

UNIVERSITY OF PANNONIA
THESIS SUMMARY

**The Moderating Role of Technological Capabilities in the Relationship
Between Entrepreneurial Marketing and Firm Performance**



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CHAPTER I

INTRODUCTION

1.0. Chapter overview

This chapter contains the background of the study, an introduction to the SME sector in Sudan, a statement of the problem, research questions, and research objective, afterwards, we delve to clarify the significance of the study and a penalization operationalization definition of key variables used in this study and lastly organization of the study.

1.1. Background of the study

Small and Medium Sized Enterprises (SMEs) are more sensitive to changes in the environment than larger businesses. They have fewer resources to face economic downturns, but they also have a special flexibility in the way they operate, allowing them to take swift decisions when these are needed. They also have inner characteristics, such as management style, affecting how their operations are run, which is significantly different from how larger companies run their businesses. A particularly interesting strand of academic literature on SMEs has been developing in the interface between marketing and entrepreneurship. While considering the unique nature of SMEs, researchers have been actively trying to understand how these characteristics relate to SME marketing practices. Entrepreneurial marketing is therefore a subject of increasing academic interest, particularly as opposed to marketing practices in larger businesses (Cacciolatti, & Lee, 2015).

As a concept entrepreneurial marketing was launched in 1982, and many researchers tried to describe this concept (Morris et al., 2001; Becherer et al., 2012; Westerlund, & Leminen, 2018; Whalen et al., 2016). Meanwhile, the word is also associated with marketing activities in small businesses with limited capital and who need to rely on innovative and unsophisticated tactics. Additionally, EM can be seen as a modern paradigm that integrates crucial aspects of marketing and entrepreneurship into an integrated concept in which marketing is a business-based operation.

Though, in the present business environment, with growing dynamics, conditions, and competitions, entrepreneurs and managers must skip traditional management principles and replace them with original innovative thoughts and procedures, this is considered a promising and growing research field at the intersection of the two most important areas of business administration. In the same scope many scholars have been involved in entrepreneurial marketing has a positive effect on performance (e.g., Becherer et al., 2012; Sadiku-Dushi et al., 2019; Hacioglu et al., 2012; Hamali et al., 2016).

On the other hand, technological capabilities encompass a firm's ability to leverage technological resources and innovations for competitive advantage. In the context of SMEs in Sudan, the intersection of entrepreneurial marketing and technological capabilities becomes particularly critical, influencing how these businesses adapt to the digital era and navigate global market complexities. This research aims to investigate the moderating role of technological capabilities in shaping the relationship between entrepreneurial marketing and firm performance within SMEs in Sudan. Recent studies highlight the importance of understanding the impact of technology on marketing strategies and firm outcomes in various contexts (Coviello et al., 2017; Morgan et al., 2020).

By delving into these dynamics, the study seeks to provide actionable insights that can inform strategic decision-making and policy formulation for SMEs in Sudan. Moreover, the study is aligned with the current discourse on the role of technology in entrepreneurship and marketing practices in emerging economies (Hultman & Shaw, 2017; Miocevic et al., 2017). Through a nuanced exploration of these dynamics, this research contributes to the academic understanding of entrepreneurial marketing, technological capabilities, and firm performance, offering practical implications for SMEs in Sudan's unique business environment.

Hence, the importance of this research is to increase the understanding and enrich the knowledge of entrepreneurial marketing strategy and its relationship with firm performance. Moreover, this study explores how certain dimensions of EM correlate with the firm performance dimensions. Thus, the research focuses on identifying correlations of

EM dimensions and their impact on the performance of SMEs in Khartoum-Sudan. Similarly, this research attempts to explore the impacts of technological capabilities as a moderating role in the relationship between entrepreneurial marketing and firm performance in Sudanese small and medium-sized enterprises.

1.2. Statement of the problem

In Sudan, governments are facing enormous economic slowdowns and unemployment problems. In addition, the forces of globalization and technological advancements are putting pressure and demands on the rate of enhancement in social and economic development. In such situations entrepreneurship is thought of as the main accelerator of economic development, using job creation, utilization of resources, improved production through innovation, value creation, and wealth accumulation. However, due to the challenges that face the success of entrepreneurship (finance, management of business, policies, etc.), there is a pressing need to adopt a holistic approach to this phenomenon to generate high levels of dynamism, innovation, effectiveness, and introduce policies, programs, and initiatives that foster entrepreneurship development (Khattab et al., 2019).

Likewise, business organizations in Sudan are challenged with intense competition in this manner making the survival and growth of any business dependent on their ability to offer superior value to customers (Osman et al., 2018). Similarly, there were a few studies conducted in the field of entrepreneurial marketing in SDN. Thus, this study attempts to address the gaps and limitations in the literature to formulate a problem statement.

The moderating effect of technological capabilities on the relationship between entrepreneurial marketing and firm performance is important because the characteristics of this kind of capabilities (that promote improvement and innovation) can enhance the positive effect of entrepreneurial marketing and firm performance. However, there is previous research that examines only the direct impact of technological capabilities on firm or marketing performance. e.g., (Camisón, & Villar-López 2014; Tzokas et al., 2015).

Consequently, this study shows the need for a complementary interaction between (entrepreneurial marketing and firm performance) which will be developed by technological capabilities as a moderator variable.

Therefore, this study attempts to address the above-mentioned research gaps and limitations in the existing entrepreneurial marketing literature. Moreover, we will try to address this gap by presenting scientific solutions and practical contributions with systematic foundations to help these enterprises reach the desired goal. On the other hand, the existence of contemporary technological capabilities indicates the importance of the technological capabilities that SME firms are supposed to implement in Sudan to gain the desired achievement by applying an entrepreneurial marketing strategy.

Thus, this research addresses the gaps and limitations in the literature by investigating the link between entrepreneurial marketing, firm performance, and technological capabilities. Generally, this research will investigate the moderating effect of technological capabilities on the relationship between entrepreneurial marketing and firm performance in the SME sector in Sudan.

1.2.1. Research Questions

The main question of this research is: Do technological capabilities moderate the relationship between entrepreneurial marketing and firm performance in Sudanese SMEs? Throughout this study, we also attempt to find out the answers for the following sub-questions:

1. What is the extent level of understanding entrepreneurial marketing in Sudanese SMEs?
2. What is the relationship between entrepreneurial marketing and firm performance in Sudanese SMEs?
3. What are the benefits of employing technological capabilities in Sudanese SMEs?

1.3. Research Objectives

The general objective of this study is to explore and describe the relationship between entrepreneurial marketing and firm performance in Sudanese SMEs by utilizing technological capabilities as a moderate variable.

1. We also intend to explain the extent level of understanding and implementing entrepreneurial marketing (EM) as a strategy in Sudanese SMEs.
2. We aim to find out the benefits of utilizing technological capabilities (TCPs) as moderator variables between EM and MP in Sudanese SMEs.

CHAPTER II

LITERATURE REVIEW

2.0. Introduction

The literature review sheds light on the areas of entrepreneurial marketing (EM), firm performance, and technological capabilities. The discussion of each is conducted by the review of relevant literature to explain the relationship between entrepreneurial marketing and firm performance. It will also explain the moderating effect of technological capabilities on the relationship between entrepreneurial marketing and firm performance.

