$) with institutional trust and a weak and insignificant relationship ($r = 0.135$; $p < 0.01$) with supply chain collaboration. Another result reported in the conceptual model was that institutional trust had a weak positive but insignificant relationship ($r = 0.124$; $p < 0.01$) with supplier performance. However, supply chain collaboration had a strong positive and significant association ($r = 0.896$; $p < 0.01$) with supplier performance.

Discussion and conclusions

The first alternative hypothesis ($Ha_{1)}$ which stated that there was a positive and significant relationship between information sharing and institutional trust among SMEs was supported and accepted in this study. This decision was premised on the presence of a moderately positive and significant relationship between information sharing and institutional trust ($r = 0.345$; $p < 0.01$). This result indicates that the adequate enhancement of the degree of information shared among SMEs and their supply chain partners could stimulate their degree of mutual trust. This result is consistent with the results of previous studies conduted by a number of researchers (e.g. Gosh & Fedorowicz 2008; Kui-ran, Ji-ning & Ping 2012), which concluded that the sound exchange of critical information between business partners is paramount to their abilities and capabilities to embark on and adopt strong trusting relationships. The notion of information sharing per se is further regarded by a number of academics (e.g. Kwon & Suh 2004; Nyaga et al. 2010) as an essential prerequisite in determining strong and sustainable trust in buyer-supplier relationships. Thus, by implication, the transfer and exchange of information and knowledge among SMEs and their partners has a stimulus effect on the free establishment and creation of a strong and trustworthy rapport.

The second alternative hypothesis ($Ha_{2),}$ which suggested that there is a positive and significant relationship between information sharing and supply chain collaboration among SMEs, was supported and accepted. As a rationale for accepting this decision, the result of the structural model analysis revealed a positive and significant relationship ($r = 0.262$; $p < 0.01$) between information sharing and supply chain collaboration. This result illustrates that information sharing exerts



Significance level < 0.05; * significance level < 0.01; *** significance level < 0.001**

Figure 2: The structural model

some positive, *albeit* weak, yet significant influence on supplier collaboration. This result was validated by Barratt (2004) who found that the ability of an organisation to effectively collaborate and engage in mutual problem resolutions resides in its willingness to exchange strategic information with external parties. Further support for this result was found in a study by Prajogo and Olhager (2012) who observed that supply chain units are characterised by a constant flow of inputs, which contributes strategically and enables each chain to perform in a collaborative and synergistic manner. These assertions give credence to the central role performed by the efficient

sharing of information among SMEs and their suppliers in defining their synergistic abilities to work together.

The third alternative hypothesis ($Ha_{3),}$ which postulated that information quality has a positive and significant relationship with institutional trust among SMEs, was supported and accepted in this study, since a strong positive relationship ($r = 0.740$; $p < 0.01$) was observed between the two constructs. This result demonstrates that an improvement in the quality of information exchanged and conveyed between SMEs and their suppliers contributes significantly to enhancing the level of mutual trust existent between them. This result is congruent with other studies by Chen et al. (2011) and McDowell, Harris and Gibson (2013), in which it was observed that the continuous and sustained exchange of relevant information and other sensitive data between supply chain partners results in the establishment of a greater level of trust within SMEs' supply chain environment. Fawcett et al. (2007) add that one of the key factors that promotes the willingness of supply chain partners to build strong and long-standing trusting relationships is their capacity to continually share sensitive and strategic information. Hence the effective and efficient exchange of core and crucial strategic information and the knowledge base between SMEs and their suppliers remain critical components of the success of their supply chain activities as demonstrated by supplier competence.

The fourth alternative hypothesis (Ha_4), which proposed that there is a positive and significant relationship between information quality and supply chain collaboration among SMEs, was not supported and thus rejected, based on the statistically insignificant result ($r = 0.135$) observed in the structural modelling analysis. This result implies that the exchange of quality information between SMEs and their suppliers does not necessarily culminate in more robust collaboration between them. It should be noted that this result contradicts the results of a number of studies (e.g., Squire, Cousins, Lawson & Brown 2009; Nagarajan, Savistkie, Raganathan, Sen & Alexandrov 2013) in which a positive interplay between information quality and supply chain collaboration obtained the opposite results. This unorthodox result could perhaps be attributed to the idea that the greater the volume and quality information shared, the higher the possibility that the one of the parties may use that information to their unfair advantage, causing a possible breach of contract and conflict situation (Sahadev 2008). It is possible that in such scenarios, information is exchanged but does not enhance collaboration between the parties involved until trust is adequately established between the parties. Hence the adequate sharing of quality data and other proprietary information between SMEs and their suppliers does not essentially enhance the synergy between them.

