JOURNAL OF CRITICAL REVIEWS

ISSN- 2394-5125 VOL 08, ISSUE 01, 2021

ARE TRIPLE HELIX AGENTS THE ANSWER FOR PROMOTING SME DEVELOPMENT? INVIGORATING INNOVATION AND ENHANCING PERFORMANCE OF SMEs IN SOUTH AFRICA

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Abstract

The phenomenon of the Triple Helix system has been recognised widely in developed countries. However, in Southern Africa's developing countries, the significance of how Triple Helix agents can influence product innovation has been largely overlooked. Hence, this study's main goal is to tackle this research gap.This article examines the connection between university, industry and government as a mechanism for improving the performance of small and medium-sized businesses (SMEs).This study also proposed that product innovation is a vital moderating factor of this relationship.A quantitative research approach has been used for this study. A structured questionnaire was developed and administered to 250 SME managers within the Johannesburg metropolitan area of South Africa. The collected data were analysed utilising structural equation modelling utilizing the Smart PLS software.SME Collaboration with Universities, SME Collaboration with Industry and SME Collaboration with Government Agents had a positive and a significant influence on product innovation. A strong positive relationship was also found between product innovation and business performance. Moreover,the association between the triple helix agents and business performance was significantly moderated by product innovation. These results lead to widening the scope of academic discourse in the fields of entrepreneurship and small business management, especially from a South African view, and the relationships identified have significant practical consequences for SME managers, university management, industry professionals, and government officials.

Keywords: universities, Industry, government agents, product innovation; business performance

1. Introduction

In most economies, the largest contributors to economic activity are small and medium enterprises (SMEs) (Struwig & Lillah, 2017). SMEs maintain a focal position in resolving socio-economic challenges, for example, unemployment and poverty, particularly in developing countries. Consequently, they have turned into the real wellspring of livelihood (Mathu & Tlare, 2017; Nyoni & Bonga, 2018; Dzomonda & Masocha, 2018; Dzomonda & Fatoki, 2019). Given their significance, as far as economic development, and the key role they play in various economies goes, SMEs require further examination. Furthermore, it is important to specify that the significance of SMEs is portrayed by the point that all through the world over 95 per cent of enterprises are in the form of SMEs (Aksoy, 2017).

As a consequence of the globalisation of economies with a greater competitive atmosphere, fast technological shifts and shorter product and innovation lifecycles, countless organisations, especially small and medium-sized enterprises, focus on innovation, which is the main driver of sustainable competitive advantage (Bayarçelik, Taşel & Apak, 2014). Small and medium-sized enterprises, as they are progressively perceived as focal innovation contributors, assume universally a significant role in national economies. Like those from advanced and emerging markets around the world, SMEs are a major force for South Africa's financial development

ISSN- 2394-5125 VOL 08, ISSUE 01, 2021

(Bayarçelik *et al.*, 2014). SMEs, however, face real challenges as they lack the knowledge and financial support. Not many have strong R&D capacities and are facing barriers to innovation along these lines (Guerrero & Urbano, 2017; Ueasangkomsate & Jangkot, 2017). These SMEs should include all employees in the process of innovation and create a shared principle dependent on the significance of innovation to be effective. Late developments in accessible innovation stress that creativity is only possible where the invention cycle includes external entities other than the business (Olmos-Peñuela, García Granero, Castro-Martínez & Deste Cukierman, 2017). SMEs partnering with academia, business, and the government may also motivate them to get funding to boost their creativity (Najafi-Tavani, Najafi-Tavani, Naudé, Oghazi & Zeynaloo, 2018).

Despite this noted interest in SME research, there are some gaps in the existing empirical literature relating to the nexus between TripleHelix agents and product innovation as well as business performance. This calls for a need for further scholarly introspection. Most international studies were carried out in developed countries. For instance, Ratten, Dana, Han and Welpe (2007) examined the internationalisation of Small and Medium-sized Enterprises (SMEs) in 27 European countries. Heikkilä and Bouwman (2018)analysed Business Model Innovation (BMI) in European micro, small and medium-sized enterprises (SMMEs).Suryani, Iramani and Lindiawani (2017) researched problems disrupting performance and growth of SMEs in Indonesia. Against the aforementioned background, scant remains known on the same in the developing parts of the world.

Henceforth, it is also essential to note that past researchers in developing nations have examined SMEs in distinct environments by focusing on the connection between inbound open innovation and the economic performance of companies in the Nigerian oil and gas industry (Akinwale, 2018); the impact of technology-based self-service banking, financial literacy borrowing and financial literacy budgeting on the economic performance of rural SMEs in Zimbabwe's agricultural sector (Maziriri, Mapuranga & Madinga, 2018); the impact of business innovation methods in post-Soviet transition economies on SME innovation performance (Apanasovich, Heras & Parrilli, 2016); the greatest barriers to SME growth in developing countries (Wang, 2016); financing SME development in Africa (Quartey, Turkson, Abor & Iddrisu, 2017); and demystifying small and medium enterprises' (SMEs') performance in emerging and developing economies (Ndiaye, Razak, Nagayev & Ng, 2018).

Although these studies are informative, they did not examine howSME collaboration with universities, SME collaboration with industry and SME collaboration with government agents impactproduct innovation as well as business performance,thus the fundamental motivation behind this investigation is to fill this gap. Besides, the moderating impact of product innovation stillneeds further clarification as there is still limited empirical research in the literature. It isexpected that product innovation can be a mechanism through which SME Collaboration with Universities, SME Collaboration with Industry and SME Collaboration with Government Agents can positively and significantly impact the business performance of SMEs. This is one of theimportant empirical contributions of this study because it offers a more nuanced explanation ofthe essence of product innovation as a moderating variable.It would be naïve to believe a priori that in developing nations such as South Africa, findings from the developed world can be implemented pro-rata.Hence, this lacuna is therefore subject to confirmation and deserves to be addressed on its own.

Also, to the best knowledge of the researchers, none or few have used Structural Equation Modeling (SEM) to test these relationshipsof SME Collaboration with Universities, SME Collaboration with Industry, SME Collaboration with Government Agents, product innovation and business performance.In terms of the conceptual model proposed in this study, it can be noted that it is original and by testing the proposed model in a developing country context, this study contributes to the literature by bringing findings from a geographically different context.

This article is pursuing a structure set. To begin with, this examination is placed in context. Secondly, a review of literature is conducted, and it is based on past research related to the constructs under investigation. Thirdly, a conceptual model is formulated, and hypotheses are developed to test linkages between the variables under study. Furthermore, the results are scrutinised in terms of previous theory. Moreover, both theoretical and practical implications are drawn from the empirical evidenceand recommendations for future research are made.

2. Contextualisation of the study

2.1 The Triple Helix Agents

Based on the literature review, this study aims to investigate the impact of SME collaboration with Triple Helix agents (universities, industry, and government) on product innovation and business performance. The concept and the advantages of Triple Helix collaboration are generally discussed within innovation frameworks structures (Champenois & Etzkowitz, 2018). Lawmakers and local authorities are committed to supporting

regional development by promoting cooperation among various social actors. These actors consist primarily of local businesses, universities, and governmental organisations, and their main capacity to support them is to focus on improving activities related to innovation (Brem & Radziwon, 2017). In this way, the Triple Helix approach aims to help researchers simply understand the connections between universities and their surroundings that have advanced from earlier narrow perspectives on the leading role of either the state or the enterprise.The idea, therefore, brings together government and private actors through communicated cooperation in mixed resources, needs and solutions (Brem & Radziwon, 2017).

Studies by Triple Helix Agents explored the innovation of small and medium-sized enterprises. It was noted that the Triple Helix approach provided advantages in terms of access to resources, such as knowledge and skills, which could then be useful in creating innovation for SMEs (Ueasangkomsate & Jangkot, 2017). SMEs can allow innovation from cooperation in a Triple Helix context (Brink & Madsen, 2016).The researchers are taking further steps in this study by uncovering how SMEs can join a Triple Helix framework to facilitate innovation as well as improve SME business performance. There is a shortage of resources for the single SME but joining a Triple Helix network, however, provides exciting access to resources and information enhancement to use opportunities in their business context for SMEs (Brink & Madsen, 2016). The current research is therefore focused on studying cooperation between SMEs and Triple Helix agents to determine whether such coordinated effort has an impact on product innovation and business performance. Moreover, since this study is contextualised within the South African Context it is imperative to precisely state the examples of the triple helix agents. Firstly, SME collaboration with Universities is operationalised as the support that SMEs receive from Universities in South Africa. The support which SMEs usually get is in the form of entrepreneurial training or education as well as business incubation. For instance, SMEs being taught how to innovate their products by academics, this will result in SMEs having product innovative practices and ultimately improving their business performance. With regards to SME collaboration with industry, this pertains to the assistance which SMEs can get from private sector to successfully engaging in product innovation. So, networking with big industry partners this would stimulate product innovation and SME business performance. Lastly, SME collaboration with the government refers to the collaboration that exists between SMEs and government agents. For example, within the South African context, there are government agents such as the Small Enterprise Development Agency (SEDA) which is an agency of the South African Department of Small Business Development (DSBD) which provides non-financial support to small enterprises and cooperatives.

3. Theoretical grounding

This study employed the relational view as the lens through which the influence of the Triple Helix agents on product innovation and SME business performance was investigated.

