Moderating the Impact of E-Commerce Challenges on Adoption: Examining the Moderating Role of General Business Experience in Western, Sierra Leone SMES

Fred Konneh Songa Monson[1], Chrispus Charles Macauley[2]
[1]PhD Student: Enterprise Management, Capital University of Economics and Business, Beijing, China.
[2]Msc Student Telecommunications Management and Administration, Njala University, Sierra Leone.

ABSTRACT
Purposes
The study seeks to examine how SMEs in the Western Area are impacted by e-commerce adoption challenges. Moderating role of general business experience.
Research methodology
Descriptive and inferential statistics were used in the study's quantitative research methodology to reveal complex patterns and relationships. Respondents to a web-based survey using respondent-driven sampling included consultants, IT professionals, and business owners. Underlying patterns and model structure were identified using the Partial Least Square (SEM PLS) method of structural equation modeling in conjunction with path analysis and exploratory factor analysis.
Conclusion
The study reveals a strong positive relationship between e-commerce challenges and adoption rates, with higher challenge levels leading to higher adoption rates. Improved business experiences moderate the impact of e-commerce obstacles. The study emphasizes the importance of addressing e-commerce challenges and utilizing business experience to promote adoption among SMEs in Western Sierra Leone.
Policy implication
This paper highlights the need for improved infrastructure, technology accessibility, and digital literacy for SMEs in Western Sierra Leone, recommending specialized training, evidence-based policies, and a comprehensive strategy.
KEY WORDS: e-commerce adoption, SMEs, Sierra Leone, Western Area, challenges, General business experience, moderation, impact, developing economies.

1. INTRODUCTION

E-commerce is recognized as a new tactic to endure and remain competitive in the incredibly unstable business environment, according to Lekmat (2018). Kabir et al. (2020) describe electronic commerce, commonly abbreviated as e-commerce, as referring to internet-based commercial exchanges. Koe and Sakir (2020) define e-commerce as carrying out commercial transactions online or in digital format. No matter how developed a nation is, e-commerce has been revealed to positively impact economic growth (Kabir et al., 2020; Myovella et al., 2020) and gives businesses the chance to expand and thrive (Koe & Sakir, 2020). One ICT that is assumed to help developing nations overtake developed nations is e-commerce, which raises the GDP of those nations (Kabir et al., 2020). Hendricks & Mwapwele (2024) recognize that e-commerce helps to develop a country by generating jobs and increasing revenue.

Businesses must embrace E-commerce in order to stay relevant and competitive in the global business landscape, which has witnessed a shift from traditional market competition to an environment driven by technology (Koe & Sakir, 2020). E-commerce integration in Small and medium-Sized Enterprises (SMEs) has demonstrated encouraging trends in Africa, supporting economic expansion and giving small companies access to new markets (Lekmat, 2018; Koe & Sakir, 2020).

Because e-commerce lowers costs and broadens their geographic reach, it can be a competitive tool to counteract the resource limitations and size disadvantages faced by SMEs (Abebe, 2014; Lekmat, 2018; Yasin et al, 2014). While SMEs can benefit greatly

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from e-commerce in terms of performance enhancement and competitive advantage, the majority of SMEs are more likely to use the internet for file transfers, email correspondence, and information gathering than for the development of services, business automation, internal business information processing, and other activities (Awa et al, 2015; Lekmat, 2018). SMEs around the world are finding that e-commerce adoption is becoming more and more essential to their ability to stay competitive as the market shifts from traditional to digital platforms (Koe & Sakir, 2020).

Because of things like shoddy infrastructure, expensive costs, and inconsistent internet connectivity, SMEs in developing nations like Sierra Leone experience particular difficulties when attempting to implement e-commerce (Brima & Sesay, 2019). According to Monson (2024) and Monson & Momodu (2024), network coverage, mobile internet access, and other technological difficulties are just a few of the infrastructure, affordability, and accessibility issues that Sierra Leone continues to face. Notwithstanding these challenges, there has been interest in the possible advantages of e-commerce adoption, such as increased market share and improved operational effectiveness (Mayayise, 2024). These difficulties impede company growth and competitiveness and prevent the full realization of the advantages linked with e-commerce (Hassen et al., 2021). The impact of e-commerce challenges on adoption among SMEs in the region is moderating the role of general business experience, is still not well understood despite efforts to address these issues. Sub-Saharan Africa's Sierra Leone offers a unique setting for researching SMEs' adoption of e-commerce, providing insights into the obstacles and moderating the role of general business experience in this industry.

This study is motivated by the urgent need to pinpoint and remove obstacles preventing SMEs in Western Sierra Leone from adopting e-commerce. To effectively develop policies and strategies aimed at improving adoption rates in the region, it is imperative to comprehend the ways in which infrastructure, customer preferences, and geographic location influence the adoption of e-commerce (Brima & Sesay, 2019; Monson, 2024; Koe & Sakır, 2020). This study specifically looks into the moderating impact of general business experience to provide insightful information about how to deal with e-commerce issues. The second goal of this study is to significantly add to the body of knowledge already available about the adoption of e-commerce in Sierra Leone's Western Area. Previous studies, like Brima and Sesay (2019) and Koe and Sakir (2020), assessed their hypotheses using multiple linear regression models and Pearson correlations. This study, on the other hand, uses Structural Equation Modeling using Partial Least Square (SEM-PLS), a technique that is renowned for providing better predictive power and superior latent variable explanatory abilities. Thirdly, this study's theoretical underpinnings the Technological Organization Environment (TOE) and the Perceived E-Readiness model are different from those of earlier research (e.g., Brima and Sesay, 2019; Kabir et al., 2020). This study is especially novel because these models have not yet been used in the context of Sierra Leone's adoption of e-commerce. Lastly, this research adds to the greater conversation about e-commerce adoption in Sierra Leone and related areas by investigating the moderating role of general business experience.

Examining the mediating role of e-commerce obstacles on adoption among SMEs in Sierra Leone's Western Area is the primary goal of this paper. In particular, the study seeks to: Examine how SMEs in the Western Area are obstructed by e-commerce adoption challenges. Examine how general business experience can moderate the effects of e-commerce difficulties on adoption. The following research questions will direct the study in order to fulfill the above-mentioned objectives: What effects do the adoption challenges associated with e-commerce have on SMEs in Sierra Leone's Western Area? In what ways does the relationship between e-commerce adoption among SMEs and its challenges get mitigated by general business experience?