2.1. The concept of entrepreneurial marketing (EM)

Entrepreneurial Marketing “EM” has gained significant academic legitimacy since its inception in the 1980s, and a sizeable body of various research on it has emerged (Hallbäck & Gabrielsson, 2013). Entrepreneurial marketing is a marketing strategy that can be better suited to resource constraints and challenges in SMEs (SMEs). Common to all definitions of EM is the concept that it lies at the nexus between entrepreneurship and marketing. Entrepreneurial marketing has opened the door to many research streams that have led to diverse views and meanings of the EM term. An alternative marketing model was needed to be identified which could also be used among small enterprises.

In this study, we have drawn the concept of EM developed by (Zahra & Garvis, 2000; Zahra et al., 2003). argue that EM includes seven dimensions. Five of these dimensions – proactiveness, innovation orientation, taking risk orientation, focusing on opportunity, and leveraging resources– derive and come from the literature on entrepreneurship. While other two dimensions of EM –value creation–and customer satisfaction orientation are derived from the literature on marketing (Hooley et al., 2001; Kohli & Jaworski, 1990). According to Alqahtani & Uslay, (2020); and Morris et al., (2002;) organizations that choose EM as their strategy benefit from interlinking among the underlying dimensions. These interlinking are valuable when pursuing exploratory as well as exploitative innovation. Thus, the interlinking between the EM dimensions offers firms

yet a different advantage, allowing them not only to create exploitative or exploratory innovation but to rotate between these innovation types.

Hills & Hultman, (2011) has contributed to the EM context arguing that traditional marketing that is created in literature may not be completely applied to small and medium enterprises. The company's conduct is another stream of entrepreneurial marketing analysis. This stream found that EM as a more promising opportunity to describe the marketing of companies that are small and resource-limited enterprise-driven entrepreneurial actions. Subsequently, the extent of research has extended from small companies to large companies. Many previous studies illustrate that however limited, entrepreneurial marketing can be used for any size of business (Hisrich & Ramadani, 2017; Kraus et al., 2009).

This research responds to the call by (Webb et al., 2011; Lam and Harker 2015; and Jayawarna et al., 2014). for an EM theoretical base to advance the theory and the relationship between marketing and entrepreneurship and their link with firm performance which can then be used to make clear how small and medium terms enhances EM and other terms development skills. The connection between execution theories, sense-making, implementation, and contextual marketing demonstrates a clear interrelation between entrepreneurship and marketing and provides "a unique framework for advancing the understanding of the process and entrepreneurship and its potential marketing link" (Mpanza, 2016). EM is not only the nexus between marketing and entrepreneurship, but furthermore marketing and entrepreneurship – customer-focused and entrepreneur/innovation-focused.

All EM definitions, however, have something in common; they all include both marketing and entrepreneurial aspects. The most frequently EM definition that can be found in the literature Rashad, (2018) defines EM as *“proactive identification and exploitation of opportunities for acquiring and retaining profitable customers through innovative approaches to the risk management, resource leveraging and value creation”*.

CHAPTER III
THEORETICAL FRAMEWORK AND HYPOTHESES
DEVELOPMENT

3.0. Introduction

This chapter presents the theoretical framework of the study which describes the relationship between independent, dependent, and moderating variables. Followed by the hypothesis's development is formulated based on the developed research framework.

3.1. Underlying theories of the study

A theoretical framework is a conceptual model of how one theorizes are make logical sense of the relationships among the several factors that have been identified as important to the problem (Hamad, 2019). The aim of this study is to examine the impact of the moderating role of technological capabilities on relationship between entrepreneurial marketing on firm performance. The theoretical framework of the study is anchored on the **resource-based view theory and dynamic capabilities theory**. Thus, the concept of entrepreneurial marketing has been addressed by numerous studies such as: (Alqahtani & Uslay, 2020; Hills & Hultman, 2013; Sadiku-Dushi et al., 2019; Ramadani et al., 2014; Rashad, 2018; Zahra & Garvis, 2000). The entrepreneurial marketing concept in this study is represented as a predictor for firm performance. To elaborate on the relationship between study variables, the research focused on the following theories as clarified by numerous researchers:

3.1.1 The resource-based view theory (RBV)

The resource-based view provides the theoretical foundation for this study regarding the effect of entrepreneurial marketing on firm performance through technological capabilities. The RBV suggests that firms employ their physical, human, and organizational resources to gain an advantage in the marketplace. If these resources are valuable to customers, rare, and difficult to replicate, then these resources give rise to sustainable competitive advantage, enhancing firm performance, thus, the basic premise is

that resources increase the efficiency and effectiveness of firms in general and the development of new services (heng & Sheu, 2017).

Madhani, (2010) recommended that the resource-based view should consider not simply possession of resources/capabilities, but rather “strategic flexibility” concerning decision-makers' ability to pivot their business models within unstable markets. Actually, Chen et al., (2022) offers a readiness index for owner-managers to survive or even thrive in light of environmental circumstances. In this current study, these extensions are considered by exploring how owner-managers engage in TCPs activities to strengthen their performance-enhancing entrepreneurial marketing behaviors.

3.1.2. Dynamic capability theory (DCT):

The dynamic capabilities theory (DCT) explains that to sustain their competitive advantage firms need to renew their stock of valuable resources as their external environment changes. The (DCT) provides the theoretical foundation for this study regarding the effect of entrepreneurial marketing orientation on firm performance through technological capabilities. This means that if a firm possesses Valuable, Rare, Inimitable, and Non-substitutable resources but does not use any dynamic capabilities, its superior returns cannot be sustained without dynamic capabilities and a firm's returns may be short-lived if the environment exhibits any significant (Helfat, & Peteraf, 2009).

Marketing and technological capabilities are primary drivers of a firm's performance and thus of central interest to managers. Nevertheless, how these two capabilities align with changing environments to secure superior performance remains unclear. Thus, and according to the above discussion, the impacts of entrepreneurial marketing on firm performance may not directly be expected; however, within the moderating of technological capabilities where interaction will take place and the technological capabilities transform entrepreneurial marketing into outputs of created value. Thus, technological capabilities represent routines and processes that enable firms to utilize entrepreneurial marketing in firm performance.

In other words, entrepreneurial marketing as a resource lead to technological capabilities which influence firm performance (Hamad, 2019). Resource-based view

