

Small and medium business transformational leadership and supply chain management

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The performance-related problems facing small and medium enterprises (SMEs) in South Africa are well known. Efforts to find lasting solutions are ongoing and include empirical research focusing on various business practices and models. Applying leadership practices and supply chain management to SMEs provides fertile ground for groundbreaking solutions. This study tested the relationship between transformational leadership, supply chain execution and supply chain performance in manufacturing SMEs in South Africa. The study uses structural equation modelling to examine this empirical connection using data collected from 411 professional employees drawn from SMEs in three South African provinces. The study found that idealised influence and intellectual stimulation exert a positive impact on supply chain execution. Supply chain execution is positively linked to four supply chain performance factors, namely agility, reliability, cost optimisation and responsiveness.

Transdisciplinary contribution: The study connects transformational leadership, which is an organisational behaviour construct to supply chain management, the latter of which is an emerging business discipline. The study recognises that business strategy is implemented by people whose conduct and practices are pivotal to strategic success. In addition, the study has an entrepreneurship orientation as it addresses the challenges facing manufacturing SMEs in South Africa.

Keywords: transformational leadership; supply chain execution; supply chain performance; manufacturing sector; SMEs.

Introduction

There is a growing significance for small and medium enterprises (SMEs) in most countries and regions of the world.¹ Small and medium enterprises form the majority of businesses in South Africa, contributing more than 50% towards aggregate gross domestic product (GDP).² The SME sector is recognised as a probable solution to South Africa's unrelenting challenges.^{2,3} For example, SMEs are viewed as a potential avenue for creating employment in South Africa, where the unemployment rate is estimated to be 34.9% by the end of the last quarter of 2021.⁴ Small and medium enterprises are also a critical source of disruptive innovations within this Fourth Industrial Revolution era that drives developing economies forward, especially technology.⁵ Moreover, SMEs assist in boosting business growth in the country through their trade with other businesses, either downstream or upstream, in their various supply chains.⁶ They further provide experiential learning opportunities to numerous higher education graduates who require such practical exposure early in their careers.⁷ These contributions demonstrate to all stakeholders the importance of the SME sector to the economy of South Africa, and why continuous efforts to improve the success of SMEs are merited.

Disturbingly, most SMEs in South Africa face a lack of growth, financial bankruptcy and, in most cases, premature business closure.² In most instances, small businesses decline in their early stages of development, typically in the initial 5 years of operating.¹ Despite the availability of total funding from government and private initiatives supporting and developing small businesses, mostly remain unsuccessful.^{2,7} Small and medium enterprises in South Africa experience difficulties and challenges during economic dips and recessions and periods of economic growth.^{5,7} The SME failure rate in South Africa commonly lies between 75% and 85%, which is exceedingly high.⁷ This alarming failure rate has given rise to discussions among policymakers and scholars in South Africa regarding the ability of SMEs to offer economic solutions to the challenges facing the country.⁶ Additionally, the challenges inhibiting the growth, survival and sustainability of SMEs in South Africa include internal and external business environment elements.³ The SME business failure in South Africa is further attributed to the flaws in the strategic structure of leadership and

the inability to embrace dynamic performance by these businesses.⁸ These failures generate the impression that it is necessary to investigate how leadership can be harnessed to assist the growth of SMEs.

As businesses require formalised structures as the enterprise grows, leadership is necessary to support transparency, accountability, ethical behaviour and eventual profitability within the SME business.^{7,8} How the business accomplishes and activates its resources is vital for the competency of the manufacturing SMEs and made possible through good leadership.⁹ Through ineffective leadership and the additional burden of the meagre availability of such crucial factors, manufacturing SMEs in South Africa are highly vulnerable to failure.^{5,9} The organisation's success or performance is also influenced by various leadership styles.¹⁰ Hence, leadership styles are relevant to the SME environment because they influence individual and organisational performance and ultimate success.

This study aims to determine the influence of transformational leadership on supply chain execution (SCE) and supply chain performance (SCP) within the South African manufacturing SMEs. The study directs its attention to how transformational leadership influences the execution of supply chain strategy in manufacturing SMEs. Furthermore, the study examines how the execution of supply chain strategies contributes to the performance of this supply chain in South Africa. Transformational leadership has been touted as one of the most effective models of SCP improvement within the spectrum of leadership styles.^{10,11} Additionally, supply chain management (SCM) has in recent years emerged as one of the critical strategies for business success, providing an impetus to pursue suitable methods of optimising its execution and performance.^{12,13,14} This study represents an attempt to generate new knowledge on how optimum performance of supply chain strategy may be achieved as driven by a critically acclaimed organisational human factor in the form of transformational leadership.

There is much literature on leadership, although only a few address the nexus between leadership and SCP.^{15,16,17} Within South Africa, a few studies have directed their focus to leadership and SCM.^{18,19,20} However, evidence of studies that tested the impact of transformational leadership on SCE and SCP in manufacturing SMEs in South Africa is uncommon. The dearth of such studies in developing economies such as South Africa is interesting, given that SMEs are a primary form of business that exerts a more significant economic impact than large businesses.^{21,22} Continuous empirical research, inclusive of this study, is required then to generate fresh insights that support the survival and growth of SMEs in crucial sectors such as manufacturing.

