# FACTORS INFLUENCING E-COMMERCE TAX ADMINISTRATION: A GOVERNANCE AND REGULATION PERSPECTIVE

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## Abstract

This study examines the main factors affecting tax management in e-commerce activities in Vietnam. Our research team employed a combination of quantitative and qualitative analyses using structural equation modeling (SEM) and various analytical tools available through Stata software. A survey sample of 342 participants, including individuals, business households, enterprises engaged in e-commerce activities, and tax officials, revealed that factors related to the specific collection characteristics of e-commerce taxation negatively impact tax management effectiveness. In contrast, other factors such as legal regulations and policies of tax, taxpayer awareness, quality of human resources, tax socialization activities, and application & development of technology contribute positively to tax administration efficiency. Among these, the quality of human resources is found to have the most significant influence on management effectiveness. Based on these insights, we discuss potential solutions to enhance the quality and effectiveness of tax administration in Vietnam, such as improving the regulatory framework to address loopholes in e-commerce taxation, leveraging advanced technologies, and strengthening the capacity of tax officials through specialized training programs. Additionally, promoting taxpayer awareness and fostering collaboration between regulatory agencies and digital platforms can further enhance governance in tax administration, ensuring a more transparent and efficient system (Giang, 2023; Adelakun et al., 2024; Qinyuan et al., 2024).

**Keywords:** E-Commerce, Tax Administration, Taxation of E-Commerce

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# 1. INTRODUCTION

The advancement of information technology has brought extensive changes to numerous industries, particularly commerce, where digital transactions have increasingly become the primary mode of exchange. In brief, e-commerce, which began with the application of electronic data interchange (EDI) technologies, has grown as a crucial economic sector. Today's e-commerce ecosystem includes various transaction models, such as business-to-business (B2B), business-to-consumer (B2C), and business-to-government (B2G), that enable the global exchange of goods and services without containment by geographical boundaries (Sutrisno et al., 2024; Wulfert & Dennhardt, 2023). While the growth of e-commerce offers many economic opportunities, it also poses substantial challenges in tax administration, in particular in the context of cross-border transactions and the increasing anonymity associated with digital transactions.

From a practical perspective, the rapid proliferation of e-commerce has created complications in attempts to administer tax worldwide. Even while e-commerce reduces transaction costs and increases market efficiency; it also erodes conventional tax systems for many factors, such as anonymity in digital transactions, various modes of making payments, and the non-existence of physical presence. In this regard, some countries, such as China and the United States, have devised regulatory frameworks with the aim of better addressing the peculiar tax challenges thrown up by e-commerce. The inability of tax authorities to identify taxable entities is on the rise as more companies shift their activities from brick-and-mortar stores to digital platforms, invoking various jurisdictions. This development is further compounded by the growing use of digital currencies and alternative payment systems, reducing further the transparency of transactions and making attempts to impose tax compliance even more difficult.

Academic research related to tax administration in e-commerce activities has remained at its foundation in Vietnam. While some studies cover the overall impact of e-commerce on the economy, few focus on the issues faced in that particular sector. For example, Nguyen and Le (2019) emphasize that despite the rapid growth pace of the Vietnamese e-commerce market, the institutional framework for taxing e-commerce activities remains inadequate. This reflects the global trend whereby developing countries such as Vietnam lag behind other developed nations in instituting sustainable tax policies for e-commerce. As cross-border e-commerce grows, the need for a comprehensive understanding of tax management in this area becomes increasingly urgent. Efficient management of taxes means ensuring fair competition between businesses operating in both the digital and traditional spheres and thus ultimately sustaining revenue streams with the shift toward a digital economy.

From the above discussion, this study, based on some theories, aims to analyze the factors affecting tax administration in e-commerce activities in Vietnam. Besides, the research constructs models to test and evaluate the impact of different factors on the effectiveness of tax administration and provides recommendations for improving the system of tax administration in Vietnam due to the development of e-commerce.