Policymakers, business professionals, and academic researchers interested in promoting e-commerce adoption and SME development in Sierra Leone and comparable contexts should take note of the important implications this study bears. The results of this study can help shape focused interventions meant to assist SMEs in overcoming e-commerce obstacles and utilizing digital technologies for sustainable growth by illuminating the moderating role of general business experience (Brima & Sesay, 2019; Kabir et al., 2020). Furthermore, this study advances our understanding of e-commerce dynamics in the context of developing economies by synthesizing insights from earlier research on e-commerce adoption factors and models (Idris et al., 2017; Hendricks & Mwapwele, 2024). This enhances scholarly discourse and directs practical interventions.

This paper is separated into six main section; section ones provides the pressing need to understand the dynamics of e-commerce adoption in the context of developing economies, framed by a statement of the problem and the motivation for this study, objectives and research questions. The next section presents the literature review section which provides an inclusive synopsis of global trends in e-commerce adoption, with a specific focus on the challenges and progress observed in African countries and the unique insights gleaned from studies conducted in Sierra Leone. Section three focuses on the theoretical framework which integrates the Technological Organizational Environmental Framework (TOE) and the Perceived E-readiness model, laying the groundwork for hypothesis development (Idris et al (2017). Section four clearly set up the map and direction of the research whilst section five presents' data and analysis by shedding light on the empirical findings, followed by section six which is the conclusions

that summarize key insights, highlight theoretical contributions, underscore practical implications, and suggest avenues for future research.

2. LITERATURE REVIEW

E-commerce, according to Kabir et al. (2020), is the practice of selling goods and services online. Koe and Sakir (2020) define e-commerce as conducting business over the Internet or in a digital format. Modern globalization depends profoundly on e-commerce, which helps businesses prosper in a market that is becoming more and more digital. In order to stay relevant and survive, organizations need to adjust to the changing landscape of market competition, which is shifting from traditional to digital platforms (Koe & Sakir, 2020). In developing nations, for example, small and medium-sized enterprises (SMEs) encounter significant obstacles when attempting to implement e-commerce because of things like unstable internet connections, inadequate infrastructure, exorbitant costs, and low technology literacy (Brima & Sesay, 2019). To successfully implement policies that support the adoption of e-commerce, legislators must first identify these obstacles.

Adoption obstacles for e-commerce differ depending on the region, with rural SMEs facing more significant challenges than their urban counterparts (Brima & Sesay, 2019). Moreover, the widespread adoption of mobile devices required for e-commerce transactions is hampered by the lack of appropriate infrastructure, including network coverage, battery life, repair and maintenance, and mobile internet access (Monson, 2024). Targeted policies that support technological innovation and socioeconomic development in developing countries are necessary to address these issues (Monson & Momodu, 2024).

Idris et al. (2017) argue in favor of an integrated model to comprehend the adoption of e-commerce in developing nations, criticizing the prevalent adoption theories. In order to overcome these obstacles, Hassen et al. (2021) highlight the inefficiencies in SMEs' adoption of e-commerce in developing nations and suggest a number of adoption models. Hendricks and Mwapwele (2024) emphasize the interdependence of technology, environment, and customer trust as the three main obstacles preventing the widespread adoption of e-commerce. Mayayise (2024) emphasizes the significance of trust in consumer-to-consumer e-commerce settings and calls for the diversification of methods and factors in future research.

Ayob (2021) and Zain et al. (2020) have both investigated distinct facets of e-commerce adoption and pinpointed a range of factors that foster its expansion. Ayob (2021) claims that e-commerce adoption is more common in specific demographic groups, including women, younger people, more educated, employed, and higher income individuals. The adoption of e-commerce at the national level is also significantly shaped by cultural norms, such as individualism, masculinity, and uncertainty avoidance. In contrast, Zain et al. (2020) concentrated on the adoption of e-commerce by small and medium-sized businesses (SMEs) in a developing country's business services sector. According to Zain et al. (2020), SMEs' decisions to adopt e-commerce are heavily influenced by a number of organizational, technological, and environmental factors. These factors include perceived relative advantage, compatibility, e-commerce knowledge and expertise, external change agents, and competitive pressure.

Using knowledge from Brima & Sesay (2019), Monson (2024), and Koő & Sakır (2020) to identify and eliminate these barriers, this study aims to close the research gap by offering a thorough understanding of the barriers stopping SMEs in Western Sierra Leone from adopting e-commerce. Building on earlier research to provide nuanced perspectives on the role of experiential knowledge in mitigating adoption barriers, it aims to provide useful insights into how SMEs in the region can navigate e-commerce challenges by examining the moderating impact of general business experience (Brima & Sesay, 2019). In addition, unlike previous regression-based methods, this study makes use of Structural Equation Modeling with Partial Least Squares (SEM-PLS) to improve latent variable explanatory abilities and predictive power, providing a more thorough examination of the factors influencing e-commerce adoption (Mseti, 2020). Furthermore, it expands the theoretical underpinning of e-commerce adoption research beyond conventional models (e.g., Brima & Sesay, 2019; Kabir et al., 2020) by introducing the Technological Organization Environment (TOE) and the Perceived E-Readiness model to the context of e-commerce adoption in Sierra Leone's Western Area. The study's innovative methodologies and theoretical frameworks, along with its examination of the moderating role of general business experience, greatly advance the dialogue surrounding the adoption of e-commerce in Sierra Leone and other comparable contexts. This, in turn, informs the development of policies and strategies aimed at promoting economic growth and development in the area.

3. THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

3.1. Theoretical framework

The Technological Organizational Environmental Framework (TOE) and the Perceived E-readiness model are combined into the study's theoretical framework. Idris et al. (2017) claim that the Perceived E-readiness model and the TOE Framework provide a suitable framework for research on SMEs' adoption of e-commerce. The TOE framework, introduced by Tornatzky & Fleischer in

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1990, posits that technological innovation in organizations is influenced by a combination of external environmental factors, organizational factors, and technological factors. According to earlier research (Tornatzky & Fleischer, 1990; Idris, 2015; Monson & Momodu, 2024), decision-makers should take these intricate factors into account when evaluating technological innovation within their organizations. They offer a thorough comprehension of the organizational context, encompassing communication procedures, organizational size, and informal and formal methods (Tornatzky & Fleischer, 1990).The technological context pertains to the features and availability of the technology, while the environmental context includes elements like market structure, government regulation, and technology infrastructure (Tornatzky & Fleischer, 1990; Idris, 2015; Nazir, 2019).

