



# Customers' perception of e-commerce usage during the Covid-19 pandemic: Evidence from selected online firms in Ghana

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## Abstract:

During the COVID-19 pandemic, an increasing number of people turned to e-commerce to purchase what they needed. Arguably, only a handful of studies have explored the effects of the pandemic on Ghana and Africa as a whole. The primary focus of the study is to investigate consumers' perceptions of e-commerce enterprises in Ghana during the COVID-19 pandemic. The study utilized a quantitative design and adopted a positivism philosophy. Randomly, 200 staff and consumers of e-commerce firms in the Ga East Municipal District in the Greater Accra Region were surveyed for the study. The results were analyzed using multiple regression. The findings indicate that benefits, self-efficacy, and ease of use have a positive and statistically significant relationship with customer perception, whereas trust and security show no statistically significant relationship with customer perception. Furthermore, the study reveals that the COVID-19 pandemic had a positive effect on the operations of e-commerce firms. The recommendation is for firms to develop and establish a pandemic or emergency response strategy and policy to guide their response in terms of communication and business strategy. This proactive approach can help protect their firm and consumers, ultimately boosting growth and sustainability. Additionally, the government is encouraged to invest in ICT infrastructure and provide support to players in the ICT space through favourable tax and regulatory conditions. Such measures would incentivize investments in the sector and contribute to its growth.

## Keywords:

E-commerce; Customer perception; Logistics operations; COVID-19.

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## 1. Introduction

E-commerce has become increasingly popular, especially during the COVID-19 pandemic, as people practiced social distancing (Knott, 2021). Consumers utilize the internet to make purchases, such as food and other essential items, apparel, and entertainment, that they would typically make in stores. In 2022, retail e-commerce sales were estimated to exceed 5.7 trillion U.S. dollars worldwide, and this figure is expected to reach new heights in the coming years (van Gelder, 2023). Businesses in West Africa are also experiencing an increase in internet sales. According to an online survey conducted in 2020 and 2021, 81 percent of Nigerian consumers have increased their online shopping since the outbreak, while Ghana saw a 79 percent increase in online purchases (Agyapong, 2022).

A survey conducted by the Ghana e-commerce Association indicated that e-commerce has seen a significant increase in demand due to the COVID-19 pandemic (Asinor, 2021). Ghana, which previously had low online shopping patronage, has seen a significant increase in sales as consumers avoid retail stores and problems associated with panic buying, such as long queues, panic buying, and conditional sales, among others. Elselund Ewudzie-Sampson, the founder of Big Samp's Market in Ghana, has noticed a significant surge in demand since the outbreak. Her company specializes in market shopping and delivery (Knott, 2021).

Even though the COVID-19 pandemic has led to a lot of growth in e-commerce in Ghana, it has also brought to light problems for businesses that are trying to bridge the digital divide to keep up with the growth. The first is inefficient logistics that affect activities like managing and delivering orders. Secondly, limited technological infrastructure and a lack of basic ICT knowledge to support their operations and facilitate business processes prevented small businesses, especially from profiting from the e-commerce surge (Ansong & Turkson, 2022). Thirdly, unfamiliarity or lack of knowledge about e-commerce prevented many Ghanaian businesses from taking advantage of the e-commerce surge, especially in remote areas. Finally, security issues and cybercrime threats prevented many Ghanaians from fully embracing e-commerce because of online fraud prevalent in Africa (Naab & Bans-Akutey, 2021).

Arguably, only a handful of studies sought to explore the effects of the COVID-19 pandemic on e-commerce in Ghana and Africa as a whole. The majority of the studies reviewed have arguably focused on developed western countries. For example, to gain government support, the US government commissioned a research study on how businesses survived and operated under the COVID-19 pandemic (Sarkis et al., 2020). The handful of e-commerce studies on Ghana (e.g., Aduhene & Osei-Assibey, 2021; Naab & Bans-Akutey, 2021; Amofah & Chai, 2022; Kankam, 2022), on the other hand, were silent on the challenges the e-commerce firms faced during the pandemic. For instance, Aduhene and Osei-Assibey (2021) investigated the influence of COVID-19 pandemic on the food supply chain in Ghana, whereas Kankam (2022) investigated how digital marketing platforms impacted purchase decisions among students during the COVID-19 era. The economic effects of the COVID-19 pandemic restrictions on enterprises and livelihoods were also studied in these studies.