The rest of the paper is structured as follows. Section 2 reviews the relevant literature concerning tax administration in e-commerce, setting out the key factors impacting tax compliance and efficiency. Section 3 describes the research method, covering the data-gathering approach, sampling strategy, and type of analysis carried out. Section 4 provides the results of the statistical analysis. Section 5 discusses implications for the literature and practical relevance for tax administration in Vietnam. Section 6 summarizes the most important messages with suggestions for the direction of further research.

# 2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

## 2.1. Literature review

The digital economy is driven by digital technologies, including e-commerce, digital platforms, and virtual currencies. However, these innovations have blurred the boundaries of traditional tax jurisdictions, creating complexities in determining tax obligations and enforcement mechanisms (Adelakun et al., 2024). Within the European Union, Smyrnova et al. (2023) indicate that countries have different tax regulations and policies, which sometimes make it difficult for businesses to transact across borders within the bloc, allowing them to take advantage of legal loopholes to reduce or avoid paying taxes, especially through tax havens or complex financial strategies. Liu (2020) and Lipka (2022) have affirmed that the development of e-commerce has created many new challenges for businesses and management agencies in all aspects of economics, technology, society, and especially tax management in e-commerce.

In Nigeria, Shagari (2014) studied the determinants of tax administration efficiency by measuring factors such as the use of information and communication technology in tax administration, audit performance, and taxpayers' perception of corruption. The study data were collected through surveys and interviews with 124 tax authorities and taxpayers. The results of the study showed that there was only a significant relationship between the use of information and communication technology; there was no significant relationship whatsoever between tax administration efficiency and strong audit practices or taxpayers' perception of corruption. The research model is based on the modification of the model by Muturi and Kiarie (2015), studying the impact of the online tax system in terms of online tax payment, online tax registration, and online tax surcharge for tax procedures. The study also points out the limitations of online tax research and the remittance regime of taxpayers related to the reversal of tax planning and implementation plans of tax administration agencies. At the same time, it also confirms that technology enhances the productivity of tax collection and that tax administration can be effectively implemented in tax planning and implementation, thereby ensuring easy tax collection. In addition, studies by Mas and Varala (2021) and Qinyuan et al. (2024) also emphasize the difficulties arising from the digital and cyber nature of e-commerce activities. From here,

the above formulas have created problems for the tax base, requiring the capacity and expertise of tax departments to be constantly cultivated and improved. At the same time, the application of information technology, such as big data, blockchain, and chatbots, is also considered a useful tool to help increase management efficiency (Giang, 2023).

Several studies conducted after 2020 highlight the importance of information technologies (IT) in tax efficiency and compliance. For instance, a study by Rahayu and Kusdianto (2022) emphasizes that the integration of cloud-based tax filing systems significantly improves taxpayer compliance by reducing administrative burdens and errors. Moreover, the shift towards digital tax payment systems has led to greater transparency and traceability in financial transactions (Ariyibi et al., 2024).

To address the difficulties in the management process, propaganda work needs to be strongly promoted, as well as to improve taxpayers' tax compliance behavior, thereby reducing the burden on tax authorities (Zhiwei et al., 2020). Recent research results by Toly et al. (2023) also show that increasing public awareness and tax knowledge will positively affect tax compliance, thereby actively supporting tax management activities of competent authorities, thereby contributing to the development of a sustainable and effective tax system. In doing so, increasing tax socialization is considered an important factor in raising taxpayers' awareness of their obligations (Lutfi et al., 2023).

Furthermore, within the European Union, tax compliance challenges arise due to varying regulations across member states. Smyrnova et al. (2023) discuss how digital taxation frameworks and IT-based solutions, such as electronic invoicing and digital tax reporting, mitigate tax evasion risks. These solutions enable governments to track transactions in real-time and close loopholes exploited by businesses operating across borders. The increasing digitalization of tax administration underscores the need for continuous improvements in IT infrastructure. Research by Qinyuan et al. (2024) supports this perspective, highlighting the importance of cybersecurity measures in protecting sensitive taxpayer data. As cyber threats evolve, governments must integrate robust IT security strategies into their tax systems to ensure data integrity and taxpayer confidence.

