



Research Paper

# Sustainability of Thai E-commerce Industry among SMEs: A Market Study

<sup>1</sup>Kittiwat Rattanamanee <sup>2</sup>Danny Wong Barrenechea

<sup>1</sup> Prince of Songkla University, Trang Campus, Thailand  
Email ID: kittiwat.rat@gmail.com

<sup>2</sup> Philippine Christian University, Philippines  
Email: dwbateneo1@gmail.com

Corresponding author e-mail: kittiwat.rat@gmail.com

Received: 18/02/2024,

Revised: 23 /04/2024,

Accepted: 09/06/2024

Published: 30/06/2024

**Abstract:** This study aims to examine the factors that influence the E-commerce sustainability of Thai SMEs, explore environmental, social, and economic dimensions to enable practical and sustainable e-commerce, and develop E-commerce sustainability-based economic dimensions for Thai SMEs. This quantitative study collected data from 400 e-commerce entrepreneurs in Thailand using a convenient sampling method. Data were analyzed using descriptive and inferential statistics. The hypotheses were tested using analysis of variance and multiple regression. The findings reveal that environmental, social, and economic factors can explain the variance in the Sustainability of E-commerce among Thai SMES at 63.1 % (Adjusted R<sup>2</sup> = .631). When considering each variable, it is found that economic factors affect the Sustainability of E-commerce among Thai SMES the highest ( $\beta=.53$ ,  $t= 10.80$ , Sig. =.000) at a significance level of .01, followed by the environmental factors ( $\beta=.198$ ,  $t=4.164$ , Sig.=.005) at a significance level of .01; and social factors ( $\beta=.126$ ,  $t=2.831$ , Sig.=.000) at a significance level of .01. The independent variables in the equation explain a variance of approximately 63.1%. Moreover, economic and environmental factors affect the Sustainability of E-commerce among Thai SMES at a significance level of .01, Social factors affect the Sustainability of E-commerce among Thai SMES at a significance level of .05. The Multiple Regression equation shows that the Environmental, Social and Economic factors in the equation can explain approximately 63.1% of the variance.

**Keywords**— E-commerce, Sustainability of E-commerce, Environmental Factors, Social Factors, Economic Factors

## 1. Introduction

Thailand's Industry 4. Regarding zero policies, the government has encouraged electronic activities through E-commerce and Social media applications [1]. In addition, the development of digital structures such as the national fiber optics network, which is known as the nationwide broadband network, has been identified as another crucial factor in Thai Industry 4. no policies to close the digital gap and enhance a country's new economy through e-commerce [2].

Thailand's e-commerce market (large companies and Medium Enterprises) is USD 112,331. In 2019, it was estimated to be 53 million, which was 6. The share of card payments decreased to 1 percent compared with the previous year and constituted 31. 2 percent of GDP. In terms of the e-commerce subsector, B2B e-commerce held the largest market share in 2019, contributing 47. Regarding the

distribution of e-commerce value, C2C E-commerce has the lowest share of 5 percent, while B2C E-commerce has a share of 37. 2 percent, and B2G E-commerce had the highest share of 47. 2 percent [3]. E-commerce activities are mainly directed towards the domestic market, accounting for 91. This represented 3 percent of the total online products and services in 2019 [4].

An analysis of the factors that affect the sustainability of Thai MSMEs e-commerce. To the best of our knowledge, few prior studies have focused on examining e-commerce adoption in Thailand. They employed a survey of customers to investigate the factors that influence online shopping in Thailand, while other studies employed survey data from Thai MSMEs [4]. Factors influencing e-commerce adoption in 400 MSMEs in Thailand. Several researchers have



proposed that Thai MSMEs require organizational readiness. Owing to technological, cultural, financial, and logistical factors, many Thai MSMEs require more readiness to analyze the factors that affect the adoption of e-commerce by Thai MSMEs through ANOVA. They separated their sample of 452 respondents into three categories of e-commerce readiness: innovators, early adopters, early majority, and laggards [5].

ESD helps to achieve practical and sustainable compliance of e-commerce with the environment, society, and economy. Economic sustainability is the way in which business owners should optimize the use of resources in order to make profits and generate enough returns to investors. This means that organizations should pay attention to both short- and long-term objectives by finding ways through which customers get what they pay for and are satisfied with the products and services they receive [6].

This study presents a conceptual framework for sustainable e-commerce by focusing on the optimization of asset utilization and controlling resource consumption. Provocation: This offers targets the optimization of factory production and management costs and quick adjustment to customers' needs and wants, enhancing customer satisfaction, loyalty, and trust through customer service. This makes customers stop shopping online and instead shop for products in physical stores if e-commerce firms are unable to support them [7]. However, as in previous empirical studies that investigated e-commerce adoption by Thai MSMEs, the authors did not pay attention to the E-commerce sustainability-based economic dimensions that can be assessed by the proportion of e-commerce sales to total sales (e-commerce utilization/intensity).

## 2. Literature Background

**Environmental Theory:** The theory used in the e-commerce industry regarding the environment is concerned with the ability of various online businesses to minimize their impact on the environment and even contribute positively towards the conservation of the environment [8].