Given the outlined research gaps, it becomes imperative to conduct a study that examines the effect of the COVID-19 pandemic on e-commerce firms in Ghana, focusing on buying and selling online and logistics management of businesses in Ghana during the pandemic. Specifically, this study sought to examine customers' perception of e-commerce usage during the COVID-19 pandemic.

## 2. Background and related literature

Qin et al. (2014) define e-commerce as "the process whereby traditional trade is carried out by electronic methods. The electronic methods refer to electronic technologies, tools, equipment, and systems, including telephone, telegram, television, facsimile, e-mail, electronic data interchange, computer, the communication network, credit card, electronic money, and the Internet, etc." (p.3). E-commerce, at its most basic level, is the



procurement of goods and services and the transmission of payments or data through an electronic network, most commonly the internet.

### 2.1 E-commerce success measurement

E-commerce, like any other digital technology or consumer-based purchasing sector, has evolved. Mobile commerce has grown in popularity as mobile devices have become more common. Thanks to sites like Facebook and Pinterest, social media has become a key driver of e-commerce (Herzallah et al., 2022). Businesses may take advantage of the shifting market to improve their relevance and expand their market in the internet world.

E-commerce platforms are utilized by firms for online marketing, sales, and logistics, promoting economic growth in developing countries and introducing new transaction methods. Boateng et al. (2008) highlight the potential of e-commerce in boosting GDP development and job creation by facilitating trade, boosting exports, and providing local firms with cost savings and exposure to global markets, ultimately boosting foreign exchange profits. E-commerce empowers women and expands educational opportunities, particularly in developing countries. It encourages entrepreneurship and contributes to family income.

### 2.2 Factors impacting e-commerce success

Due to the containment of the virus, millions of people stayed home in early 2020, making digital channels the preferred shopping choice. Due to the scarcity of items and services at various outlets and stores, the lockdowns in the nations influenced customers' purchasing behavior. For this reason, consumers relied on the e-commerce platform to provide for their basic needs (Amofah & Chai, 2022). In June 2020, everyday things like food, apparel, and retail tech items saw extremely high demand, reaching a record 22 billion monthly visits. Retailers rose to the occasion, not only by increasing online sales but also by adopting new technologies that enhanced consumer relationships and convenience (Asinor, 2021). United Nations (UN) economists discovered that despite broad travel limitations, some pre-pandemic big hitters have seen their fortunes reverse in the previous year.

### 2.3 Conceptual framework

A conceptual framework illustrates the connection between the key variables of a study. It demonstrates the relationship between the independent variables (customer perception and the COVID-19 pandemic) and the dependent variable (e-commerce). Customer perception was evaluated using benefits, trust, self-efficacy, ease of use, and security. In other words, it assessed the effect of benefits, trust, self-efficacy, ease of use, and security on the usage of e-commerce services. The relationship between the variables is summarized in Figure 1. TAM and UTAUT guided the study and the conceptual framework.

TAM was selected over other models such as the Theory of Planned Behavior (TPB) and Theory of Reasoned Action (TRA) because it could be adjusted and extended to include trust and risk (Ha & Nguyen, 2019). In other words, TAM suggests that consumers' willingness to use and accept a technology depends on the technology's ability to enhance their performance and the ease with which the technology can be utilized. When clients perceive e-commerce services to be useful (PU) and easy to use (PEOU), the likelihood of using the service increases (Gefen & Straub, 2000). TAM was used to incorporate perceived usefulness (benefits), trust, perceived self-efficacy, perceived ease of use, and perceived security to investigate customer perceptions of e-commerce organizations, as well as the implications of the COVID-19 pandemic on the logistic operations of e-commerce firms.

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Figure 1: Conceptual Framework

Benefit is a person's tendency to use a tool or technology where the technology can help them do activities better. The benefits that consumers feel when shopping online is convenience, which is arguably not available in traditional shopping media. Online purchases can also minimize the uncertainty caused by online shopping (Syahdan, 2021). Extant studies (e.g., Teoh et al., 2013; Pratiwi & Dewi, 2018; Pratama & Suputra, 2019; Syahdan, 2021) consider benefits as a determinant of consumer perception. Hence, it is hypothesized in this study that:

**H1:** *Benefits positively influence consumers' perception of e-commerce enterprises during the COVID-19 pandemic.*

Trust is the level of risk involved in a relationship to get the expected results (Koller, 1988). In the context of online shopping, consumers are constantly faced with the risk of uncertainty, such as payment risk, products, information, time, and psychology, thus providing a sense of discomfort when deciding on an online purchase (Syahdan, 2021). Studies by Teoh et al. (2013) and Syahdan (2021) consider trust as a determinant of consumer perception. This study hypothesizes that:

**H2:** *Trust positively influences consumers' perception of e-commerce enterprises during the COVID-19 pandemic.*

Self-efficacy is a person's perception of doing something. If one can perform a behavior, then it is easy to request the results of such behavior (Bandura, 1977). The results of previous studies showed that self-efficacy affects attitudes and behaviors in different situations (Teoh et al., 2013; Syahdan, 2021). Self-efficacy leads to competency assessments about completing specific tasks and increases confidence to move cognitive resources to successfully perform specific tasks (Syahdan, 2021). Extant studies (e.g., Teoh et al., 2013; Kim et al., 2010; Pratiwi & Dewi, 2018; Syahdan, 2021) consider self-efficacy as a determinant of usage. This study, therefore, hypothesizes that:

**H3:** *Self-efficacy positively influences consumers' perception of e-commerce enterprises during the COVID-19 pandemic.*

Ease of use in the context of technology usage refers to how easily and intuitively users can navigate, interact, and complete transactions on the system (Davis, 1989). It encompasses various aspects of the user interface, design, and functionality that contribute to a seamless and user-friendly experience. When customers find an e-commerce platform easy to use, it positively influences their perception and overall satisfaction. Extant studies (e.g., Teoh et al., 2013; Alyabes & Alsalloum, 2018; Pratiwi & Dewi, 2018; Syahdan, 2021) consider ease of use as a determinant of consumer usage. It is, therefore, hypothesized that:

**H4:** *Ease of use positively influences consumers' perception of e-commerce enterprises during the COVID-19 pandemic.*

Security becomes a set of consumer risk reduction related to individual data privacy and online transactions (Marriott et al., 2017). Teoh et al. (2013) and Syahdan (2021) indicated that security is a guarantee of the

convenience of transactions, the accuracy of transactions, and the ease of using applications that cannot be hacked. Online shopping can guarantee increased security of online shopping sites. There is also a high-risk guarantee and communication system that guarantees confidentiality during the use of such online shopping (Syahdan, 2021). Extant studies (e.g., Teoh et al., 2013; Kim et al., 2010; Syahdan, 2021) consider security as a determinant of consumer usage.

**H5:** *Security positively influences consumers' perception of e-commerce enterprises during the COVID-19 pandemic.*

### 3. Research Methodology

The study adopted a quantitative research design. A quantitative research design operates on inductive logic rather than deductive reasoning, and for that matter, is highly influenced by the quest for generalization, replicability, and numbers (Creswell & Creswell, 2005). Hence, it is suitable to be used in answering the objective of this study.

#### 3.1 Study population and area

The population of this study consists of customers of selected e-commerce firms within the Ga East Municipal Assembly (GEMA). The target population includes over 100 e-commerce firms, 500 e-commerce staff, and over 10,000 e-commerce consumers in the GEMA.

The study was conducted within the Ga East Municipal Assembly (GEMA). This municipal assembly is estimated to have a total population of 186,230 (GEMA, 2023). GEMA is one of the highly urbanized municipalities in Ghana, with about 90% of the population living in urban areas. This high level of urbanization is a reason why the municipality was selected as the study area. Knowing that highly urbanized areas tend to have denser populations, then hypothetically, the need for on-the-go services such as e-commerce is likely to be high.

#### 3.2 Sampling

The study utilized a probability sampling technique to ensure an equal chance of participant selection, a crucial aspect of research, as it was a quantitative method, thereby enhancing the efficiency of the research process (Creswell & Creswell, 2005). The accessible population consisted of over 50 e-commerce firms with over 1,000 consumers within GEMA. GEMA was selected because of its urbanized nature, population, and e-commerce market growth. The area was also chosen due to the proximity, accessibility, and availability of respondents. Two hundred consumers were selected using the convenience sampling technique.

Table 1 provides the breakdown of the category or industry of e-commerce firms selected for the study.

Table 1: *Categories of e-commerce Firms sampled for the study*

Category	Frequency	Percentage (%)
Fashion and accessories	21	41
Electronics	9	18
Essentials (food, healthcare etc.)	7	14
Financial services	6	12
Education and online courses	5	11
Others	2	5
<b>Total</b>	<b>50</b>	<b>100</b>



### 3.3 Data collection instrument

Questionnaires were used for data collection, employing two sets. The first set was directed at consumers of e-commerce services, and the second set was directed at staff of e-commerce firms. The two sets of questionnaires were utilized because the researcher aimed to elicit responses from the perspective of both consumers and staff of the e-commerce firms regarding the study objectives. The questionnaires mainly consisted of closed-ended questions, with only a few open-ended questions. Respondents were required to choose the best response from various alternatives for the closed-ended questions, while they were allowed to provide their opinions on the open-ended questions.