3.1 The theory of relational view

This research is based on the relational view that Dyer and Singh created in 1998 as a hypothesis. The theory of relational view has its roots in the market and resource-based views that have contributed considerably and substantially to the original knowledge of the sources of the competitive benefit of a company where companies compete on an individual basis (Dyer & Singh, 1998:660). Thus, in explaining the sources of differential performance and competitive advantages in alliances or networks, the market and resource-based views were found inadequate (Dyer & Singh, 1998:660; Lavie, 2006:639). According to Wong (2011:35), market and resource-based views appear to have overlooked the fact that an individual company's benefits (or disadvantages) are often related to the benefits (or disadvantages) of a relationship network in which the company is integrated. The concept of the relational view is based on such deficiencies in the literature to supplement and complement the two theories on the competitive advantage of companies. The theory argues that the relationship between firms or a company dyad is an increasingly important unit of analysis to understand the differential performance (relational rents) of firms and competitive advantage. This theory is therefore important in shedding light on assets arising from cooperation, data and procedures in the context of cooperation between SMEs and the Triple Helix agents as opposed to an individual enterprise.

The theory asserts that competitive advantage is accomplished by drawing distinctive capacities from the interconnections between members (Dyer & Singh, 1998; Kumar *et al*., 2017). These distinctive capabilities are created as the network enables companies to (1) invest in related resources; (2) create inter-company information sharing routines; (3) use effective governance processes; and (4) utilise complementary capacities (Dyer & Singh, 1998). According to Kumar *et al*. (2017), this network helps by developing a teamwork culture whereby planning and sharing tasks can work efficiently.

In this research, the relational theory is relevant because it emphasises a company's need to work with other

partners. It can therefore be observed that SMEs, universities, industry and government representatives should work together to promote product innovation and eventually improve business performance in SMEs. Besides, the researchers,in this research draw on the principles of the theory of relational review to hypothesise the interactions in the South African SME setting between the constructs of the research. No past research has applied for the relational review in the context of the South African SME setting to suggest that the Triple Helix agents act as antecedents of product innovation and business performance.

4. Discussion of the research constructs

This section of the literature review discusses the different research variables undertaken as part of this study.

4.1 SME collaboration with universities

SMEs have requirements, generally more organisational and/or technological (Gunasekaran, Putnik, Peças & Henriques, 2006). SMEs are therefore primarily interested in using their university interactions to tackle requirements that are nuclear to their company results (Gunasekaran, Putnik, Peças & Henriques, 2006). Universities and other research organisations provide technology transfer, formal R&D cooperation, skilled private workforce training and innovative expertise to businesses (Zeng, Xie & Tam, 2010; Ueasangkomsate & Jangkot, 2017). Etzkowitz and Leydesdorff (2000) conclude after conducting a meta-review that universities would benefit from linking their research with that of Triple Helix Agents, thereby promoting the primacy of the university as a source of innovation. As a significant source of fresh information for SMEs in developing nations, collaboration with higher education and government study organisations has been created (Liefner, Hennemann & Xin, 2006). SME collaboration with universities can take place in a variety of ways, such as meetings, consultancy, contract research and joint research to formalise and organise (Kauppila, Mursula, Harkonen & Kujala, 2015). The drivers of SME cooperation with universities include access to funding and innovation, enhanced status in fighting for funding and science skills, and eventually gaining competitive advantage as a collaborative result (Kauppila *et al*., 2015; Ankrah & Omar, 2015).

4.2 SME collaboration with industry

Organisations like SMEs are now trying to improve their innovation and creativity through collaboration across industry networks (Asikhia & van Rensburg, 2014). Industry collaboration is key to gaining access to resources and finding knowledge inputs to produce fresh innovations and goods (Freitas, Marques &E Silva, 2013). Small businesses working with this sector achieve more benefits as far as creative work is concerned and can offer quality products at a low cost (Salleh & Omar, 2013). Industry collaboration stimulates innovation as it allows access to external resources and knowledge that a small business may need internally (Lee, 2011; Belderbos, Carree, Lokshin & Sastre, 2015).

4.3 SME collaboration with government

Serei (2016) claims that the role of government in SME development is mainly to create an enabling atmosphere in which SMEs flourish and make a significant contribution to the economy. Halberg (2000) also reveals that the role of the South African government in the development of small and medium-sized enterprises is to promote and support small and medium-sized enterprises aimed at increasing the number of enterprises to create an enabling survival and growth environment (Chimucheka, 2013). As a result of this development, the capacity of SMEs to achieve economic growth through competitiveness, on the one hand, work creation and income distribution on the other (Berry, von Blottnitz, Cassim, Kesper, Rajaratnam & van Seventer, 2002) drives this role of government. SME cooperation with the government is essential in ensuring that tiny businesses have access to grants and economic help to be operational and competitive in the marketplace (Salleh & Omar, 2013). Government collaboration also requires flexibility in the framework of policy and legislation aimed at promoting small business innovation (Ueasangkomsate & Jangkot, 2017). Guerrero and Urbano (2017) argue that, through collaborative attempts, SMEs can obtain data and aid from the government.

4.4 Product innovation

Product innovation is the creation of new products, adjusting the present product design or using new techniques and means in the present manufacturing methods (Reguia, 2014). In other words, it relies on existing markets for existing products, distinguishing characteristics and functions that do not have present offers (Reguia, 2014). In addition, product innovation is the introduction of a fresh or considerably enhanced good or service in terms of its features or intended uses; including important changes in technical requirements, parts and equipment, integrated software, user-friendliness or other functional features (Kamakia, 2014). Product innovation covers several aspects such as the development of new products, the improvement of the design of established products, or the use of new resources or components to create established products (Hanaysha, Hilman &

Abdul-Ghani, 2014).

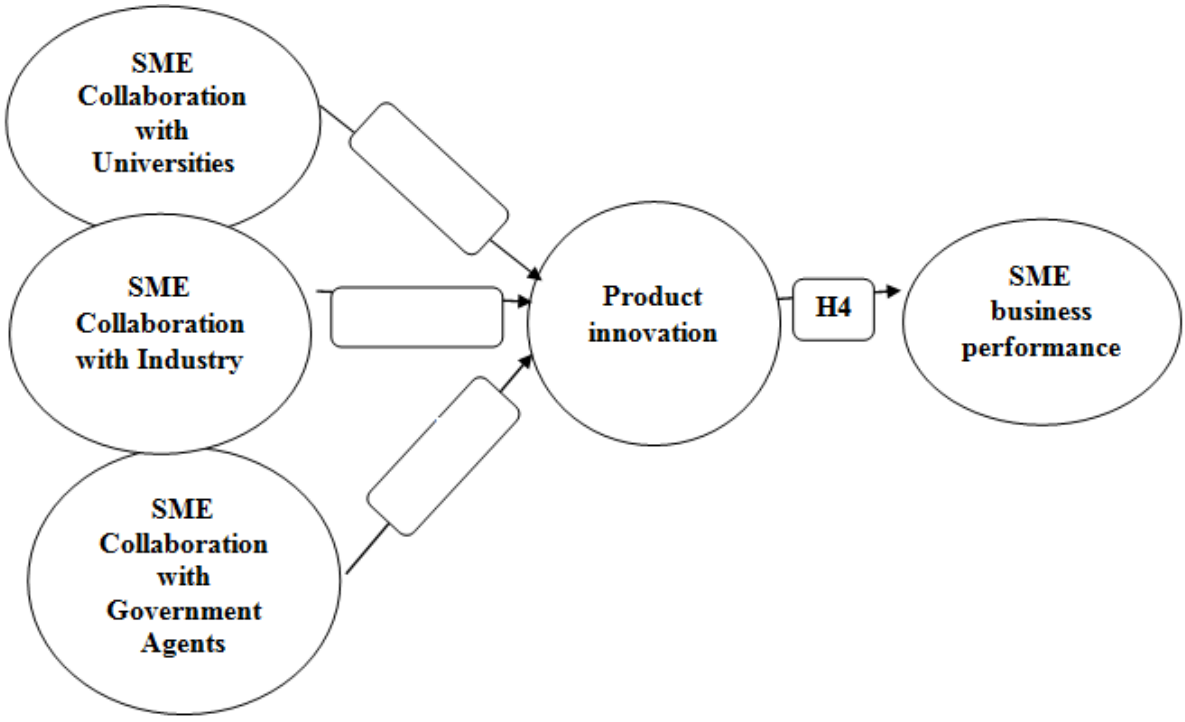
4.5 Business performance

Business performance is described as measuring the capacity of a company to compete and make profits (Mafundu & Mafini, 2019). Business performance is viewed as both an objective measure and a subjective measure. Objective performance measures are essentially financial, while non-monetary execution sections are identified by a subjective measure (Dubihlela, 2012). Furthermore, Matsuno and Mentzer (2000) have shown that business performance should be seen not only as monetary execution (solid total figures referring to authoritative execution) but also as non-financial execution (consumer loyalty, customer maintenance, social recognition, corporate picture and worker satisfaction). With the final objective of this investigation, subjective business performance measurements were used to estimate the business performance of SMEs, attributable to the unwillingness of most SME owners to disclose their money-related data (Brownhilder, 2016). Nevertheless, the problem of deciphering some objective performance data is another issue in the examination of small firms (Zulkiffli & Perera, 2011). Performance, for example, could be considered "poor" if there are misfortunes or low benefits in the information. Such confusion may occur if, for example, companies have numerous R&D duties, including items and market improvements for future development (Zulkiffli & Perera, 2011). These misinterpretations may be due to variations in profit data and may lead to the correlation of objective measures between tiny companies in different industries (Zulkiffli & Perera, 2011). To maintain a strategic distance from these issues, the researchers used subjective measures since non-monetary components, exhibits a clearer and more extensive discernment and measurement of performance (Ismail, Rose, Abdullah & Uli, 2010).

