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Innovation types and SMEs financial performance relationship: Evidence from Eritrea

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The objective of this current study is to investigate the relationship between different types of innovation and the financial performance of small and medium-sized enterprises (SMEs) in a developing country, specifically in Eritrea. To achieve this, a questionnaire was distributed to managers/owners of selected firms, and Smart-PLS structural equation modeling was employed to test the hypotheses. The results reveal that all the types of innovation considered, including product/service, process, marketing, and organizational innovations, have a significantly positive effect on the financial performance of SMEs. These findings can increase awareness among entrepreneurs, researchers, and policymakers regarding the relationship between innovation and SMEs' financial performance. They also underscore the significance of innovation as a fundamental driver for firms to enhance their competitiveness. This study contributes to a better understanding of how different types of innovation impact SMEs' performance. This study builds upon prior evidence regarding the impact of innovation on firm performance. It also significantly extends the existing literature on innovation and SMEs from the perspective of a developing country, thereby making substantial contributions to research in terms of policy, practice, and theory.

Key words- Innovation types, financial performance, developing country, small and medium-sized enterprise.

INTRODUCTION

Innovation is of vital importance to enterprises as it serves as a key driver of success and long-term sustainability. It is widely recognized as a fundamental tool in development strategies, enabling businesses to enter new markets, expand their current market share, and gain a competitive advantage. Firms are increasingly realizing the significance of innovation, particularly in the face of rapid technological advancements and heightened global competition, which can quickly erode the value of existing products and services (Gunday et

al., 2011). In a world marked by heightened global and regional uncertainties, enterprises must maintain a competitive edge through innovation. Innovation plays a pivotal role in business strategies for several reasons, including gaining a stronger market position, implementing more efficient manufacturing processes, enhancing reputation, and securing a sustainable competitive advantage.

According to Oanh (2019), enterprise innovation capability is a substantial means by which firms can add

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to productivity. Enterprises which do not take part in innovation put themselves in great risk (Njoroge et al., 2019). It is contended that, since, competition has become tough and product life cycles shortened, an enterprise aptitude to stimulate innovation would be crucial in enhancing productivity and sustain a competitive advantage (Teece et al., 2016). The core justification for innovativeness is that enterprises strive to attain better market and increase their competitive benefit. It tends to assist enterprises to develop quickly and effectively, ultimately more profitably compared to non-innovators. Thus to meet customer necessities and present products or services and to be competitive in the market innovation is very necessary for enterprises. In general, innovation is vital, for the survival and sustainability of businesses organizations.

Due to their inherent characteristics, SMEs are often more agile in implementing significant innovations compared to larger enterprises. The introduction of innovative products or services is a fundamental business activity within SMEs (Sirmon et al., 2011). According to the resource-based theory, innovation is widely recognized as a critical factor influencing the performance of SMEs (Al-Ansari et al., 2013; Gunday et al., 2011). However, there has been limited exploration of the effects on firm performance within the context of developing countries. This is largely because most studies on innovation and resource-based theory have primarily been conducted among large enterprises in developed countries (Al-Ansari et al., 2013). Furthermore, the research on the association between innovation types and financial performance has often focused on product and process innovations (technological), neglecting other types such as marketing and organizational innovations (non-technological) (Gunday et al., 2011). All this denotes literature gap regarding innovation effect on SMEs financial performance. Thus this study, intend to fill this gap by examining innovation types (product, process, marketing organizational) effect on the SMEs performance in the context of under developed Sub-Saharan African country, Eritrea. The main research question that guides the research is, what is the relationship between innovation types selected and financial performance of SMEs?