The consumer questionnaire was structured in two parts (Sections A and B). Section A introduced the researcher and the purpose of the study, also soliciting socio-demographic characteristics of the participants. Section B focused on achieving the objective of the study, which sought to examine consumers' perceptions about e-commerce enterprises during the wake of the pandemic. It posed questions aimed at addressing this objective, with the statements adapted from Teoh et al. (2013).

The questionnaire employed closed-ended and 5-point Likert scale statements. The closed-ended questions provided options from which respondents were to choose. The Likert scale responses ranged from strongly disagree (1) to strongly agree (5) and from reduced greatly (1) to increased greatly (5), with respondents indicating their level of agreement to the provided statements.

### 3.4 Data Processing and Analysis

The collected data were entered, coded, and analysed using the Statistical Package for Social Sciences (SPSS). Initially, the data were vetted and cleaned to check for non-response and incomplete responses. Following that, descriptive and inferential analyses were conducted to arrive at the results. Multiple regression was employed to analyze the factors influencing customers' perception in the usage of e-commerce. The independent variable is customer perception, while the independent variables are benefits (B), trust (T), self-efficacy (SE), ease of use (EU), and security (S).

### 3.5 Model Specification

Ordinary Least Squares (OLS) was used to analyse the models and regressions of the study. The model for the study is illustrated as:

$$CP = \beta_0 + \beta_1B + \beta_2T + \beta_3SE + \beta_4EU + \beta_5S + e$$

Where CP = Consumers' Perception

B = Benefits

T = Trust

SE = Self-efficacy

EU = Ease of use

S = Security

e = Error term

$\beta_0$  = Constant

$\beta_1-5$  = Coefficients of variables

#### 4. Analysis of results

The demographic profile of the study’s respondents is presented in Table 2. It shows the gender, age, education, years of e-commerce use, and annual income.

Table 2: Demographic characteristics of respondents

Characteristics	Description	Frequency	Percentage (%)
Gender (n=200)	Male	110	55
	Female	90	45
Age (n=200)	Below 20	30	15
	21 – 30	90	45
	31 – 40	60	30
	41+	20	10
Education (n=200)	Diploma	27	14
	Bachelors	31	16
	Masters	122	61
	Others	20	10
Years of Use (n=150)	Below 1	36	24
	1 – 2	84	56
	3+	30	20
Consumer monthly income	Below 2,000	54	36
	2,000 – 4,000	37	25
	4,001 – 6,000	26	17
	6,001 – 8,000	18	12
	8,001+	15	10

Source: Field Data (2022)

##### 4.1 Reliability analysis

According to Bhattacharjee (2012), reliability is the extent to which the study can be repeated with the same results. The reliability for the survey can be seen as receiving quality answers for the questions and how the researcher was able to get the respondents to understand the questionnaire. To achieve this, the researcher used simple questions and statements. The instruments were also reviewed and piloted to ensure reliability, validity, completeness, and understandability. In addition, a Cronbach Alpha test for reliability was conducted using the Statistical Package for Social Sciences (SPSS) to test the reliability of the study instrument. The Cronbach Alpha for benefits (B), trust (T), self-efficacy (SE), ease of use (EU), security (S), and consumers’ perception (CP) were 0.854, 0.810, 0.690, 0.841, 0.794, and 0.739, respectively. These values are higher than 0.60. This means that the constructs demonstrate reasonably high internal consistencies (Hair et al., 2012).

##### 4.2 Regression analysis

The regression analysis was carried out to test the hypotheses developed for the study. Table 3 shows that the R-square (R<sup>2</sup>) of 0.575 suggests that 57.5% of the variation in e-commerce usage (UE) is caused by benefits (B), trust (T), self-efficacy (SE), ease of use (EU), and security (S). This also suggests that 42.5% is caused by other factors which are not the focus of this study.

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Table 3: *Regression Statistics of E-commerce Usage (UE)*

Model	R	R Square	Adjusted R Square	Standard Error
1	0.596 <sup>a</sup>	0.575	0.504	1.924

a. Predictors: (Constant), Benefits, Trust, Self-Efficacy, Ease of Use and Security.  
b. Dependent Variable: E-commerce Usage

Table 4 shows that the significance F of 0.00 is less than the significance level (0.05). This implies that the model is significant, and the null hypothesis that benefits (B), trust (T), self-efficacy (SE), ease of use (EU), and security (S) have no relationship with e-commerce usage can be rejected. Therefore, benefits (B), trust (T), self-efficacy (SE), ease of use (EU), and security (S) are found to have a relationship with e-commerce usage.