5. Overview of the conceptual model and hypotheses formulation

Deducing from the review of the literature and the theory of relational view, a research model is conceptualised. Hereafter hypothesised relationships will be developed. The conceptual model in this study suggests that the predictor variables are SME collaboration with universities, SME collaboration with industry and SME collaboration with government agents. In addition, product innovation is the mediating variable. Moreover, SME business performance is the dependent or outcome variable for the current study model. A conceptual model to guide the empirical study as shown in Figure 1 is proposed based on a synthesis of the converging literature related to the research variables.

Figure 1: Conceptual model



5.1 SME collaboration with universities and product innovation

A study by Jones and de Zubielqui (2017) presents that, while universities have for some time been perceived as providers of training, these institutions have a critical positive effect on innovation results in SMEs. It has been revealed that universities are small firm's options as they continue looking for innovative ideas (Olmos-Peñuela *et al.,* 2017). Ueasangkomsate and Jangkot (2017) found that collaboration with universities is the best method to realise innovation. In emerging countries, collaboration with universities has been elicited as being an important source of new knowledge for SMEs' innovation processes. It is revealed that universities are the main external characters that can essentially improve firms' product innovation abilities (Najafi-Tavani *et al.*, 2018). Universities can make new knowledge or technology, which can motivate thoughts for new industrial products or processes. Commonly, it is difficult for businesses, particularly SMEs, to directly create new products since their technology is not advanced enough for innovation or they need more capable human resources (Lee & Kim, 2016).Against a background of such inconclusive findings, the following hypothesis is posited:

H1: SME collaboration with universities produces a positive effect on product innovation.

5.2 SME collaboration with industry and product innovation

One of the policy approaches to improving the industrial competitiveness and innovation of small and medium enterprises is that it can be accelerated through industry-SME collaboration. High costs of new product, market and technology development may act as barriers to the innovative abilities and performance of small enterprises (Piperopoulos, 2016). Enterprises need collaboration inside their industrial sector to take advantage of sources of knowledge, new technologies, as well as new markets. On account of developing economies, knowledge sharing through firms' collaboration effectively affected enterprises' innovation performance (Ueasangkomsate & Jangkot, 2017). Collaboration with the industry sector assists the firm's employees to become more innovatively focused and in the long run, increases the enterprise's innovative culture. In the case of SMEs, this is particularly applicable (Olmos-Peñuela *et al.,* 2017). Therefore, based on this assumption, a second hypothesis is formulated as follows:

H2: SME collaboration with industry produces a positive effect on product innovation.

5.3 SME collaboration with government agents and product innovation

Government plays a key role in collaboration with small enterprises by introducing policy initiatives aimed at promoting the innovation of small enterprises (Ueasangkomsate & Jangkot, 2017). The role of government in supporting business innovation is significant because innovation development is one of the huge variables contributing to an increase in national economic output (Kim, Kim, Suh & Zheng, 2016). SMEs' collaboration with government facilitates access to knowledge, technology, capital and information on innovation opportunities (Guerrero & Urbano, 2017). Research conducted by Abdymanapov, Toxanova, Galiyeva, Muhamedzhanova, Ashikbayeva and Baidalinov (2016) accentuates that government can offer support for SMEs' involvement in product innovation. Along these lines, deriving from the literature and the empirical proof above, it is hypothesised that:

H3:SME collaboration with government produces a positive effect on product innovation.

5.4 Product innovation and SME business performance

Innovations have a fundamental impact on an enterprise's competitive advantage and can considerably impact business performance (Rangus & Slavec, 2017). A study by Aksoy (2017) found that product innovation has a positive relationship with business performance. Products that are new to customers can help create new markets that generate growth in sales. Cost-effective innovative products can expand total market size and profits by drawing in new customers from undiscovered market fragments (Jajja, Kannan, Brah & Hassan, 2017). Product innovation thus positively affects business performance (Chan, Yee, Dai & Lim, 2016). An innovative culture can improve the performance of the firm and empower the development of new products which need creativity, partnership and effective employee relations. Moreover, SMEs can utilise innovation culture as a vital tool to encourage the development of new products and improve business performance (Aksoy, 2017). The current research, therefore, proposes the following hypothesis:

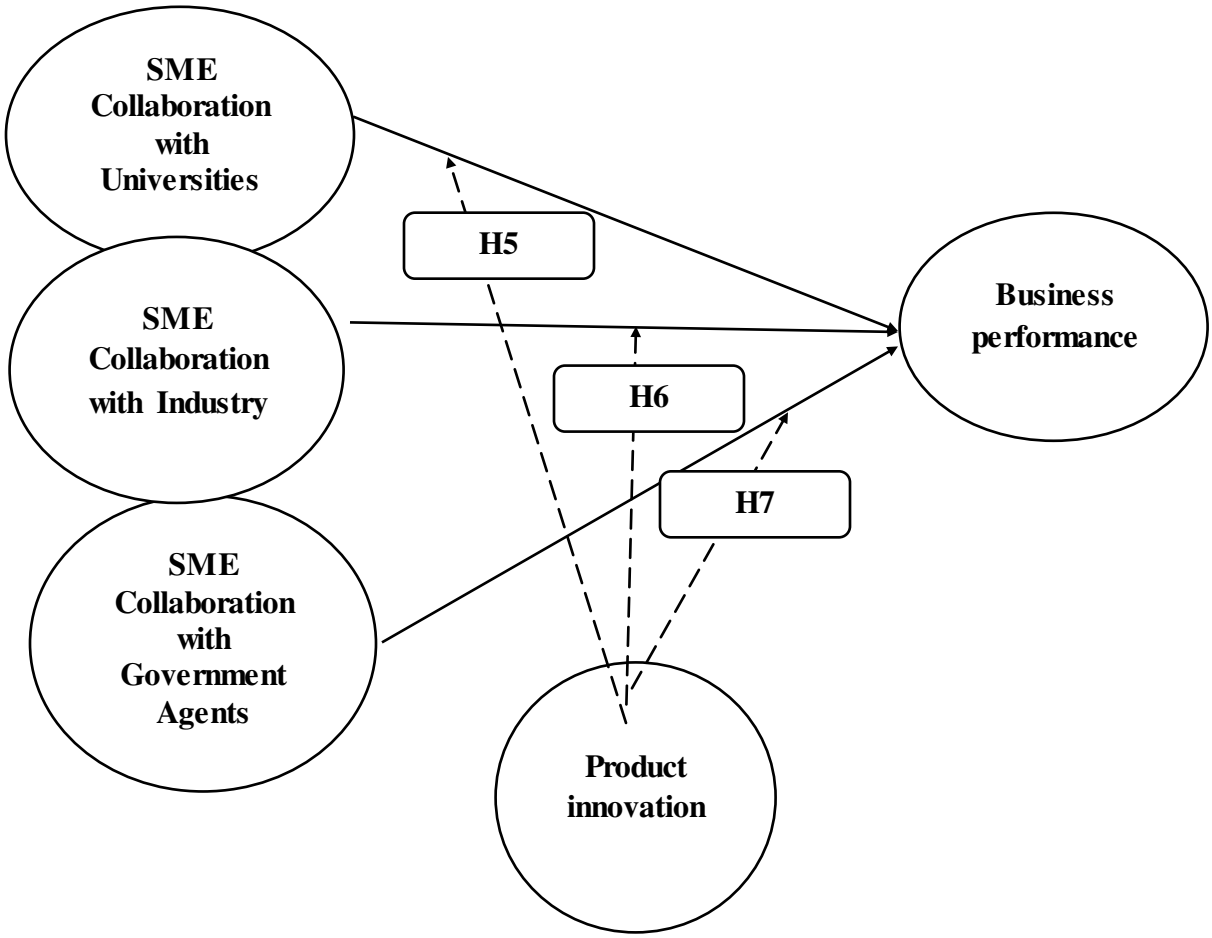
H4: Product innovation has a positive effect on SME business performance.

6. Alternative model

Apart from the posited relationships depicted in conceptual model 1 (Figure 1), direct and indirect relationships between the variables under investigation are plausible. An alternative research model 2 that incorporates product innovation as a moderating variable was also incorporated in this studyfor comparison with the main model.

ISSN- 2394-5125 VOL 08, ISSUE 01, 2021

Figure 2: Alternative research model 2



Although the last hypothesis statement established (H1, H2, H3 & H4) basic linkages between the triple helix agents, product innovation and business performance. A better understanding of these complex relationships could shed light on this phenomenon. Several works consider product innovation a moderator variable in the achievement of better business performance. For instance, Kibisu, and Awino (2017) determined the moderating effect of innovation on the relationship between enterprise risk management strategies and performance. In addition, Lee and Colarelli O'Connor, (2003) investigated product innovativeness as a moderator that influences the relationship between communication strategy and new product performance. Furthermore,Li, Li, Feng and Xu (2019) examined the moderating role of product innovation novelty on the relationship between customer involvement and new product development (NPD) cost performance.