The rest of the paper is structured as follows: the second section presents review of relevant literature and hypothesis development. The methodology applied is outlined in the third section. The fourth part comprises the results and discussion. And the last part is about the conclusion and implications of the study

LITERATURE REVIEW

Theoretical background

The purpose of this empirical study is to investigate the

relationship between different types of innovation and firm financial performance. According to the Organization for Economic Cooperation and Development (OECD, 2005), innovation encompasses the implementation of new or significantly improved products (goods or services), processes, marketing methods, or organizational methods in business practices, workplace organization, or external relations. There are two conventional ways of distinguishing between types of innovation. First, differentiation is based on the object of change, as proposed by Schumpeter in 1934. Second, innovations can be differentiated based on their degree of 'newness,' which is determined by the extent of change. Four kinds of objects of change or innovation (product, process, organizational, and marketing) have been implemented, based on the OECD report (OECD: 2005). Moreover, the extent of change linked with innovation may be displayed in terms of total newness or significant improvement. In line with the objective of the paper, this empirical study adopts the four-dimensions of innovation, as suggested by different scholars (OECD, 2005; Oke, 2007).

Service/product innovation includes new service or product with intensely enriched performance features, for instance integrated software and technological design, so as to satisfy the basic client needs better than the existing ones (OECD:2005). Product innovation is the making of a totally new product from new materials or the modification of current products to satisfy customer needs (Amara and Landry, 2005). It can also be defined as new changes in those actions that are undertaken to convey the main product/service and make it more appealing to clients. Service/Product innovation is a crucial driver of success that offers chance to expand into new market and aids firms to unearth opportunities to achieve an amazing income (Koloniari et al., 2018)

Process innovation is reengineering and improving internal operation of enterprise process. According to Schumpeter (1934) it is the application of new or considerably enriched development or distribution methods, changes in human resources, equipment and working practices. He highlighted it as the operation of new service or product strategies, or new approaches of selling the service or product. This type of innovation may affect productivity and efficiency of companies (Nambisan et al., 2017). Thus process innovation should, be a change in the action of delivering and manufacturing of goods that considerably allows the value added to the investors to be augmented (Oanh, 2019).

Marketing innovation is the implementation of new marketing strategies involving significant improvements in product design, product packaging, product positioning, and product promotion or pricing (OECD, 2005). Its main aim is to better satisfy client's needs, open up new markets, or place firms' goods on the market with the intent of expanding enterprise sales. It plays a vital part in satisfying market needs and responding to opportunities

of the market (Gunday et al., 2011). Thus it is essential for the business to align with the strategy and comprehending of marketing innovation to create sustainable progress.

Organizational innovation is “implementation of a new form of management in the firm’s business practice, workplace, or external relations of the business” (OECD, 2005). It is intended to improve firm performance by plummeting operational and administrative costs; it also helps to increase work place gratification which in turn increases labor productivity. It is highly related to all administrative practices, such as activities to stimulate team unity, redesigning of organizational structures, communication, processes, information exchange, and sharing knowledge and cooperation.

Hypothesis development

The relationship between product/service innovation and SMEs performance

Innovation enhances product quality, which adds to enterprise financial performance and, eventually, to an enterprise competitive edge (Al-Ansari et al., 2013). Rosli and Sidek (2013) study on numerous sectors of the industry in Malaysia and their findings showed that process and product are related positively to the performance of enterprise, where the later type of innovation has a larger impact. Similarly, Tung (2012) emphasized the significance incessant product innovation to assure customer loyalty, competitiveness, organization performance and survival. Atalay et al. (2013), showed significant and positive effect of product innovation on enterprise performance by taking a sample from automotive supplier industries. Augusto et al. (2014) concluded that, compared to firm wide innovation, product innovation is more significant on enhancing firm performance. Tsai et al. (2020), conducted research on high-tech firms located in Taiwan, and found that product innovation has a positive impact on organizational performance. They also revealed that the degree of this positive effect is more significant in high levels of business uncertainty. Moreover, other existing literatures have confirmed the positive association between innovation and enterprise performance (Omri, 2015; Calantone et al., 2002).