While the importance of tax knowledge on tax compliance behavior has been demonstrated by several researchers, the early work of Eriksen and Fallan (1996) supports the principle that taxpayer compliance can be improved through better tax knowledge. The study by Giang (2023) has been published on the topic that taxpayer awareness is the foundation of tax compliance, including taxpayer recognition, and attitudes toward tax compliance. The other empirical study that found a significant positive impact of tax knowledge on tax compliance is Andreas and Savitri (2015). However, some studies have found mixed results on the relationship between tax awareness and tax compliance. Others have found a weak correlation between tax knowledge and tax compliance attitudes (Cvrlje, 2015).

## 2.2. Hypothesis development

### 2.2.1. Legal regulations and policies of taxation on e-commerce

The findings by Mitra and Stern (2003) depict that e-business registration, information storage, and control avoid tax fraud incidence, establishing the positive correlation between regulatory opacity and loss revenue minimization. Slemrod et al. (2001) have also pointed out the aspect that harsh tax policies for online transactions yield positive results, at least when transparency of payment of tax is ensured, and thereby can be an incentive to businesses to improve compliance. Moreover, in the context of China, Li and Lin (2016) have also highlighted that clear legal regulations help prevent tax evasion and enhance governmental administrative efficiency. Adelakun et al. (2024) stated that the development of digital commerce has blurred traditional tax boundaries, enabling businesses to easily exploit legal loopholes to reduce tax obligations, leading to revenue losses for the state budget. Data-driven policy reforms and real-time analytics will help the government better track e-commerce transactions. A good example is the Australian Taxation Office, which has devised appropriate tax policies concerning e-commerce, which benefit both the regulators and the businesses operating in the digital market. From these models, the hypothesis is proposed as follows:

*H1: Legal regulations and policies of taxation on e-commerce have a positive impact on the effectiveness of tax administration in e-commerce activities.*

### 2.2.2. Taxpayer awareness

Taxpayers' awareness and compliance in fulfilling their tax obligations not only depend on the provisions of the state tax law such as collection methods, tax rates, inspections, and penalties, but also depend on the will of the taxpayers, that is, the level of taxpayers will comply with tax laws (Antoa et al., 2001). Nur-Tegin's (2008) study highlighted the strong impact of corruption on taxpayers' tax compliance when conditions permit. In the case of Malaysia, the percentage of corporate revenue is regularly extracted annually to bribe government officials to conceal revenue that should be reported for tax purposes. In the case of taxpayers identifying tax regulations, having good financial potential, being propagated, and being supported by the tax authority has a positive relationship with tax administration efficiency (Ngo et al., 2023). The results of this study are consistent with the study conducted by Rendy and Irawati. (2019) who found that the understanding of tax regulations significantly affects the compliance of taxpayers. However, contrary to the study conducted by Arisandy (2017), taxpayers' understanding of tax regulations on online business activity regulations does not significantly affect individual taxpayers' compliance in Pekanbaru. Based on this, the paper proposes the following hypothesis:

*H2: Taxpayers' awareness has a positive impact on the effectiveness of tax administration in e-commerce activities.*

*Legal regulations and policies of taxation on e-commerce*

Previous studies have investigated the impact of legal solutions and tax policies on taxpayers' awareness to improve tax administration efficiency. The findings of Sapiei et al. (2014) indicated that tax complexity, tax mechanism, tax deterrence, tax law fairness, and tax psychological costs have a significant relationship, including at least one type of non-compliance. The results of the study indicate that simplifying the tax system would have a positive impact on public relations strategies and establishing a more comprehensive charter for taxpayers to understand and comply with regulations for tax compliance. Mararia (2014) previously studied the integrated tax management system (ITMS) of tax collection of small and medium enterprises in Nairobi and also found that penalties and fines have a very significant relationship with taxpayer compliance awareness. Another study by Siahaan (2013) found an indirect effect of tax transparency on voluntary compliance through trust. This finding is consistent with Rawlin (2008), which found that governments with relatively high levels of tax transparency showed a greater trust and would be able to achieve greater voluntary compliance from taxpayers. In line with previous studies, the research team proposed the following hypothesis:

*H2.1: The legal regulations and policies of taxation on e-commerce have a positive impact on taxpayer awareness.*

*Tax socialization activities*

Kirchler (2008) indicates that increased tax socialization efforts such as guidance, support, and transparent communication positively influence tax compliance awareness. Ajzen's (1985) theory of planned behavior further supports this by explaining that tax authorities' provision of information and assistance through socialization programs raises taxpayer awareness of tax obligations, fostering compliance intentions and behaviors. Alm et al. (2012) suggest that penalties have a stronger impact on compliance awareness when paired with a high audit rate. Torgler (2007) notes that taxpayers' willingness to cooperate with tax authorities increases when tax authorities offer timely and comprehensive guidance on tax regulations, positively influencing compliance awareness. Feld (2006) finds that when taxpayers perceive tax compliance as a social duty recognized by the community and tax authorities, their compliance awareness and motivation can be reinforced. However, a lack of transparency and guidance from tax authorities may diminish this motivation, resulting in a negative relationship with compliance awareness. Based on these models, the following hypothesis is proposed:

*H2.2: Tax socialization activities have a positive impact on taxpayer awareness.*

*E-commerce tax collection characteristics*

E-commerce has a globalized nature, meaning it not only develops within individual countries but also serves as a bridge for trade between countries in the world through technology and Internet communication (Wang, 2014). The study by Nadeem et al. (2018) pointed out that tax collection is difficult when considering jurisdiction, taxing authority, permanent establishment, and scope of tax collection. If the tax collection system is unclear or has too many loopholes, taxpayers may be easily swayed, tend to take advantage of loopholes to avoid taxes, or not comply strictly. E-commerce business activities can be easily carried out through the Internet with low capital, so more and more small and medium enterprises, individuals, and business households participate in this field. Especially with retail trade, taxpayers can easily evade taxes because they do not issue sufficient invoices, so there is not enough basis for tax authorities to calculate taxes, and this is a big loophole in e-commerce tax collection (Nguyen et al., 2012). Based on previous research, the group proposed the following hypothesis:

*H2.3: E-commerce tax collection characteristics have a negative impact on taxpayer awareness.*

### 2.2.3. The application and development of technology

Previous studies have shown that the development and integration of information technology applications are essential in improving the effectiveness of electronic tax management. IT applications, including e-tax filing and e-auditing systems, positively impact the accuracy and efficiency of tax data processing (Kudrle, 2021). Research by Yamen et al. (2023) demonstrated a significant negative association between digitalization adoption and tax evasion. However, digitalization can also pose challenges if the technological infrastructure is underdeveloped or tax agents are not uniformly prepared, especially when the perception of usefulness and ease of use remains limited (Omodero & Iyoha, 2022). A study conducted in Malaysia shows that the application of technology infrastructure in tax management strongly supports the success of tax digitalization (Xue et al., 2013). Adelakun et al. (2024) pointed out that technologies such as blockchain and artificial intelligence can enhance transparency and tax supervision but also pose challenges related to privacy and data security. Porter and Millar's (1985) model on the competitive advantage of information technology from IT applications not only enhances tax management but also creates competitive advantages for businesses in e-commerce by optimizing processes and reducing operational costs. Based on this, the following hypothesis is proposed:

*H3: The application and development of technology have a positive impact on the effectiveness of tax administration in e-commerce activities.*

### 2.2.4. The quality of tax human resources

In recent years, tax authorities need to be effectively trained to cover not only changes in laws but also tax regulations for e-commerce. A training course on public relations and information technology helps improve the relationship between staff and taxpayers by integrating this training course into the tax law training (Alm et al., 2012). Competent and professional tax authorities are more likely to convince taxpayers that cooperation and voluntary tax compliance is the right course of action (Gangl et al., 2012). Serim et al. (2014) showed that there is a significant and positive relationship

between the education level of tax officials and the increased voluntary compliance of "new" taxpayers who expect satisfaction from tax services in exchange for their tax payments. The study also found a negative relationship between the electronic and technological knowledge of the staff and the tax regulations and information of the taxpayers. However, the results of Mwangi et al. (2018) showed that the work of enhancing the professional knowledge of tax staff on the operation of the tax system and the use of personnel with technology application skills in detecting tax fraud demonstrated a positive relationship with the detection of tax fraud. This finding is consistent with the study by Akindele (2011), that inadequate training, disruption in communication, and poor management skills are the root causes of fraud in major financial institutions. Based on this study, the paper proposes the following hypothesis:

*H4: The quality of tax human resources has a positive impact on the effectiveness of tax administration in e-commerce activities.*

## 3. RESEARCH METHODOLOGY

The research team used qualitative research methods to synthesize domestic and international studies on tax administration in e-commerce activities. The team has identified factors that significantly affect the effectiveness of tax administration, selected independent variables, and built an appropriate research model based on previous studies. After the qualitative research step, with the research model adjusted to be more suitable, the team conducted a quantitative research method by distributing questionnaires and collecting data to verify the research model. The group has

designed a questionnaire to collect assessments for the research subjects of tax officials at tax departments, individuals, business households, and enterprises engaged in e-commerce business activities in Vietnam. The questions are arranged and evaluated on a scale of 1 to 5 (5-point Likert scale), representing the increasing level of agreement of respondents. Finally, Stata 15 software is used for descriptive statistics and linear structural equation modeling (SEM) analysis.

In this study, a non-probability sampling method was used, specifically the Snowball sampling method, due to the access conditions of the study subjects. The minimum sample size in the paper is determined based on the sampling requirement of exploratory factor analysis (EFA) is 200 samples. When collecting survey responses, the research team screened and recorded valid survey responses with 342 forms, satisfying the minimum sample requirement.

In addition to the SEM method used in this study, other approaches such as multiple linear regression (MLR) or panel data regression could also be suitable for assessing the impact of various factors on tax administration in e-commerce. However, SEM was chosen for its ability to analyze complex relationships between latent and observed variables, providing a more comprehensive understanding of how these factors influence tax management. Additionally, due to research resource constraints, we were unable to incorporate other methods, such as in-depth interviews with experts in the field or long-term studies tracking tax compliance trends over time. If implemented, these approaches could provide deeper insights into the effectiveness of tax policies.