Literature review

Manufacturing small and medium enterprises in South Africa

In South Africa, SMEs are establishments or listed companies and are functional in a stable business location with a range of 5–100 paid employees performing their duties at that permanent business premises.²³ Manufacturing SMEs are small and medium businesses that convert raw materials or combine other products into finished goods.²⁴ They lean towards exhibiting complex business practices, have vibrant reporting structures and constantly conform to legislation and the law.²⁵ Manufacturing SMEs are relatively viewed as having more substantial maturity than SMEs in other sectors, enabling them to manage their supply chains and fulfil their corporate social responsibilities.²⁴ Therefore, such businesses typically rise to become market leaders as they create or adopt sustainable supply chain practices.

Transformational leadership

The transformational and transactional leadership model was introduced and popularised by Bass in the mid-1980s.¹¹ The model identifies transformational leadership, which occurs when a leader motivates and inspires a group of followers and transactional leadership, which occurs when a leader takes the initiative to reach followers by exchanging valued things.²⁶ Transformational and transactional leadership methods are often considered in tandem with each other. The current article is derived from a larger study that considered both leadership styles. However, the article is exclusively directed to providing a report on the transformational leadership aspect, with the transactional part being contained in a separate report.

Transformational leadership emphasises satisfying basic needs and meeting advanced desires by stimulating followers to offer novel solutions to enhance the workplace.^{25,26} This leadership methodology causes a change in individuals and socioeconomic systems. In its best form, it generates valued and positive transformation in followers to develop them into leaders.²⁷ There are four dimensions of transformational leadership: idealised influence (II), individualised consideration (IC), intellectual stimulation (IS) and inspirational motivation (IM).¹¹

Idealised influence aims to advance a shared vision and improve associations with followers.^{11,27} It encourages organisations to set a mission and vision that establishes pride in its followers and gains their respect and trust towards the leaders.²⁸ Individualised consideration involves considering followers' individual needs and coaching, mentoring and guiding them to establish a learning environment.^{28,29} Intellectual stimulation urges knowledge, skills and information sharing to generate additional innovative and inventive ideas.²⁹ It enables leaders to be creative in seeking innovative ideas and different ways to solve problems.³⁰ Inspirational motivation concentrates on motivating followers by setting a greater level of desired

expectations for them.²⁸ It communicates high expectations, demonstrates a mutual commitment towards achieving goals and uses symbols to focus efforts.³⁰

Within South Africa, organisations, depending on their backgrounds, employ different forms of leadership such as democratic, situational, transactional and autocratic, among others. The success of some companies such as Cummins Africa, Vodacom and Shoprite is linked to their ability to employ a combination of leadership styles.³¹ Some South African manufacturing companies such as Kellogg's, Steeledale and Tongaat Hulett have used the transformational leadership style to drive their human capital strategies.³² Overall, transformational leaders know how to inspire, encourage, motivate and stimulate employees to perform in ways that improve strategy development and implementation.³³ The result is an engaged workforce that is inclined to innovate and assist in shaping and improving an organisation's performance and future success.

Supply chain execution

Supply chain execution is a concept linked to SCM and relates to the flow process of tasks and activities involved in the supply chain.⁹ A supply chain is a network of people and organisations that are linked to ensure the supply of goods and services to end consumers. Supply chain management is the active management of supply chain activities to maximise customer value and achieve sustainable competitive advantages.³⁴ The supply chain activities include procurement, order fulfilment, manufacturing, warehousing, shipping, transporting and the information systems required to coordinate these activities.^{9,34} Supply chain execution relates to the implementation of these activities through integrating visual materials and products and intangible features such as relationships and services.^{35,36} It describes how companies drive the movement of products from procurement to distribution, including functions such as production, warehousing and transportation.³⁶ This is often an area the company pays a lot of attention to because it is a key cost centre and classically leads to cost savings.³⁷ There is evidence that an effective SCE can result in improvements in the performance of firms in areas such as cost savings, enhanced quality, risk mitigation, better collaboration with suppliers and customers, and improved cash flow, among others.¹⁴ Therefore, smoothed implementation of supply chain strategy is essential because it yields sustainable competitive advantages and enhances the performance of both organisations and the supply chain.

Supply chain performance

Supply chain performance is the supply chain's ability to supply quality products in the right quantities and at the required time while minimising the total cost involved in supplying these products.^{38,39} This study incorporated a modified model composed of four factors: supply chain agility (SCA), supply chain reliability (SCRL), supply chain responsiveness (SCR) and supply chain cost (SCC) as the dimensions of SCP.³⁸ These decision areas are essential to

intraorganisational development in the entire supply chain. Hence, the SCP framework adopted in this study recognises an appropriate combination of performance indicators based on the typical goals of a supply chain and multidimensional performance measures that characterise supply chains.³⁹

Supply chain agility

Supply chain agility is the ability to respond to unanticipated changes.³⁸ It is the supply chain's capability to react swiftly to deviations in the market.³⁹ An agile supply chain responds promptly to changes in demand and supply and involves the smooth management of external risks and exposures.^{37,39} Supply chain agility may also be regarded as a company's capability to swiftly fine-tune its approach, mainly in management of stock levels, procurement, as well as distribution to meet the volatile and dynamic supply chain processes.^{39,40} Businesses such as Jack Maserow Furniture Manufacturers, Mustek and Emerson have robust SCA and have been able to adapt to change easily, navigate unpredictable market dynamics and manipulate emerging business prospects within South Africa and beyond.⁴⁰ Furthermore, the harsh lessons learnt from the recent COVID-19 pandemic have boosted the ability of some manufacturing companies in South Africa (e.g. Samsung, BMW, Alvern Cables) to build agility-boosting processes as they seek to improve their preparedness to deal with the dynamism characterising today's global markets.^{41,42} An agile manufacturing SME supply chain in South Africa will therefore be able to remain competitive by reacting to changes swiftly and competently in the ever-volatile markets and changing customer expectations.