Applying the Perceived E-Readiness approach (PERM) to developing countries is a more advantageous strategy (Idris, 2015). According to Molla and Licker (2005), a comprehensive analysis of the uptake of online commerce in developing countries requires a multi-perspective evaluation that considers managerial, internal organizational, and external contextual factors. According to Molla and Licker's (2005) hypothesis, the model has two crucial constructs for evaluating both internal and external factors. An internal component called perceived organizational e-readiness, is composed of organizational perception, organizational readiness for e-commerce adoption, and manager commitment (Idris, 2015; Monson & Momodu, 2024). Collectively, they offer a comprehensive understanding of the interaction between internal organizational dynamics, external environmental factors, and personal perceptions. This makes it possible to examine how e-commerce challenges mediate adoption while taking general business experience into account as a moderating factor.

3.2 Research hypothesis

E-commerce challenges and e-commerce adoption among SMEs in the Western Area of Sierra Leone

Brima and Sesay (2019) explains the significant challenges that companies in developing nations like Sierra Leone must overcome, including expensive overhead, shoddy infrastructure, and inconsistent internet connectivity. In a similar vein, Monson's (2024) research on the influence of infrastructure on technology adoption emphasizes how important accessibility and infrastructure are in determining adoption trends. However, regardless of a nation's degree of development, (Koe & Sakir, 2020) discovered that e-commerce positively contributes to economic growth (Kabir et al., 2020; Myovella et al., 2020). It is argued that e-commerce is an ICT that can help developing nations overtake developed nations by boosting GDP (gross domestic product) (Kabir et al., 2020). These findings highlight how crucial it is to address e-commerce problems in order to encourage adoption. Hence;

   i.   H1: Is there a significant relationship between e-commerce challenges and e-commerce adoption among SMEs in the Western Area of Sierra Leone
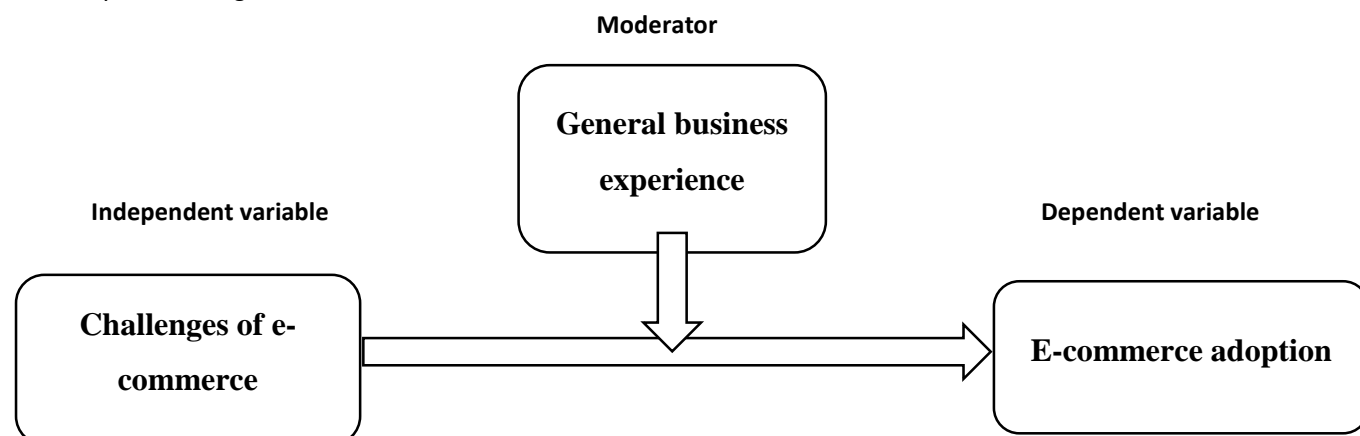
General business experience moderate the relationship between e-commerce challenges and adoption among SMEs in the Western Area of Sierra Leone

According to Koe and Sakir's (2020) research, the factors that drive adoption of e-commerce among Malaysian entrepreneurs are entrepreneurial competence, relatedness, and autonomy. The idea is consistent with the theoretical framework of self-determination theory in entrepreneurship, which holds that general business experience, as a stand-in for entrepreneurial competence and autonomy, may in fact mitigate the impact of e-commerce challenges on adoption (Koe & Sakir, 2020). Hence;

ii.   H2: Does general business experience moderate the relationship between e-commerce challenges and adoption among SMEs in the Western Area of Sierra Leone.

3.3 Research Model

The study's model is given below:

Source: Researchers (2024) compilation based on review of literature

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4. RESEARCH METHODOLOGY

4.1 Design of research

Consistent with earlier studies (Brima and Sesay, 2019; Kabir et al., 2020; Zain et al., 2020), this investigation utilizes a quantitative research methodology to ensure precise and uniform data analysis techniques. This study examines patterns, trends, and relationships in greater detail using both descriptive and inferential statistics, enabling a trustworthy interpretation and well-informed conclusions to be drawn from the dataset (Arshad et al., 2019). A precise representation of the phenomenon under study is made possible by this well-balanced combination, which also enables comparisons with prior studies and, when necessary, the establishment of generalizability.

4.2 Study setting

The research is centered on SMEs in the Western Area, Freetown, Sierra Leone. Responses were found from business owners and employees, business consultants, Information technology service providers and other information technology practitioners in the entrepreneurial ecosystems.

4.3 Sampling strategy

The study employed a web-based sampling technique called respondent driven sampling (RDS) (Wejnert and Heckathorn, 2008). Because Web-based RDS (WebRDS) is online and referral chains can move quickly, studies involving large samples should proceed faster than with traditional sampling methods (Wejnert and Heckathorn, 2008). Heckathorn (1997) and Heckathorn et al. (1999), recommended that respondents who had access to and can shared the google form questionnaire with others and get them to participate as they are within the same sector and network. This was applicable in this study.

