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DETERMINING THE MEDIATING ROLE OF SUPPLIER AND CUSTOMER INTEGRATION TOWARDS ENHANCING RETURN ON INVESTMENT OF SMALL AND MEDIUM ENTERPRISES

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─Abstract ─
It is no use having organisational vision, goals and objectives without the careful strategic alignment of how to integrate the different functional activities to achieve set goals and objectives. A healthy organisation requires an integration strategy to contribute to the continuous success of the organisation. The ability of small to medium enterprises (SMEs) to integrate business activities across the supply chain and with customers will no doubt achieve competitive advantage over competitors. The purpose of this study is to determine supply chain influence on the mediating role of supplier and customer integration toward enhancing SMEs return on investment within the southern Gauteng region. A quantitative method of data collection was adopted and SMART-PLS (3.0) software for structural equation modelling (SEM) was used to analyse statistically the measurement and structural model. Based on the theoretical review, a research framework detailing the hypothesis relationship between the research constructs was developed. From the research findings, the results provide support for the proposed positive relationships between the constructs with the evidence that supply chain relationship among SMEs is a connecting thread with the potential of integrating both suppliers and customers for the purpose of reducing operating cost and improvement of final product to customers.

Key words: *Supply chain relationship, Supplier, Customer, Integration, SMEs, Return on investment*

JEL Classification: L1

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1. INTRODUCTION

It is no use having organisational vision, goals and objectives without the careful strategic alignment of how to integrate the different functional activities to achieve set goals and objectives (Qi, Huo, Wang & Yeung 2017). The organisational objectives may specify all the organisational functional units as well as their specific job requirements, but the most important is that all the functional units or activities cooperate and work together in order to achieve set goals and objectives (Danese 2013; Kocoglu, Imamoglu, Ince & Keskin 2011). Supply chain integration (SCI) is a very important concept in ensuring business performance because of its added benefits emanating from significant savings and high levels of profitability (Prajogo & Olhager 2012). According to Rajaguru & Matanda (2013), all organisations within the supply chain network need to direct, organise and integrate all the functional activities to function effectively and efficiently. SCI is the alignment of all organisation's activities within the supply chain from the point of manufacturer to the point of consumption of goods or services by the ultimate customer (Zhao, Feng & Wang 2015; Song, Li, Wu, Liang & Dolgui 2017). SCI, therefore, involves planning, implementing and controlling the efficient and effective flow of products and services, information, money and decisions within and outside the organisation in order to meet customer's specific requirements at a low cost (order fulfilment) (Flynn, Huo & Zhao 2010).

The ability of SMEs to integrate business activities with supply across the supply chain and with customers will no doubt achieve competitive advantages over their competitors (Swierczek 2013). The resulting benefits from SCI are as follows: there is a high level of information exchange with key suppliers through information technology; the establishment of a quick-ordering system; a high stable procurement through supply network; data integration and system-wide information system integration among internal functions; integrative inventory management system; periodic interdepartmental meetings among internal functions; a high level of follow-up with customers for feedback; organic linkage with customers through information network and agility of ordering process (Danese, Romano & Formentini 2013; Lee, Kim & Kim 2014; Palma-Mendoza, Neailey & Roy 2014). SMEs may, therefore, be a step ahead of their competitors as they are able to supply value added products and meet customers' specific requirements in the right condition, at the right time and place.

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1.1. Social network theory

The social network theory is a management approach used to understand organisational performance, turnover, promotion and innovation (Hatala & Lutta 2009; Wang & Noe 2010; Moqbel 2012). It includes all different organisations with different aims and objectives. According to Pozo, Manuel, Gonzalez-Aranguena and Owen (2011) a social network is a "set of nodes representing people, groups, and organisations or enterprises that are connected by links showing relations or flows between them". Lee, Ruan and Lai (2005) posit that when organisations are involved in a social network, the relationship ties and the embedded resources constitute the focal individual organisation's social capital. This can help the organisation in pursuing set objectives and goals and enable the organisation to cope with uncertainty in the market environment. A social network consists of a network of organisations among which there is a system of relationships that are interdependently connected (Faust 2010). It is also seen as relational ties or links between organisations that provide individual organisations the opportunity for the transfer of flow of resources, information and creative ideas, which enhance organisations' performance (Ramirez-Ortiz, Caballero-Hoyos & Ramirez-Lopez 2004; Wang & Noe 2010). Therefore, social organisational networking can be a source of innovation and creativity.