H1: Product/service innovation positively influences SMEs performance

The relationship between process innovation and SMEs performance

Kowo et al. (2019), using survey method conducted research on major telecommunication operator employees in Lagos State, Nigeria, to examine the relationship

between process innovation and organizational performance. Their study found out that process innovation has a significant impact on enterprise performance. According to the study of Varis and Littunen (2010) in Finland SMEs, process innovation is positively related to enterprise performance. Ar and Baki (2011), conducted empirical research on Turkish SME’s and established positive and significant effect of process innovation on enterprises. Madrid-Guijarro, et al. (2013) took sample from Spanish SMEs and found that process innovation positively linked with enterprise performance during different economic conditions. According to Valmohammadi (2012) study on the innovation management practices in Iranian organizations, active innovation processes are positively linked to enterprise performances. Similarly, Atalay et al. (2013) revealed that process innovation has positive and significant influence on enterprises. Sintset et al. (2013) qualitatively investigated the impacts of process innovation on municipalities’ performances in Sweden by using the method of grounded theory. Their study revealed that, the application of process innovation has a positive impact on the municipalities financial and customer’s performances. Muharam et al. (2020), investigated the link between process innovation, market innovation and enterprise financial performance of Indonesian pharmaceutical companies. Their findings emphasized that there is a positive association between process innovation, market innovation and firm financial performance. Cheng et al. (2010) found a significant impact of process innovation on firm performance, but the effect was lower than that of product innovation. However according to Ar and Baki (2011), findings, the effect of process innovation on performance was as significant as the effect of product innovation on performance. Demeter et al. (2021) investigated the effect of process innovation on enterprise performance in the context of a dependent market economy.

The result of the study showed process innovation to have some influence on business performance.

H2: Process innovation positively influences SMEs performance

The relationship between marketing innovation and SMEs performance

According to Quaye and Mensah (2019) there is positive impact of marketing innovative strategies on enterprise sustained advantages, particularly for SMEs. Sulston et al. (2022) conducted research study using Structural Equation Modeling (SEM) to investigate the role of innovation in an enterprise growth. The findings of the study indicated that marketing innovation have a significant impact on marketing performance. Peng et al. (2021), studied Marketing Innovation influence on

Performance, using empirical data from China and found that it has significant positive impact on enterprise performance. Cuevas-Vargas and Parga-Montoya (2020) examined the marketing innovation on Jordanian private commercial banks and their findings revealed that, marketing innovation has a valuable effect on business long-term competitive edge and growth. Otero-Neira et al. (2009) conducted a study on SMEs innovation and performance relationship and found strong evidence of market innovation positively affected firm performance. Similarly, in the manufacturing industries marketing innovation continue to be effective for performance enhancement (Bartoloni and Baussola 2016; Gunday et al., 2011). Wang (2015) conducted research in Taiwanese high-tech companies and stated that focusing on marketing contribute in achieving superior innovation performances and in turn enterprise success. John and Davies (2000) conducted research on insurance firms of a medium-size and marketing innovations found to simplify new ways of comprehending the diverse markets and increasing sales. According to Naidoo (2010) marketing innovations help sustainable competitive edge by promoting product differentiation and cost efficiency. Moreover many researches have delivered positive assessment on higher marketing innovativeness results (Hult and Ketchen, 2001; Wu et al., 2003; Walker, 2005).

H3: Marketing innovation positively influences SMEs performance

The relationship between organizational innovation and SMEs performance

According to Donkor et al. (2018) innovation capabilities has been found to have a positive effect on SME's financial performance in Ghana. Similarly another study on Ghanaian SME's has found that organizational innovations have a positive impact on their international performance (Donbesuur et al. 2020). Research study on small and medium Pakistani textile enterprises revealed that that innovation capability had a significant impact on SME performance (Arshad and Arshad, 2019). Sofalchian et al. (2018) examined the impact of organizational innovation on the performance of manufacturing firms in Rasht Industrials Park. Their findings revealed a positive association between organizational innovation and performance through process innovation capabilities. According to Yavarzadeh et al. (2015) investigation on organizational innovation and performance relationship in Iran, product, process, organizational innovations have a positive and significant financial effect on organizational efficiency. In their study on the link between organizational innovation capability and performance in pharmaceutical SMEs in Iran, Dadfar et al. (2013), found a positive association between organizational innovation capabilities and performance, due to the existence of