**Energy Efficiency:** 1) Data Centers: The energy used by data centers can be cut, thus minimizing carbon emissions because data centers use a large amount of energy. Using renewable energy sources and optimizing cooling systems are common strategies; 2) Green Hosting: Selecting web **Digital Products and Services:** Dematerialization is a strategy for providing a digital version of a physical product, for instance, an e-book rather than a book [16]. Thus, e-commerce companies can support environmental responsibility and enhance consumers' trust and satisfaction.

**Social Theory:** Social theory in the context of e-commerce defines the effects of online businesses on society and their interrelations [17].

hosts powered by renewable energy and those that have laid down proper measures to protect the environment [9].

**Sustainable Packaging:** 1) Use of Biodegradable or Recyclable Packaging Materials: The use of packaging materials that can be decomposed or recycled to preserve the environment; 2) Packaging Waste: Decreasing the amount of packaging used and designing the packaging in such a way that it will not be hazardous to the environment [10].

**Efficient Logistics:** 1) Efficient Delivery Routes: Implementation of algorithms to help in the design of efficient delivery routes can minimize the use of fuel and hence emissions; 2) Electric or Hybrid Delivery Vehicles: Replacement of traditional delivery vehicles with electric or hybrid vehicles to minimize emissions of greenhouse gases; 3) Local Distribution Warehouses: Reducing the distance that goods to be delivered have to cover through the establishment of local distribution centers [11].

**Supply Chain Management:** 1) Sustainable Procurement: This entails buying products from suppliers who uphold environmental standards; 2) Traceability: Putting measures that will help sustain environmentally friendly practices through the supply chain [12].

**Waste Reduction:** The two types of strategies are: 1) Product Lifecycle: Involves designing products to have a longer life cycle and encourages reuse and recycling of products; 2) Return Management: Concerns about how returns are managed so that there is efficient disposal of products or resale [13].

**Consumer Engagement:** 1) Awareness Campaigns: Raising the awareness of consumers about sustainable behavior and motivating them to adopt sustainable consumption; 2) Incentives: Providing the customers with the stimuli to encourage them to choose the sustainable option, for instance, offering a discount for the customers who select the slow and green shipping method [14].

**Corporate Responsibility:** 1) Sustainability Reporting: The timely preparation of reports on the environmental issues and sustainable development practices of the company; 2) Certification: Gaining certification such as ISO 14001 to show the company's commitment towards environmental management [15].

**Digital Inclusion:** 1. Accessibility: Websites and online services available to people with disabilities; 2. Broadband Access: Closing the 'digital divide' by increasing access to and use of the Internet [18].

**Consumer Behavior:** 1) Product and marketing adaptation to consumer needs and desires considering privacy issues; 2) Trust and safety: Creating conditions for consumer trust through safe payment methods and company measures protecting consumer data [19].

**Community Building:** 1) Social Media Interaction: Building the community and creating interactions with customers through social networking sites; 2) Customers' Responses: Collecting and implementing customers' suggestions and opinions to enhance products and/or services [20].

**Cultural Sensitivity:** 1. Cultural Sensitivity: This encompasses the aspect of marketing and selling culturally sensitive products and services to people of different cultures and diversification; 2. Localization: This is the adaptation of products and services to suit the culture of specific regions or countries [22].

**Social Impact Initiatives:** 1) Philanthropy: E-commerce companies that give back to society and support social causes; 2) Sustainability: Encouraging ethical consumption and supporting green initiatives. It is thus important for e-commerce businesses to consider these aspects in a bid to create a positive impact on society in terms of trust, embracing minorities, and principles of ethics [23].

### **Economic Theory**

Economic theory in e-commerce deals with the ways in which economic concepts affect and are affected by the e-commerce industry. Market Structure and Competition: 1) Price Competition: Due to the ability to compare prices online, firms are forced to lower their prices to gain market share; 2) Market Entry and Exit: Due to reduced entry and exit barriers, firms can quickly enter and exit the market, thus increasing competition and innovation [24].

**Consumer Behavior and Demand:** 1) Price Elasticity: Consumers are more sensitive to price changes in the e-commerce platform because they can easily compare prices; 2) Convenience and Accessibility: E-commerce enhances consumer demand due to convenience and variety of products that are available [25].

**Economies of Scale:** 1) Operational Efficiency: E-commerce firms can attain lower operational costs than traditional retail outlets because they do not require large infrastructure such as physical stores; 2) Increased Market Access: Visually, e-commerce companies can tap the global market, thus increasing their market size and hence increasing their economies of scale [26].

**Supply Chain and Logistics:** 1) Supply Chain: Many e-commerce companies optimize the supply chain through technology, thereby increasing efficiency and decreasing costs; 2) Inventory Management: The adoption of the just-in-time inventory system and other forms of technology enable firms to regulate inventory levels and avoid wastage and high storage costs [27].

**Employment and Labor Markets:** 1) Change in Work: With e-commerce, there is a change of work from

**Ethical Business Practices:** 1) Fair Labor: This promotion of fair labor practices within the supply chain to encourage the proper treatment of workers as well as ethical sourcing; 2) CSR: This is the involvement of the company in social responsibility projects that include giving a portion of the company's profits to charity or conducting community projects [21].

brick-and-mortar stores to delivery services, stocking of merchandise and technology departments; 2) Gig Economy: This is the emergence of work opportunities where people can work as independent contractors or employers on a short-term basis in areas such as delivery and customer relations [28].