4.4 Methods of gathering data

Data on adoption, general business experience, and e-commerce challenges were collected from 121 respondents using a structured questionnaire distributed via Google forms. This strategy allowed for the efficient gathering of data from SMEs in the Western Area of Sierra Leone. Google Forms proved to be an accessible and user-friendly platform, resulting in a higher response rate from the participants.

4.5 Variable measurement

The research used structured questionnaires with a seven-point Likert scale, from "Strongly Disagree" to "Strongly Agree," to gauge participants' opinions about the difficulties of e-commerce, their degree of adoption, and their overall business experience. A five-point grading system was also used to classify general business experience into the following categories: (i) Less than 1 year, (ii) 1-5 years, (iii) 6-10 years, (iv) 11-15 years, and (v) 16 and above. This methodology facilitated the acquisition of nuanced responses and provided the researchers with comprehensive insights into the viewpoints of the participants.

4.6 Methods of data analysis

In order to provide a thorough overview of the significant variables, descriptive, and inferential statistics, this paper used the Structural Equation Modeling on Partial Least Square Method (SEM PLS) using SMART PLS 4 and the Statistical Package for the Social Sciences (SPSS 21) (Monson & Momodu, 2024). To identify underlying patterns and structures, the data was put through exploratory factor analysis and path analysis. According to Pituch & Stevens (2016), exploratory factor analysis is frequently employed early in a study to validate dimensionality and learn more about the connections among a group of variables. The PLS bootstrapping technique was used to assess the model's structure.

5. RESULTS AND DISCUSSIONS

This paper used Wold's (1974) Partial Least Squire (PLS) approach to structural equation modeling (SEM), which has undergone several modifications. Henseler et al. (2009) established that the tool was designed for low-structure, high-dimensional data analysis. First, SPSS21 was used to analyze the respondents' demographic data. Next, an exploratory factor analysis (EFA) was performed using SMART PLS 4 to measure the construct validity and reliability, as well as the underlying factors of the observed items being studied (Mseti, 2020; Monson & Momodu, 2024). Lastly, the PLS bootstrapping technique was utilized to analyze the model's structure.

5.1 Demographic statistics

Gender

Table 1 displays the frequency distribution of respondents' genders. Out of the 121 respondents in the sample, 82 (67.8%) identified as female and 39 (32.2%) as male.

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Age

The age range of 36 to 45 years old comprised the majority of respondents, making up 62 individuals (51.2%). The age group of 46 to 60 years old, which included 33 respondents (27.3%), came next. The age groups of 16–25 and 26–35 years showed smaller proportions, with 11 people (9.1%) and 15 people (12.4%), respectively.

Experience

When it came to business experience, 70 participants (57.9) said they had one to five years of experience; 26 participants (21.5%) said they had six to ten years of experience; and 18 participants (14.9%) said they had less than a year of experience. Furthermore, lower percentages were noted for the 11–15 and 16 and-over groups, with 5 (4.1%) and 2 (1.7%), correspondingly.

Education

In terms of education, the majority of participants 62 (51.2%) had a bachelor's degree. Those with a diploma (30.6%) and master's degree (12.4%) were next in line. Just 7 (5.8%) people reported having other educational credentials.

Type of business

Based on Table 1, the vast majority of participants 96 people, or 79.3% had a sole proprietorship structure. Furthermore, 20 respondents (16.5%) said they were a part of a partnership, whereas only 5 respondents (4.1%) said they were a part of a limited private company.

Table 1: Demographic profile of the respondents

Category	Variable	Frequency	Percentage
Gender	Female	82	67.8
	Male	39	32.2
	Total	121	100
Age	16-25years	11	9.1
	26-35years	15	12.4
	36-45years	62	51.2
	46-60years	33	27.3
	Total	121	100
Experience	Less than 1 years	18	14.9
	1-5years	70	57.9
	6-10years	26	21.5
	11-15years	5	4.1
	16years and above	2	1.7
	Total	121	100
Education	Master	15	12.4
	Bachelor	62	51.2
	Diploma	37	30.6
	Others	7	5.8
	Total	121	100
Business type	Sole Proprietorship	96	79.3
	Partnership	20	16.5
	Limited Private Company	5	4.1
	Total	121	100

Source: Field work (2024)

5.2 Measurement model

5.2.1 Exploratory factorial analysis

In order to determine which variables form logical subsets that are reasonably independent of one another, Tabachnick and Fidell (2013) state that factor analysis is a multivariate statistical technique that can be applied to a single set of variables.

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To investigate the degree of correlation between each indicator and the associated latent construct, a factorial analysis was performed. All indicators showed strong factor loadings for the "Challenges of E-commerce" construct, ranging from 0.810 to 0.909, suggesting a significant contribution to the measurement of the underlying construct. In the same way, all indicators showed significant factor loadings for the "E-commerce Adoption" construct, which ranged from 0.774 to 0.878, demonstrating their strong correlation with the latent construct. These outcomes demonstrate the measurement model's validity and dependability.

5.2.2 Assessment of construct reliability

According to Hair et al. (2010), reliability is the degree to which a variable or set of variables is consistent in what it is intended to measure. Cronbach's alpha is used to assess a questionnaire's reliability (Shrestha, 2021). When Cronbach's alpha, which has a range of 0 to 1, is greater than 0.7, it is deemed acceptable and indicates that the test's items have a high degree of correlation with one another (Lavrakas, 2008).

According to Netemeyer (2003), composite reliability is a gauge of scale item internal consistency.Similar to other reliability metrics, the composite reliability cutoff is set at 0.7. A construct reliability score between 0.6 and 0.7 is considered to be representative (Henseler & Sarstedt, 2013).

In terms of Cronbach's alpha, the Challenges of E-commerce" and E-commerce Adoption variables have values of 0.972 and 0.966, respectively, above the suggested cutoff point of 0.7, indicating excellent internal consistency (Hair et al., 2010; Shrestha, 2021). The composite reliability scores for E-commerce adoption and challenges are 0.969 and 0.975, respectively, above the minimum threshold of 0.7 (Netemeyer, 2003; Henseler & Sarstedt, 2013).