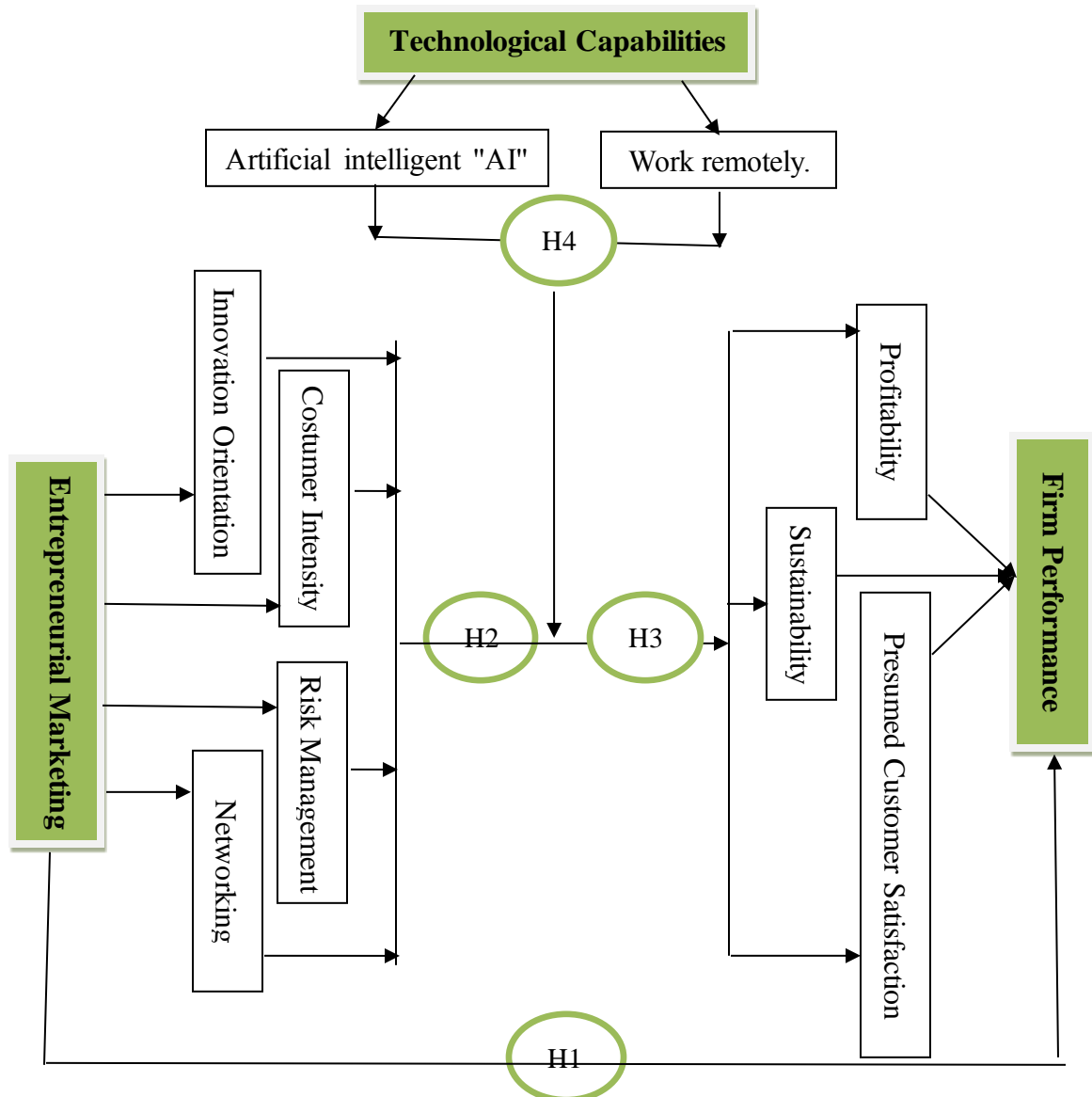
theory of the framework in this research is justifiable as explained before, it provides the theoretical base for understanding the effect of entrepreneurial marketing on technological capabilities and firm performance. Dynamic capability theory provides a base for understanding how technological capabilities can moderate the relationship between entrepreneurial marketing and firm performance.

Thus, the connection between marketing and entrepreneurship presents a challenge since there are too many heterocomplex, too many remote questionnaire studies with single interviewees, and too few qualitative studies according to the comprehensive review of the literature has given a general view of the concepts and variables used in the investigation of the correlation between entrepreneurial marketing EM & firm performance. Underpinned by the resource-based view, the study's conceptual model Figure (3.1) contained four hypothesized paths and 9 control variables. However, Figure (3.1) below presents the conceptual framework for this study which proposes links of entrepreneurial marketing to firm performance and the theoretical approach of this study proposes that technological capabilities as a moderating variable in the relationship between entrepreneurial marketing and firm performance.

3.2. The conceptual framework of the study

Figure (3.1) below presents the conceptual framework for this study which proposes the links of entrepreneurial marketing to firm performance, the theoretical approach of this study proposes that technological capabilities as moderating variable in the relationship between entrepreneurial marketing to firm performance.

Figure (3.1). Conceptual framework



Source: own editing based on qualitative-thematic analysis (2024).

CHAPTER IV

RESEARCH METHODOLOGY

4.0. Introduction

In this chapter, a discussion of a general research design first, including a combination of qualitative and quantitative approaches, followed by, a discussion on the population of interest, sampling procedures, and sample-size, followed by the development of the questionnaire (study variable measurements). It also includes the methods used in collecting data, in analyzing the data, and in testing the hypotheses.

4.1. General research design

4.1.1. First phase: qualitative approach

The objective of the qualitative phase in this study is to analyze and explore in depth the extended knowledge of entrepreneurial marketing EM and to which extent the Sudanese entrepreneurs, managers, and employees are knowledgeable and familiar with the discipline of EM as a strategy that can be implemented in their enterprises. Thus, we have designed the main question of EM: What are the factors/dimensions that come to your mind when you hear about entrepreneurial marketing? followed by questions about firm performance as well as the technological capabilities TCPs. The purpose was to develop the research pre-model of our study. And to achieve this purpose the study was conducted using a qualitative approach by implementing a thematic analysis.

Since the study adopts an *inductive philosophy* in qualitative methodology, we have applied grounded theory and briefly go over the numerous trustworthiness verification techniques we used to begin thematically analyzing our qualitative data. As a result, the current study and other studies are in line Singh et al., (2021) which may be used as an illustration of how to modify the suggested general framework for trustworthiness verification to fit certain qualitative approaches. (See Appendix 2).

4.1.2. Second phase: quantitative approach

The objective of the quantitative phase is to examine the application of entrepreneurial marketing EM perceptions on firm performance FP in Sudanese SMEs.

The study tries to explain the relationship between entrepreneurial marketing and firm performance by testing technological capabilities as a moderating variable. Based on previous literature, this research attempts to provide some explanation and description of how EM may create positive FP for SMEs in Sudan. In this manner, our study is quantitative. Reliable with the purpose of this study, the study relied on the “*Positivism philosophy*”, *deductive approach* to theory development, quantitative methodological choice, survey strategy, and cross-sectional Time horizon and using a personally administered questionnaire.

CHAPTER V

DATA ANALYSIS AND FINDINGS

5.0. *Introduction*

This chapter shows the process through which the data that was collected from SME firms in Sudan was analyzed to present the findings. The chapter was organized into two main parts: Firstly: Qualitative methodology divided into three sections as following (Data analysis process and criteria, thematic analysis, and the result of thematic analysis). Secondly: Quantitative methodology contains three sections. The first section includes data cleaning, factor loading, missing data, unengaged responses, outliers, frequencies of SMEs and respondents, and reliability analysis. the second section is the goodness of the measure to shows the descriptive analysis of the study variables includes principal component analysis PCA, Correlation, and Independent T-test analysis (ANOVA). The last section focuses on the results of path analysis and hypothesis testing.

5.1. **Firstly: Qualitative methodology**

5.1.1. **Data analysis process**

Thematic analysis was conducted to create an in-depth analysis to recognize the specific themes researched during the discussions. Furthermore, we utilized thematic analysis, as a method for identifying, analyzing, and interpreting patterns within data, to examine the data that was gathered (Nouri et al., 2018).

Following the six phases of thematic analysis, we employed Clarke et al., (2015) approach as following:

- I. Familiarization with the data: we thoroughly investigated the data collected from discussions from entrepreneurs. This was accomplished by repeatedly evaluating the data that had been acquired. Thus, we were able to become as familiar with the data as feasible by repeatedly listening to the recorded data and writing down the recorded discussions.
- II. Coding: We have created an initial coding list for the main and intersections dimensions.