Thus, the principles of economics enable e-commerce companies to comprehend market conditions and improve their performance and competitiveness. The social, environmental and economic factors have made the e-commerce one of the most booming industries in the business environment of Thailand. These factors, on the other hand, not only depict the environments in which the business operates, but also hold great potential for business development. Therefore, these dynamics can enhance the competitiveness and sustainability of e-commerce firms in Thailand. Environmental issues have become a new driving force affecting consumers' buying behavior and business operations. Thai consumers are now more concerned about the environment and support companies that are environmentally friendly. To this end, e-commerce companies in Thailand are finding ways to incorporate green measures into their business operations. For example, most are changing packaging to biodegradable, avoiding plastic waste, and ensuring that there is an effective delivery system to decrease the carbon footprint. Moreover, the Thai government has doubled its efforts to ensure environmental conservation by implementing policies and offers that will make organizations embrace sustainable measures. This is a useful strategy for aligning the company to the environmental concerns and targets of society, as it attracts environmentally conscious consumers and prepares the firm for anticipated changes in environmental policies, thus enhancing sustainability and organizational resilience [29].

Social factors are critical for e-commerce growth in Thailand. The country has a high level of Internet usage, and most of the population is known to be engaged in the use of technology, especially among the youth. The increased adoption of mobile devices, especially smartphones, has increased the uptake of mobile commerce (m-commerce) through applications and mobile friendly websites. Thais are actively engaged in the use of social media, including Facebook, Instagram, and Line, where information concerning business promotion, customer relations, and direct selling is disseminated. E-commerce firms use these sites to interact with many consumers and improve brand equity [30].

This study also shows that cultural factors are essential components of e-commerce. The buying behaviors of Thai people are influenced by factors such as convenience, price, and service delivery. Thus, e-commerce companies that offer localization of products, timely delivery, and targeted advertising are able to stand out from competition. In addition, one cannot overemphasize the role of trust in online transactions because people are prone to fraudulent activities. Thus, secure and efficient payment systems, quality customer service, and the absence of hidden return policies generate consumer trust and motivate them to become loyal customers.

Thailand's economy has greatly boosted its e-commerce business. The middle-class population and the average income of the population are growing, which leads to the enhancement of consumers' purchasing power and the need for new goods and services available on the Internet. Thus, e-commerce businesses have a wider market to explore and bargain for because of reduced economic vulnerability.

Logistics and infrastructure enhance the effectiveness and affordability of e-commerce businesses. The availability of transport facilities, warehouses, and efficient delivery systems helps in the faster and reliable delivery of orders. This improves the satisfaction levels of customers and reduces the expenses of operations, thus enabling businesses to offer cheap prices.

Government policies and regulatory frameworks are also efficient in this regard. Supportive factors that help e-commerce growth include the provision of incentives to digital startups, clear and understandable tax policies regarding online transactions, and strong laws that protect

consumers. In addition, trade policies that enhance the selling of goods and services over the Internet enable Thai firms to tap into and compete in the international market.

This study identifies that environmental, social, and economic factors make Thailand a favorable environment for e-commerce. Therefore, Thai e-commerce firms can improve and develop their operations and strategies in the following ways: these factors not only lead to more fast-paced growth but also guarantee stable development and sustainability in a constantly changing market environment. These trends are expected to grow further in the future and thus help in the growth of the Thai e-commerce market to the advantage of consumers and businessmen.

### **Theoretical Framework**

The conceptual framework presented in Figure 1 illustrates the key factors influencing e-commerce sustainability among Thai MSMEs. It categorizes these factors into three main dimensions: Environmental, Social, and Economic, each of which contains specific sub-factors. This framework highlights the relationships and varying degrees of influence these factors have on achieving sustainable e-commerce practices in the Thai MSME sector.

1. What factors influence the e-commerce sustainability of Thai MSMEs?
2. How should companies focus on the environmental, social, and economic dimensions to enable practical and sustainable e-commerce?
3. How can Thai SMEs achieve e-commerce sustainability-based economic goals?