Table 4: *ANOVA of E-commerce Usage*

	df	SS	MS	F	Significance F
Regression	<b>5</b>			<b>46.281</b>	<b>0.000<sup>b</sup></b>
Residual	<b>194</b>				
Total	<b>199</b>				

a. Predictors: (Constant), Benefits, Trust, Self-Efficacy, Ease of Use and Security.  
b. Dependent Variable: E-commerce Usage

As shown in Table 5, the coefficients and p-value of benefits (B), trust (T), self-efficacy (SE), ease of use (EU) and security (S) in terms of consumer perception are indicated.

Table 5: *Regression Coefficients of E-commerce Usage*

Variables	Coefficients	Standard Error	t Stat	p-value
Constant	0.166	0.237	0.720	0.495
Benefits (B)	0.556	0.059	9.568	0.000
Trust (T)	0.063	0.055	1.147	0.000
Self-efficacy (SE)	0.109	0.052	2.151	0.000
Ease of use (EU)	0.195	0.063	3.172	0.002
Security (S)	0.032	0.044	0.759	0.000

Dependent variable = E-commerce Usage (UE)

The summary of the hypotheses analysis results is presented in Table 6.



Table 6: *Summary of Study Hypotheses Results*

<b>Hypothesis</b>	<b>Results</b>
<b>H1:</b> Benefits positively influenced consumer’s perception of e-commerce enterprises during the COVID-19 pandemic.	Supported
<b>H2:</b> Trust positively influenced consumer’s perception of e-commerce enterprises during the COVID-19 pandemic.	Supported
<b>H3:</b> Self-efficacy positively influenced consumer’s perception of e-commerce enterprises during the COVID-19 pandemic.	Supported
<b>H4:</b> Ease of use positively influenced consumer’s perception of e-commerce enterprises during the COVID-19 pandemic.	Supported
<b>H5:</b> Security positively influenced consumer’s perception of e-commerce enterprises during the COVID-19 pandemic.	Supported

## 5. Discussion of findings

This section delves into the analysis presented in the preceding section, aiming to evaluate the research objective, which focused on assessing customers' perception of e-commerce usage during the Covid-19 pandemic: Evidence from selected online firms in Ghana.

The analysis delved into consumers' perspectives on e-commerce enterprises in Ghana during the COVID-19 pandemic, drawing inspiration from the Technology Acceptance Model (TAM). Given its extensive application in studying technology adoption among individuals (Surendran, 2012; Ajibade, 2018), TAM was deemed fitting for examining consumers’ perception towards e-commerce enterprises in Ghana during the COVID-19 pandemic. Table 7 showcases the results of hypothesis testing for the factors employed to assess consumers' perception of e-commerce enterprises in Ghana.

The study revealed a positive relationship between benefits (B), trust (T), self-efficacy (SE), ease of use (EU), security (S), and customers’ perception of e-commerce usage (UE). This aligns with findings in extant e-commerce studies (e.g., Pratiwi & Dewi, 2018; Teoh et al., 2013; Syahdan, 2021). Specifically, the study found that customers’ perception of gaining benefits correlates positively with e-commerce usage, consistent with Teoh et al. (2013), Pratiwi and Dewi (2018), Pratama and Suputra (2019), and Syahdan (2021).

Moreover, trust was identified to have a positive relationship with e-commerce usage, consistent with Teoh et al. (2013), Kim et al. (2010), Pratiwi and Dewi (2018), and Syahdan (2021). However, Alyabes and Alsalloum (2018) found that the perception of trust may have a negative relationship with e-commerce usage.

Customers’ perception of self-efficacy also demonstrated a positive relationship with e-commerce usage, corroborating results from Teoh et al. (2013), Alyabes and Alsalloum (2018), Pratiwi and Dewi (2018), and Syahdan (2021), who discovered that self-efficacy influences customers' perception of e-commerce system usage.

Furthermore, the study unveiled that customers’ perception of the e-commerce system being easy to use has a positive relationship with e-commerce usage, aligning with findings from Teoh et al. (2013), Alyabes and Alsalloum (2018), Pratiwi and Dewi (2018), and Syahdan (2021).