Drawing from above, as much as studies have examined the moderating role of product innovation it is, however, imperative to mention that there have been no accurate empirical estimates of how product innovation may influence SME business performance in ways that go beyond linear relationships. This brings to the following research question:

- *Does product innovation moderate the relationship between different levels of SME Collaboration with Universities, SME Collaboration with Industry, SME Collaboration with Government Agents and the business performance of SMEs*?

By addressing this research question, a contribution is made to have a better theoretical understanding of the relationship between the triple helix agents and business performance of SMEs and some empirical insights are provided into whether product innovation moderately influences this relationship.Therefore, based on the previous arguments, the following three hypotheses are proposed:

H5: Product innovation positively and significantly moderates the relationship between the SME Collaboration with Universities and business performance

H6: Product innovation positively and significantly moderates the relationship between the SME Collaboration with industry and business performance
H7: Product innovation positively and significantly moderates the relationship between the SME Collaboration with government agents and business performance

7. Research methodology

This present investigation pursues a positivist paradigm, as it tries to discover a connection between constructs expressed for this examination and utilises target estimation instruments for the information gathering and investigation methods. The researchers selected a quantitative research approach since it elevates the exactness of results through statistical analysis. The target population for this investigation involved small and medium enterprises. Indisputably, the target population was characterised as managersof SMEs situated in the Gauteng region of South Africa during 2019, when the data was gathered by means of self administered questionnaires which were distributed by researchers of this study. The sampling frame for the examination comprised SME managers within the Gauteng province of South Africa. A list of 1945 SMEs in Gauteng was acquired from the Small Enterprise Development Agency (SEDA), the leading organisation for small enterprise development in South Africa. Respondents that were incorporated into the survey were given questionnaires which they needed to complete. This studyutilised the simple random probability sampling strategy.The simple random samples were used to determine the sample measurement using the Raosoft test calculator in this examination. Atotal population of 1945 was used, with a margin error of 5%, confidence interval of 95% and a response distribution of 50%, which utimately resulted in a recommended sample size of 321 SMEs.

8. Measurement instrument and questionnaire design

All the constructs in this article, except respondents' demographic profile, were measured on a five-point Likert rating scale with the endpoints of 1 = strongly disagree to 5 = strongly agree. The multi-item approach was adopted from past investigations and modified to fit the setting of the present examination (Ueasangkomsate & Jangkot, 2017; Maziriri 2018; Maziriri 2020). The construct and scale sources, scale items utilised and Cronbach's alpha values for the scales are given in Table 1.

TABLE 1: Measurement scales and their sources.

Construct and source	Description	Cronbach's Alpha
SME Collaboration with Industry: As adapted from Ueasangkomsate and Jangkot, (2017*)*	• SMEs receive knowledge transfer from universities • SMEs receive advice/help from universities about innovation development • SMEs use the services of universities as incubators for entrepreneurs • SMEs receive support and help from teachers, specialists, or students from universities • SMEs receive support from universities in the form of use laboratories, tools, or equipment	0.940
SME Collaboration with Government Agents: As adapted from Ueasangkomsate and Jangkot, (2017	• SMEs in the industry participate in creating innovation with the academic sector • SMEs in the industry make a joint investment for R&D or other research projects • SMEs in the industry apply knowledge from research and development to real practice • SMEs in the industry can access resources from universities/government (e.g., funding, technology, venue, utilities) • SMEs exchange their knowledge through inter-firm collaboration (e.g., funding, technology, venue, utilities)	0.946
SME Collaboration with Government Agents: As adapted from Ueasangkomsate and Jangkot, (2017	• SMEs have opportunities to contact/access government agents regarding their policies • SMEs can access knowledge through the support of government agents (e.g., Small Enterprise Development Agency, SEDA). • SMEs receive utility infrastructure from government agents	0.956

	when wanting to establish new plants • SMEs receive financial support from government agents • SMEs know about the services or information available from government agents	
Product innovation: As adapted from Maziriri, (2018).	• Our firm often emphasizes developing new products through new technologies to simplify their package. • Our firm often emphasizes developing new products through new technologies to simplify their construction • Our firm often emphasizes developing new products through new technologies to easily recycle their components. • Our firm often emphasizes developing new products through new technologies to easily decompose their materials • Our firm often emphasizes developing new products through new technologies to use natural materials • Our firm often emphasizes developing new products through new technologies to reduce damage from waste as much as possible. • Our firm often emphasizes developing new products through new technologies to use as little energy as possible.	0.798
*Business performance:*As adapted from Maziriri (2020).	• Our market-share growth is the best in the industry • Our sales turnover is the best in the industry • We provide the best supplier product quality in the industry • We provide the best supplier communication in the industry • We provide the best supplier delivery performance in the industry • We provide the best work in process (WIP) inventory in the industry • We have the best order-fulfilment lead time in the industry • We have the best product-quality development in the industry • We have the best performance-appraisal results in the industry • We have the best skill level of employees in the industry • We have the best departmental communication in the industry • Our resolution of customer complaints is the best in the industry • Our customer loyalty/retention is the best in the industry • Our quality reputation and award achievement is the best in the industry • Our product returns rate is the best in the industry • Our speed of order handling and processing is the best in the industry	0.856

9. Data analysis

The gathered data from SMEs were then recorded on an Excel spreadsheet after screening returned questionnaires. Then same data were analysed using software for descriptive statistics, Cronbach alpha values and correlations, namely the Statistical Package for Social Sciences (SPSS version 25.0). For testing the psychometric properties of the measurement scales and testing the hypotheses, a partial least squares-structural equation modelling approach (PLS-SEM) was conducted using the SmartPLS (version 3.2.8) statistical software. Monecke and Leisch (2012:3) explain that SmartPLS is stand-alone software that specialises in PLS path models and is based on a Java Eclipse platform that makes its operating system independent. Partial least squares can facilitate the evaluation of both measurement and structural models (Subramaniama *et al*., 2017). This study used PLS for two main reasons: first, the objective of the study was to predict the dependent variable and second, the latent variable scores were used for predictive relevance in the subsequent analysis (Hair, Ringle & Sarstedt, 2011:137). In addition, Hair *et al*. (2011:138) emphasise that these arguments led to the widespread acceptance of PLS in research.

ISSN- 2394-5125 VOL 08, ISSUE 01, 2021

10. Demographic profile summary

In the wake of checking for missing values and anomalies, a total number of 250 questionnaires were completed out of the underlying sample of 321. This resulted in a 77.8 per cent response rate. Of these, 71 were unusable because a few items on the questionnaires were not answered. Figure 1 presents the classification of information related to the participants' gender. The largest portion of the sample was male, 62.4 per cent (n=156); followed by those who revealed that they were female, 33.2 per cent (n=83). Moreover, the remainder of the respondents, 4.4 per cent (n=11) preferred not to mention their gender. Most of the participants indicated that 32.4 per cent (n=81) of the respondents were between 50 to 59 years of age, closely followed by 30.0 per cent (n=75) who indicated being 31 to 39 years of age, then followed by 18.4 per cent (n=46) who were between 40 to 49 years of age. A further 12.4 per cent (n=31) indicated that they were between 18 to 30 years of age. Lastly, the remainder of the respondents, 6.8 per cent (n=17) revealed that they were 60 years and above. In terms of the level of education of the respondents, most of the respondents, 37.6 per cent (n=94), indicated that they were holders of a diploma qualification. This was then followed by 30.0 per cent (n=75) of the respondents who indicated that they have degrees. In addition, 20.0 per cent (n=50) of the respondents revealed that they have no formal education. This was then followed by 12.4 per cent (n=31) who indicated that they have only obtained some basic education.

The employment figures for this specific sample profile (Table2) indicate that most of the SME businesses employ fewer than 50 employees per business entity, with 44.0 per cent (n=110) of the surveyed businesses placed in the category of 10 to 50 employees and 32.4 per cent in the category of 100 to 200 employees. In addition, 21.2 per cent (n=53) of the respondents' businesses were ranked in the category of 50 to 100 employees. The remainder of the respondents, 2.4 per cent (n=6), revealed that they were in the category of fewer than 10 employees. These findings coincide with the work of Moodley (2002:37), who asserts that "SMEs are important, because, although recruiting less per entity, their potential for job creation is in numbers". Moreover, Figure 1 provides the profile of the surveyed SMEs in terms of their location. Most of the respondents, 74.0 per cent (n=185), expressed that their businesses are local, which is in the industrial areas of the Gauteng Province of South Africa. The remainder of the respondents, 26.0 per cent (n=65), indicated that they are located within the various CBD areas of the Gauteng Province of South Africa

TABLE 2: Sample demographic characteristics

Gender	**Frequency**	**Percentage (%)**
Male	156	62.4
Female	83	33.2
Prefer not to say	11	4.4
Total	**250**	**100.0**
Age distribution of the respondents	**Frequency**	**Percentage (%)**
18 to 30 years	31	12.4
31 to 39 years	75	30.0
40 to 49 years	46	18.4
50 to 59 years	81	32.4
60 years and above	17	6.8
Total	**250**	**100.0**
Level of education	**Frequency**	**Percentage (%)**
No formal education	50	20.0
Basic education	31	12.4
Diploma	94	37.6
Degree	75	30.0
Total	**250**	**100.0**
Number of employees (full-time)	**Frequency**	**Percentage (%)**
Less than 10 employees	6	2.4
Between 10 and 50 employees	110	44.0
Between 50 and 100 employees	53	21.2
Between 100 and 200 employees	81	32.4
Total	**250**	**100.0**

The location of the business	**Frequency**	**Percentage (%)**
CBD	65	26.0
Industrial	185	74.0
Total	**250**	**100.0**

11. Scale accuracy analysis

The scale accuracy analysis is presented in Table 3 followed by a discussion of themeasurement scale reliability and validity.