This study centres on the importance of supply chain relationship between SME business functions and across other business functions to improve competitive performance. Within these relationship ties, friendships that seek advice are developed and improved upon. Supply chain relationship is a new source of information and knowledge flow (Krackhardt & Kilduff 2002). According to Borgatti and Halgin (2011), the stronger the link between two or more organisations, the more the benefits of the relationship help them to outperform their competitors. This network can become a source of innovative ideas because supply chain link a particular organisation to a supplier who is also connected to other suppliers. Through this link, that particular organisation can gain more information and innovative ideas faster than its competitors could (Ramirez-Ortiz *et al.* 2004). The relationship function is the flow of product, service and related information that are both customer and supplier integrated.

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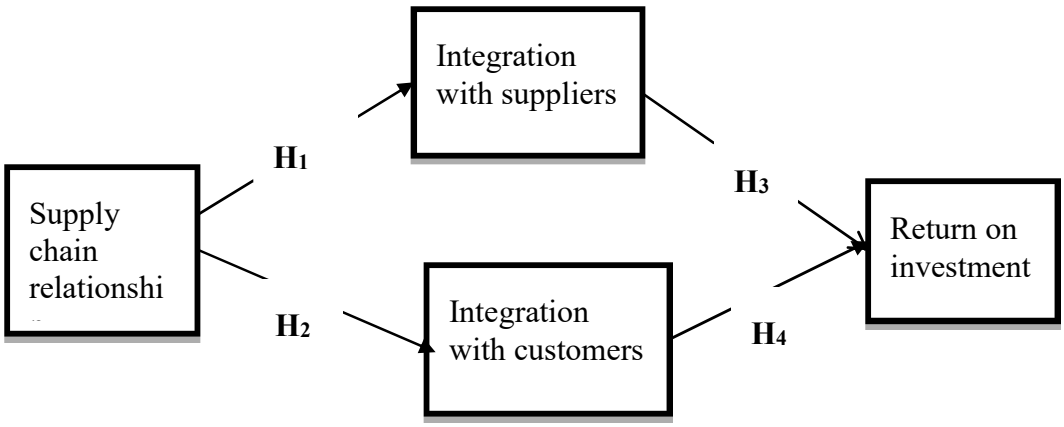
2. PROPOSED CONCEPTUAL MODEL AND RESEARCH HYPOTHESIS

Figure 1 represents the study's conceptual model. The research model consists of four basic constructs, which are supply chain relationship, integration with suppliers, integration with customers and SMEs performance. The model explains the relationship between the constructs, stating supply chain relationship as the antecedence variable influencing supply chain integration with suppliers and customers, which are the mediating variable for SMEs to achieve high levels of business performance as an outcome variable. The research hypothesis developed for this study explains the relationship among the constructs in more detail.

Figure 1: Conceptual model



2.1. Supply chain relationship and supply chain integration

In these emerging global and technological business challenges, both researchers and practitioners of supply chain networks are of the opinion that gaining competitive advantage is no longer achieved through a single organisation working in isolation but that competitive advantage is achieved through a network of inter-organisational relationships (Wu, Chuang & Hsu 2014:122; Oghazi, Rad, Zaefarian, Beheshti & Mortazavi 2016). With this, SMEs can access critical network resources and focuses on how their organisation can achieve and preserve sustained competitive advantage through the collaborative relationships with other firms in a network environment (Hammervoll 2011; Albino, Dangelico & Pontrandolfo 2012). This view also proposes that supply chain relationship will achieve significantly reduced cost, shorter lead-time, increased productivity,

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enhanced quality performance and sustainability through relation-specific assets, knowledge-sharing routines, complementary resources and capabilities, and effective governance (Li, Humphreys, Yeung & Cheng 2012; Kim & Chai 2017). It, therefore, is hypothesised that:

H_1: Supply chain relationship has a significantly positive influence on supplier integration.