effective innovation management and commitment through the organization. Similarly, Bahta et al. (2020) in their study to examine CSR and its effect on SMEs innovation capability and performance in a developing country found that significant and positive relationship between innovation capability and SMEs financial performance. Keskin (2010) using multiple regression analysis investigated the effect of innovation capabilities on the enterprise performance by taking a sample of 246 middle and senior managers in Turkey, and study result indicated that innovation has an impact on firm performance. Noruzy et al. (2013), using structural equation modeling from a sample of 106 Iranian manufacturing firms, found a direct link between organizational innovation and organizational performance. Additionally, Camison and Villar-Lopez (2014), by taking a survey from 144 Spanish manufacturing enterprises and using structural equation modeling confirmed that organizational innovation for products and processes can lead to higher business. Mooghali and Jafari (2014) investigated the effect of organizational innovation on product innovation, market performance and innovative performance of the companies. The results of the study indicated that organizational innovation has a significant effect on both market and innovative performance of the firm. Strychalska-Rudzewicz and Rudzewicz (2021) investigated the association between organizational innovativeness and enterprise performance, with innovation culture as moderator in Poland and their result showed a substantial and positive impact of organizational innovativeness on enterprise performance.

Taneseb and Park (2020) study results in Korean public-sector organizations showed organizational innovation positive on impact on work performance, through the mediation effect of organizational work resources. Camisón and Villar-López (2014) research study showed a positive association between organizational innovation and enterprise performance. Moreover many research studies found that organizational innovation valuable for enterprise performance (Sakowski et al., 2018; Gunday et al., 2011; Armbruster et al., 2008) and viable source for competitive advantage (Mol and birkinshaw, 2009; Hamel, 2006).

H4: Organizational innovation positively influences SMEs performance

Conceptual framework of innovation and organizational performance

Figure 1 presents conceptual framework of the current research study. The independent variables are drawn from review of literature and innovation theories. Moreover the study research model draws from current knowledge on innovation and performance (Gunday et al., 2011). This would be utilized to examine the effect of

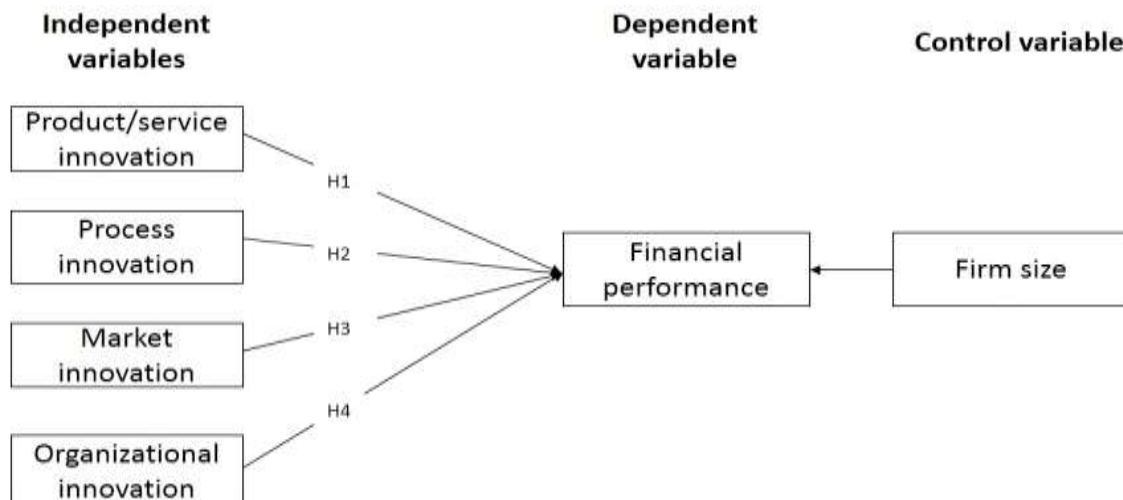


Figure 1. Research model.