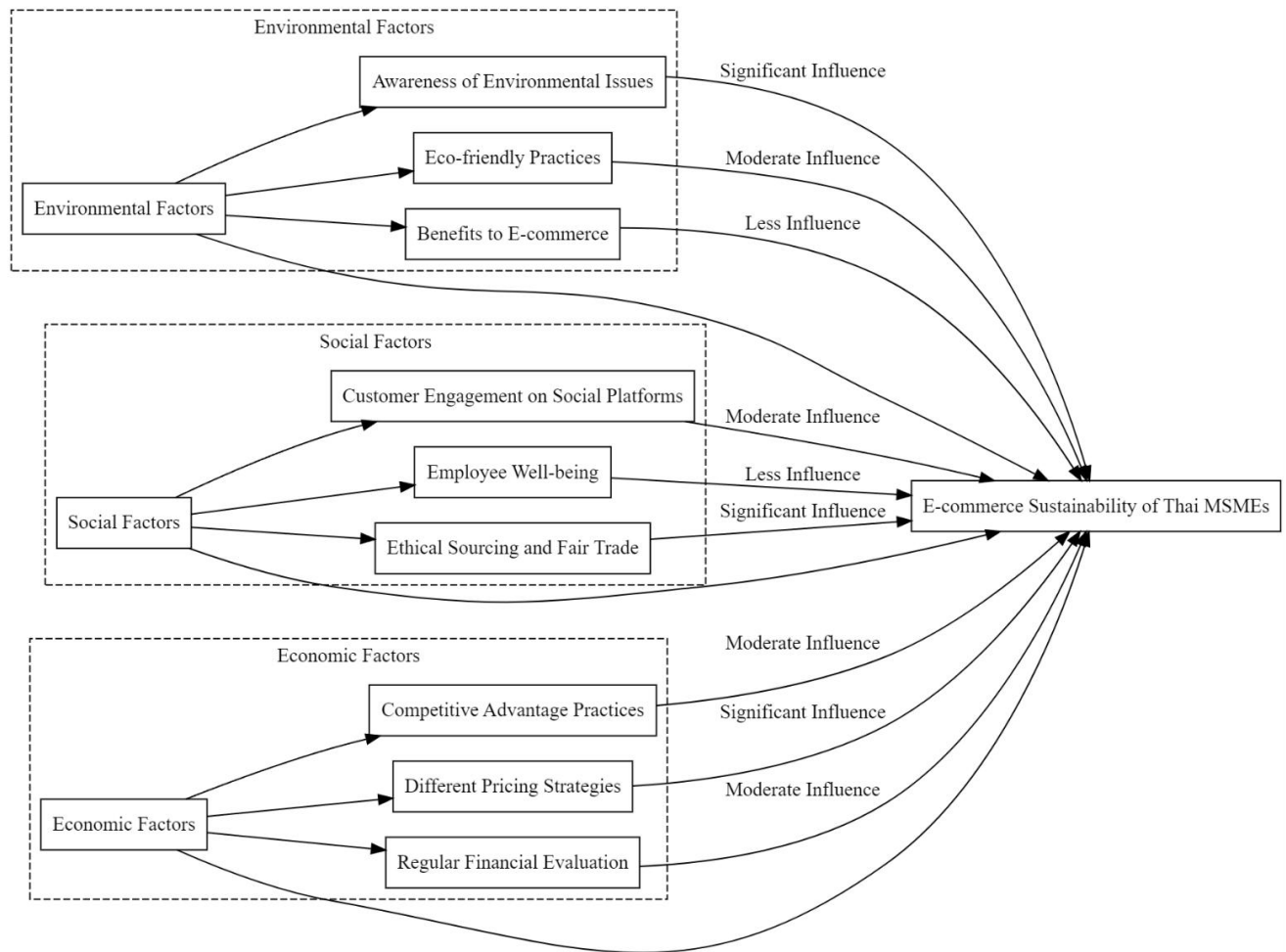


Figure 1: Conceptual Framework

### Statement of Problems

The various problems faced by the E-commerce industry in Thailand are 1) Logistics and Delivery Challenges because Thailand's infrastructure, particularly in rural areas, is underdeveloped, causing delays in delivery times and increasing shipping costs; Major cities like Bangkok suffer from severe traffic congestion, complicating delivery schedules and rising operational costs; Ensuring efficient last-mile delivery is a challenge due to geographic diversity and the need for a widespread distribution network. These delays and high shipping costs can lead to negative customer experiences and companies may need to invest heavily in logistics solutions or partnerships, increasing operational costs [31]. 2) Payment System Limitations: Many consumers are wary of online transactions due to fears of fraud and data breaches. A significant portion of the population is unbanked or prefers cash transactions, limiting the use of digital payment methods and ensuring secure and seamless integration of various payment gateways can be technologically challenging. Therefore, high cart abandonment rates occur due to limited payment options or trust issues with online payments. Businesses lose potential revenue from customers who prefer cash or are not

comfortable with online payments. 3) Regulatory and Compliance Issues because navigating Thailand's regulatory environment, including import/export laws, taxes, and consumer protection regulations, is complex. Regulatory frameworks can change frequently, requiring constant adaptation by businesses, including international transactions, face additional hurdles in customs and duties. This non-compliance can result in fines, legal actions, or operational shutdowns. Significant resources are required to ensure compliance, in addition to operational expenses. 4) Market Competition and Saturation, because the rapid growth of e-commerce has led to a saturated market with many players, including local and international giants. Intense competition often leads to price wars, squeezing profit margins. Establishing and maintaining brand loyalty is difficult in crowded markets. Therefore, businesses may have to lower prices to stay competitive, reduce profitability, and increase spending on marketing and promotions. 5) Consumer Trust and Security Concerns: online fraud and scams are prevalent, damaging consumer trust. The presence of counterfeit goods on some platforms reduces consumer confidence in e-Commerce. There are concerns about data privacy, and the security of personal information deters consumers. Therefore, Low consumer trust can reduce online