H_2: Supply chain relationship has a significantly positive influence on customer integration.

2.2. Customer/supplier integration and SMEs return on investment

External integration is divided into customer and supplier integration. Supplier integration is the strategic relationship that exists between the purchasing firm and the supplier (Li & Tang 2010). It involves the setting of standard performance levels required by each party in a relationship for commitment purposes (Yu, Gimenez, Fynes & Wiengarten 2015). Furthermore, both parties put key performance indicators (KPIs) forward as a roadmap to achieve a high level of performance (Danese 2013). Customer integration involves the coordination, implementation and controlling of goods and services as well as the forward and backward flow of information from the point of origin to the point of consumption (Yu, Jacobs, Salisbury & Enns 2013). External integration, therefore, is the collaboration and involvement of suppliers and customers into the overall business plan and process of an organisation to gain competitive advantages through exceeding customer expectations (He, Lai, Sun & Chen 2014). External supply chain integration aligns an organisation's process with those of customers and suppliers (Jayaram & Xu 2013). External integration involves the distribution of knowledge and information among customers and suppliers regarding sale forecasting, product design and marketing plans, inventory levels and promotion plans (Zhao, Carvugil & Cavusgil 2013). This allows quick replenishment of store shelves and increases flexibility for keeping up with changing customer demands and catering for diverse customer needs. Customer integration can be a source of innovation for SMEs as customer demand for goods and services changes over time (Cabigiosu, Zirpoli & Camuffo 2013; Schaarschmidt & Killian 2014).

H_3: Supplier integration has a significantly positive influence on SMEs return on investment.

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H_4: Customer integration has a significantly positive influence on SMEs return on investment.

3. METHODOLOGY

The study uses a quantitative method of data collection and analysis because it was the type of methodology that suited the type of questionnaire structure designed to collect data for the study (Maree 2007:78).

3.1. The sample description

The sample comprised owners/managers of SMEs. Data were collected from the SMEs within Vereeniging, Vanderbijlpark and Meyerton. These towns are in the southern Gauteng region of South Africa. The Small Business Directory of the Vaal Triangle was used to gain access to a representative sample consisting of small and medium enterprises through a simple random sampling technique. Four field workers were trained to distribute and collect the questionnaires after a letter of consent had been sent to the targeted SMEs informing them of the purpose of the study.

3.2. Measuring instrument and data collection

Primary data were generated by means of a questionnaire. Closed questions were used in the study. The questionnaire was divided into four sections, namely supply chain relationship, supplier integration, customer integration (external supply chain integration) and SMEs return on investment. The research scales are adopted from previous works. Minor adaptations were made in order to fit the research context and purpose. Supply chain relationship measuring items were adapted from Kenny and Fahy (2011). Supplier and customer integration measure items were adapted from Narasimhan and Kim (2002). Lastly, SMEs return on investment measurement items were adopted from Green, Whitten and Inman (2012). All the measurement items were measured on seven-point Likert scales to express the degree of agreement, with one denoting strongly disagree, to seven denoting strongly agree. Out of the 500 questionnaires that were distributed, a total of 401 were collected and used for the final data analysis. The size of the sample was based on the studies undertaken by Thakkar, Kanda & Deshmukh (2008), Bourlakis, Maglaras, Aktas, Gallear and Fotopoulos (2014) and Jaharuddin, Dato' Mansor and Yaakob (2016) on supply chain performance in SMEs. However, an ethical clearance letter was attached to the questionnaire to seek permission and inform the SMEs of the purpose of the study before completing the questionnaire.