TABLE 3: Scale accuracy analysis

Research constructs		**Mean values**	**SD values**	**Item to total correlation values**	**α value**	**CR**	**AVE**	**Factor loading**	**VIF (outer) values**
Codes	**Code items**								
SMECU	SMECU1	5.728	1.314	0.690	0.945	0.962	0.838	0.972	1.234
	SMECU2	5.630	1.224	0.631				0.972	1.432
	SMECU3	5.719	1.160	0.827				0.632	1.238
	SMECU4	5.702	1.247	0.731				0.981	1.785
	SMECU5	5.476	1.176	0.692				0.969	1.982
SMECI	SMECI1	5.613	1.094	0.686	0.876	0.910	0.669	0.828	1.553
	SMECI2	5.547	1.180	0.643				0.864	1.567
	SMECI3	5.249	1.203	0.501				0.833	1.633
	SMECI4	5.705	1.070	0.843				0.763	1.672
	SMECI5	3.928	1.477	0.531				0.799	1.983
SMECGA	SMECGA1	3.713	1.593	0.605	0.856	0.896	0.634	0.819	1.342
	SMECGA2	4.195	1.425	0.889				0.779	1.543
	SMECGA3	5.083	1.305	0.632				0.797	1.653
	SMECGA4	5.582	1.163	0.853				0.820	1.453
	SMECGA5	5.748	1.075	0.856				0.764	1.873
PI	PI1	5.630	1.328	0.737	0.904	0.924	0.636	0.841	1.692
	PI2	5.456	1.143	0.897				0.838	1.772
	PI3	4.862	1.424	0.506				0.768	1.798
	PI4	5.593	1.199	0.801				0.755	1.831
	PI5	5.513	1.261	0.781				0.789	1.982
	PI6	5.822	1.168	0.790				0.792	1.989
	PI7	5.226	1.431	0.731				0.794	2.109
BP	BP1	5.152	1.437	0.793	0.939	0.947	0.578	0.762	1.524
	BP2	5.670	1.188	0.784				0.728	1.570
	BP3	5.464	1.168	0.855				0.732	1.733
	BP4	5.307	1.398	0.824				0.778	1.926
	BP5	5.547	1.232	0.879				0.778	1.945
	BP6	5.728	1.314	0.690				0.771	1.956
	BP7	5.728	1.224	0.631				0.792	1.987
	BP8	5.630	1.160	0.827				0.769	2.009
	BP9	5.719	1.247	0.731				0.704	2.051
	BP10	5.702	1.176	0.692				0.774	2.652
	BP11	5.476	1.094	0.686				0.783	2.714
	BP12	5.613	1.180	0.643				0.755	2.823
	BP13	5.547	1.203	0.501				0.753	2.919

Note:SMECU=SME Collaboration with Universities; SMECI=SME Collaboration with Industry, SMECGA=SME Collaboration with Government Agents,PI=product innovation; BP =business performance;SD= Standard Deviation; CR= Composite Reliability; AVE= Average Variance Extracted.

ISSN- 2394-5125 VOL 08, ISSUE 01, 2021

A confirmatory factor analysis (CFA) was employed and the SEM was estimated using PLS data. Table 3 and Figure 3 depict the CFA findings, whereas Table 5 and Figure 2 summarise the SEM findings. The CFA was used to evaluate the measurement model, representing the outer model in PLS. Hair, Black, Babin, Anderson and Tatham (2006) mention that the purpose of the measurement model is to evaluate the reliability and validity of variables. Table 1 shows that the item-total correlation value lies between 0.501 and 0.797 which is above the cut-off point of 0.5 recommended by Anderson and Gerbing (1988). The higher inter-item correlations reveal convergence among the measured items. Nunally and Bernstein (1994:1) explain that "alpha values should exceed 0.6". All variables in this study represent satisfactory reliability with the Cronbach's alpha between 0.856 and 0.945.

The study also used composite reliability values in testing the reliability of the five research constructs. The CR values vary between 0.896 and 0.962. The obtained values from CR are above the acceptable reliability score of 0.7, thus validating the internal consistency of the five research construct measures, according to Nunnally and Bernstein (1994). The results show that the average variance extracted values of this study are between 0.578 and 0.838. These AVE values are above the recommended 0.40, indicating a satisfactory measure (Anderson & Gerbing, 1988:411). As shown in Table 1, "loadings of all items should be more than the suggested value of 0.5" (Hair, Black, Babin, Anderson & Tatham, 2006:23). Factor loadings in this study ranged from 0.632 to 0.981, meeting the specification of the recommended value of 0.5. Items EE1 and EP11 were deleted because of the low factor loadings (below 0.5). The remaining items fulfil the requirements of reliability and convergent validity. According to Hair *et al*. (2017:13), discriminant validity refers "to items measuring different concepts". Table 3 presents the results of the discriminant validity analysis.

Table 3: Results of discriminant validity analysis (HTMT)

VARIABLES	SMECU	SMECI	SMECGA	PI	BP
SMECU	1.000	-	-	-	-
SMECI	0.387	1.000	-	-	-
SMECGA	0.582	0.543	1.000	-	-
PI	0.542	0.429	0.564	1.000	-
BP	0.596	0.530	0.504	0.554	1.000

Note: Hetero-trait-Monotrait-ratio = (HTMT); SMECU=SME Collaboration with Universities; SMECI=SME Collaboration with Industry, SMECGA=SME Collaboration with Government Agents, PI=product innovation; BP =business performance.

Discriminant validity was evaluated using the Hetero-Trait-Monotrait Ratio (HTMT) criterion (Table 2), despite recommendations from previous studies (Henseler, Hubona & Ray, 2016; Verkijika & De Wet, 2018) indicating that HTMT is more suitable to evaluate discriminant validity than Fornell-Larcker's commonly used criteria. When taking a more conservative position, discriminant validity is reached when the HTMT value is below 0.9 or 0.85 (Verkijika & De Wet, 2018, Neneh, 2019). Table 2 reveals that the highest obtained HTMT value is 0.645, which is below the conservative value of 0.85. As such, all the constructs meet the criteria for discriminant validity.

12. Multicollinearity assessment of the outer model

For PLS-SEM, common method bias (CMB) is detected through a full Collinearity assessment approach (Kock, 2015). VIF values should be lower than the 3.3 threshold (Hair et al., 2011, Kock, 2015). This is indicative that the model is free from common method bias. Any value greater than 3.3 means the model is affected by CMB. Therefore, upon following standard procedures in business research, the variance inflation factor (VIF) values were computed in lieu of reporting the collinearity issues in this work. The SMART PLS 3 output reports the following: VIF (outer) values for SME Collaboration with Universities (1.234 to 1.982), SME Collaboration with Industry (1.553 to 1.983), SME Collaboration with Government Agents (1.342 to 1.873), product innovation (1.692 to 2.109) and business performance (1.524 to 2.919).

13. Assessment of the goodness of fit (GoF)

Overall, R^2 for product innovation and business performance in Figure 3 indicate that the research model explains 92.6% and 93.8%, respectively, of the variance in the endogenous variables. To calculate the global goodness-of-fit (GoF) statistic, a formula provided by Tenenhaus, Vinzi, Chatelin and Lauro (2005:173) was used as indicated in the equation:

The goodness of Fit = $\sqrt[2]{}$ (average of all AVEs values * average of all R^2)

= $2\sqrt{0.671*0.373}$

= 0.50

where AVE represents the average of all AVE values for the research variables while R^2 represents the average of all R^2 values in the full path model. The calculated global GoF is 0.50, which exceeds the threshold of GoF > 0.36 suggested by Wetzels, Odekerken-Schröder and van Oppen (2009:187). Therefore, it can be concluded that the research model has a good overall fit.

14. The Standardized Root Mean Square Residual (SRMR)

The SRMR is an index of the average of standardized residuals between the observed and the hypothesized covariance matrices (Chen, 2007). The SRMR is a measure of the estimated model fit. When SRMR = <0.08, then the study model has a good fit (Hu & Bentler, 1998), with a lower SRMR being a better fit. Table 3 shows the theoretical model's SRMR was 0.06, which revealed that the model had a good fit, whereas the Chi-Square was equal to 1919.097 and NFI equal to 0.901 was also measured, meeting the recommended threshold for NFI >0.90 (Chininga, Rungani, Chiliya & Chuchu, 2019).