The fifth alternative hypotheses (Ha_5), which postulated that institutional trust has a positive and significant relationship with supplier performance was rejected since the relationship was statistically insignificant ($r = 0.124$). This result indicates that the existence of trust between SMEs and their suppliers does not automatically lead to improved supplier performance. This result appears to present a different reading of the general consensus of previous studies conducted by a number of researchers (Dirks & Ferrin 2001; Zhang, Cavusgil & Roath 2003; Corsten & Kumar 2005; Jain, Khalil, Johnston & Cheng 2014), which concluded that trust is the backbone of and a prerequisite factor for supplier performance appraisal. The current study also contradicts a study by Nielsen (2007), which found that supplier trust is a key determinant factor that enables businesses to conduct their transactions openly and freely through the sharing of strategic inputs and outputs from their inbound and outbound supply chain activities. This improves the overall performance of suppliers. Thus, according to the results of this study, SMEs need to be vigilant in their supply chain activities, since the presence of trust between them and their suppliers may not inevitably lead to improved supplier performance.

The sixth alternative hypothesis (Ha_6), which postulated that there is a positive and significant association between supply chain collaboration and supplier performance among SMEs was supported and accepted, since the relationship was statistically significant ($r = 0.896$; $p < 0.01$). This result exemplifies the key and more central role performed by supply chain collaboration in improving supplier performance. This result was substantiated by Parker (2007) and Cao and Zhang (2011), who found that effective and efficient collaborative efforts among business partners contributes significantly to enhancing their overall performance level, ultimately resulting in greater levels of profitability. It is thus clear that SMEs seeking to improve the performance of their suppliers should, among other things, expedite their collaborative efforts in supply chains.

Limitations and implications for further research

Apart from the relevance of its findings, this study was limited in a number of areas which might be further addressed in future research. Some of these limitations could reside in the possibility of sampling bias because of the use of convenience sampling, which may have had the effect of reducing the accuracy of the results. Future studies could be conducted using probability sampling techniques, which would reduce the risk of sampling bias. The limitations associated with the small sample size sample size (n = 400) and the restricted geographic context (Southern Gauteng, exclusively) might make it difficult to generalise the results to other

contexts. Similar studies could be conducted in the future, using amplified sample sizes and an enlarged geographic scope. Furthermore, tangible resources could be used in future studies as opposed to intangible ones in the light of the constructs selected in this study, with a view to providing other significant and interesting insights which were not covered in this study. In addition, refining the results by testing the framework in industry-specific SME categories such as manufacturing, retail and mining SMEs could also contribute to further meaningful results. It might also be fruitful to expand the framework to include other sectors of the economy such as larger companies in order to compare results.

Managerial implications

In terms of the results obtained, it is essential for managers and other decision makers in SMEs to adopt strategies and policies focusing on improving relationships that were found to be supportive in this investigation. Supply chain collaboration could be improved by establishing strong partnerships with third-party logistics companies, engaging in mutual and joined forecast activities and adopting collaborative planning, forecasting and replenishment (CPFR) which enables supply chain partners to collaboratively align their supply- and demand-based activities through the effective exchange or flow of information (Liu & Kumar 2003). These initiatives could facilitate the development and strengthening of synergistic processes between business partners, leading to improved supplier performance

To ensure that information quality leads to enhanced institutional trust, SMEs could introduce recent technologies such as point-of-sale (POS) systems and just-in-time (JIT) systems, which refer to the ability of businesses to share real-time information on customers' needs with their partners in order to limit or reduce demand variability and prevent any unnecessary forecasting decision (De Villiers, Nieman & Niemann 2008). To ensure that institutional trust supports supplier performance, SMEs could focus on developing their own supplier bases by training staff and acquiring the necessary skills and competences. Furthermore, it might be necessary for SMEs to select one specific and reliable supplier with which to conduct their business and implement strategies that could that enable both parties to nurture and develop a strong relationship based on the mutual aspects of problem sharing and other resolutions. This would foster some level of trust between these partners because they would confidence in the fact that these suppliers would be able to meet their expectations and demands on time.