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4. DATA ANALYSIS AND RESULTS

4.1. Demographic characteristics of SMEs

Most of the SMEs were in business between 5-6 years (n=132; 32.9%) and recorded annual sales between R1m to <R5m (n= 145; 36.2%). In terms of their physical assets, most of the SMEs had an asset base of <R4m (n= 166; 41.4%) and had less than 50 employees (n= 216; 53.9%).

Table 1: Measurement accuracy assessment and descriptive statistics

Research constructs	Indicators	Descriptive statistics		Reliability statistics			Validity statistics		
		Mean ($\bar{x}$)	SD	Alpha (α)	*Rho*	CR	AVE	√AVE	Factor loading
Supply chain relationship	R1	4.64	1.446	0.889	0.896	0.919	0.694	0.833	0.847
	R2	4.84	1.226						0.737
	R3	5.09	1.238						0.847
	R4	5.16	1.037						0.850
	R5	5.08	1.235						0.877
Supplier integration	SI1	4.98	1.385	0.888	0.899	0.914	0.641	0.800	0.802
	SI2	5.08	1.113						0.844
	SI3	5.16	1.047						0.886
	SI4	5.08	1.056						0.765
	SI5	5.05	1.091						0.716
	SI6	5.12	1.100						0.779
Customer integration	CI1	5.05	1.232	0.936	0.938	0.948	0.723	0.850	0.859
	CI2	5.07	1.272						0.886
	CI3	5.25	1.014						0.883
	CI4	5.18	1.034						0.865
	CI5	5.24	1.001						0.811
	CI6	5.21	.951						0.842
	CI7	5.21	1.180						0.801
	ROI1	4.91	1.443		0.955	0.961	0.779	0.882	0.787

Return on investment	ROI2	5.12	1.136	0.952					0.908
	ROI3	5.16	1.057						0.898
	ROI4	5.23	1.008						0.922
	ROI5	5.15	1.044						0.912
	ROI6	5.23	.978						0.849
	ROI7	5.29	1.003						0.894

Note: Alpha (α) = Cronbach's alpha; Rho= Dillon-Goldstein's *rho; CR=Composite reliability; AVE=Average variance extracted*

4.2. Psychometric properties of the measurement scale

The SMART-partial least squares (SMART-PLS 3) structural equation modelling procedure was applied on the inferential statistics. Psychometric properties of the measurement scale are reported in Table 1, which presents the research constructs, Cronbach alpha test, composite reliability (CR), average variance extracted (AVE) and item loadings.

Three statistical methods, namely Cronbach's alpha test (α), Rho value and composite reliability test (CR) were used to assess the internal reliability of the measurement model. Table 1 indicates the alpha values for all four constructs range from 0.888 to 0.952, Dillon-Goldstein's *rho* values range from 0.888 to 0.955, while the composite reliability values range from 0.914 to 0.961 respectively, which, therefore, are above 0.7 and indicate good internal consistency reliability (Johnson and Christensen 2012).

The AVE value for this study, ranges from 0.641 to 0.779 with estimated values greater than 0.5, provide an acceptable level of internal reliability and validity of the research construct (Khosrow-pour 2006:75; Vinzi, Chin, Henseler & Wang 2010). Convergent validity was determine using the obtained item loadings, which were expected to be above 0.5. Drawing from the Table 1, all item loadings are greater than 0.5 (i.e. ranging from 0.716 to 0.912). This indicates acceptable individual item convergence in the validity of all scale items. Discriminant validity was done by assessing whether inter-correlation matrix among the constructs are less than the square root of the AVE and that the HTMT values are below 0.90 (Garson 2016). In Table 2, the inter-correlation values for all paired latent variables are less than √AVE (ranging from 0.680-0.780) and HTMT values (ranging from 0.527-0.823) respectively indicate the existence of discriminant validity (Khosrow-pour 2006:76).