5.2.3 Assessment of construct validity

The Average Variance Extracted (AVE), according to Fornell and Larcker (1981), is a measure of the amount of variance a construct absorbs in comparison to the amount of variance brought on by measurement error. Convergent validity is confirmed if AVE is greater than or equal to 0.5 (Shrestha, 2021). Fornell and Larcker (1981) assert, however, that if the composite reliability is higher than 0.6 and the AVE is less than 0.5, the construct's convergent validity is still sufficient.

The AVE values for both constructs satisfy the necessary requirements in terms of convergent validity. In particular, the AVE is 0.749 for challenges of E-commerce and 0.726 for E-commerce adoption, both exceeding the 0.5 threshold (Fornell & Larcker, 1981; Shrestha, 2021).

The reliability of the constructs was further supported by the calculation of Rho_A values, another measure of internal consistency reliability, which were found to be 0.974 for challenges of E-commerce and 0.967 for E-commerce adoption. All things considered, these findings imply that the measurement model exhibits sufficient validity and reliability for evaluating the relevant constructs. To evaluate discriminant validity between constructs, the Heterotrait-Monotrait Ratio of Correlation (HTMT) was used; values should ideally fall between -1 and 1. (Henseler, Ringle, & Sarstedt, 2015). The HTMT ratio for the relationship between E-commerce adoption and challenges of E-commerce was 0.698, suggesting a reasonably strong correlation between these constructs. Because all HTMT ratios are within the acceptable range and the constructs measure distinct phenomena as intended, these results are consistent with discriminant validity (Henseler et al., 2016).

Table 2: Showing pattern mattrix, construct reliability and validity

Pattern mattrix , construct reliability and validity						
Main construct	Indicator	Factor loadings	Cronbach's alpha	Rho_A	Composite reliability	Average variance extracted
Challenges of e-commerce	q13	0.834	0.972	0.974	0.975	0.749
	q14	0.860				
	q15	0.860				
	q16	0.866				
	q17	0.876				
	q18	0.909				
	q19	0.885				
	q20	0.876				
	q21	0.810				
	q22	0.894				

	q23	0.852				
	q24	0.867				
	q25	0.858				
E-commerce adoption	q1	0.862	**0.966**	**0.967**	**0.969**	**0.726**
	q2	0.873				
	q3	0.878				
	q4	0.854				
	q5	0.864				
	q6	0.774				
	q7	0.861				
	q8	0.876				
	q9	0.853				
	q10	0.803				
	q11	0.877				
	q12	0.841				

Source: Field work (2024)

5.2.4 Model fit

Henseler et al. (2014) introduced the Standardized Root Mean Square (SRMR) as a goodness of fit metric for PLS-SEM to avoid model misspecification. A recent simulation study shows that even fully correctly specified models can yield SRMR values of 0.06 and above (Henseler et al., 2014). Values of less than 0.08 are considered to be a good fit for the SRMR, which is defined as the difference between the observed correlation and the model implied correlation matrix, according to Hu and Bentler (1998).

To evaluate model fit, the SRMR values were computed for the saturated and estimated models. The estimated model's SRMR was 0.060, a little higher than the saturated model's 0.059. The estimated model's chi-square value was 744.136, while the saturated model's was 742.244. Hu and Bentler (1998) state that SRMR values less than 0.08 signify a good model fit. When this criterion is taken into account, the saturated and estimated models both show acceptable fit because their SRMR values are below the cutoff.

5.3 Assessment of the structural model

5.3.1 Collinearity assessment of the structural model

Using the variance inflation factor (VIF), collinearity problems were evaluated for the inner models in line with the suggestion of Kline (2005) and Myers (1990) which state that a tolerance of less than 0.10 or a VIF of more than 10 indicate significant multicollinearity concerns.

As suggested by Kline (2005) and Myers (1990), the VIF was used to evaluate the degree of collinearity within the inner model. It was discovered that the VIF values for the constructs general business experience and challenges of e-commerce were 1.014 and 1.056, respectively. These values show that there are no significant problems with multicollinearity because they are much below the threshold of 10 (Kline, 2005).

Table 3: Showing inner model variance inflation factor

Inner model variance inflation factor	
Construct	**variance inflation factor**
Challenges of e-commerce	1.056
General business experience	1.014

5.3.2 Hypothesis testing

The findings show that obstacles to e-commerce have a significant positive direct impact on e-commerce adoption (β = 0.62, p <.001). The distribution centered around a slightly favourable e-commerce adoption tendency amid challenges is supported by the sample mean (M=0.633) and standard deviation (SD=0.078). Additionally, there is strong evidence to refute the null hypothesis from the t-statistics (t=7.995), which show a statistically significant relationship between the two constructs. This indicates that greater adoption rates of e-commerce are linked to higher levels of perceived challenges.

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The results indicate that general business experience has a significant moderating effect on the relationship between the challenges of e-commerce and e-commerce adoption
(β = -0.288, p <.002). As general business experience increases, the negative impact of perceived challenges on e-commerce adoption appears to be lessened. To put it another way, SMEs with more business experience appear to be better able to manage the drawbacks of e-commerce difficulties and still succeed in gaining traction.

The model explains roughly 56.5% of the variation in the adoption of e-commerce, according to the R-Square value of 0.565.

In conclusion, e-commerce adoption is significantly influenced by its challenges. Additionally, the relationship between e-commerce adoption and its challenges is moderated by general business experience, indicating that adoption is negatively impacted by e-commerce challenges.

Table 4: Showing Path coefficients, Sample mean, standard deviations, T-Statistics and P Values

Main constructs	Path coefficient	Sample mean (M)	Standard deviation	T statistics	P values	Levels of relationship
Challenges of E commerce -> E commerce adoption	0.620	0.633	0.078	7.995	0.000	Significant
General business experience x Challenges of E commerce -> E commerce adoption	-0.288	-0.279	0.092	3.131	0.002	Significant
	R=0.565		Adjusted R=0.553			

Source: Field work (2024)

5.3.3 Prediction relevance and effect size

A nonparametric test can be used to evaluate the study model's predictive relevance (Chin, 1998; Fornell & Cha, 1994; Geisser, 1975; Stone, 1974). Using SMART PLSpredict, the model predictive relevance test was conducted and evaluated according to Shmueli et al. (2019) based on the comparison of RMSE or MAE values between the PLS-SEM analysis and the naïve LM benchmark. From table 5 below, it's clear that the PLS-SEM analysis shows lower RMSE and MAE values than the naïve LM benchmark for most of the indicators. More specifically, when compared to the LM benchmark, the PLS-SEM indicators continuously displayed lower values. As evidenced by lower RMSE or MAE, most indicators show better predictive performance with PLS-SEM; however, one MAE value (q4) was higher than the naïve LM benchmark. Thus, the model can be classified as having medium predictive power according to the criterion given by Shmueli et al. (2019), where the majority of indicators in the PLS-SEM analysis have lower RMSE or MAE values compared to the naïve LM benchmark.