Table 1. Demographic characteristics.

Demographic variable	Frequency	%
Gender		
Male	79	71.8
Female	31	28.2
Firm age		
Between 1 and 5 years	18	16.4
Between 6 and 10 years	25	22.7
Between 11 and 15 years	16	14.5
Above 16 years	51	46.4
Educational level		
high school	27	24.5
diploma	36	32.7
bachelors,	44	40
masters and above	3	2.7
Number of employees		
5 - 10	48	43.6
Above 11	62	56.4
Industry		
Manufacturing	36	32.7
Services	74	67.3
Total	110	100

the innovation types (independent variables) on the SMEs financial performance (dependent variable).

METHODOLOGY

Data collection and procedure

To investigate the impact of different innovation types on the

financial performance of SMEs in Eritrea, we conducted a cross-sectional study. The study population includes SMEs from various sectors located in the capital city, Asmara. This area was chosen due to the fact that the majority of enterprises listed in the Ministry of Trade and Industry (MTI) are situated in Asmara, providing a balanced representation of both manufacturing and service sectors (MTI, 2018). The data were collected through a survey, administered to the owner/manager. In this study 110 Eritrean SMEs were taken as a sample and using PLS structural equation modeling, direct relationship between dependent and independent variables were tested. Table 1 shows the demographic characteristics of the respondents.

Measurement of variables

Innovation types were measured and adopted from the study of Gunday et al. (2011). The construct comprises of 21 items, and scored using a five-point Likert scale. Financial performance was measured and adopted from the study of Gunday et al. (2011) and Martinez-Conesa et al. (2017). The construct comprises 4 items and Likert scale of 1-5 used to measure the enterprise performance for the last 3 years. Firm owners are not legally required to issue information related to financial performance making it difficult to obtain them easily. This compelled us to use perceptual measures of financial performance in this study. (Lubatkin et al., 2006). Besides, it is recommended that self-report of firm performance by managers substantially associate with objective measures of performance (He and Wong, 2004; Chang and Hughes, 2012). Finally, the authors controlled the firm size that may influence the connection between innovation types and enterprise performance. The size of the enterprise is examined by the number of employees (Sweeney, 2007; Tilakasiri, 2012; Saeidi et al., 2015).

Data analysis

SPSS Statistical package version 21 and Smart PLS 4 used to analyze data. Variance based smart – PLS, structural equation modeling approach is preferred for its aptitude to determine causal relationships among all latent constructs simultaneously, while dealing with measurement errors (Hair et al., 2016). Furthermore, PLS-SEM is best fit for explanatory study (Farooq and Radovic-

Table 2. Reliability and validity results.

Constructs	FL	Alpha	CR	AVE
Product/service				
PS_1	0.699			
PS_2	0.711			
PS_3	0.710	0.816	0.869	0.541
PS_4	0.888			
PS_5	0.843			
Process				
Proc_1	0.811			
Proc_2	0.827			
Proc_3	0.835			
Proc_4	0.809	0.885	0.887	0.685
Proc_5	0.856			
Market				
Mkt_1	0.833			
Mkt_2	0.874			
Mkt_3	0.792	0.832	0.835	0.665
Mkt_4	0.757			
Organizational				
Org_1	0.792			
Org_2	0.823			
Org_3	0.814			
Org_4	0.806	0.871	0.907	0.566
Org_5	0.694			
Org_6	0.691			
Org_7	0.774			
Performance				
FP_1	0.806			
FP_2	0.858			
FP_3	0.852	0.848	0.855	0.686
FP_4	0.794			

Markovic, 2017). Measurement and structural models are two classifications of SEM analysis (Anderson and Gerbing, 1988). Measurement model tests the validity and reliability of the indicators for each construct while the connection between dependent and independent variables structural model (Smith, 2003).