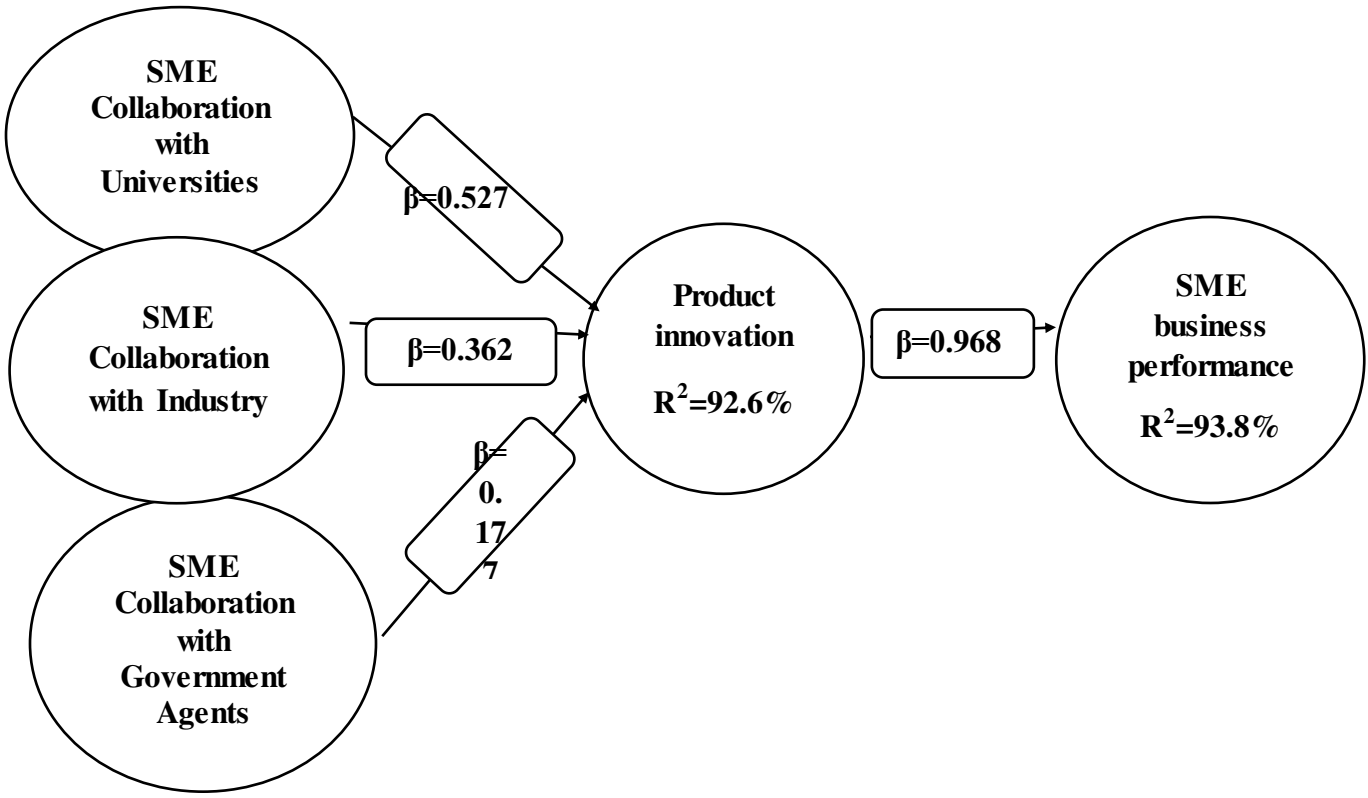
Table 4. Model fit summary.

Estimated Model	
SRMR	0.060
d_ULS	1.727
d_G1	0.941
d_G2	0.783
Chi-Square	1919.097
NFI	0.901

14. Path model results and factor loadings

The PLS estimation results for the structural model for the research constructs are shown in Figure 3. The findings of the structural model are displayed in Table 5.

Figure 3: Structural model



ISSN- 2394-5125 VOL 08, ISSUE 01, 2021

Figure 4: Structural model depicting estimates for moderation

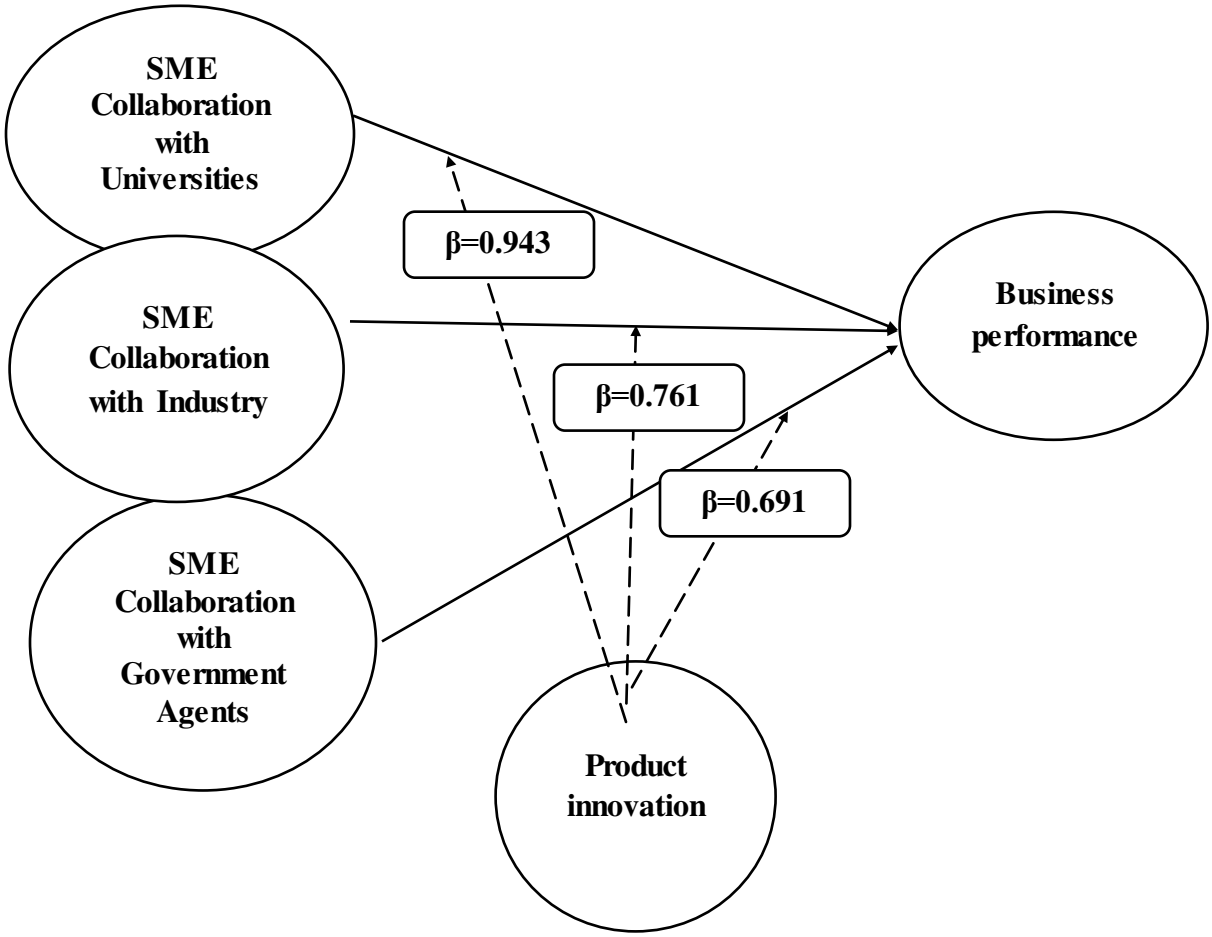


TABLE 5: Results of structural equation model analysis

Hypothesis	Path	Path coefficients (β)	T-statistics	Supported
H_1	SMECU → PI	0.527	7.135	Yes
H_2	SMECI → PI	0.362	4.413	Yes
H_3	SMECGA → PI	0.177	2.128	Yes
H_4	PI → BP	0.968	12.828	Yes
H_5	SMECU**PI** → BP	0.943	11.535	Yes
H_6	SMECI → PI → BP	0.761	9.145	Yes
H_7	SMECGA → PI → BP	0.691	8.593	Yes

Note: Arrows signify the relationships between each construct to indicate the proposed hypothesis.

15. The outcome of hypotheses testing

In this study, hypotheses testing was conducted by path coefficient values, as well as the t-values for the structural model obtained from the bootstrapping algorithm. According to Beneke and Blampied (2012), t-values indicate whether a significant relationship exists between variables in the model and path coefficients, demonstrating the strength of the relationships in the model. Table 4 shows the standardised path coefficients and their corresponding t-values. A statistically significant relationship is expected to have a t-value that exceeds 1.96 at a 5% level of significance (Chin, 1998).

15.1 The outcome of testing hypothesis 1: SME collaboration with universities and product innovation

The primary hypothesis expresses that SME collaboration with universities produces a positive effect on product innovation. In this examination, this speculation was bolstered. It can be seen in Figure 3 and Table 4 that SME collaboration with universitiesshowed a positive impact (β=0.527) and was statistically significant (t=7.135) in predictingproduct innovation. This outcome proposes that the higher the level of collaboration of SMEs with universities, the higher the level of product innovation in the SMEs. Along these lines, this examination fails to dismiss H1. It is important to mention that these outcomes are per the research of Akinwale (2018), who emphasised that SMEs can also collaborate with universities to broaden their knowledge base by jointly conducting research together. This will further enable them to gain access to new forms of product innovation that could assist their innovative activities, which could increase their performance (Akinwale, 2018).