Supply chain costs

Supply chain cost has a place among the primary indicators of SCP and refers to the monetary value utilised in supply chain processes.^{18,42} It is a record of the inputs used in supply chain processes and reflects the effectiveness of cost control mechanisms. More so, SCCs are an essential performance dimension, as financial resources are used to perform various activities within the scope of SCM.³⁹ In most manufacturing companies, the drivers of SCC include investment costs, transportation costs, procurement, production and inventory costs. However, minimising SCC is an incredibly complex and challenging endeavour requiring intelligent, integrated planning and decision-making optimisation solutions.⁶ One such solution entails optimally balancing the trade-offs between production, procurement, transportation, inventory, distribution and other costs – penalties for lateness, performance targets and other key performance indicators.⁴³

Supply chain reliability

Supply chain reliability is the aptitude of a supply chain system or component to accomplish its obligatory functions under stated circumstances for a specified period.⁴² The reliability of the supply chain emphasises whether the correct product gets to the proper place, in the right amount, at the

scheduled time, using suitable documents and to the right consumer.⁴³ Within South Africa, the reliability of most supply chains is limited by factors such as ongoing electricity power shortages, vandalism on critical infrastructure such as railways, political unrest and disasters such as the 2021 KwaZulu-Natal flooding and COVID-19.^{45,46,47} To improve the reliability of their supply chains, manufacturing SMEs should improve their supply chain structures, inventory control policies and information sharing and focus more on customer demand.⁴⁸

Supply chain responsiveness

Supply chain responsiveness refers to the swiftness of the supply chain process and the degree to which it meets the varying needs of customers regarding their demand and response to other supply chain matters in the dynamic business setting.⁴⁹ It includes the ability of a supply chain to respond to changes in the market.⁴⁴ The changes relate to *inter alia* lead times, demand for new, varied and innovative products, and market volatilities.⁴⁹ Responsiveness enables firms to readjust their resources fast and effectively in producing varied levels and combinations of outputs to satisfy customer needs and adapt to environmental changes.²⁴ It, therefore, enables manufacturers to reduce risk.

Research model and hypotheses

The research model considered in the study is presented in Figure 1. It consists of four predictor constructs (IL, IS, IM and IC), SCE as the mediator and SCR as the outcome variable consisting of four measurements (SCA, SCRL, SCC and SCR).

Transformational leadership and supply chain execution

Implementing transformational leadership practices is an essential aspect of strategy execution in many organisations.^{49,50} The implementation of supply chain strategy is enabled by delegation, supportive, integrative leader-follower relationships and participative aspects that the transformational leadership style develops in organisations.⁴⁶ Following the investigations on leadership and business performance, it has been observed that

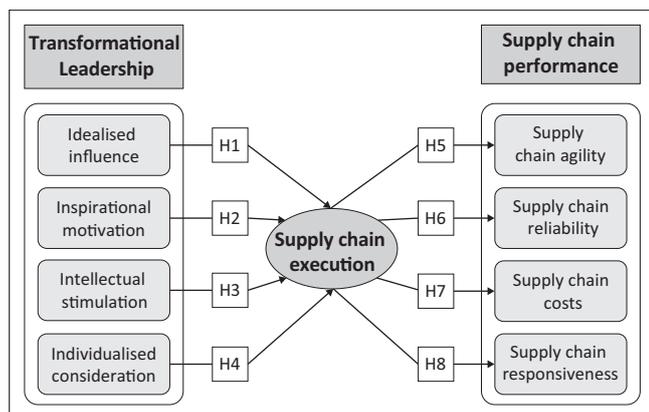


FIGURE 1: Conceptual framework.

transformational leadership practices such as IS and IM can predict the effective development and implementation of business strategy.^{47,50} Transformational leadership has been strongly associated with organisational outcomes such as SCP and positive financial and non-financial performance.^{42,50} Considering the aforementioned insights, the following hypotheses are formulated:

H1: IL has a significant positive influence on SCE in manufacturing SMEs in South Africa.

H2: IM has a significant positive influence on SCE in manufacturing SMEs in South Africa.

H3: IS has a significant positive influence on SCE in manufacturing SMEs in South Africa.

H4: IC has a significant positive influence on SCE in manufacturing SMEs in South Africa.

Supply chain execution and supply chain performance

Several studies in various environments have linked the effective implementation of supply chain strategies to superior SCP and competitive advantage.^{24,41,50} A model on SCP that validates the nexus between the antecedents of performance, its consequences and SCE was established.⁵¹ This leads to the following hypotheses:

H5: SCE has a significant positive influence on SCA in manufacturing SMEs in South Africa.

H6: SCE has a significant positive influence on SCRL in manufacturing SMEs in South Africa.

H7: SCE significantly optimises SCC in manufacturing SMEs in South Africa.

H8: SCE has a significant positive influence on responsiveness in manufacturing SMEs in South Africa.