References

Abor, J. & Quartey, P. 2010. 'Issues in SME development in Ghana and South Africa', *International Research Journal of Finance & Economics*, 39: 218–228.

Ailawadi, K., Farris, P. & Parry, M. 1997. 'Explaining variations in the advertising and promotional costs/sales ratio: a rejoinder', *Journal of Marketing*, 61(1): 93–96.

Al-Abdallah, G.M., Abdallah, A.B. & Hamdan, K.B. 2014. 'The impact of supplier relationship management on competitive performance of manufacturing firms', *International Journal of Business and Management*, 9(2): 192–202.

Anderson, J.C. & D.W. Gerbing. 1988. 'Structural equation modeling in practice: a review and recommended two-step approach', *Psychological Bulletin,* 103(3): 411–423.

Ang, S.H. 2008. 'Competitive intensity and collaboration: impact on firm growth across technological environments', *Journal of Strategic Management*, 29(10): 1057–1075.

Ayyagari, M., Beck, T. & Demirguc-Kunt, A. 2007. 'Small and medium enterprises across the globe', *Small Business Economics*, 29: 415–434.

Bagozzi, R.P. & Yi, Y. 1988. 'On the evaluation of structural equation models', *Journal of Academy of Marketing Science,* 16(1): 74–94.

Barratt, M. 2004. 'Understanding the meaning of collaboration in the supply chain', *Supply Chain Management: An International Journal*, 9(1): 30–42.

Beyene A. 2002. 'Enhancing the competitiveness and productivity of small and medium scale enterprises (SMEs) in Africa: an analysis of differential role of national governments through improved support services', *Africa Development*, 27(3):130–156.

Bollen, K.A. 1990. 'Overall fit in covariance structure models: two types of sample size effect', *Psychological Bulletin*, 107(2): 256–259.

Browne, M.W. & Cudeck, R. 1993. *Alternative ways of assessing model fit.* 2nd ed. Thousand Oaks, CA: Sage.

Bryman, A. & Bell, E. 2007. *Business research methods*. 2nd edition. New York: Oxford University Press.

Cao, M. & Zhang, Q. 2011. 'Supply chain collaboration: impact on collaborative advantage and firm performance', *Journal of Operations Management*, 29: 163–180.

Carr, A.S., Kaynak, H., Hartley, J.L. & Ross, A. 2008. 'Supplier dependence: impact on supplier's participation and performance', *International Journal of Operations and Production Management*, 28(9): 899–916.

Cavusgil, T.S., Deligonul, S. & Zhang, C. 2004. 'Curbing foreign distributor opportunism: an examination of trust, contracts, and the legal environment in international channel relationships', *Journal of International Marketing*, 12(2): 7–27.

Chen, J.V., Yen, D.C., Rajkumar, T.M. & Tomochko, N.A. 2011. 'The antecedent factors on trust and commitment in supply chain relationships', *Computer Standards and Interfaces*, 33, 262–270.

Childhouse, P. & Towill, D.R. 2003. 'Simplified material flow holds the key to supply chain integration', *Omega*, 31(1): 17–27.

Chinomona, R. 2011. 'Non-mediated channel powers and relationship quality: a case of SMEs in Zimbabwe channels of distribution'. PhD thesis, Taiwan, National Central University. [Online] Available at http://thesis.lib.ncu.edu.tw/ETDsearch/getfile?URN =964401607&filename=964401 607.pdf. Accessed: 26 August 2014.

Chinomona, R. 2012. 'The impact of organisational support on work spirituality, organizational citizenship behaviour and job performance: the case of Zimbabwe's small and medium enterprises (SMEs) sector', *African Journal of Business Management,* 6(36): 10003–10014.