shopping. E-commerce platforms face reputational damage if they are associated with fraud or counterfeit products [32]. 6) Technology and Infrastructure Gaps because urban areas have good internet connectivity, and rural areas often lack reliable high-speed internet. The disparity in technological access between urban and rural areas limits potential market reach, and technological advancements require continuous investment. Therefore, E-commerce businesses may struggle to reach a broad audience, particularly in less developed regions. Poor infrastructure can lead to inefficient operations and service delivery. 7) Cultural and Language Barriers because Thailand's diverse linguistic landscape requires businesses to offer multilanguage support. Understanding and catering to local cultural preferences and shopping behaviors can be complex. Failure to communicate effectively with and engage diverse customer bases can limit market success. Businesses must tailor their branding and communication to resonate with the local consumers. 8) Return and refund management because managing returns and refunds involves complex logistics and inventory management. The costs of processing returns and refunds can be high, especially for smaller businesses. Addressing issues related to fraudulent returns adds complexity and cost. These impacts are inefficient return processes that can lead to dissatisfaction and loss of customer loyalty. High volumes of returns can strain the logistics and inventory systems. 9) Customer Service and Support: Because managing a large volume of customer inquiries, especially during peak times, is challenging, ensuring high-quality, timely, and accurate customer support is crucial but resource intensive. Poor customer service can lead to negative reviews and loss of repeat business. Therefore, significant resources must be allocated to maintain effective customer support. 10) Digital Marketing and Consumer Engagement: The digital marketing landscape is constantly evolving, requiring businesses to stay up to date with the latest trends and technologies. Effectively targeting and personalizing marketing efforts for diverse consumer segments is challenging. Creating engaging and relevant content consistently requires creativity and resources. Ineffective marketing strategies can lead to poor brand visibility and engagement. The high costs associated with digital marketing campaigns, especially in competitive markets, can strain budgets. These detailed problem statements highlight the multifaceted challenges faced by the e-commerce industry in Thailand, each requiring strategic planning and targeted solutions [33].

**Objectives :** To examine the factors that influence e-commerce sustainability of Thai SMEs.

1. To Explore the environmental, social, and economic dimensions that enable practical and sustainable e-commerce.
2. To develop e-commerce sustainability-based economic dimensions for Thai SMEs.

### **3. Research Methodology**

This study's population is composed of e-commerce entrepreneurs in Thailand who have registered in the Department of Business Development, Ministry of Commerce. As of December 30, 2023, was 88,379 entrepreneurs (The Department of Business Development, 2023). Yamane (1973) calculated the sample size for quantitative research as 400 samples. A convenience sampling technique was applied. It is beneficial to select accurate respondents who can provide practical information [37]

The researcher designed a questionnaire that targeted a group of teachers and managers. The conceptual framework and research objectives are reviewed. The survey questionnaire design included five aspects: (1) Personal information of the respondents. (2) questions on environmental factors, (3) questions on social factors, (4) questions on economic factors, and (5) questions on the sustainability of e-commerce business. After creating a questionnaire, the researcher tested the content for validity and reliability using three experts to mark [38] under the Item-Objective Congruence Index (IOC) process, which received an IOC score of 0.917, which is a suitable level. After adjusting the questionnaire, the adjusted questionnaire was tested for reliability by distributing 30 questionnaires to the population that had the same characteristics as the sample group, but they were not the sample group of this study. The value of Cronbach's Alpha Coefficient was 0.918, making it suitable for data collection. The researcher used online survey platforms to collect data. Quantitative data will be analyzed by using the statistical system of the SPSS Statistics program. Firstly, data from the questionnaire will be transformed into numbers, making it easier and more convenient for SPSS analysis. Descriptive statistics such as frequency, percent, mean, and standard deviation are used in descriptive analysis. Inferential statistics such as correlation and t-tests analyze the relationship between independent and dependent variables. Lastly, hypotheses will be tested by one-way ANOVA and Multiple Regression with a statistically significant level of 0.05 to exhibit research findings and answer the research questions and hypotheses.

#### 4. Results

Many respondents are female (54.0%) male (39.5%) and other gender (6.5%). Most respondents are 30-40 years (35.8%) followed by age below 30 years (34.5%), age 41-50 years (22.8%) and age 51-60 years are at the least (7.0%). The majority of respondents have college degree education (38.8%) followed by below college degree (28.2%) , bachelor’s degree (26.0%), master’s degree (5.5%) and Doctoral degree (1.5%). Many respondents are managers (51.0%), followed by staff (43.5%) and owner (5.5%). The majority of respondents work in E-commerce business for 4-5 years (35.3%), followed by 1-3 years (30.0%), fewer than 1 year (27.8%), 5-10 years (6.0%) and more than 10 years (1.0%)

#### The Analysis of Environmental Factors

TABLE 1: Analysis of Environmental Factors

Factors	Mean	Standard Deviation	Interpretation
1. Awareness of the importance of environmental issues (Environ1)	4.365	.631	Highest
2. Specific environmental practice is eco-friendly (Environ 2)	4.340	.552	Highest
3. Environmental practice provides benefits to E-commerce (Environ 3)	4.250	.713	Highest
Overall	4.318	.539	Highest

From TABLE 1, the overall environmental factors are in the highest level (M=3.318, S.D = .539). It has been found that the awareness of the importance of environmental issues is at the highest level with the highest mean score (M=4.365, S.D =.631), followed by specific environmental practice is co-friendly (M=4.340, S.D = .552), and environmental practice provides benefits to E-commerce (M=4.250, S.D = .713).