Research method and design

The study followed a quantitative survey method based on deductive cognitive and a positivism philosophy, as it required to test link between various concepts and hypotheses.⁵²

Population and sample size

The target population included SCM professionals, managers and owners of SMEs operating in North-West, Free State and Gauteng provinces, South Africa. A sample frame of participating SMEs was obtained from the Small Enterprise Development Agency (SEDA). Up to 180 manufacturing SMEs in different industries were recognised and contacted using this list. From these enterprises, a sample of 411 purposively selected professional employees. Purposive sampling was useful in the selection of those respondents who possessed knowledge about the area of the study. In terms of the inclusion criteria, respondents chosen to participate in the study were holders of matric certificates or higher qualifications. They also had to possess knowledge of SCM. The sampling size was determined using Green's rule of thumb. The rule prescribes the following formulae $N \geq 50$

+ 8 m (with m representing the number of predictor variables in the model). Using this rule, 82 was expected to be the minimum sample size, given the four transformational leadership constructs that were predictor variables in the study. Hence, a sample size of $n = 411$ used in this study is consistent with Green's rule of thumb.

Instrumentation and data collection

Measurement scales were operationalised from previously validated scales. Transformational leadership was measured using a 12-item scale adapted from the multifactor leadership questionnaire.¹¹ To measure SCE, a five-item scale was used.²⁶ Supply chain performance indicator items were all adapted from existing measurement scales.^{38,53,54,55} Only validated measurement scales (with a minimum Cronbach's alpha of 0.7) were adapted for this study. Five-point Likert scales ranging from 1 = strongly disagree to 5 = strongly agree were used as the response option on measurement scales. Data were collected using a structured and self-administered survey questionnaire. The questionnaires were distributed using an online survey, in light of the national lockdown restrictions in place because of the COVID-19 pandemic. Respondents were given 3 weeks to complete the questionnaire. To ensure that only those SMEs who were suitable for the study were selected, two screening questions were placed on the questionnaire cover letter. The two questions read as follows: (1) do you have a basic understanding of the transformational leadership style? and (2) do you feel that the transformational leadership style is practised in your SME? Only those SMEs where the respondents provided positive confirmation to these two questions were included in the survey.

Data analysis

The collected data were analysed using the Statistical Package for Social Sciences (SPSS version 27.0) and SMART partial least squares (PLS version 3.0) tools. The key statistical techniques employed in the study include structural equation modelling (SEM) and exploratory factor analysis (EFA).

Ethical considerations

Central Research Ethics Committee: Vaal University of Technology (FRECMS-22072020-042).

Results

Response rate and demographic profile of respondents

A total of 500 survey questionnaires were sent to the respondents targeted in their respective manufacturing SMEs. From the 500 questionnaires, 411 valid questionnaires were available for use in the ultimate analysis, signifying a response rate of 82.2%, which is echoed by several suitable studies.^{54,55,56} Gender, race, education level and age were used as demographic variables, and no significant differences were noticed ($p > 0.05$). Male respondents dominated the

survey with 57.9% ($n = 238$). In terms of race, 51.8% ($n = 213$) were black Africans. The majority age group was 34–41 years representing 38.4% ($n = 158$). Concerning education level status, 45.3% ($n = 186$) of respondents were holders of diplomas.

Exploratory factor analysis

To assess the research constructs' factor structures, EFA was performed. The EFA used the principal component analysis technique, based on varimax rotation. Data factorability was determined using the Kaiser–Meyer–Olkin measure of sampling adequacy (KMO) and Bartlett's test of sphericity. The KMO scores were higher than the 0.5 lowest prescribed value. Bartlett's test results for all constructs were significant at 0.000. Hence, the captured data were deemed suitable for factor analysis.⁵⁵ Communalities were higher than the 0.3 recommended minimum.⁵⁷ Only factors with eigenvalues higher than 1.0 and items with factor loadings greater than 0.5 were retained.⁵⁸ Four-factor structures were extracted for the transformational leadership (TL) and SCP scales, while a unidimensional one emerged for the SCE factor. The EFA results are reported in Table 1.

As indicated in Table 1, all measurement items achieved factor loadings surpassing the prescribed 0.5 minimum cut-off value.⁵⁹ Eigenvalues for the extracted factors were higher than 1.0.⁵⁷ In addition, all factors extracted exceeded the prescribed minimum cumulative percentage of variance of 60%. Therefore, all the scale dimensions reported in Table 1 were retained.

Measurement Scale Assessment

The hypothesised relationships were tested using SEM. This involved first testing the accuracy of the measurement scale for reliability and validity, based on various indicators computed using the PLS technique. The scale accuracy assessment results are indicated in Table 2.

Construct reliability was tested using Cronbach's alpha coefficient, composite reliability and the median Rho A coefficient. All values (Table 2) were above the recommended minimum cut-off value of 0.7, confirming that internal consistency reliability was adequate in the study for all measurement scales. A pilot study was undertaken involving 54 conveniently selected respondents drawn from the Ekurhuleni region to determine the content validity and the preliminary reliability of the questionnaire. Positive reproach was attained from the pilot survey, which specified a few negligible matters that were addressed before the main survey. Convergent validity was tested using the standardised regression weights. A minimum cut-off value of 0.4 was applied as recommended.⁵⁹ Two items, SCA5 and SCR5, were discarded for attaining low standardised regression weights of 0.245 and -0.191 , respectively. However, the rest of the items attained factor loadings above 0.4, indicating that convergent validity was adequate. In addition, average variance extracted (AVE) values were above the minimum

TABLE 1: Exploratory factor analysis.