Chinomona, R. & Pretorius, M. 2011. 'SME manufacturers' cooperation and dependence on major dealers' expert power in distribution channels', *South African Journal of Economics and Management Sciences*, 12(2):170–187.

Corsten, D. & Kumar, N. 2005. 'Do suppliers benefit from collaborative relationships with large retailers? An empirical investigation of efficient consumer response adoption', *Journal of Marketing*, 69(3): 80–94.

Creswell, J. W. 2009. *Research design: qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage.

Daugherty, P.J., Richey, R.G., Genchev, S.E. & Chen, H. 2005. 'Reverse logistics: superior performance through focused resource commitments to information technology', *Transportation Research Part E*, 41(2): 77–92.

De Villiers, G., Nieman, G. & Niemann, W. 2008. *Strategic logistics management*: *a supply chain approach.* Pretoria: Van Schaik.

Derocher, R. & Kilpatrick, J. 2000. 'Six supply chain lesions for the new millennium', *Supply Chain Management Review*, 3(4): 34–41.

Devaraj, S., Krajewski, L. & Wei, J.C. 2007. 'Impact of e-business technologies on operational performance: the role of production information integration in the supply chain', *Journal of Operation Management*, 25(6): 1199–1216.

Dirks, K.T. & Ferrin, D.L. 2001. 'The role of trust in organisational settings', *Organisation Science,* 12(4): 450–467.

Fatoki, O. & Garwe, D. 2010. 'Obstacles to the growth of new SMEs in South Africa: a principal component analysis approach', *African Journal of Business Management*, 4(5): 729–738.

Fawcett, S.E., Osterhaus, P., Magnan, G.M., Brau, J.C. & McCarter, M.W. 2007. 'Information sharing and supply chain performance: the role of connectivity and willingness', *International Journal of Supply Chain Management*, 12(5): 358–368.

Feldmann, M. & Müller, S. 2003. 'An incentive scheme for true information providing in supply chains', *Omega,* 31(2): 63–73.

Fornell, C. & Larcker, D. 1981. 'Structural equation models with unobservable variables and measurement error', *Journal of Marketing Research*, 18 (1): 39–50.

Fraering, M. & Minor, M. S. 2006. 'Sense of community: an exploratory study of US consumers of financial services', *International Journal of Bank Marketing,* 24(5): 284–306.

Gao, J., Zhang, C., Wang, K. & Ba, S. 2012. 'Understanding online purchase decision making: the effects of unconscious thought, information quality, and information quantity', *Decision Support Systems*, 53: 772–781.

Gorla, N., Somers, T.M. & Wong, B. 2010. 'Organisational impact of system quality, information quality, and service quality', *Journal of Strategic Information Systems*, 19: 207–228.

Gosh, A. & Fedorowicz, J. 2008. 'The role of trust in supply chain governance', *Business Process Management Journal*, 14(4): 453–470.

Hair, J.F., Anderson, R.E, Tatham, R.L. & Black, W.C. 2006. *Multivariate data analysis*. 6th edition. London: Prentice-Hall.

Handfield, R.B. & Bechtel, C. 2002. 'The role of trust and relationship structure in improving supply chain responsiveness', *Industrial Marketing Management*, 31(4): 367–382.

Ho, L.I., Feng, S.Y., Lee, Y.C. & Yen, T.M. 2012. 'Using modified IPA to evaluate suppliers' performance: multiple regression analysis and DEMATEL approach', *Expert Systems with Applications*, 39, 7102–7109.

Hoegl, M. & Wagner, S.M. 2005. 'Buyer-supplier collaboration in product development projects', *Journal of Management*, 31(4): 530–548.

Holmberg, S. 2000. 'A systems perspective on supply chain measurements', *International Journal of Physical Distribution and Logistics Management*, 30(10): 847–868.

Hsu, C.C., Kannan, V.R., Tan, K.C. & Leong, G.K. 2008. 'Information sharing, buyer-supplier relationships, and firm performance: a multi-region analysis', *International Journal of Physical Distribution and Logistics Management*, 38(4): 296–310.

Hu, L.T. & Bentler, P.M. 1995. *Evaluating model fit in structural equation modeling: concepts, issues, and applications.* Thousand Oaks, CA: Sage.