- III. Searching for themes: Building themes and gathering all the coded data relevant to each sub-theme involved an active process that we engaged in.
- IV. Reviewing themes: We considered if the created themes provide a compelling and convincing narrative regarding the collected data. This was a crucial stage in building the underlying themes.
- V. Defining and naming themes: Each theme was thoroughly examined, and the "essence" of each was determined. We then created a clear and informative name for each theme.
- VI. Writing up: To provide the reader a coherent and persuasive narrative about the data, we finally integrated the analytic narrative and data extracts together.

i. Summary of thematic analysis

Table 5.3.1 Presents the generated multidimensional findings for entrepreneurial marketing, technological capabilities, and firm performance.

First theme	Dimensions	Second theme	Dimensions	Third Theme	Dimensions
Entrepreneurial marketing	Innovation orientation	Technological capabilities "TCPs"	Security	Firm Performance "FP"	Financial performance: Revenue/profits, return on investment (ROI), and shareholder value
	Focus on opportunities		Digital communication capability		Sustainability
	Segmentation		Digital tools		Customer satisfaction
	Customer intensity		Ability to work remotely		Growth
	Proactiveness identification		Artificial intelligent "AI"		Operational efficiency
	Leveraging resource		Research and Development		Employee satisfaction

			Capability R&D	
	Risk management		Technological Acquisition	
	Value creation		New business models	
	Agility		Agility and Flexibility	
	Networking			

Own editing, based on thematic analysis.

5.2. Secondly: Quantitative methodology

5.2.1. Reliability of Scales Using Cronbach's Alfa

The analysis of reliability using Cronbach's Alpha indicates satisfactory internal consistency for the scales utilized in the study, as recommended by Hair et al., (2019). An acceptable level of reliability is achieved when Cronbach's alpha exceeds 0.50. Specifically, the Entrepreneurial Marketing scale, comprising 14 items, demonstrates a Cronbach's Alpha of 0.731, indicating good reliability. The Technological Capabilities scale, which consists of 6 items, shows a slightly lower but still acceptable Cronbach's Alpha of 0.538. Similarly, the Firm Performance scale, comprising 9 items, exhibits a Cronbach's Alpha of 0.615, suggesting moderate internal consistency.

Overall, the combined scales, consisting of 28 items, yield a Cronbach's Alpha of 0.815, indicating strong reliability across the comprehensive set of measures used in the study.

Table 5.3 Reliability of scales using Cronbach's Alfa

Variable	Number of items	Cronbach's Alfa
Entrepreneurial marketing	14	0.731
Technological capabilities	6	0.538
Firm Performance	9	0.615
Overall	28	0.815

Own editing by researcher (2024).

5.2.2. Goodness of measures

This section reports the results of validity and reliability tests as a means to assess the goodness of measure in this study constructs (Sekaran, 2003). The study used Principal Component Analysis (PCA) The following is the detailed information of (PCA).

5.2.2.1. Exploratory Factor Analysis: Utilizing (PCA)

The evaluation of the construct validity of the scales involved assessing the Kaiser-Meyer-Olkin (KMO) coefficient and conducting the Bartlett Sphericity test, which determined the necessity of employing factor analysis (Hair et al., 2019). Exploratory Factor Analysis (EFA) was then utilized to examine the validity structure of the scale. Within the implementation of EFA, various techniques can be utilized for factor extraction, with **Principal Component Analysis (PCA)** being the most employed method, according to Hair et al. (2019). PCA primarily serves as a means of reducing dimensionality, transforming the original variables into a smaller set of uncorrelated variables known as principal components.

This process facilitates simplifying the data structure and identifying underlying factors, as emphasized by Abdi and Williams (2010). Additionally, factor rotation is employed in EFA to determine variable groupings, with Varimax rotation being a widely used method. Varimax rotation is considered an orthogonal rotation technique aimed at maximizing the variance of squared loadings within each factor while ensuring distinct loadings for each variable, as elucidated by Tabachnick et al., (2007).

5.2.8.1 Entrepreneurial marketing dimensions (Independent variable)

Kaiser-Meyer-Olkin (KMO) and Bartlett's Test were used to find out about the suitability and accuracy of factors within a provided sample (Hair et al., 2019). The results presented in table 5.4 show that KMO = 0.686, Bartlett test value $\chi^2 = 673.7$, $p = .000$. To conduct item factor analysis, it is recommended to ensure a Kaiser-Meyer-Olkin (KMO) value of at least 0.50. Additionally, it is crucial for the Bartlett test to yield significant results, as indicated by Abdi and Williams (2010). The results obtained from the scale indicate the suitability of the data for factor analysis.

The factor analysis employed principal components analysis and varimax vertical rotation to eliminate items with factor loading values below .30, as well as items with loading values across different factors, as outlined by Abdi and Williams (2010). Hence, 4 items were excluded from the measurement since they were not determinative of which factor is measured.

Based on the analysis conducted using principal components analysis and Varimax rotation, four factors were identified, each with eigenvalues exceeding 1 as it seen in figure 1. The results presented in table 1 show these factors explain a cumulative variance of 52.99%, with the first factor explaining 24.01%, the second 10.69%, the third 9.61%, and the fourth 8.66%. This suggests that the identified factors account for a significant portion of the variance within the scale. Further examination reveals that out of the 14 items on the scale, 5 items align with the first factor, while 3 items align with each of the remaining three factors. This distribution of items across factors provides insight into the underlying structure of the scale and helps in understanding the dimensions it measures.

Additionally, the factor loadings of all items fall within the range of 0.761 to 0.305, indicating their contribution to the respective factors. Moreover, all items exhibit Item-total Correlation Coefficients above 0.30, indicating their discriminative power in assessing the constructs measured by the scale.

Overall, the findings suggest a robust four-factor structure consisting of 14 items, with each factor capturing distinct dimensions of entrepreneurial marketing. The high Item-total Correlation Coefficients further validate the reliability and validity of the scale in assessing the intended constructs.

Table 5.4 EFA utilizing (PCA) for Entrepreneurial marketing EM dimensions.

Items	Scale Item No	Factor Loading Values			
		Factor 1	Factor 2	Factor 3	Factor 4
CI1	1	.761			
IO1	2	.761			

CI4	3	.664			
Net3	4	.658			
Net1	5	.493			
CI5	6		.766		
Net4	7		.666		
CI2	8		.516		
IO3	9			.824	
RM1	10			.545	
RM2	11			.443	
IO2	12				.747
IO5	13				.718
IO4	14				.305
Variance (%)		24.01%	10.69%	9.61%	8.66%
Total Variance		52.99%			
KMO		.684			
Bartlett test value χ^2		673.7			
Bartlett's test of p-value		0.000			

Own editing by researcher (2024).

5.2.2.2. Technological capabilities dimensions (Moderator variable)

The findings presented in Table 5.5 demonstrate that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.665, indicating a moderate level of suitability for factor analysis. Additionally, the Bartlett test yielded a significant result with a chi-square value of 97.7 and a p-value of .000, further supporting the appropriateness of the data for factor analysis.

For the factor analysis procedure, principal components analysis was utilized in conjunction with varimax rotation to enhance interpretability by maximizing the variance of factor loadings. Items with factor loading values below .30 were excluded, as were items exhibiting loadings across multiple factors. Consequently, four items were removed from the measurement scale due to their inability to distinctly represent a particular factor.