Scale	Item	Description of item	Factor loading
II	TL1	Our managers make employees feel good to be around them.	0.856
	TL8	Employees have complete faith in our managers.	0.622
	TL15	Employees are proud to be associated with managers.	0.870
IM	TL2	Our managers direct with a little modest word what the employees could do.	0.704
	TL9	Our managers provide interesting pictures about what employees can do.	0.713
	TL16	Our managers help employees to find meaning in their work.	0.922
IS	TL3	Our managers enable employees to think about old problems in new ways.	0.608
	TL10	Our managers provide employees with new ways of looking at puzzling things.	0.720
	TL17	Our managers get employees to rethink ideas that they had never questioned before.	0.861
IC	TL4	Our managers help employees to develop themselves.	0.597
	TL11	Our managers let employees know that they always think of employees' welfare.	0.912
	TL18	Our managers give personal attention to employees who seem rejected.	0.697
SCE	SCE1	Our supply chain members share risks and rewards.	0.875
	SCE2	Our firm extends its supply chain beyond its suppliers and customers.	0.891
	SCE3	Our firm has dedicated SCM employees.	0.920
	SCE4	Our firm participates in the SCM efforts of its customers.	0.898
	SCE5	Our supply chain employees are involved in standardising supply chain practices and operations.	0.851
	SCE6	Our firm has processes to respond to supply chain plans changes.	0.737
SCA	SCA1	Our supply chain can respond to variations in the market without overstocking.	0.842
	SCA2	Our supply chain can react sufficiently fast to new market development.	0.879
	SCA3	Our supply chain can influence the capabilities of our associates to retort to the market.	0.894
	SCA4	Our supply chain can estimate the demand in the market.	0.875
	SCA5	Our supply chain has the capacity to decrease lead times.	0.832
SCRL	SCRL1	Our supply chain system increases our order fill rate.	0.690
	SCRL2	Our supply chain system increases our inventory turns.	0.841
	SCRL3	Our supply chain system reduces our safety stocks.	0.765
	SCRL4	Our supply chain system reduces our inventory obsolesces.	0.754
	SCRL5	Our supply chain relies on a few high-quality suppliers.	0.665
SCC	SCC1	Our supply chain arrangement decreases distribution costs.	0.747
	SCC2	Our supply chain arrangement decreases the costs of warehousing.	0.933
	SCC3	Our supply chain arrangement decreases stock level costs.	0.807
	SCC4	Our supply chain process lessens the product warranty claims from our partners.	0.941
SCR	SCR1	Our supply chain has a short order-to-delivery cycle time.	0.801
	SCR2	Our supply chain is capable to meet high demand and order fill rates when our customers unexpectedly tighten their lead time requirements.	0.845
	SCR3	Our supply chain has speed and capability for quality improvement.	0.925
	SCR4	Our supply chain has fast customer response times.	0.901

IC, individualised consideration; II, idealised influence; IM, inspirational motivation; IS, intellectual stimulation; SCA, supply chain agility; SCM, supply chain management; SCE, supply chain execution; SCA, supply chain cost; SCR, supply chain responsiveness; SCRL, supply chain reliability; TL, transformational leadership.

TABLE 2: Psychometric properties of the measurement model.

Construct	Scale items	Standardised regression weights	Cronbach's alpha value	Rho A	CR	AVE	√AVE
II	TL1	0.911	0.784	0.791	0.89	0.73	0.885
	TL8	0.761	-	-	-	-	-
	TL15	0.882	-	-	-	-	-
IM	TL2	0.467	0.901	0.911	0.79	0.56	0.748
	TL9	0.743	-	-	-	-	-
	TL16	0.598	-	-	-	-	-
IS	TL3	0.845	0.846	0.851	0.83	0.63	0.794
	TL10	0.921	-	-	-	-	-
	TL17	0.576	-	-	-	-	-
IC	TL4	0.876	0.888	0.890	0.81	0.59	0.768
	TL11	0.765	-	-	-	-	-
	TL18	0.652	-	-	-	-	-
SCE	SCE1	0.401	0.787	0.810	0.88	0.57	0.755
	SCE2	0.793	-	-	-	-	-
	SCE3	0.765	-	-	-	-	-
	SCE4	0.542	-	-	-	-	-
	SCE5	0.687	-	-	-	-	-
SCA	SCA1	0.421	0.856	0.857	0.86	0.56	0.746
	SCA2	0.813	-	-	-	-	-
	SCA3	0.562	-	-	-	-	-
	SCA4	0.801	-	-	-	-	-
	SCA5	0.921	-	-	-	-	-
SCRL	SCRL1	0.619	0.833	0.835	0.87	0.57	0.756
	SCRL2	0.774	-	-	-	-	-
	SCRL3	0.790	-	-	-	-	-
	SCRL4	0.774	-	-	-	-	-
	SCRL5	0.805	-	-	-	-	-
SCC	SCC1	0.573	0.792	0.7.95	0.76	0.46	0.678
	SCC2	0.514	-	-	-	-	-
	SCC3	0.803	-	-	-	-	-
	SCC4	0.767	-	-	-	-	-
SCR	SCR1	0.732	0.872	0.874	0.82	0.54	0.735
	SCR2	0.528	-	-	-	-	-
	SCR3	0.774	-	-	-	-	-
	SCR4	0.871	-	-	-	-	-

√AVE, square root average variance extracted; II, idealised influence; IM, inspirational motivation; IS, intellectual stimulation; IC, individualised consideration; SCE, supply chain execution; SCA, supply chain agility; SCRL, supply chain reliability; SCC, supply chain costs; SCR, supply chain responsiveness.

prescribed threshold of 0.4, further confirming the adequacy of convergence validity in the study constructs.