Huang, S.H. & Keskar, H. 2007. 'Comprehensive and configurable metrics for supplier selection', *International Journal of Production Economics*, 105(2): 510–523.

Inayatullah, N., Narain, R. & Singh, A. 2012. Role of buyer-supplier relationship and trust in organizational performance. *Delhi Business Review X*, 13(2), July–December: 73–82.

Ireland, R.D. & Webb, J.W. 2007. 'A multi-theoretic perspective on trust and power in strategic supply chains', *Journal of Operations Management*, 25: 482–497.

Jain, M., Khalil, S., Johnston, W.J. & Cheng, J.M.S. 2014. 'The performance implications of power-trust relationship: the moderating role of commitment in the supplier-retailer relationship', *Industrial Marketing Management*, 43: 312–321.

Ketkar, S., Kock, N., Parente, R. & Verville, J. 2012. 'The impact of individualism on buyer-supplier relationship norms, trust and market performance: an analysis of data from Brazil and the USA', *International Business Review*, 21: 782–793.

Kongolo, M. 2010. 'Job creation versus job shedding and the role of SMEs in economic development', *African Journal of Business Management*, 4(11): 2288–2295.

Krishnan, R., Martin, X. & Noorderhaven, N. 2006. 'What does trust matter to alliance performance?', *Academy of Management Journal,* 49: 894–917.

Kui-Ran, S., Ji-Ning, W. & Ping, W. 2012. 'Impact of information sharing and buyer dependence among supply chain members on trust and strategic flexibility', *International Journal of Management Science and Information Technology*, 6: 43–65.

Kulp, S.C., Lee, H.L. & Ofek, E. 2004. 'Manufacturer benefits from information integration with retail customers', *Management Science*, 50 (4): 431–444.

Kwon, I.W.G. & Suh, T. 2004. 'Factors affecting the level of trust and commitment in supply chain relationships', *Journal of Supply Chain Management*, 40(2): 4–14.

Ladzani, M.W. & Seeletse, S.M. 2012. 'Business social responsibility: how are SMEs doing in Gauteng, South Africa?', *Social Responsibility Journal*, 8(1): 87–99.

Li, J., Sikora, R., Shaw, M.J. & Woo, T.G. 2006. 'A strategic analysis of interorganisational information sharing', *Decision Support Systems,* 42: 251–266.

Li, S. & Lin, B. 2006. 'Accessing information sharing and information quality in supply chain management', *Decision Support Systems,* 42: 1641–1656.

Li, S., Ragu-Nathan, B., Ragu-Nathan, T.S. & Subba Rao, S. 2006. 'The impact of supply chain management practices on competitive advantage and organisational performance', *Omega: International Journal of Management Sciences,* 34:107–124.

Liu, E. & Kumar, A. 2003. Leveraging information sharing to increase supply chain configurability. Conference paper. 24th International conference on information systems, Barcelona, Spain.

Lukács, E. 2005. 'The economic role of SMEs in world economy, especially in Europe', *European Integration Studies*, 4(1): 3–12.

Mafini, C. & Omoruyi, O. 2013. 'Logistics benefits and challenges: the case of SMEs in a South African local municipality', *Southern African Journal of Entrepreneurship and Small Business Management,* 6(166): 145–167.

McDowell, W.C., Harris, M.L. & Gibson, S.G. 2013. 'The influence of communication and information quality on trust in the small business supply chain', *The Journal of Applied Management and Entrepreneurship*, 18(2): 21–38.

McLaren, T.S., Head, M., & Yuan, Y. 2002. 'Supply chain collaboration alternatives: understanding the expected costs and benefits', *Internet Research: Electronic Networking Applications and Policy*, 12(4): 348–364.

Mentzer, J.T., Foggin, J.H. & Golic, S.L. 2000. 'Collaborations: the enablers, impediments, and benefits', *Supply Chain Management Review*, 4(4): 52–58.

Millington, A., Eberhardt, M. & Wilkinson, B. 2006. 'Supplier performance and selection in China', *International Journal of Operations and Production Management*, 26(2): 185–201.