Based on the analysis conducted using principal components analysis and Varimax rotation, two factors were identified, each with eigenvalues exceeding 1 as shown in Figure 2. These factors account for a cumulative variance of 48.2%, with the first factor explaining 30.72% and the second 17.47% as shown in table 2. This indicates that the identified factors explain a significant portion of the variance within the scale. Further examination reveals that out of the 6 items on the scale, 3 items align with each factor. This distribution of items across factors provides insight into the underlying structure of the scale and helps in understanding the dimensions it measures. Additionally, the factor loadings of all items fall within the range of 0.816 to 0.568, indicating their contribution to the respective factor.

Moreover, all items exhibit Item-total Correlation Coefficients above 0.30, suggesting their discriminative power in assessing the constructs measured by the scale. Overall, the findings suggest a robust two-factor structure consisting of 6 items, with each factor capturing distinct dimensions of technological capabilities.

Table 5.5 EFA utilizing (PCA) for Technological capabilities dimensions.

Items	Scale Item No	Factor Loading Values	
		Factor 1	Factor 2
RWC1	1	.816	
RWC2	2	.599	
RWC3	3	.583	
AI1	4		.802
AI5	5		.627
AI3	6		.568

Variance (%)	30.72%	17.47%
Total Variance	48.20%	
KMO	.665	
Bartlett test value χ^2	97.70	
Bartlett's test of p-value	0.000	

Own editing by researcher (2024).

5.2.2.3. Firm Performance FP dimensions (Dependent variable)

The findings presented in Table 5.6 demonstrate that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.662, indicating a moderate level of suitability for factor analysis. Additionally, the Bartlett test yielded a significant result with a chi-square value of 255.23 and a p-value of .000, further supporting the appropriateness of the data for factor analysis. Consequently, 5 items were removed from the measurement scale due to their inability to distinctly represent a particular factor.

Based on the analysis conducted using principal components analysis and Varimax rotation, a three-factor structure was identified for assessing Firm Performance. These factors collectively account for a significant portion (53.31%) of the variance within the scale. The first factor explains 25.63% of the variance, the second factor 14.65%, and the third factor 13.03%.

Further examination reveals that out of the 9 items on the scale, 3 items align with each factor. This distribution provides insight into the underlying structure of the scale and helps in understanding the dimensions it measures. Additionally, the factor loadings of all items fall within the range of 0.736-0.436, indicating their contribution to their respective factors. Moreover, all items exhibit Item-total Correlation Coefficients above 0.30, indicating their discriminative power in assessing the constructs measured by the scale. Overall, these findings suggest a robust three-factor structure consisting of 9 items, with each factor capturing distinct dimensions of Firm Performance.

Table 5.6 EFA utilizing (PCA) for Firm Performance FP dimensions.

Items	Scale Item No	Factor Loading Values		
		Factor 1	Factor 2	Factor 3
PCS5	1	.736		
PCS2	2	.709		
Su4	3	.666		
Su3	4		.693	
P5	5		.691	
P1	6		.597	
PCS4	7			.436
PCS1	8			.766
PCS3	9			.679
Variance (%)		25.63%	14.65%	13.02%
Total Variance		53.31%		
KMO		.662		
Bartlett test value χ^2		255.23		
Bartlett's test of p-value		0.000		

Own editing by researcher (2024).

5.2.3. Correlation matrix

Pearson's correlation analysis was employed to examine the relationships between variables. The results displayed in Table 5.7 indicate significant correlations among all the independent, moderator, and dependent variables. However, Remote Work Capability exhibited no significant correlation with innovation orientation, profitability, and Presumed Customer Satisfaction ($p > 0.05$).

Furthermore, the correlation coefficients ranging between 0.570 and 0.127 confirm the absence of multicollinearity issues. Multicollinearity is identified when there is a high

correlation (0.9 or greater) between any independent variable and another set of independent variables (Tabachnick and Fidell, 2007).

Table 5.8 correlation matrix of the variables

	IO	CI	RM	Net	RWC	P	PCS	SU
IO	1							
CI	0.314**	1						
RM	0.219**	0.292**	1					
Net	0.317**	0.404**	0.188**	1				
RWC	0.106	0.378**	0.165**	0.200**	1			
AI	0.203**	0.363**	0.127*	0.346**	0.326**			
P	0.088	0.312**	0.129*	0.261**	0.03	1		
PCS	0.391**	0.347**	0.211**	0.311**	0.08	0.189**	1	
SU	0.308**	0.341**	0.130*	0.570**	0.158*	0.273**	0.251**	1

* Correlation is significant at the 0.05 level and **Correlation is significant at the 0.01 level.

IO= innovation orientation, CI= Customer intensity, RM= Risk management, Net= Networks, RWC= Remote Work Capability, AI= Artificial Intelligent, P= profitability, PCS= Presumed Customers Satisfaction, and SU= Sustainability.

5.2.4. Path analysis

The research utilized path analysis with AMOS v26 to examine the proposed model and validate the hypotheses. Structural Equation Modeling (SEM) path analysis is a powerful statistical technique used in various fields, due to its ability to model complex relationships among multiple variables. Unlike simpler methods like regression analysis, SEM allows for the simultaneous estimation of multiple relationships, including those involving latent variables, while also correcting for measurement error in observed variables (Hair et al., 2019). The study aimed to explore the intricate relationships between innovation orientation, customer intensity, risk management, networking, remote work capability, artificial intelligence, and key organizational outcomes such as profitability, sustainability, and presumed customer satisfaction.

The results presented in table 5.11 indicate that innovation orientation significantly influences sustainability and customer satisfaction, with a positive ($\beta = 0.116$, $p = 0.024$) and ($\beta = 0.284$, $p = 0.000$) respectively, supporting H1:2 and H1:3. Customer intensity also positively affects profitability and customer satisfaction, as evidenced by ($\beta = 0.254$, $p = 0.000$) and ($\beta = 0.209$, $p = 0.001$) respectively, confirming H1:4 and H1:6. Networking exhibits a strong positive association with sustainability ($\beta = 0.463$, $p = 0.000$) and customer satisfaction ($\beta = 0.138$, $p = 0.021$), supporting H1:11 and H1:12. However, innovation orientation, risk management, and networking do not significantly influence profitability, as indicated by rejected hypotheses H1:1, H1:7, and H1:10 respectively. Similarly, risk management does not significantly impact sustainability or customer satisfaction, with estimates ($\beta = -0.020$, $p = 0.698$) and ($\beta = 0.080$, $p = 0.168$) respectively, leading to the rejection of H1:8 and H1:9. Overall, the results highlight the differential effects of various factors on different organizational outcomes, underscoring the complexity of strategic management dynamics.

In other hand, the results show that innovation orientation does not significantly influence work remotely capability ($\beta = -0.035$, $p = 0.548$) or artificial intelligence adoption ($\beta = 0.053$, $p = 0.365$), rejecting hypotheses H2:1 and H2:2, respectively. However, customer intensity positively affects both work remotely capability ($\beta = 0.351$, $p = 0.000$) and artificial intelligence adoption ($\beta = 0.264$, $p = 0.000$), supporting hypotheses H2:3 and H2:4. Conversely, risk management and networking do not significantly impact work remotely capability or artificial intelligence adoption, rejecting hypotheses H2:5, H2:6, H2:7, and supporting H2:8, where networking positively influences artificial intelligence adoption ($\beta = 0.234$, $p = 0.000$). Moreover, work remotely capability negatively influences profitability ($\beta = -0.200$, $p = 0.000$), confirming hypothesis H3:1.