Discriminant validity was tested using the Fornell and Larcker criterion, which prescribes that the square root of the AVE value for each construct must be higher than the highest correlation between that construct and the rest of the constructs. As indicated in Table 3, all AVE square root values for each construct were higher than its correlations with other constructs, indicating that the requirement for discriminant validity was satisfied in the study.

Hypotheses tests results

Hypotheses were tested using the SMART PLS technique by testing and examining relationships among the sets of observed variables. The results are presented in the structural model in Figure 2.

Figure 2 shows path coefficients ranging between 0.025 and 0.772, demonstrating the existence of relationships between some of the constructs. Statistically significant relationships emerged between II and SCE ($\beta = 0.169$) as well as between IC and SCE ($\beta = 0.495$). Supply chain execution exerted a strong significant positive influence on all SCP constructs. The actual results for each hypothesis tested in the study are presented in Table 4.

Eight hypotheses were tested in this study, as shown in Table 4. Six of the eight hypotheses were supported. However, two results (H2 and H3) were rejected because of statistically insignificant relationships indicated by p -values higher than the 0.05 significance level.

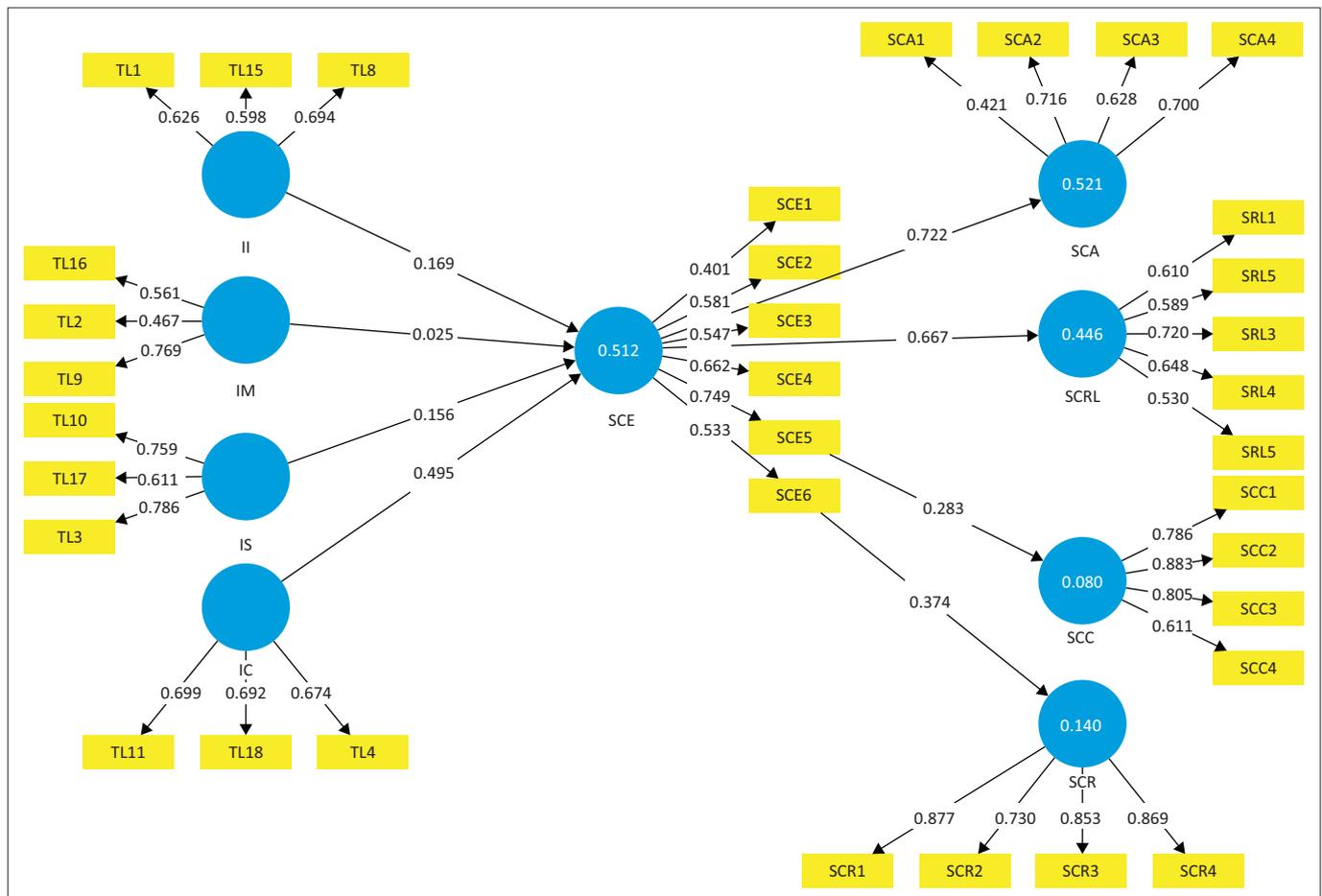
Discussion

The analysis performed in the study was based on eight proposed relationships among the TL, SCE and SCP constructs. The results show that IM ($\beta = 0.025$; $t = -0.328$; $p = 0.743$) and IS ($\beta = 0.156$; $t = 1.764$; $p = 0.078$) were both statistically insignificant in influencing SCE. In other words, IM and IS do not contribute to the execution of supply chain strategy in manufacturing SMEs. Most SMEs are characterised by the dominant role of top management (entrepreneur) in the firm.^{30,31} The dominant entrepreneur at the top of the SME can hinder the implementation of IM and IS leadership practices by dictating other people-based practices in the

TABLE 3: Discriminant validity.