TABLE 2: The Analysis of Social Factors

Factors	Mean	Standard Deviation	Interpretation
1. E-commerce engages with customers on social platforms (Social 1)	4.260	.688	Highest
2. The business supports employee well-being (Social 2)	4.220	.702	Highest

3. The business practices ethical sourcing and fair trade. (Social 3)	4.150	.670	Highest
Overall	4.210	.574	Highest

From Table 2, the overall social factors are in the highest level (M=4.210, S.D=.574). It has been found that E-commerce engagement with customers on social platforms has the highest level with the highest mean (M=4.260, S.D=.688), followed by The business supports employee well-being (M=4.220, S.D =.702), and The business practices ethical sourcing and fair trade (M=4.150, S.D = .670)

#### The Analysis of Economic Factors

TABLE 3: Analysis of Economic Factors

Factors	Mean	Standard Deviation	Interpretation
1. Business implements competitive advantage practice (Econ 1)	4.258	.695	Highest
2. The business used different pricing strategies (Econ 2)	4.298	.656	Highest
3. The business evaluates its financial status regularly (Econ 3)	4.290	.638	Highest
Overall	4.282	.513	Highest

From Table 3.4, the overall economic factors are at the highest level (M=4.282, S.D =.513). It has been found that the business used different pricing strategies has the highest level with the highest mean score (M=4.298, S.D=.656), followed by the business evaluates its financial status regularly (M=4.290, S.D=.638), and The business implements competitive advantage practice (M=4.258, S.D=.695).

#### The Analysis of Sustainability

TABLE 4: Analysis of Sustainability Factors

Factors	Mean	Standard Deviation	Interpretation
1. The business reduces environmental impact (Sustain 1)	4.270	.662	Highest
2. The business practice social responsibility campaign (Sustain 2)	4.378	.613	Highest

3. The business maintains financial profitability (Sustain 3)	4.310	.644	Highest
Overall	4.319	.521	Highest

profitability (M=4.310, S.D=.644), and the business reduces environmental impact (M=4.270, S.D=.662)

**Hypotheses Test**

**Hypothesis 1: Environmental Factors**

**H1: Environmental factors significantly influence the sustainability of E-commerce among Thai SMEs.**

From Table 4, the overall sustainability factors are at the highest level (M=4.319, S.D =.521). It has been found that the business practice social responsibility campaign has the highest level with the highest mean score (M=4.378, S.D=.613), followed by the business maintains financial

TABLE 5: Multiple Regression Analysis between Environmental factors and Sustainability of E-commerce among Thai SMEs

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig	Tolerance	VIF
	B	Std. Error	Beta					
Constant	1.315	.156			8.414	.000		
Environ 1	.281	.077	.240		3.653	.000**	.382	2.619
Environ 2	.220	.078	.234		2.826	.005**	.190	5.272
Environ 3	-.037	.060	-.051		-.627	.531	.195	5.120

R <sup>2</sup> = .634, Adjusted R <sup>2</sup> = .631	F = 228.72	Sig. = .000
**Significant level of .01	*Significant level of .05	

From Table 5, it shows that independent variables, Environmental Factors which includes Awareness of the importance of environmental issues (Environ1), Specific environmental practice is eco-friendly (Environ 2) and Environmental practice provides benefits to E-commerce (Environ 3) can explain the variance of Sustainability of E-commerce among Thai SMES at 48.3 % (Adjusted R<sup>2</sup> = .483). When considering of each variable, it is found that Awareness of the importance of environmental issues (Environ1) affects Sustainability of E-commerce among Thai SMES highest (Beta =.281 , t= 3.654 , Sig. =.000) at significant level of .01, followed by Specific environmental

practice is eco-friendly (Environ 2) (Beta=.220 , t=2.826, Sig=.005) at significant level of .01. However, Environmental practice provides benefits to E-commerce (Environ 3) does not affect Sustainability of E-commerce among Thai SMES at significant level of .05. Therefore, Hypothesis 1 is accepted.

**Hypothesis 2: Social Factors**

**H2: Social factors significantly influence the sustainability of E-commerce among Thai SMEs.**

TABLE 6: Multiple Regression Analysis between Social factors and Sustainability of E-commerce among Thai SMEs

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig	Tolerance	VIF
	B	Std. Error	Beta					
(Constant)	1.754	.142			12.346	.000		
Social1	.196	.035	.259		5.608	.000**	.634	1.576
Social2	.090	.035	.121		2.573	.010**	.611	1.637
Social3	.325	.037	.418		8.742	.000**	.592	1.690

R <sup>2</sup> = .465, Adjusted R <sup>2</sup> = .461	F = 114.63	Sig. = .000
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**Significant level of .01	*Significant level of .05	
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From Table 6, it shows that independent variables, Social Factors which includes E-commerce engages with customers on social platforms (Social 1), The business supports employee well-being (Social 2), and the business practices ethical sourcing and fair trade. (Social 3) can explain the variance of Sustainability of E-commerce among Thai SMES at 46.1 % (Adjusted R2 = .461). When considering each variable, it is found The business practices ethical sourcing and fair trade. (Social 3) affects Sustainability of E-commerce among Thai SMES highest (Beta =.325 , t= 8.742 , Sig. =.000) at significant level of .01,

followed by E-commerce engages with customers on social platforms (Social 1), (Beta=.196 , t=25.608, Sig.=.010) at significant level of .01, and The business supports employee well-being (Social 2) (Beta=.09, t=2.573, Sig.=.000) at a significance level of .01. Therefore, Hypothesis 2 is accepted.