Additionally, every indicator has a Q^2predict value between 0.306 and 0.496. In general, predictive relevance is indicated by a Q^2predict value larger than 0, whereas insufficient predictive power is indicated by a value near 0 or negative (Geisser, 1975). The Q^2predict values for each indicator show that the PLS-SEM model has predictive relevance, indicating that the model can forecast data that is not in the sample with reasonable accuracy.

Finally, Using Cohen's (1988) framework, the relationship between the challenges of E-commerce and E-commerce adoption shows a very strong effect size with an f^2 value of 0.838. F square values above 0.35 are deemed strong, according to Cohen's criteria. This suggests that the obstacles associated with online shopping play a major role in explaining the variance in e-commerce adoption that is seen, thereby having a major effect on the E-commerce adoption. From a practical standpoint, this indicates that shifts in how e-commerce challenges are perceived have a significant impact on e-commerce adoption rates.

Table 5: Showing the predictive relevance of the model

Indicator	Q^2predict	PLS-SEM_RMSE	PLS-SEM_MAE	LM_RMSE	LM_MAE
q1	0.346	1.371	0.991	1.619	1.128
q2	0.429	1.244	0.924	1.315	0.957
q3	0.496	1.167	0.868	1.281	0.970
q4	0.344	1.508	1.211	1.552	1.208
q5	0.388	1.245	0.941	1.322	0.981
q6	0.306	1.362	0.966	1.609	1.164
q7	0.353	1.318	0.939	1.528	1.067

q8	0.408	1.160	0.902	1.378	1.033
q9	0.35	1.167	0.885	1.328	0.989
q10	0.327	1.309	0.931	1.387	1.032
q11	0.385	1.207	0.89	1.330	0.961
q12	0.394	1.198	0.903	1.330	0.988

Source: Field work (2024)

6. CONCLUSIONS AND THEORETICAL CONTRIBUTIONS

6.1 Conclusions

This study examined the moderating impact of e-commerce challenges on adoption, focusing on the moderating role of general business experience. The findings provide valuable insights for promoting e- commerce growth in the Western Area, Sierra Leone and other contexts with similar attributes.

Using factor analysis, Cronbach's alpha, composite reliability, and AVE, the study concludes that there is sufficient validity and reliability in measuring the constructs. As evidenced by the HTMT values falling within the acceptable range, both constructs demonstrated discriminant validity and satisfied the requirements for convergent validity.

Additionally, the saturated and estimated models showed a good fit, with values below the suggested threshold, according to the SRMR model fit assessment. VIF analysis was used to rule out any collinearity issues, as the values were well below the threshold of concern.

The results indicate a strong positive relationship between e-commerce challenges and e-commerce adoption, implying that greater challenge levels correspond to higher adoption rates. The study also shows that there is a significant moderating effect of general business experience on the adoption and challenges of e-commerce relationship. This suggests that improved overall business experiences lessen the negative effects of e-commerce obstacles on adoption. A satisfactory level of explanation is provided by the model, which accounts for about 56.5% of the variance in e-commerce adoption.

In order to promote adoption among SMEs in Western Sierra Leone, the study's conclusion emphasizes the critical importance of addressing e-commerce challenges and utilizing business experience.

The PLS-SEM model, evaluated using SMART PLSpredict, shows lower RMSE and MAE values compared to the LM benchmark. Its predictive performance is better, and Cohen's framework reveals a strong effect size between e-commerce challenges and adoption rates.

6.2 Theoretical contributions

This paper contributes theoretically in a number of ways to our understanding of the dynamics of e-commerce adoption in SMEs, with a focus on Western Sierra Leone. First off, this study provides an extensive theoretical framework for examining the intricacies of e-commerce adoption by fusing the TOE and the Perceived E-readiness model. Tornatzky & Fleischer's (1990) discussion of the TOE framework offers insights into the technological, organizational, and environmental factors influencing adoption. Therefore Idris et al. (2017) proposed the utilization of both Perceived E-readiness model and the TOE, which offers a nuanced understanding of the readiness perceptions crucial for adoption. This research expands the theoretical knowledge of e-commerce adoption by combining internal and external factors through the integration of these frameworks.

Second, the investigation into the moderating influence of general business experience brings fresh perspectives to the body of knowledge on the adoption of e-commerce. By illustrating how general business experience moderates the relationship between e-commerce challenges and adoption, this study adds to the body of research on the importance of entrepreneurial competence and experience, building on the findings of Hassen et al. (2021) and Koe and Sakir (2020). This study provides detailed theoretical insights into the relationship between experience, obstacles, and adoption outcomes by clarifying how SMEs with different levels of experience overcome e-commerce adoption barriers.

Thirdly, the study highlights the significance of methodological rigor in advancing theoretical frameworks, as discussed by Hair et al. (2010) and Henseler et al. (2016), with regard to discriminant validity, reliability, and model fit assessment. This paper enhances the methodological standards in e-commerce adoption research by thoroughly assessing the measurement and structural models. This ensures the validity and reliability of theoretical constructs and empirical findings.

Finally, this paper provides useful insights for policymakers, practitioners, and researchers by clarifying the ways in which e-commerce challenges affect adoption and the moderating effect of general business experience. This study advances theoretical frameworks and offers helpful advice for encouraging SMEs in the region to adopt e-commerce by firmly establishing theoretical insights in empirical data and methodological rigor.