Construct	IC	II	IM	IS	SCA	SCC	SCE	SCR	SCRL
IC	0.768	-	-	-	-	-	-	-	-
II	0.435	0.885	-	-	-	-	-	-	-
IM	0.525	0.810	0.748	-	-	-	-	-	-
IS	0.621	0.526	0.589	0.794	-	-	-	-	-
SCA	0.557	0.656	0.524	0.485	0.746	-	-	-	-
SCC	0.741	0.439	0.645	0.740	0.469	0.628	-	-	-
SCE	0.679	0.764	0.463	0.550	0.722	0.583	0.755	-	-
SCR	0.355	0.595	0.680	0.613	0.509	0.527	0.674	0.735	-
SCRL	0.586	0.562	0.404	0.520	0.686	0.512	0.667	0.506	0.756

II, idealised influence; IM, inspirational motivation; IS, intellectual stimulation; IC, individualised consideration; SCE, supply chain execution; SCA, supply chain agility; SCRL, supply chain reliability; SCC, supply chain costs; SCR, supply chain responsiveness.



IC, individualised consideration; II, idealised influence; IM, inspirational motivation; IS, intellectual stimulation; SCA, supply chain agility; SCE, supply chain execution; SCC, supply chain cost; SCR, supply chain responsiveness; SCRL, supply chain reliability; TL, transformational leadership.

FIGURE 2: Structural model.

TABLE 4: Results of hypotheses testing.

Relationship	Hypothesis	Beta	t-value	p	Outcome
II → SCE	H1	0.169	2.361	0.018	Supported and significant
IM → SCE	H2	0.025	0.328	0.743	Not supported and insignificant
IS → SCE	H3	0.156	1.764	0.078	Supported and insignificant
IC → SCE	H4	0.495	7.172	0.000	Supported and significant
SCE → SCA	H5	0.722	18.907	0.000	Supported and significant
SCE → SCRL	H6	0.667	16.895	0.000	Supported and significant
SCE → SCC	H7	0.283	3.708	0.000	Supported and significant
SCE → SCR	H8	0.374	6.314	0.000	Supported and significant

II, idealised influence; IM, inspirational motivation; IS, intellectual stimulation; IC, individualised consideration; SCE, supply chain execution; SCA, supply chain agility; SCRL, supply chain reliability; SCC, supply chain costs; SCR, supply chain responsiveness.

enterprise. Furthermore, because of the relatively small firm size, the entrepreneur often concentrates on providing the vision and direction (idealised influence), overlooking IM and IS practices in the process as they might be deemed unnecessary and expensive to implement.³¹

Additionally, most SMEs tend to be managed in an informal way, which again opens a large degree of discretion as to which leadership style to employ or not.⁵⁰ In this study, the results suggest that most manufacturing SMEs consider IM and IS to be non-contributors to the implementation of supply chain strategy, a result that could be attributed to the way most of these SMEs are managed. Perhaps there are no conscious efforts by managers in manufacturing SMEs to apply leadership best practices as part of business strategy. In any case, it has been stated that poor management practices are a major contributing factor to the demise of many SMEs in South Africa. As such, IM and IS as practised in manufacturing SMEs may not be adequate to impact supply chain strategy execution.

Moreover, these results could be attributed to the fact that SCM is an emerging concept in most manufacturing SMEs in South Africa. It may be argued that supply chain strategy is still at its inception stage in developing countries such as South Africa.^{49,50} Despite its rising popularity globally, SCM has been a critical concern for manufacturing SMEs in the developing world and South Africa, and its implementation is still at its foundation stage. Consequently, most managers and owners of small businesses are still finding a balance in terms of which leadership practices to apply in their nascent supply chain practices. As such, the manufacturing SME sector is responding to this scenario as managers and owners grapple with applying the appropriate leadership practices to reach supply chain goals.

Among the four leadership practices, II ($\beta = 0.169$; $t = 2.361$; $p = 0.018$) and IC positively predicted SCE ($\beta = 0.495$; $t = 7.172$; $p = 0.000$). The positive outcome of this relationship confirms that if manufacturing SMEs in South Africa direct their efforts towards the application of the II and IC leadership practices, there is a greater possibility that the implementation

of supply chain strategies and processes can be improved. These practices include a positive work environment, excellent reward and recognition programmes, and training and development. Hence, the stronger the II and IC practices in manufacturing SMEs, the better the implementation of supply chain strategies. Although SCM has been successfully implemented in large manufacturing companies such as Samsung, Cummins and Stryker, it remains essential for manufacturing SMEs to establish the most appropriate transformational leadership mix that can impact positively the management of their supply chains.³⁰ Such leadership practices can be applied to the manufacturing SME sector for SCM professionals, managers and owners to deliver quality leadership, which improves both their SCE and SCP.