**Hypothesis 3: Economic Factors**

**H3: Economic factors significantly influence the sustainability of E-commerce among Thai SMEs.**

TABLE 7: Multiple Regression Analysis between Economic factors and Sustainability of E-commerce among Thai SMEs

Model	Unstandardized Coefficients		Standardized Coefficients		Sig	Tolerance	VIF
	B	Std. Error	Beta	t			
(Constant)	.943	.139		6.791	.000		
Economic1	.236	.027	.314	8.613	.000**	.746	1.340
Economic2	.354	.028	.446	12.793	.000**	.818	1.222
Economic3	.198	.030	.242	6.579	.000**	.734	1.363
R <sup>2</sup> = .607, Adjusted R <sup>2</sup> = .604				F = 203.55		Sig. = .000	
**Significant level of .01				*Significant level of .05			

From Table 7, it shows that independent variables, Economic Factors which includes The business implements competitive advantage practice (Econ 1), The business used different pricing strategies (Econ 2), and The business evaluates that financial the status regularly (Econ 3) can explain the variance of Sustainability of E-commerce among Thai SMES at 60.4 % (Adjusted R2 = .604). When considering each variable, it is found The business used different pricing strategies (Econ 2), affects

Sustainability of E-commerce among Thai SMES highest (Beta =.354 , t= 12.793 , Sig. =.000) at significant level of .01, followed by The business implements competitive advantage practice (Econ 1), (Beta=.236 , t=8.613, Sig.=.010) at significant level of .01, and The business evaluates its financial status regularly (Econ 3) (Beta=.198, t=6.579, Sig.=.000) at a significance level of .01. Therefore Hypothesis 3 is accepted.

TABLE 8. Multiple Regression Analysis between Independent variable and Sustainability of E-commerce among Thai SMEs

Model	Unstandardized Coefficients		Standardized Coefficients		Sig	Tolerance	VIF
	B	Std. Error	Beta	t			
(Constant)	.663	.141		4.693	.000		
Environ	.198	.048	.205	4.164	.000**	.383	2.611
Social	.126	.045	.139	2.831	.005**	.383	2.610
Econ	.530	.049	.521	10.800	.000**	.396	2.523
R <sup>2</sup> = .634, Adjusted R <sup>2</sup> = .631				F = 228.72		Sig. = .000	
**Significant level of .01				*Significant level of .05			

From Table 8, it shows that independent variables, which include environmental, social, and economic factors, can explain the variance in the Sustainability of E-commerce among Thai SMES at 63.1 % (Adjusted R2 = .631). When considering of each variable, it is found that Economic factors affect Sustainability of E-commerce among Thai SMES highest (Beta =.53 , t= 10.80 , Sig. =.000) at significant level of .01, followed by Environmental factors (Beta=.198 , t=4.164, Sig.=.005) at significant level of .01, and Social factors (Beta=.126, t=2.831, Sig.=.000) at a significance level of .01.

The analysis of Multiple Regression has predicted the Sustainability of E-commerce among Thai SMES from Environmental, Social and Economic factors as follows:

TABLE 9: Regression Variable

Variable	Description
Environ	Environmental factors
Social	Social factors
Economic	Economic factors
Y	Sustainability of E-commerce among Thai SMES

The regression equation is as follows:

$$Y = .631 + .198(\text{Environ}) + .126(\text{Social}) + .530(\text{Economic}) + e(.317)$$

Where:

- $R^2 = .634$
- Adjusted  $R^2 = .631$

The Multiple Regression equation, Adjusted R2 = .631, shows that independent variables in the equation can explain the variance of approximately 63.1%. Moreover, the Economic factors and Environmental affect the Sustainability of E-commerce among Thai SMES at a significant level of .01, Social factors affect the Sustainability of E-commerce among Thai SMES at a significant level of .05

## 5. Discussion

### Hypothesis 1: Environmental Factors

**H1: Environmental factors significantly influence the sustainability of E-commerce among Thai SMEs.**

Environmental Factors which include Awareness of the importance of environmental issues (Environ1), Specific environmental practice is eco-friendly (Environ 2) and Environmental practice provides benefits to E-commerce (Environ 3) can explain the variance of Sustainability of E-commerce among Thai SMES at 48.3 % (Adjusted R2 = .483). When considering of each variable, it is found that Awareness of the importance of environmental issues (Environ1) affects Sustainability of E-commerce among Thai SMES highest (Beta =.281 , t= 3.654 , Sig. =.000) at significant level of .01, followed by Specific environmental practice is eco-friendly (Environ 2) (Beta=.220 , t=2.826,

Sig.=.005) at significant level of .01. However, Environmental practice provides benefits to E-commerce (Environ 3) does not affect Sustainability of E-commerce among Thai SMES at significant level of .05. Therefore, Hypothesis 1 is accepted.