6.3 Implications for practice

The study's conclusions have important ramifications for those working with SMEs in Western Sierra Leone and other comparable contexts to encourage their adoption of e-commerce. First of all, since e-commerce difficulties have a significant influence on adoption, practitioners ought to give priority to resolving these difficulties through focused interventions and support systems. Measures to enhance digital literacy, improve infrastructure, and make technology more accessible can all help reduce adoption barriers and allow SMEs to take advantage of e-commerce's opportunities**.**

Second, practitioners should consider the moderating effect of general business experience when designing their support programs and capacity-building initiatives. The study shows that SMEs with more business experience are better able to handle the challenges of e-commerce and are more skilled at taking advantage of adoption opportunities. Because SMEs have different needs and levels of experience, initiatives to improve e-commerce readiness should provide specialized training and mentorship programs. Practitioners can maximize the impact of capacity-building initiatives and optimize resource allocation by offering tailored support to SMEs according to their degree of business experience.

Thirdly, to develop e-commerce effectively in Western Sierra Leone, practitioners should adopt a contextually aware strategy that considers socioeconomic, cultural, and infrastructure contexts. This approach allows for tailored interventions for SMEs, ensuring equitable, sustainable, and responsive e-commerce development. Strategies should empower marginalized communities, promote inclusive growth, and utilize local knowledge and resources. By understanding the regional environment and implementing customized strategies, professionals can optimize e-commerce advancements and promote equitable economic expansion.

Finally, this study suggests that practitioners can use the findings to develop evidence-based policies to promote e-commerce adoption on regional and national scales. By incorporating theoretical frameworks and empirical findings, comprehensive strategies can be developed, focusing on strengthening digital infrastructure, promoting digital entrepreneurship, and enhancing regulatory frameworks, thereby boosting economic growth and employment

6.4 Limitations for practice

The following were noted as this paper's limitations. First, due to contextual differences in infrastructure, economic conditions, and business practices, the findings may be unique to SMEs in the Western Area of Sierra Leone and may not be directly applicable to SMEs in other regions or countries. Second, despite efforts to guarantee a diverse representation, it is possible that some SMEs have different e-commerce adoption patterns and challenges than those included in the sample, which could impact the generalizability of the findings. Thirdly, the cross-sectional design of the study limits the capacity to evaluate long-term trends or causal relationships over time by capturing a snapshot of e-commerce adoption and challenges at a particular point in time. Lastly, future research could look into other possible moderators or mediators that could help with the creation of focused intervention plans intended to facilitate SMEs' shift to online shopping as well examining other aspects of SMEs.

REFERENCES

1) Abebe, M. (2014). Electronic commerce adoption, entrepreneurial orientation and small and medium-sized enterprise (SME) performance. Journal of Small Business and Enterprise Development, 21(1), 100-116.
2) Awa, H. O., Awara, N. F., & Lebari, E. D. (2015). Critical factors inhibiting electronic commerce (EC) adoption in Nigeria: a study of operators of SMEs. Journal of Science & Technology Policy Management, 6(5), 143-164.
3) Arshad,M.S., Jibran,R. & Qasmi.H.,A. (2019) Consumer's Preferences About Branded Verses Non Branded Mobile Phones in Faisalabad. Science Journal of Business and Management. Special Issue: Pure Marketing and Management. Vol. 7, No. 5, pp. 127-134. doi: 10.11648/j.sjbm.20190705.14
4) Ayob, A., H. (2021) E-commerce adoption in ASEAN: who and where?, Future Business Journal, Springer.
5) Brima, A. S. and Sesay B., (2019) Barriers to E-Commerce Adoption among SMEs in Sierra Leone: The Moderating Role of Geographical Location, International Journal of Science and Management Studies (IJSMS), Volume: 02 Issue: 01
6) Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling: JSTOR.
7) Cohen, J. (1988), Statistical Power Analysis for the Behavioral Sciences, Lawrence Erlbaum,Mahwah, NJ.

8) Fornell, C., & Cha, J. (1994). Partial Least Squares (PLS), unpublished working paper. Ann Arbor: University of Michigan Business School.

9) Fornell, C., & Larcker, D. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. Journal of Marketing Research, 18(1), 39– 50

10) Geisser, S. (1975). The predictive sample reuse method with applications. Journal of the American Statistical Association, 70(350), 320-328.

11) Hair, J. F., JR., Black, W. C., Babin, B. J., & Andersen, R. E., (2010). Mutilvariate data analysis (7th ed.). Upper Saddle River, NJ: Pearson Prentice Hall. 280

12) Hassen, H., Rahim, N.H.B.A., Othman, A.H.A., Shah, A. (2021). A Model for E-Commerce Adoption by SMEs in Developing Countries. In: Alareeni, B., Hamdan, A., Elgedawy, I. (eds) The Importance of New Technologies and Entrepreneurship in Business Development: In The Context of Economic Diversity in Developing Countries. ICBT 2020. Lecture Notes in Networks and Systems, vol 194. Springer, Cham. https://doi.org/10.1007/978-3-030-69221-6_39

13) Heckathorn, Douglas D. 1997. ''Respondent-Driven Sampling: A New Approach to the Studyof Hidden Populations.'' Social Problems 44:174-99

14) Heckathorn, Douglas D., Robert S. Broadhead, Denise L. Anthony, and David L. Weakliem.1999. ''AIDS and Social Networks: Prevention Through Network Mobilization.'' Sociolo-gical Focus 32:159-79

15) Hendricks, S. and Mwapwele, S. D. (2024) A systematic literature review on the factors influencing e-commerce adoption in developing countries, Data and Information Management , Elsevier, https://doi.org/10.1016/j.dim.2023.100045

16) Henseler, J., Dijkstra, T.K., Sarstedt, M., Ringle, C.M., Diamantopoulos, A., Straub, D.W., Ketchen, D.J. Jr, Hair, J.F., Hult, G.T.M. and Calantone, R.J. (2014), "Common beliefs and reality about PLS: comments on Rönkkö & Evermann (2013)", Organizational Research Methods, Vol. 17 No. 2, pp. 182-209.

17) Henseler, J. & Sarstedt M. (2013) Goodness-of-fit indices for partial least squares path modeling, Computational Statistics, Vol. 28 No. 2, pp. 565-580.

18) Henseler, J., Houbona G., Ray P.A. (2016)Using PLS path modeling in new technology research:updated guidelines Industrial Management & Data Systems, Vol. 116 Iss 1 pp. 2 – 20

19) Henseler, J., Ringle, C.M., & Sarstedt, M. (2015). A newcriterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135.