Lastly, the study uncovered that customers’ perception of the system being secure also has a positive relationship with e-commerce usage, in line with Teoh et al. (2013), Kim et al. (2010), and Syahdan (2021).



According to the findings of the e-commerce report of Europe (Lone et al., 2021), the perception of e-commerce during the COVID-19 pandemic was generally positive. Respondents reported a positive public perception of the industry, with a majority also expressing a positive political perception of the sector. The study's findings, corroborating that all the variables forming customers' perceptions, were significant and positively related to e-commerce usage during the COVID-19 pandemic.

## 6. Conclusion and recommendations

The study aimed to investigate the determinants of customers' perception of e-commerce usage during the COVID-19 pandemic in Ghana, utilizing descriptive statistics and hypothesis testing. The research objective was addressed through the application of the Technology Acceptance Model (TAM). A quantitative research approach was employed, involving 200 participants and a structured questionnaire. The findings, including descriptive statistics, hypothesis testing, and multiple regression results, were presented through tables.

The study revealed that customers held a positive perception of e-commerce enterprises during the COVID-19 pandemic. Additionally, it identified that benefits, trust, self-efficacy, ease of use, and security positively influenced customer perception and adoption of e-commerce businesses. Furthermore, the study observed that the COVID-19 pandemic had a positive impact on the operations of e-commerce firms.

### 6.1 Recommendations

Due to the profound impact of the pandemic on e-commerce and the notable successes achieved by e-commerce firms, it is imperative for these entities to develop and implement a comprehensive pandemic or emergency response strategy and policy. This strategic approach aims to ensure business continuity and enhance customer experience and perception. To achieve this, e-commerce firms should prioritize hiring competent staff, especially in the ICT department, to effectively address the challenges posed by emergencies and guarantee satisfactory customer experiences.

Investing in the development of human resources is crucial for overcoming potential scarcity during emergencies and ensuring continued positive customer experiences. Periodic adoption of the latest and state-of-the-art technology, coupled with staff training, is essential for achieving optimal outcomes and meeting organizational objectives in the rapidly evolving digital landscape.

Given the capital-intensive nature of ICT infrastructure, it is recommended that governments actively invest in this sector. Additionally, support for ICT players through favorable tax and regulatory conditions can incentivize further investment. Recognizing the broader economic impact on e-commerce firms within a country, governments should strive to maintain macroeconomic stability and foster growth to bolster e-commerce operations.

At both regional and continental levels, governments should collaborate to develop clear, harmonized, and applicable policies and programs in critical areas such as electronic transactions legislation, digital consumer protection, data privacy and security, and cybercrime legislation. E-commerce firms, in turn, should align their policies and programs with these guidelines to guide and drive their digitalization and digital transformation agenda, enabling them to capitalize on the opportunities presented by the growing digital economy.

In terms of policy suggestions to address the broader impact of pandemics, governments should take immediate action. This includes increasing digitalization and ICT adoption in national and sub-regional transportation and logistics, harmonizing regional responses to pandemics, developing a regional framework for pandemic response, expanding infrastructure, and fostering collaboration among regional health agencies and service providers. These measures will contribute to minimizing the impact of the current and future pandemics, ensuring a more resilient and interconnected global landscape.



## 6.2 Suggestions for future studies

Researchers and practitioners are encouraged to explore the impact of the COVID-19 pandemic on specific industries along the supply chain and e-commerce value chain using qualitative or mixed research approaches. Focus areas could include maritime, transportation (sea, air, rail, and road), finance (banking, insurance, etc.), and other relevant sectors.

A comparative study approach can be adopted to analyze two sectors, industries, or countries, shedding light on the pandemic's effects, the sustainability of gains made, and the strategies employed to address identified challenges. Potential comparisons could involve contrasting countries such as Ghana and Nigeria, sectors like the public and private sectors, and industries including road and air transportation.

Furthermore, researchers and practitioners should consider exploring the mediating and moderating effects of consumer and firm factors, such as gender, age, income, awareness, size, managerial digital knowledge, and experience. Future studies could delve into understanding how e-commerce firms across diverse markets and countries have been impacted by the COVID-19 pandemic and the strategies implemented to navigate these challenges.

Examining the aftermath of the COVID-19 pandemic in relation to businesses is crucial. Researchers can investigate the long-term effects, adaptations, and resilience strategies implemented by businesses throughout the pandemic. This holistic approach will contribute to a comprehensive understanding of the varied impacts and responses within the business landscape.

## Conflict of interest

The authors declare no conflicting interest in the conduct of the study.

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