### Hypothesis 2: Social Factors

**H2: Social factors significantly influence the sustainability of E-commerce among Thai SMEs.**

Social Factors which include E-commerce engages with customers on social platforms (Social 1), The business supports employee well-being (Social 2), and The business practices ethical sourcing and fair trade. (Social 3) can explain the variance of Sustainability of E-commerce among Thai SMES at 46.1 % (Adjusted R2 = .461). When considering each variable, we find the business practices of ethical sourcing and fair-trade. (Social 3) affects Sustainability of E-commerce among Thai SMES highest (Beta =.325 , t= 8.742 , Sig. =.000) at significant level of .01, followed by E-commerce engages with customers on social platforms (Social 1), (Beta=.196 , t=25.608, Sig.=.010) at significant level of .01, and The business supports employee well-being (Social 2) (Beta=.09, t=2.573, Sig.=.000) at a significance level of .01. Therefore, Hypothesis 2 is accepted.

### Hypothesis 3: Economic Factors

**H3: Economic factors significantly influence e-commerce sustainability among Thai SMEs.**

Economic Factors which include The business implements competitive advantage practice (Econ 1), The business used different pricing strategies (Econ 2), and The business evaluates its financial status regularly (Econ 3) can explain the variance of Sustainability of E-commerce among Thai SMES at 60.4 % (Adjusted R2 = .604). When considering each variable, it was found that the business used different pricing strategies (Econ 2), affecting the Sustainability of E-commerce among Thai SMES the highest (Beta =.354, t= 12.793, Sig. =.000) at significant level of .01, followed by The business implements competitive advantage practice (Econ 1), (Beta=.236 , t=8.613, Sig.=.010) at significant level of .01, and The business evaluates its financial status regularly (Econ 3) (Beta=.198, t=6.579, Sig.=.000) at a significance level of .01. Therefore Hypothesis 3 is accepted. Independent variables, which include environmental, social, and economic factors, can explain the variance in the Sustainability of E-commerce among Thai SMES at 63.1 % (Adjusted R2 = .631). When considering of each variable, it is found that Economic factors affect Sustainability of E-commerce among Thai SMES highest (Beta =.53 , t= 10.80 , Sig. =.000) at significant level of .01, followed by Environmental factors (Beta=.198 , t=4.164, Sig.=.005) at significant level of .01, and Social factors (Beta=.126, t=2.831, Sig.=.000) at a significance level of .01. The independent variables in the equation explain a variance of approximately 63.1%. Moreover, the Economic factors and Environmental affect



the Sustainability of E-commerce among Thai SMES at a significant level of .01, Social factors affect the Sustainability of E-commerce among Thai SMES at a significant level of .05

## 6. Conclusion

This study aims to investigate the factors influencing the sustainability of e-commerce among Thai SMEs, focusing on environmental, social, and economic dimensions. Quantitative analysis conducted on data from 400 e-commerce entrepreneurs in Thailand revealed significant insights into the determinants of sustainable e-commerce practices. The findings highlight that economic factors have the most substantial impact on e-commerce sustainability among Thai SMEs with a beta coefficient of 0.53. This indicates that businesses that focus on competitive advantage practices, diverse pricing strategies, and regular financial evaluations are more likely to achieve sustainable operations. Environmental factors, particularly awareness of environmental issues and eco-friendly practices, also play a crucial role, albeit to a lesser extent, with a beta coefficient of 0.198. Social factors, including customer engagement on social platforms, employee well-being, and ethical sourcing, contribute to sustainability, but have a relatively lower impact (beta coefficient = 0.126). The results underscore the importance of a multifaceted approach to achieving e-commerce sustainability.

Thai SMEs should prioritize economic strategies that enhance competitive advantage and financial health, while integrating environmental and social practices into their operations. This holistic approach not only ensures long-term viability but also aligns with growing consumer demand for sustainable business practices. Moreover, the study suggests that policy interventions and support from the Thai government can further enhance e-commerce sustainability by addressing logistical, regulatory, and technological challenges. Providing incentives for digital startups, ensuring robust consumer protection, and enhancing infrastructure, especially in rural areas, can contribute significantly to the sustainable growth of the e-commerce sector. Economic, environmental, and social factors significantly influence the sustainability of e-commerce among Thai SMEs. Businesses that effectively integrate these dimensions into their strategies are more likely to achieve sustainable growth and remain competitive in a dynamic e-commerce landscape. Future research could explore the longitudinal impact of these factors, and the role of emerging technologies in enhancing e-commerce sustainability.

**Author Contributions:** Kittiwat Rattanamanee: Conceptualization, methodology, data collection, data analysis, and writing of the original draft. Dr. Danny Wong Barrenechea: Supervision, validation, and review and editing of the manuscript.

**Data Availability:** Data are available upon request.

**Conflict of Interest:** The authors declare no conflicts of interest.

**Funding:** This study received no external funding.

**Similarity Checked:** Yes.

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