RESULTS

Measurement model

Table 2 demonstrates the results of the PLS factor loading (FL), reliability, Average Variance Explained (AVE) of the items utilized to measure product/service innovation, process innovation, market innovation, and financial performance.

The FL and AVE of the items considered are greater than 0.6 and 0.5, respectively, and topped the required

threshold; subsequently, Convergent validity has been proven (Henseler et al., 2009). The composite reliability (C.R.) of the five constructs topped the given boundary of 0.7 suggested (Hair et al., 2014). This reveals the maintenance of the reliability of all scales in this current study.

DV demonstrates sufficient difference among constructs (Hair et al., 2014). According to Fornell and Larcker (1981) DV criteria requires that each construct's square root of the AVE must exceed that of correlations between constructs and Table 3 proves the presence of discriminant validity.

Goodness of Fit (GOF)

Goodness of fit (GoF) was tested using one of the most

Table 3. Discriminant validity.

	F. Perf	Mkt Innov	Org Innov	Proc Innov	Prod/Serv innov
F. Perf	0.828				
Mkt Innov	0.387	0.815			
Org Innov	0.342	0.190	0.752		
Proc Innov	0.379	0.278	0.232	0.828	
Prod/Serv innov	0.470	0.114	0.247	0.168	0.735

Table 4. Hypothesis testing.

Hypothesis	Path coefficient	T- statistics	P- values	Decision
H1: Prod/serv innovn -> F. Perf	0.367	4.836	0.000***	Accepted
H2: Proc Innov -> F. Perf	0.210	2.632	0.009**	Accepted
H3: Mrkt Innov -> F. Perf	0.258	4.138	0.000***	Accepted
H4: Org Innov -> F. Perf	0.154	2.009	0.045*	Accepted

***p < 0.001; **p < 0.01; *p < 0.05.

widely used statistical techniques, the GoF formula, as proposed by Tanenhaus et al. (2005) to assess model fit. Henseler et al. (2016), defined it as “the linear mean of the average AVE and average R^2 for dependent variables”. The cut-off values of GoF are 0.1 = small GoF; 0.25 = medium GoF; 0.36= large GoF (Wetzels et al., 2009). Using the formula, a 0.50 GOF was obtained, indicating that the model satisfies the large criteria and thus is acceptable.

$$\text{GOF} = \sqrt{\text{AVE}} * \sqrt{R^2}$$

$$\text{GOF} = \sqrt{0.793} * \sqrt{0.405} = 0.50$$

Structural model

To test the hypothesized relationships, we run the bootstrapping technique with 5000 sub-samples in Smart-PLS. Multicollinearity and common method bias were checked with the values for variance inflation factor (VIF). Above 3.3 VIF indicates the existence of high multicollinearity and a sign of common method bias (Diamantopoulos and Siguaw, 2006). The VIF scores are under 3.3, showing absence of multicollinearity (Hair et al., 2014), and common method bias problems (Kock, 2015). SEM results are displayed in Table 4.

In this paper, the result of the analysis demonstrates a definite connection between Product/service innovation and SME performance, having path coefficient value ($\beta = 0.367$, $p < 0.000$). The impact of process innovation on SME financial performance is found to be significant ($\beta = 0.210$, $p < 0.009$). Market innovation had significant impact on SME performance, ($\beta = 0.258$, $p < 0.000$). Organizational innovation also has a positive and significant effect on SME financial performance ($\beta =$

0.154, $p > 0.045$). The results of the R^2 for financial performance were 0.40. Finally, an analysis to check whether the control variable play any role in the model is done. The result revealed insignificant effect of the variable.