15.2 The outcome of testing hypothesis 2: SME collaboration with industry and product innovation

The second hypothesis states that SME collaboration with industry produces a positive effect on product innovation. In this study, this supposition is upheld. It can be seen in Figure 3 and Table 4 that SME collaboration with industry exerts a positive influence (β =0.362) and was measurably significant (t=4.413) in anticipating product innovation. This outcome recommends that the higher the level of collaboration of SMEs with industry partners, the higher the level of product innovation in the SMEs. Subsequently, this investigation supports H2. These outcomes are in line with other researchers' work, such as Ueasangkomsate and Jangkot (2017), who found that SME collaboration withindustry produced a positive effect onproduct innovation.

15.3 The outcome of testing hypothesis 3: SME collaboration with government agentsand product innovation

The third hypothesis states that SME collaboration with government agents produces a positive effect on product innovation. In this examination, this hypothesis is upheld. Figure 3 and Table 4 indicate that SME collaboration with government agents exerts a positive impact (β =0.177) and is factually noteworthy (t=2.128) in anticipating product innovation. This outcome recommends that the higher the level of collaboration of SMEs with government agents, the higher the level of product innovation in the SMEs. Thus, this examination supports H3. These results are in line with the work of Vrgovic, Vidicki, Glassman and Walton (2012). These authors suggest that a government agency, using innovation hubs, could help SMEs to connect, communicate and collaborate with independent inventors and other parties to jumpstart innovation practices.

15.4 The outcome of testing hypothesis 4: Product innovation and SME business performance

The fourth hypothesis states that product innovation has a positive effect on SME business performance. This study supports this hypothesis. It can be observed in Figure 3 and Table 4 that product innovation exerts a positive influence (β=0.968) and is statistically significant (t=12.828) in predicting SME business performance. This result suggests that the higher the level of product innovation, the higher the level of business performance in the SMEs. These findings mirror the work of Setyanti and Farida (2016) who found that product innovation has a positive and significant effect on the business performance of SMEs.

15.5 The outcome of testing hypothesis 5:SME Collaboration with Universities, product innovation and business performance

The fifth hypothesis states that product innovation positively and significantly moderates the relationship between SME Collaboration with Universities and business performance.This study supports this hypothesis. It can be observed in Figure 4 and Table 5 that product innovation exerts a positive influence (β=0.943) and is statistically significant (t=11.535). This means can product innovation can be a mechanism through whichSME Collaboration with Universities can positively impact business performance. The interaction plot is presented in Figure 5.

15.6 The outcome of testing hypothesis 6: SME Collaboration with industry, product innovation and business performance

The sixth hypothesis states that product innovation positively and significantly moderates the relationship between SME Collaboration with industry and business performance.This study supports this hypothesis. It can be observed in Figure 4 and Table 5 that product innovation exerts a positive influence (β=0.761) and is statistically significant (t=9.145). This means can product innovation can be a mechanism through which SME

ISSN- 2394-5125 VOL 08, ISSUE 01, 2021

Collaboration with industry can positively impact business performance. The interaction plot is presented in Figure 6.

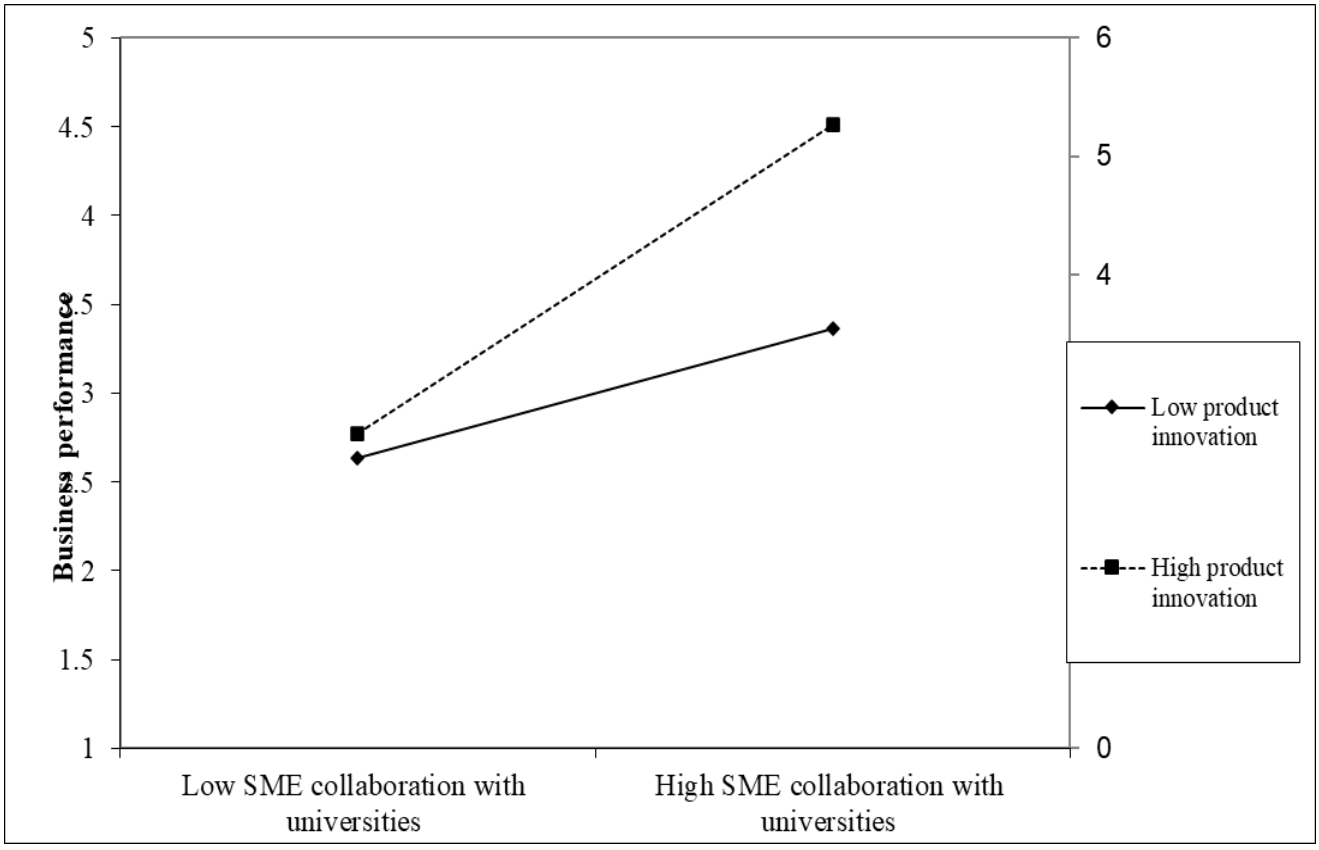
15.7 The outcome of testing hypothesis 7:SME Collaboration with government, Product innovation and business performance

The seventh hypothesis states that product innovation positively and significantly moderates the relationship between SME Collaboration with government agents and business performance.This study supports this hypothesis. It can be observed in Figure 4 and Table 5 that product innovation exerts a positive influence (β=0.691) and is statistically significant (t=8.593). This means can product innovation can be a mechanism through which SME Collaboration with industry can positively impact business performance. The interaction plot is presented in Figure 7.

16. Moderation graphs using Jeremy Dawson excel file

In statistics, moderation occurs when the relationship between two variables depends on a third variable (Cohen, Cohen, West & Aiken, 2013). The third variable is referred to as the moderator variable or simply the moderator and the effect of a moderating variable is characterized statistically as an interaction (Cohen, Cohen, West & Aiken, 2013). Therefore, to better provide full support for hypotheses 5, 6, and 7, interaction plots were created to illustrate and evaluate the interaction effect. Consequently, posthoc analyses of the interaction effects were conducted following the guidelines from Dawson (2014) as well asAiken and West (1991). Specifically, the value for product innovation was set at 1 standard deviation above and below the mean, while a range of values for the triple helix variables was entered. This approach has been widely used in prior studies when evaluating the interaction effects of business performance (Boso, Story & Cadogan, 2013; Hmieleski & Baron 2008; Wiklund & Shepherd 2005). Figure5, 6 and 7displays plots of theseinteraction effects, showing how product innovation moderates the effects of the triple helix agents on business performance.