Furthermore, the findings indicate that there is a significant positive relationship between the implementation of artificial intelligence (AI) and both profitability ($\beta = 0.251$, $p = 0.000$) and sustainability ($\beta = 0.217$, $p = 0.000$), as hypotheses H3:4 and H3:5 were accepted. However, the hypothesis suggesting a relationship between the capability to work remotely and sustainability (H3:2) as well as customer satisfaction (H3:3) were rejected

($p > 0.05$). Similarly, the hypothesis regarding the impact of AI on customer satisfaction (H3:6) was also rejected ($p > 0.05$). These findings suggest that while AI implementation positively influences profitability and sustainability, the capability to work remotely does not significantly affect sustainability or customer satisfaction.

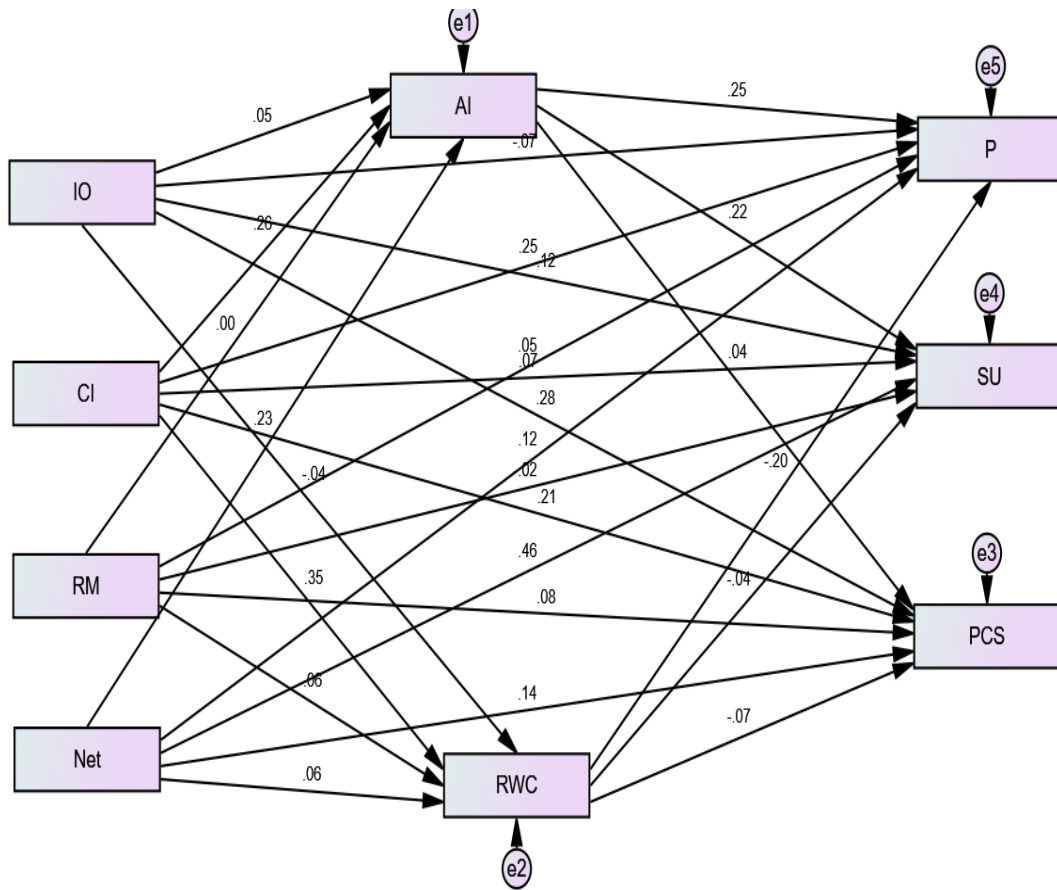
Table 5.11 Path analysis

No. of hypothe sis	Path	Estimate	P	Results
H1:1	Innovation orientation → Profitability	-0.072	0.205	Rejected
H1:2	Innovation orientation → Sustainability	0.116	0.024	Accepted
H1:3	Innovation orientation → Customer satisfaction	0.284	0.000	Accepted
H1:4	Customer intensity → Profitability	0.254	0.000	Accepted
H1:5	Customer intensity → Sustainability	0.070	0.216	Rejected
H1:6	Customer intensity → Customer satisfaction	0.209	0.001	Accepted
H1:7	Risk management → Profitability	0.048	0.401	Rejected
H1:8	Risk management → Sustainability	-0.020	0.698	Rejected
H1:9	Risk management → Customer satisfaction	0.080	0.168	Rejected
H1:10	Networking → Profitability	0.123	0.035	Accepted
H1:11	Networking → Sustainability	0.463	0.000	Accepted
H1:12	Networking → Customer satisfaction	0.138	0.021	Accepted
H2:1	Innovation orientation → Work remotely capability	-0.035	0.548	Rejected
H2:2	Innovation orientation → Artificial intelligent	0.053	0.365	Rejected

H2:3	Customer intensity → Work remotely capability	0.351	0.000	Accepted
H2:4	Customer intensity → Artificial intelligent	0.264	0.000	Accepted
H2:5	Risk management → Work remotely capability	0.060	0.302	Rejected
H2:6	Risk management → Artificial intelligent	-0.002	0.975	Rejected
H2:7	Networking → Work remotely capability	0.060	0.305	Rejected
H2:8	Networking → Artificial intelligent	0.234	0.000	Accepted
H3:1	Work remotely capability → Profitability	-0.200	0.000	Accepted
H3:2	Work remotely capability → Sustainability	0.036	0.516	Rejected
H3:3	Work remotely capability → Customer satisfaction	0.070	0.259	Rejected
H3:4	Artificial intelligent → Profitability	0.251	0.000	Accepted
H3:5	Artificial intelligent → Sustainability	0.217	0.000	Accepted
H3:6	Artificial intelligent → Customer satisfaction	0.037	0.551	Rejected

Own editing by researcher (2024).

Figure 5.4 Path analysis



Own editing by researcher (2024)

In testing the moderation effect of technological capabilities on the relationship between entrepreneurial marketing and firm performance, **interaction effects** were employed. This approach allowed for a clearer examination of how technological capabilities influence the strength or direction of the relationship between entrepreneurial marketing efforts and firm performance outcomes.

The results presented in table 5.12 suggest that the technological capabilities positively moderate the relationship between innovation orientation and sustainability ($\beta = 0.175, p = 0.000$) and customer satisfaction ($\beta = 0.315, p = 0.000$) supporting H4:2, and H4:3. Additionally, technological capabilities positively moderate the relationship between Customer intensity and profitability ($\beta = 0.274, p = 0.000$), sustainability ($\beta = 0.106, p = 0.007$), and customer satisfaction ($\beta = 0.253, p = 0.000$) that supporting H4:4, H4:5, and

H4:6. However, technological capabilities had no significant moderating effect on the relationship between innovation orientation and profitability ($\beta = -0.07$, $p = 0.208$), leading to rejection H4:1.