DISCUSSION

Innovativeness is comprehended as a vital variable that increases the existing market share and influences the performance of SMEs. However little has been done, to explore the effect on firm results, in the context of developing world for the majority of the research on innovation were mostly conducted among large enterprises in the developed countries (Al-Ansari et al., 2013). Moreover the link between innovation types and financial performance focused on product and process innovations ignoring other innovation types like marketing and organizational innovations (Gunday et al., 2011). All this denotes literature gap regarding the effect of innovation types on SMEs financial performance. Thus based on resource based theory, this study, intend to fill this gap by examining innovation types (product, process, marketing and organizational) effects on the performance of SMEs in the context of under developed Sub- Sahara African country, Eritrea.

Result from the current study proved the existence of a significant association between product/service innovation and SME financial performance. This suggests that a rise in service/ product innovation would result in a rise in the SMEs financial performance. The result of this study is consistent with Tsai et al. (2020), Atalay et al (2013) and Calantone et al. (2002), which stated significant and positive service/product innovation and organizational

performance relationship. Hence, SMEs engagement in high levels of service/product innovation would lead to good performance financially.

In this study a significant relationship between process innovation and SME financial performance was supported. Hence this suggests that a rise in process innovation would result in an improvement in SMEs financial performance.

The result is consistent with the findings of Demeter et al. (2021), Varis and Littunen (2010) and Madrid-Guijarro et al. (2013) who attested that process innovations have positive link with organizational performance. Therefore, it can be concluded that, SMEs engagement in process innovation would lead to good performance financially.

The results of this study showed that there is a significant connection between market innovation and SME financial performance. This suggests that an increase in marketing innovation is associated with an improvement in SMEs' financial performance. These findings align with previous studies that have reported a positive and significant relationship between marketing innovation and business performance, as observed in the works of Quaye and Mensah (2019) and Peng et al. (2021). Therefore, it can be suggested that, SMEs involvement in marketing innovation practices would lead to good performance financially.

Result from the current study also attested positive and significant connection between organizational innovation and SME financial performance. This shows organizational innovation has strong, direct impact on business. This finding is also compatible with that by Donkor et al. (2018), Donbesuur et al. (2020) and Gunday et al. (2011). Therefore, it can be suggested that managers need to give more consideration to organizational innovation, which have a decisive role for enhancement of financial performance and innovative capabilities.

Conclusions

In summary, all four types of innovation significantly and positively impact businesses. This underscores the importance of an innovation strategy as a key driver of enterprise performance, which should be developed and implemented as an integral part of the overall business strategy. A precise understanding of the nature of these innovations will help enterprises prioritize their production, marketing, and process strategies and implement them through the right action plans. To achieve their organizational strategic goals, SME managers should ensure sufficient investment in all selected types of innovation. Hence, it is advisable for managers to foster a conducive business environment that promotes innovative activities. This can involve activities like developing new products or services, enhancing the features of existing products or services, eliminating non-value-added processes in production or service delivery, and

innovating in the design of products or services by making changes in appearance, shape, and volume without altering their core functional and technical aspects. Additionally, refreshing routines, procedures, and processes used in enterprise operations in an innovative way can be beneficial. These innovative practices contribute to improved customer satisfaction and enhanced firm performance. Besides its managerial implications, this study contributes empirical evidence to the existing literature on innovation and financial performance within the context of a developing country. The findings can serve as a valuable reference for students and researchers interested in further exploration of this topic. One limitation of this study is its cross-sectional nature, which suggests the need for a longitudinal study to further confirm the positive relationship between dependent and independent variables. Additionally, since this study was conducted in the specific context of Eritrea, future research in other developing countries can enhance the generalizability of the results. Furthermore, this study relied on perceptual financial performance measurement, and therefore, future research may consider incorporating more objective measures to validate the findings.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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