20) Hu, L. and Bentler, P.M. (1998), "Fit indices in covariance structure modeling: sensitivity to underparameterized model misspecification", Psychological Methods, Vol. 3 No. 4, pp. 424-453.

21) Idris, A. (2015), Assessing a Theoretically-Derived E-Readiness Framework for E-Commerce in a Nigerian SME, University of Sunderland, https://www.researchgate.net/publication/282817022_Assessing_a_Theoretically-Derived_E-Readiness_Framework_for_E-Commerce_in_a_Nigerian_SME.

22) Idris, A.; Edwards,H. and McDonald,S. (2017) E-commerce adoption in Developing Countries SMEs: What Do the Prevailing Theoretical Models Offer Us?, International Conference on E-commerce, ICoEC 2017

23) Kabir, A. I.; Jakowan,M.; Bosu, J.; Mohsin,M., and Hamim, R. (2020) The emergence of E-commerce sites and its contribution towards the economic growth of Bangladesh: A qualitative study, Informatica Economică vol. 24, no. 3/2020., DOI: 10.24818/issn14531305/24.3.2020.04

24) Kline, R. B. (2005). Principles and Practice of Structural Equation Modeling. New York: The Guilford Press.

25) Koe, W.L., and Sakir, A., N. (2020) The motivation to adopt E-commerce among Malaysian entrepreneurs, Organizations and Markets in Emerging Economies, Volume 11, Issue 1, DOI: 10.15388/omee.2020.11.30

26) Lavrakas, P.J., (2008) Encyclopedia of survey research methods. SAGE Publications, Thousand Oaks.

27) Lekmat, L. (2018) Antecedents of e-commerce adoption in Thai SMEs, UTCC International Journal of Business and Economics (UTCC IJBE) Volume 10 Number 2, http://www.ijbejournal.com/images/files/800197025c5d524c6105b.pdf.

28) Mayayise, T. O. (2024) Investigating factors influencing trust in C2C e-commerce environments: A systematic literature review, Data and Information Management, Elsevier, https://doi.org/10.1016/j.dim.2023.100056.

29) Molla, A., & Licker, P.S. (2005) 'E - Commerce adoption in developing countries: a model and Instrument', Information & Management, Vol.42, pp. 877 – 899.

30) Monson, F., K.,S., (2024) Accessibility and Infrastructure Impact On Mobile Phones Choices In Developing Economy: Evidence From Sierra Leone, International Journal of Economics, Commerce and Management, United Kingdom ISSN 2348 0386 Vol. 12, Issue 2, page no 163-187. Available: https://ijecm.co.uk/wp-content/uploads/2024/02/12210.pdf

31) Monson, F., K.,S. and Momodu, A., T. (2024) "Exploring the Landscape of Open Access Fibre Optic Cable Network in Sierra Leone", TIJER - TIJER - INTERNATIONAL RESEARCH JOURNAL (www.TIJER.org), ISSN:2349-9249, Vol.11, Issue 2, page no.a336-a347, February-2024, Available :http://www.TIJER.org/papers/TIJER2402043.pdf

32) Mseti S.T. (2020) The role of Innovation and Managerial Capability in the Relationship between Intellectual Capital and Sustainable Competitive advantage, PhD Dissertation, Capital University of Economics and Business, Beijing, China.

33) Myers, R.H. (1990) Classical and Modern Regression with Applications. Boston: PWS-KENT, 1990.

34) Myovella, G.; Karacuka, M. and Haucap, J. (2020) Digitalization and economic growth: A comparative analysis of sub-saharan africa and OECD economies, Telecommunications Policy, Elsevier, Volume 44, Issue 2, https://doi.org/10.1016/j.telpol.2019.101856

35) Nazir M., A., (2019) Factors Affecting E-commerce Adoption Among SMEs. A Case Study Investigation of a Developing Economy Pakistan, a doctoral thesis of Teesside University Business School Teesside University Middlesbrough, United Kingdom.

36) Netemeyer, R. G., Bearden, W. O. and Sharma, S., (2003) Scaling procedures: Issues and applications, Sage Publications, Thousand Oaks, Calif.

37) Pituch, K. A. and Stevens, J.,(2016) Applied multivariate statistics for the social sciences: Analyses with SAS and IBM's SPSS (6th ed.), Taylor & Francis, New York.

38) Shmueli, G., Sarstedt, M., Hair, J.F., Cheah, J.-H., Ting, H., Vaithilingam, S. and Ringle, C.M. (2019), "Predictive model assessment in PLS-SEM: guidelines for using PLSpredict", European Journal of Marketing, Vol. 53 No. 11, pp. 2322-2347. https://doi.org/10.1108/EJM-02-2019-0189.

39) Shrestha, N (2021) Factor Analysis as a Tool for Survey Analysis, American Journal of Applied Mathematics and Statistics, 2021, Vol. 9, No. 1, 4-11.

40) Stone, M. (1974). Cross-validatory choice and assessment of statistical predictions. Journal of the Royal Statistical Society. Series B (Methodological), 111-147

41) Tabachnick, B.G. and Fidell, L.S.,(2013) Using multivariate statistics (6th ed.), Pearson, 2013.

42) Tornatzky, L.G., & Fleischer, M. (1990). The processes of technological innovation. Lanham, MD: Lexington Books.

43) Turban, E., et al. (2018). Electronic commerce: A managerial and social networks perspective. Springer.

44) Wejnert, C. and Heckathorn, D., D., (2008) Web-Based Network Sampling: Efficiency and Efficacy of Respondent Driven Sampling for Online Research, DOI:10.1177/0049124108318333.

45) Yasin, M. M., Alavi, J., Czuchry, A., & Shafieyoun, R. (2014). An exploratory investigation of factors shaping electronic commerce practices in Iran Benchmarking the role of technology and culture. Benchmarking: An International Journal Information Systems Management, 21(5), 775-791.

46) Wold, H. (1974). Causal flows with latent variables: partings of the ways in the light of NIPALS modeling. European Economic Review (5:1), 67-86.

47) Zain, Z.M.; Jusoh, A.A..; Munir, R.I.S.; and Putit, L. (2020) Drivers of E-Commerce Adoption amongstSmall Medium Sized Enterprises (SMEs) inthe Business Service Sector, Journal of International Business, Economics and Entrepreneurship, e-ISSN:2550-1429 Volume 5, 1