Moreover, the results show that technological capabilities do not significantly moderate the relationship between risk management and profitability ($\beta = 0.08$, $P = 0.159$), and sustainability ($\beta = -0.014$, $P = 0.720$), resulting in the rejection of both hypotheses (H4:7 and H4:8). However, the technological capabilities significantly moderate relationship between risk management and customer satisfaction ($\beta = 0.110$, $P = 0.013$), indicating its acceptance of (H4:9). Moreover, the technological capabilities significantly moderate the relationship between networking and profitability ($\beta = 0.195$, $P = 0.000$), sustainability ($\beta = 0.605$, $P = 0.000$), and customer satisfaction ($\beta = 0.196$, $P = 0.000$), leading to the acceptance of hypotheses H4:10, H4:11, and H4:12, respectively. These findings highlight the nuanced interplay between risk management, technological capabilities, networking, and key firm outcomes, emphasizing the multifaceted nature of organizational success in the contemporary business landscape.

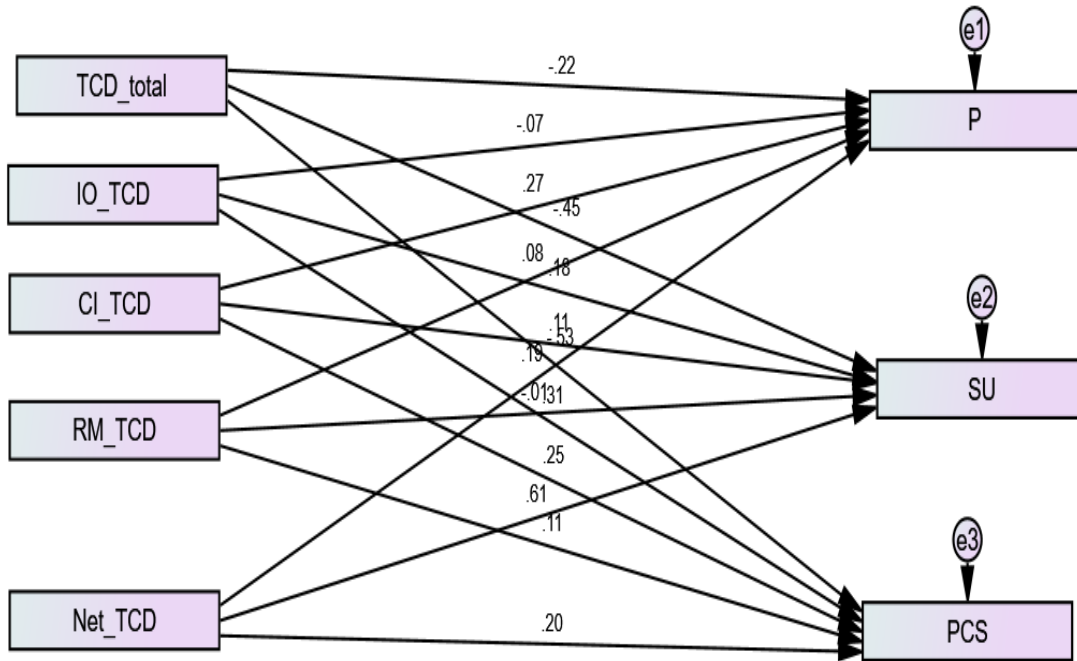
Table 5.12 Path analysis of moderation effect (TCPs)

No. of hypothesis	Path	Estimate	P	Results
H4:1	Int. (Innovation orientation x Technological capabilities) → Profitability	-0.07	0.208	Rejected
H4:2	Int. (Innovation orientation x Technological capabilities) → Sustainability	0.175	0.000	Accepted
H4:3	Int. (Innovation orientation x Technological capabilities) → Customer satisfaction	0.315	0.000	Accepted

H4:4	Int. (Customer intensity x Technological capabilities) → Profitability	0.274	0.000	Accepted
H4:5	Int. (Customer intensity x Technological capabilities) → Sustainability	0.106	0.007	Accepted
H4:6	Int. (Customer intensity x Technological capabilities) → Customer satisfaction	0.253	0.000	Accepted
H4:7	Int. (Risk management x Technological capabilities) → Profitability	0.08	0.159	Rejected
H4:8	Int. (Risk management x Technological capabilities) → Sustainability	-0.014	0.720	Rejected
H4:9	Int. (Risk management x Technological capabilities) → Customer satisfaction	0.110	0.013	Accepted
H4:10	Int. (Networking x Technological capabilities) → Profitability	0.195	0.000	Accepted
H4:11	Int. (Networking x Technological capabilities) → Sustainability	0.605	0.000	Accepted
H4:12	Int. (Networking x Technological capabilities) → Customer satisfaction	0.196	0.000	Accepted

Own editing by researcher (2024).

Figure 5.5 Path analysis of moderation role of TCPs



Own editing by researcher (2024)

Table 5.13 summary of the results

Hypotheses One: The relationship between entrepreneurial marketing and firm performance.	Partially supported
H1:1 There is a positive relationship between innovation orientation and profitability.	Rejected
H1:2 There is a positive relationship between innovation orientation and sustainability.	Accepted
H1:3 There is a positive relationship between innovation orientation and customer satisfaction.	Accepted
H1:4 There is a positive relationship between customer intensity and profitability.	Accepted
H1:5 There is a positive relationship between customer intensity and sustainability.	Rejected
H1:6 There is a positive relationship between customer intensity and customer satisfaction.	Accepted
H1:7 There is a positive relationship between risk management and profitability.	Rejected
H1:8 There is a positive relationship between risk management and sustainability.	Rejected
H1:9 There is a positive relationship between risk management and customer satisfaction.	Rejected
H1:10 There is a positive relationship between networking and profitability.	Accepted
H1:11 There is a positive relationship between networking and sustainability.	Accepted
H1:12 There is a positive relationship between networking and customer satisfaction.	Accepted
Second hypothesis: The relationship between entrepreneurial marketing and technological capabilities.	Partially supported
H2:1 There is a positive relationship between innovation orientation and work remotely capability.	Rejected
H2:2 There is a positive relationship between innovation orientation and artificial intelligent AI.	Rejected
H2:3 There is a positive relationship between customer intensity and work remotely capability.	Accepted
H2:4 There is a positive relationship between customer intensity and artificial intelligent AI.	Accepted
H2:5 There is a positive relationship between risk management and work remotely capability.	Rejected
H2:6 There is a positive relationship between risk management and artificial intelligent AI.	Rejected

H2:7 There is a positive relationship between networking and work remotely capability.	Rejected
H2:8 There is a positive relationship between networking and artificial intelligent AI.	Accepted
Third hypothesis: The relationship between technological capabilities and firm performance.	Partially supported
H3:1 There is a positive relationship between work remotely capability and profitability.	Accepted
H3:2 There is a positive relationship between work remotely capability and sustainability.	Rejected
H3:3 There is a positive relationship between work remotely capability and customer satisfaction.	Rejected
H3:4 There is a positive relationship between artificial intelligent AI and profitability.	Accepted
H3:5 There is a positive relationship between artificial intelligent AI and sustainability.	Accepted
H3:6 There is a positive relationship between artificial intelligent AI and customer satisfaction.	Rejected
Fourth hypothesis: We assume that TCPs can positively moderates the relationship between EM and FP.	Partially supported
H4.1. There is positive moderating effect of technological capabilities on the relationship between innovation orientation and profitability.	Rejected
H4.2. There is positive moderating effect of technological capabilities on the relationship between innovation orientation and sustainability.	Accepted
H4.3. There is positive moderating effect of technological capabilities on the relationship between innovation orientation and customer satisfaction.	Accepted
H4.4. There is positive moderating effect of technological capabilities on the relationship between customer intensity and profitability.	Accepted
H4.5. There is positive moderating effect of technological capabilities on the relationship between customer intensity and sustainability.	Accepted
H4.6. There is positive moderating effect of technological capabilities on the relationship between customer intensity and customer satisfaction.	Accepted
H4.7. There is positive moderating effect of technological capabilities on the relationship between risk management and profitability.	Rejected
H4.8. There is positive moderating effect of technological capabilities on the relationship between risk management and sustainability.	Rejected
H4.9. There is positive moderating effect of technological capabilities on the relationship between risk management and customer satisfaction.	Accepted
H4.10. There is positive moderating effect of technological capabilities on the relationship between networking and profitability.	Accepted
H4.11. There is positive moderating effect of technological capabilities on the relationship between networking and sustainability.	Accepted

H4.12. There is positive moderating effect of technological capabilities on the relationship between networking and customer satisfaction.