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Table 2: Correlation analysis results and discriminant validity measures

Constructs	Supply chain relationship	Supplier integration	Customer integration	Return on investment
Supply chain relationship	**1**			
Supplier integration	0.683	**1**		
Customer integration	0.680	0.728	**1**	
Return on investment	0.681	0.721	0.780	**1**
HTMT: *ROI **&** CI= 0.823; SI & CI=0.785; SI & ROI=0.770; R & CI=0.740; R & ROI=0.527; R & SI=0.751*				

Figure 2: PLS 3.0 model results

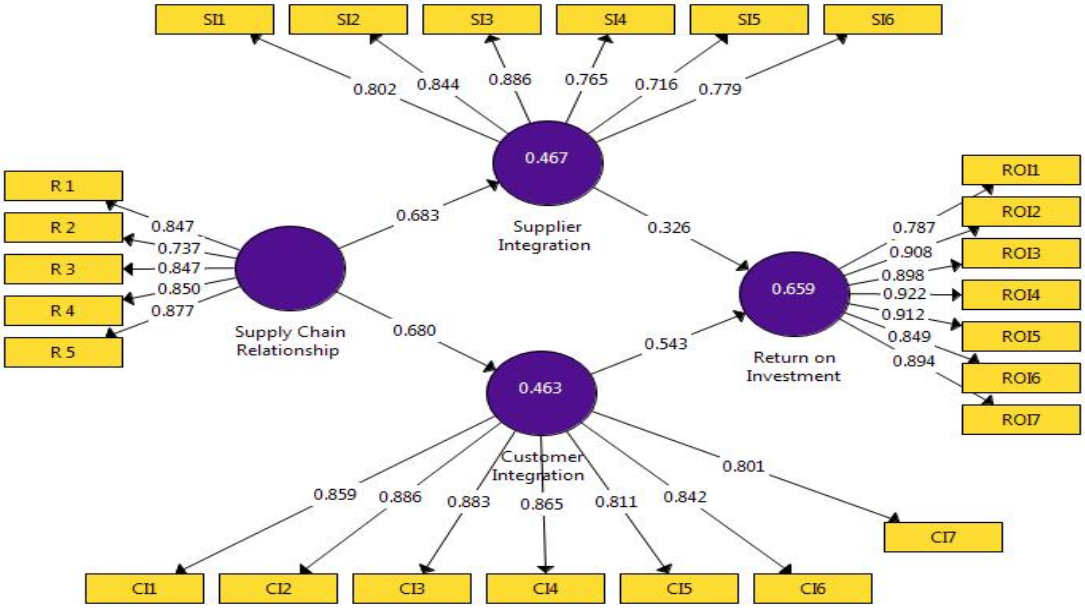

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Table 3: Results of structural equation model analysis

Proposed path relationship	Hypothesis	Path coefficient	T-value	Outcome
R ⟶ SI	H_1	0.683	12.371	Supported
R ⟶ CI	H_2	0.680	14.209	Supported
SI ⟶ ROI	H_3	0.326	3.587	Supported
CI ⟶ ROI	H_4	0.543	6.099	Supported

4.2. Path model results and factor loadings

Figure 2 indicates the path modelling results and the item loadings for the research constructs where R stands for supply chain relationship, SI for supplier integration, CI for customer integration and ROI for return on investment.

Table 3 and Figure 2 present the four hypothesised relationships, path coefficients, the t-statistics and the decision criteria. The value of the t-statistic indicates whether the relationship is significant or not. A significant relationship is expected to have a t-statistic that is above two. Drawing from the results provided in Table 3, the four hypothesised relationships (H_1, H_2, H_3 and H_4) were statistically significant.