Moberg, C.R., Cutler, B.D., Gross, A. & Speh, T.W. 2002. 'Identifying antecedents of information exchange within supply chains', *International Journal of Physical Distribution and Logistics Management*, 32(9): 755–770.

Mohr, J.J. & Spekman, R.E. 1994. 'Characteristics of partnership success: partnership attributes, communication behavior, and conflict resolution technique', *Strategic Management Journal,* 15 (2): 135–152.

Moutinho, L & Hutcheson, G. 2011. *The Sage Dictionary of quantitative management research*. London: Sage.

Nagarajan, V., Savitskie, K., Ranganathan, S., Sen S. & Alexandrov, A. 2013. 'The effect of environmental uncertainty, information quality, and collaborative logistics on supply

chain flexibility of small manufacturing firms in India', *Asia Pacific Journal of Marketing and Logistics*, 25(5): 784–802.

Narasimhan, R. & Nair, A. 2005. 'The antecedent role of quality, information sharing and supply chain proximity on strategic alliance formation and performance', *International Journal of Production Economics*, 96 (3): 301–313.

Nicolaou, A.I., Ibrahim, M. & Van Heck, E. 2013. 'Information quality, trust, and risk perceptions in electronic data exchanges', *Decision Support Systems*, 54, 986–996.

Nielsen, B.B. 2007. 'Determining international strategic alliance performance: a multidimensional approach', *International Journal of Business Review*, 16(3): 337–361.

Norman, P.M. 2004. 'Knowledge acquisition, knowledge loss, and satisfaction in high technology alliances', *Journal of Business Research*, 57(6): 610–619.

Nunnally, J. C. & Bernstein, I. 1994. *Psychometric theory*. 3rd edition. New York: McGraw-Hill.

Nunnally, J.C. 1967. *Psychometric theory*. New York: McGraw-Hill.

Nunnally, J.C. 1978. *Psychometric theory*. 2nd edition. New York: McGraw-Hill.

Nyaga, G., Whipple, J. & Lynch, D. 2010. 'Examining supply chain relationships: do buyer and supplier perspectives on collaborative relationships differ?', *Journal of Operations Management*, 28(2): 101–114.

Osarenkhoe, A. 2010. 'A study of inter-firm dynamics between competition and cooperation: a coopetition strategy', *Journal of Database Marketing and Customer Strategy Management*, 17: 201–221.

Parker, H. 2007. 'An analysis of buyer-supplier collaboration in the South African textile industry', *Acta Commercii*, 7: 207–217.

Pellissier, R. & Nenzhelele, T.E. 2013. 'The impact of work experience of small and medium-sized enterprises owners or managers on their competitive intelligence awareness and practices', *South African Journal of Information Management*, 15(1): 1–6.

Piderit, R., Flowerday, S. & Von Solms, R. 2011. 'Enabling information sharing by establishing trust in supply chain: a case study in the South African automotive industry', *South African Journal of Information Management*, 13(1): 473–478.

Pooe, D. & Mathu, K. 2011. 'The South African coal mining industry: a need for a more efficient and collaborative supply chain', *Journal of Transport and Supply Chain Management*, 5(1): 316–336.

Prajogo, D. & Olhager, J. 2012. 'Supply chain integration and performance: the effects of long-term relationships, information technology and sharing, and logistics integration', *International Journal of Production Economics*, 135: 514–522.

Prajogo, D., Chowdhury, M., Yeung, A.C.L. & Cheng, T.C.E. 2012. 'The relationship between supplier management and firm's operational performance: a multi-dimensional perspective', *International Journal of Production Economics*, 136: 123–130.

Ramanathan, U. & Gunasekaran, A. 2013. 'Supply chain collaboration: impact of success in long-term partnerships', *International Journal of Production Economics*, 1–20.

Ranganathan, C., Teo, T.S.H & Dhaliwal, J. 2011. 'Web-enabled supply chain management: key antecedents and performance impacts', *International Journal of Information Management*, 31: 533–545.

Robson, M.J., Katsikeas, C. S. & Bello, D. C. 2008. 'Drivers and performance outcomes of trust in international strategic alliances: the role of organizational complexity', *Organization Science*, 19(4): 647–665.