Accepted

Own editing by researcher (2024).

CHAPTER VI

DICUSSION AND CONCLUSION

6.0. Introduction

In this final chapter, the findings are discussed concerning previous studies, followed by theoretical and managerial implications of findings, followed by limitations and suggestions for future research, and finally an overall conclusion of the study.

6.1. Conclusion

In conclusion, this study has explored the dynamics of entrepreneurial marketing and its impact on firm performance within the context of Sudanese SMEs. Through comprehensive data analysis and discussion, several key findings have emerged. Our analysis revealed significant relationships between various dimensions of entrepreneurial marketing, technological capabilities, and firm performance indicators such as profitability, sustainability, and customer satisfaction. Notably, we found that technological capabilities play a crucial moderating role in enhancing the effects of entrepreneurial marketing strategies on firm performance, underscoring the importance of integrating technology-driven approaches into marketing initiatives for SMEs in Sudan.

Furthermore, the study highlighted the importance of contextual factors, such as the unique socio-economic landscape of Sudanese SMEs, in shaping the effectiveness of entrepreneurial marketing practices. By addressing these contextual dimensions and leveraging technological resources effectively, entrepreneurs, owners, and managers can develop tailored strategies to enhance organizational performance and gain a competitive advantage in the market. Additionally, our analysis explained the complex relationship between the study variables and dimensions/components of entrepreneurial marketing, revealing how each component interacts with technological capabilities to influence firm performance. Specifically, we found that certain dimensions of entrepreneurial marketing, such as networking and innovation orientation, exhibit varying degrees of dependence on technological capabilities, underscoring the importance of aligning technological investments with specific marketing strategies to maximize their impact on organizational outcomes.

Moreover, our findings underline the pivotal role of technological capabilities as a moderator for enhancing the effectiveness of entrepreneurial marketing strategies, serving as a cornerstone for innovation-driven growth and sustainable competitive advantage in Sudanese SMEs. Overall, this study contributes to the growing body of literature on entrepreneurial marketing and provides valuable insights for practitioners, policymakers, and academics seeking to understand and support the development of SMEs in Sudan and similar emerging market contexts.

❖ Publications

<https://m2.mtmt.hu/gui2/?type=authors&mode=browse&sel=authors10074427>

1. Veres Z. & Fegada A. (2022): The Impact of the Organizational Culture on The Employee's Performance Zain Telecom as a Case Study, Khartoum-Sudan. *European Scientific Journal, ESJ*, 18 (12), 237. <https://doi.org/10.19044/esj.2022.v18n12p237>.
2. Fegada, A., & Daoud, C. (2022). Role of Entrepreneurial Marketing to Attain Competitive Edge. *International Journal of Business Studies and Innovation*, 2(2), 1-12. <https://doi.org/10.35745/ijbsi2022v02.02.0001>
3. Alfateh Fegada & Veres Z. (2021): The effect of after-sales Services in Achieving Competitive Advantage. *Pannon Management Review* Volume 10 • Issue 4 • 49-69.
4. Alfateh Fegada. (2021) Innovative Marketing as An Entrepreneurial marketing Dimension in The Competitive Advantage of Commercial Banks-SDN. *Pannon Management Review* Volume 10 • Issue 4 • 49-69.
5. Alfateh Fegada & Zoltán Veres (2024) The Moderating Role of Technological Capabilities in The Relationship Between Entrepreneurial Marketing and Firm Performance, A Qualitative Approach. *European Scientific Journal, ESJ*, (published in the preprint: www.esipreprints.org).
6. Abdelaziz Hassan & Mustafa Adam & Zoltan Veres & Alfateh Fegada (2022): أثر التسويق الريادي على تحقيق الميزة التنافسية المستدامة (The impact of entrepreneurial marketing on achieving sustainable competitive advantage, a field study on commercial banks in El Obeid City – Sudan) (In Arabic). *مجلة الدراسات التجارية والاقتصادية المعاصرة (Journal of Contemporary Business and Economic Studies)* Vol. (5) No. (1).
7. Alfateh Fegada, (2023) Certificate of excellence in reviewing, of peer reviewing for *Asian Journal of Economics, Business and Accounting*. Certificate No: SDI/HQ/PR/Cert/110317/ALF <https://www.journalajeba.com/>

❖ **Conferences participation**

1. Alfateh Fegada (2021): Innovative marketing in the competitive advantage of commercial banks. *University of Pannonia, Innovációs Konferencia: „A Tűztorony lépcsőin – Továbblépési lehetőségek az innovációban”* Veszprém, 2021. november 23.
2. Alfateh Fegada And Zoltán Veres (2021) The Role of After-sales Support in The Competitive Edge, *Universitatea Babeş-Bolyai, the 5th edition of the International Conference on Economics and Business Management - Romania– ICEBM 2021.*
3. Alfateh Ahmed (2023) The moderating role of technological capabilities in the relationship between entrepreneurial marketing and firm performance - A qualitative approach. *Obuda University, XVIII. FIKUSZ 2023 International Conference.* ISBN 978-963-449-339-6 https://kgk.uni-obuda.hu/wp-content/uploads/2023/11/FIKUSZ2023_abstract_1129.pdf

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Appendix 2. Grounded theory trustworthiness verification: *Qualitative Validity*.

<u>Measures of Trustworthiness</u>	<u>Methods and verification strategies</u>
<p>1. Credibility:</p> <ul style="list-style-type: none"> • Adequacy of the research methods and its components. • Triangulation of data method • Triangulation of respondent • Reflective explanation 	<p>The justification for choosing a qualitative approach is explained along with the research's objective and background. The research methods have investigated what they claim to. The study explained the general research strategy that was designed to accomplish the study's objectives. The sampling approach was wisely chosen.</p> <p>The researcher utilized multiple methods for collecting the data.</p> <p>The study employed respondents from different disciplines.</p> <p>The researcher considered the respondents' emergent thinking and impressions during the discussions.</p>
<p>1. Transferability:</p> <ul style="list-style-type: none"> • How effectively a single study's outcomes from one context will transfer to other contexts 	<p>To broaden the findings' applicability, data were gathered across a variety of contexts and times. Data from each respondent was used to represent theoretical concepts.</p>
<p>2. Dependability:</p>	<p>We highlighted the numerous processes outlined in our methodology section and explicitly described our research processes to create an audit trail. We further increase the transparency of our research process by including tables that explain how the coding scheme was theoretically derived, how it was operationalized, and how it performed.</p>
<p>3. Confirmability:</p> <ul style="list-style-type: none"> • Reflexive analysis 	<p>The goal is to make sure that the results are independent from the researcher's biases. The researcher attempted to accurately record our concerns and biases throughout the study process as part of the reflective analysis.</p>