5. DISCUSSION OF RESULTS

The discussion in the foregoing section is based on the acceptance/rejection of the hypotheses set. The first hypothesis (H_1) posited that supply chain relationship has a significantly positive influence on supplier integration. As indicated in Table 3 and Figure 2, the hypothesis is accepted as the path result of the structural model showed the strongest predictive relationships (path estimate=0.683; $p=0.00<0.05$) and an explanatory power of 47 percent ($R^2 = 0.467$). This indicates that supply chain relationship helps individual suppliers to integrate, effectively and efficiently, concurrent strategy to reduce procurement cost and to eliminate risk associated with managing accurate inventory levels. As supply chain relationship involves the integration of new technology and enables access to new skills development, SMEs are able to compete globally with larger organisations with the integration process made easier to accelerate competitive advantage. This is consistent with the view of Li *et al* (2012) and Albino *et al* (2012), stating that through relation-specific assets, knowledge-sharing routines, complementary resources and capabilities and

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effective governance, SMEs suppliers within the supply chain can achieve significantly reduced costs, shorter lead-time, increased productivity, enhanced quality performance and sustainability.

H_2 was significant with the acceptance level (path estimate=0.680; p=0.00<0.05) and contributed 46 percent (R^2 = 0.463) of the explained variance in the model implying that supply chain relationship is indeed a strategic road map to SMEs effective integration with their customers. The main purpose of collaborative relationships among organisations is to enhance customer satisfaction effectively by meeting their specific needs and delivery on promise. According to Zhao *et al,* (2013) and Schaarschmidt and Killian (2014), supply chain relationship among SMEs will allow SMEs quick replenishment of store shelves and increases flexibility for keeping up with changing customer demands and catering for diverse customer needs.

H_3 and H_4, which state that supplier and customer integration has a significant positive influence on SMEs return on investment were accepted at path level (path estimate=0.326; p=0.00<0.05 and path estimate=0.543; p=0.00<0.05 respectively). As the mediating variables, supplier integration and customer integration explain 66 percent (R^2 = 0.659) indicating that a higher level of SMEs return on investment and growth is possible through efficient supplier integration and effective customer integration. A higher level of SME partnership with strategic suppliers, frequent and accurate information exchange with suppliers as well as collaborative participation in both product design stage and procurement process can aid SMEs competitive performance (Farhanghi, Abbaspour & Ghassemi 2013). On the other hand, SMEs ability to enhance customer service quality through frequent follow-ups on customer feedback, integration of computerisation of customer orders for agility, communicating and sharing market information with customers will definitely yield a higher level of return on investment (Jang 2014).

6. CONCLUSIONS AND MANAGERIAL IMPLICATIONS

The purpose of this study was to determine the mediating role of supplier and customer integration towards enhancing SMEs return on investment in Vereeniging, Vanderbijlpark and Meyerton. The validation of the research purpose was done by proposing four hypotheses that were statistically tested using Smart PLS for structural equation modelling and all four hypotheses were supported significantly. Prominently, this study provided evidence that supply chain relationship among SMEs is a connecting thread with the potential of integrating

both suppliers and customers for the purpose of reducing operating costs and improvement of final product to customers. Therefore, for SMEs to compete effectively in the emerging market, SMEs will have to embrace the need for supply chain relationship in order to enhance competitive advantages and a higher return on investment. However, SMEs will first have to review the market environment in which they operate to gain a proper understanding of the type of collaborative relationship that is appropriate.

7. LIMITATION AND FUTURE RESEARCH

The supported hypotheses of this study, as stipulated in the research model, prove that a study of this nature makes a significant contribution to the need for SMEs supply chain relationship. However, the findings cannot be generalised in their entirety since only a sample size of 401 SMEs was used in the eventual analysis. Therefore, future studies may be conducted by using and including data from other provinces in South Africa to be more informative in terms of cross-validation. Furthermore, a result comparison using a modified research model could be extended to other African countries to enhance further the current line of work. This ultimately will contribute new knowledge to the existing body of literature on the mediating role of supplier and customer integration towards enhancing SMEs return on investment. The focus of this study was based on the influence of supply chain relationship on SMEs return on investment and did not include the larger organisations. This shortcoming could be improved on with future research and could include other factors such as green supply chain and corporate social responsibility that could also impact positively on organisations' sustainability and return on investment.

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