Sahadev, S. 2008. 'Economic satisfaction and relationship commitment in channels: the moderating role of environmental uncertainty, collaborative communication and coordination strategy', *European Journal of Marketing*, 42(1/2): 178–195.

Sanchez, D. 2007. 'Socio-economic transformation in South Africa black economic empowerment and small, medium and micro enterprises'. Working Paper. Danish Institute for International Studies. [Online] Available at: http://www.isn.ethz.ch/DigitalLibrary/ Publications/Detail/?lang=en&id=25886. Accessed: 26 August 2014.

Sandberg, E. 2007. 'Logistics collaboration in supply chains: practice vs. theory', *International Journal of Logistics Management*, 18(2): 274–293.

Sarkar, A. & Mohapatra, P.K.J. 2006. 'Evaluation of supplier capability and performance: a method for supply base reduction', *Journal of Purchasing and Supply Management*, 12: 148–163.

Sawers, J.L., Pretorius, M.W. & Oerlemans, L.A.G. 2008. 'Safeguarding SMEs' dynamic capabilities in technology innovative SME-large company partnerships in South Africa', *Technovation*, 28(4): 171–182.

Schreiber, J.B., Stage, F.K., King, J., Nora, A. & Barlow, E, A. 2006. 'Reporting structural equation modeling and confirmatory factor analysis results: a review', *Journal of Educational Research*, 99 (6): 323–337.

Seppanen, R., Blomqvist, K. & Sundqvist, S. 2007. 'Measuring inter-organisational trust: a critical review of the empirical research in 1990-2003', *Industrial Marketing Management*, 36, 249–265.

Sheu, C., Yen, H.R. & Chae, D. 2006. 'Determinants of supplier-retailer collaboration: evidence from an international study', *International Journal of Operations and Production Management*, 26 (1): 24–49.

Shou, Z., Yang, L., Zhang, O. & Su, C. 2012. 'Market munificence and inter-firm information sharing: the moderating effect of specific assets', *Journal of Business Research*, 1–9.

Squire, B., Cousins, P.D., Lawson, B. & Brown, S. 2009. 'The effect of supplier manufacturing capabilities on buyer responsiveness: the role of collaboration', *International Journal of Operations and Production Management*, 29(8): 766–788.

Stouthuysen, K., Slabbinck, H. & Roodhooft, F. 2012. 'Controls, service type and perceived supplier performance in inter-firm service exchanges', *Journal of Operations Management*, 30: 423–435.

Whipple, J.M. & Russell, D. 2007. 'Building supply chain collaboration: a typology of collaborative approaches', *The International Journal of Logistics Management*, 18(2):174–196.

Wiengarten, F., Humphreys, P., Cao, G., Fynes, B. & McKittrick, A. 2010. 'Collaborative supply chain practices and performance: exploring the key role of information quality', *International Journal of Supply Chain Management*, 15(6): 463–473.

Wolf, E.J., Harrington, K.M., Clark, S.L & Miller, M.W. 2013. 'Sample size requirements for structural equation models: an evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*, 76(6): 913–934.

Wu, Z. Choi, T.Y, & Rungtusanatham, M.J. 2010. 'Supplier-supplier relationships in buyer-supplier-supplier triads: Implications for supplier performance', *Journal of Operations Management,* 28, 115–123.

Yilmaz, C., Sezen, B. & Kabadayi, E.T. 2004. 'Supplier fairness as a mediating factor in the supplier performance-reseller satisfaction relationship', *Journal of Business Research*, 57: 854–863.

Yu, Z., Yan, H. & Cheng, T.C. 2001. 'Benefits of information sharing with supply chain partnership', *Industrial Management and Data Systems*, 101(3): 114–119.

Zhang, C., Cavusgil, S.T. & Roath, A.S. 2003. 'Manufacturer governance of foreign distributor relationships: do relational norms enhance competitiveness in the export market?', *Journal of International Business Studies*, 34(6): 550–556.

Zhou, H., Shou, Y., Zhai, X., Li, L., Wood, C. & Wu, X. 2014. 'Supply chain practice and information quality: a supply chain strategy study', *International Journal of Production Economics*, 147: 624–633.