Figure 5: The moderating effect of product innovation on the relationship between SME collaboration with universities and business performance

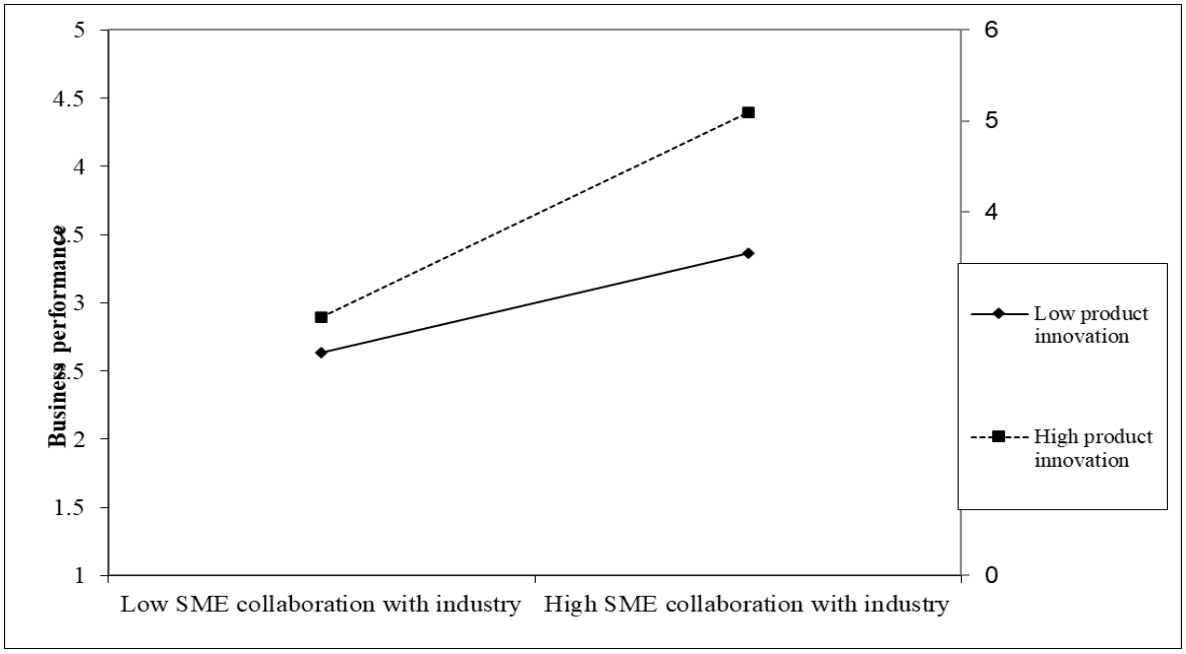


Deducing from figure 5, it can be stated that when there is low SME collaboration with universities then the business performance turns to below. However, when there is high SME collaboration with universities and when the product innovation is high, then the business performance turns to increase very big. So,in a nutshell,

ISSN- 2394-5125 VOL 08, ISSUE 01, 2021

it can be stated that product innovation strengthens the positive relationship between SME collaboration with universities and business performance.

Figure 6: The moderating effect of product innovation on the relationship between SME Collaboration with industry and business performance



Drawing from figure 6, the non-parallel lines on the graph suggest that there is the presence of an interaction effect. It can be stated that when there is low SME collaboration with industry players then the business performance turns to be low. However, when there is high SME collaboration with the industry and when the product innovation is high, then the business performance turns to increase very big. So, in summary, it can be stated that product innovation strengthens the positive relationship between SME collaboration with the industry and business performance.

Figure 7:The moderating effect of product innovation on the relationship SME collaboration with government agents and business performance

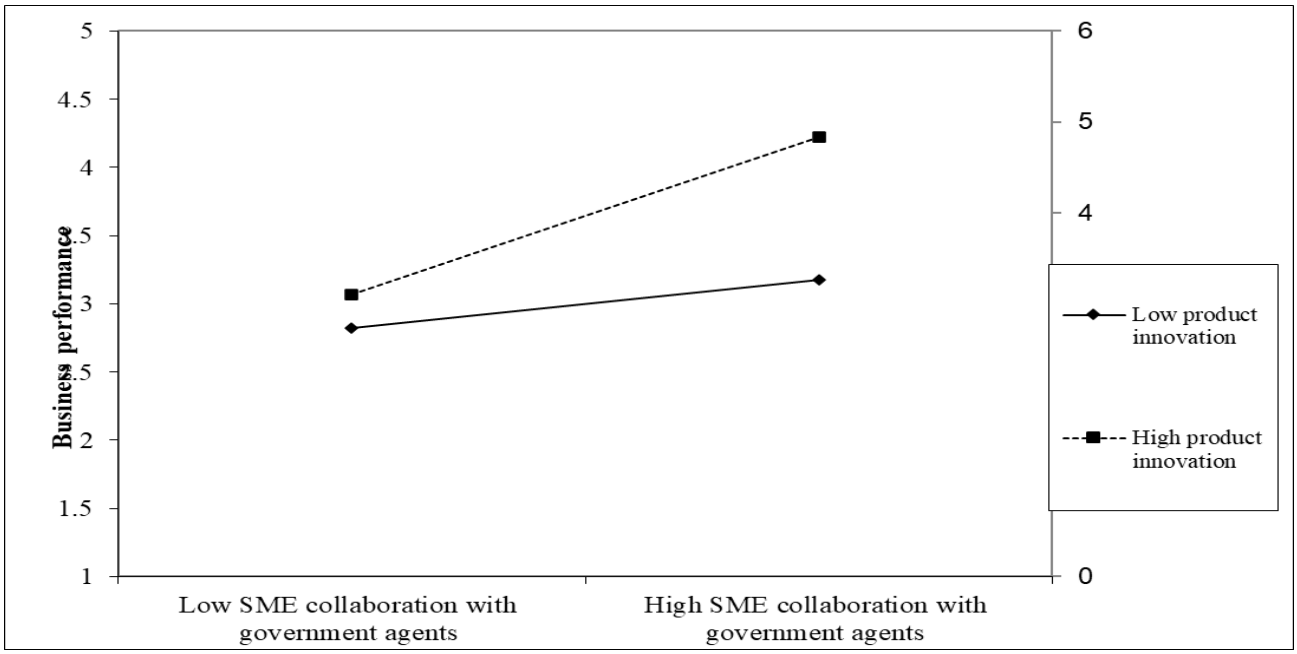


Figure 7 presents the interaction plot for H7. An analysis of the two slopes showed that the non-parallel lines depict the presence of an interaction effect. It can be stated that when there is low SME collaboration with

government agentsthen the business performance turns to be low. However, when there is high SME collaboration with government agents and when the product innovation is high, then the business performance turns to increase very big. So, in summary, it can be stated that product innovation strengthens the positive relationship between SME collaboration with government agents and business performance.

17. Implications for the study

This study's implications are concentrated around three themes: theoretical implications, practical implications and policy implications.

17.1 Theoretical implications

The present investigation offers suggestions for academics. For instance, an examination of the findings demonstrates that *SME collaboration with universities* and *product innovation* had a positive and a significant impact on each other, as shown by a path coefficient of 0.527. For academics in the field of entrepreneurship and small business management, this improves understanding of the connection between SME collaboration with universities and product innovation, as it contributes to the existing literature on these two variables.It is essential to mention that a nuanced understanding of the triple helix agents and business performance relationship was provided by considering product innovation as a moderator. Precisely it was proven that product innovation causes a moderating effect on the relationship between thetriple helix agents and business performance of SMEs.

17.2 Practical implications

On the practitioners' side, this investigation presents ways in which SME managers can improve their businesses. Given the strong connection between *SME collaboration with industry* and *product innovation* (0.362), SME managers should focus oncollaborating with other industry partners such as large organisations; this will assist them in determining how other businesses are being innovative and these ideas will assist them in implementing innovative processes in their entrepreneurial ventures and ultimately this will enhance the business performance.

17.3 Policy implications

This study offers suggestions for strategists who seek to enhance product innovation and business performance. Existing policies can be changed, keeping in mind the goal to enhance product innovation and SME business performance. The outcomes obtained from this research study can be utilised to produce new policies or revise existing policies. For example, this study has confirmed that SME collaboration with government agents positively and significantly impacts product innovation. A major suggestion of this study (concerning policy) is that government agents should consider creating policies that oblige SMEs and the Triple Helix Agents to work together towards product innovation practices and the enhancement of SME business performance. For example, policymakers, academicians and industry practitioners should work together to design curricula and course content that incorporates the relevant theoretical ingredients to stimulate product innovation and enhance SME business performance.

18. Limitations and future research suggestions

It is imperative to note that this investigation has some limitations which must be considered, even though this study has made a significant contribution to various fields. Future research should continue exploring and increasing knowledge in the small business management field. With the utilisation of moderately small sample size, the findings cannot decisively be summarised, even though various statistical questions were utilised to decide how extensive the sample of the target population should be. In future research, a larger population of SMEs should be examined. An examination of SMEs from different provinces in South Africa would be advantageous. Since this research was quantitative, future research could centre on triangulation techniques to avoid this bias. Future researchers could focus on other factors that influence product innovation and SME business performance. Comparative studies between the results of this study and those obtained from other emerging economies could be considered in the future. This may lead to insights that were not captured in the present study.

19. Conclusion

This research was undertaken to investigate the impact of the Triple Helix Agents on product innovation and SMEbusiness performance in the Gauteng Province of South Africa. The study confirms that the Triple Helix Agents are instrumental in stimulating product innovation and SME business performance.The study also examined the moderating role of product innovation on the nexus between theTriple Helix Agents and SME

business performance. SME collaboration with universities was found to have a robust influence on product innovation in comparison to SME collaboration with industry and SME collaboration with government agents. A robust relationship was also found between product innovation and SME business performance.The findings support all the stated hypotheses. Managerial implications of the findings were discussed, and limitations and future research directions were indicated. This study will add new knowledge to the existing body of entrepreneurship and small business management literature in the African setting – a research context that is currently under-researched and overlooked in academia.

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