The outcomes also highlight that SCE has a positive significant impact on all of the SCP dimensions considered in the study: SCA ($\beta = 0.722$; $t = 18.907$; $p = 0.000$); SCRL ($\beta = 0.667$; $t = 16.897$; $p = 0.000$); SCC ($\beta = 0.283$; $t = -3.708$; $p = 0.000$) and SCR ($\beta = 0.374$; $t = 6.314$; $p = 0.000$). By implication, how SCM is implemented has a positive bearing on the agility, reliability, cost structures and responsiveness of manufacturing SME supply networks. Likewise, it has been suggested that improved SCP is a result of more effective planning, good inventory management and supply chain integration in an organisation.^{47,50} From a practical perspective, the need to improve SCM strategy execution has become more apparent in the pursuit of achieving enhanced SCP. Manufacturing firms must adopt new supply chain practices to meet the prospects of achieving agility, reliability, cost optimisation and responsiveness.⁴⁸ These new practices include relationship agility, measurement integration, technology, planning execution, material and service supplier integration, internal operations and customer integration.^{46,49} This calls upon manufacturing SMEs to explore further than their norms and diversify their SCP within their respective industries and at the global level.

Among the four positive relationships, it is noteworthy to single out the relationship between SCE and SCC as an interesting result. It was found that SCE results in the reduction of SCC drivers, that is, investment, production, procurement, inventory management and transportation costs.⁴⁵ The positive relationship between SCE and SCC implies that the more a manufacturing SME implements SCE practices, the more the SSCs are reduced. Hence, the implementation of supply chain strategies is yielding the expected results in such areas as robust SCA, reliability, costs and responsiveness in manufacturing SMEs in South Africa.

Conclusion

This study examined the relationship between transformational leadership practices, SCE and SCP in South African manufacturing SMEs. It identified two transformational leadership factors, namely II and IS, which contribute to the successful execution of supply chain strategy and ultimately the performance of manufacturing SME supply chains in

South Africa. Implementation of supply chain strategies has the effect of enhancing the agility of optimising the costs and increasing the reliability and responsiveness of the manufacturing supply chain.

The study contributes to the body of knowledge by showcasing the role of leadership practices in the implementation of SCM in manufacturing SMEs. It suggests the importance of applying an appropriate mix of transformational leadership practices while attempting to improve SCM implementation. As the study shows, transformational leadership is a multidimensional factor whose subcomponents may impact differently on supply chain strategy execution. Collaboration between II and IC is likely to improve the effectiveness of SCM implementation, the latter of which is positively associated with the performance of the supply chain in the four areas considered in the study. More precisely, among the four transformational leadership factors, IS exerted the highest influence on SCE ($\beta = 0.495$). By implication, more attention should be directed to IS than the other three factors while attempting to improve supply chain strategy execution in manufacturing SMEs. For effective implementation of SCM strategy, emphasis should be placed on understanding and considering the appropriate leadership styles and contexts of SCM infrastructure, support and organisation.

Transdisciplinary contributions

The study's main purpose is to investigate the impact of transformational leadership on the implementation of SCM in manufacturing SMEs. The study may be regarded as transdisciplinary because the research constructs under consideration fall within different disciplines. Leadership, which in the study is represented by its transformational dimension, falls within organisational behaviour while SCM is an emerging stand-alone discipline that has gained prominence in recent times. Additionally, the study also involves the discipline of entrepreneurship or small business management, as its scope was restricted to SMEs. The study reveals that although these disciplines and constructs are distinct, they are interdependent and that optimal SCM performance can be realised through the strategic integration of transformational leadership and SCM practices across manufacturing SME supply chains. Thus, the study augments shared learning for knowledge creation between these disciplines.

The study authenticates the importance of leadership as a strategic driver of the performance of organisations. However, this importance is demonstrable through its interaction with other organisational factors or business strategies, in this case, SCM.

In its nature, SCM is a continuous process requiring the wide-ranging reengineering of business and supply chain processes. This may, at times, involve economically and culturally constructing SCM as driven by the underlying organisational cultures and traditions that direct its

implementation within the organisation. In the South African context, manufacturing SMEs face numerous constraints that impede the effectiveness of supply chain processes and operations. Ineffective leadership remains as one of these constraints. However, this study intervenes by invoking the application of comprehensive strategies to assist SMEs to realise the transformative impact of leadership on SCM.

In South Africa, SMEs are regarded as the economic drivers of the country. However, most SMEs either remain stagnant or fail in their first 2 years of operations. Literature indicates that most SMEs' initiatives often fail because of their inability to recognise the link between leadership and entrepreneurship drivers. The study provides insights into how transformational leadership can be harnessed for the improvement of agility, reliability, responsiveness and cost optimisation in manufacturing SMEs. In this way, it generates information to overturn the underperformance of SMEs in South Africa— a matter that has positive macroeconomic implications for the country.

Limitations and suggestions for further research

Generalisation of the study to other environments is limited because the primary data used in the study were gathered in only three South African provinces (Free State, Gauteng and North-West). A qualitative or mixed-methods approach may be applied in future studies to obtain a wider range of results. The study may also be extended to larger corporations, as the constructs used in this research are all applicable and pertinent to businesses of different sizes. Future studies could also test the impact of other leadership practices such as distributed, servant and contingency, among others on SCM in different economic sectors.

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Authors' contributions

I.L. is the researcher who led the design and conception, collection of data and manuscript write up. C.M. is the senior researcher who substantially contributed to data analysis, interpretation of results, conception and design of the study and provided guidance in the manuscript write up.

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Data availability

The data that support the findings of this study are not openly available due to confidentiality and are available from the corresponding author, I.L. upon reasonable request.

Disclaimer

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