**Figure 1.** Research model
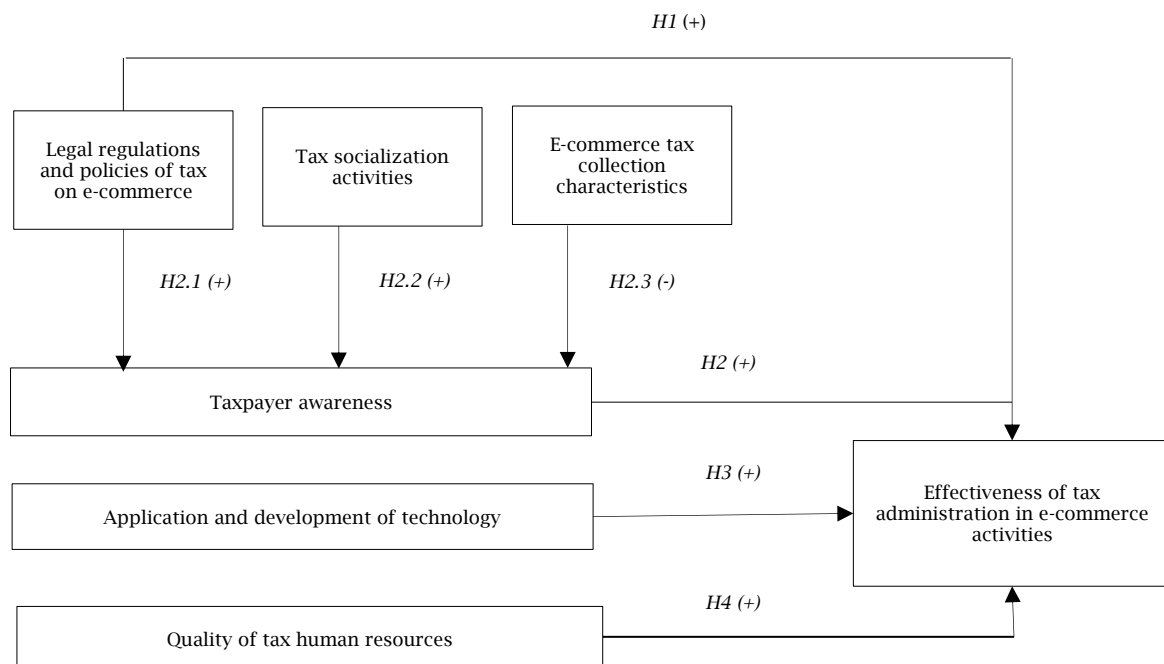


*Source: Authors' elaboration.*

The group proposed the research model with three independent variables: legal regulations and policies of taxation on e-commerce (*PL*), tax socialization activities (*XHH*), and e-commerce tax collection characteristics (*DT*) affecting the mediating variable, taxpayer awareness (*YT*), and four variables PL, YT, the application and development of technology (*CN*), and the quality of tax human resources (*NL*) affecting the dependent variable, tax administration efficiency on e-commerce (*QLT*) (Figure 1). The scales of the variables are inherited and synthesized from previous studies by Kirchler et al. (2008), Ayuma (2019), Pham (2019), and Giang (2023).

# 4. ANALYSIS OF RESULTS

## 4.1. Reliability analysis: Cronbach's alpha

The Cronbach's alpha test is used to evaluate the quality of the built scale and to check whether the observed variables of a factor are appropriate. The results of the analysis show that the Cronbach's alpha coefficient value of all factors is greater than 0.6 (Table 1). The item-rest correlation value of the observed variables was greater than 0.3. Therefore, the research scale reaches reliability for the next step of EFA analysis.

**Table 1.** Cronbach's alpha

| Variables | Symbol | Number of observed variables | Cronbach's alpha |
|---|---|---|---|
| Tax administration efficiency on e-commerce | QLT | 4 | 0.8830 |
| Legal regulations and tax policies on e-commerce | PL | 4 | 0.9385 |
| Tax socialization activities | XHH | 5 | 0.9115 |
| E-commerce tax collection characteristics | DT | 4 | 0.9260 |
| Taxpayer awareness | YT | 3 | 0.9347 |
| Application and development of technology | CN | 5 | 0.9062 |
| Quality of tax human resources | NL | 5 | 0.9015 |

*Source: Authors' elaboration.*

## 4.2. Exploratory factor analysis

The Kaiser-Meyer-Olkin (KMO) coefficient determined from the sample is 0.940, greater than 0.5, and the Bartlett test with a p-value (Sig) of $0.00 < 0.05$ indicates that the EFA results can be relied upon and used. According to the calculation results, 78.18% of the variation of the data set is explained by 7 groups of factors with an Eigenvalue > 1. The analysis results show that 7 groups of factors are arranged by the proposed model with factor loading greater than 0.5 (Table 2).

**Table 2.** Rotate factor loadings

| Item | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Factor 6 | Factor 7 |
|---|---|---|---|---|---|---|---|
| PL1 | 0.7653 | | | | | | |
| PL2 | 0.8586 | | | | | | |
| PL3 | 0.8964 | | | | | | |
| PL4 | 0.9092 | | | | | | |
| XHH1 | | 0.8671 | | | | | |
| XHH2 | | 0.8634 | | | | | |
| XHH3 | | 0.8166 | | | | | |
| XHH4 | | 0.7009 | | | | | |
| XHH5 | | 0.7382 | | | | | |
| DT1 | | | 0.8405 | | | | |
| DT2 | | | 0.8664 | | | | |
| DT3 | | | 0.9333 | | | | |
| DT4 | | | 0.9207 | | | | |
| YT1 | | | | 0.8575 | | | |
| YT2 | | | | 0.9402 | | | |
| YT3 | | | | 0.8833 | | | |
| CN1 | | | | | 0.7443 | | |
| CN2 | | | | | 0.8515 | | |
| CN3 | | | | | 0.8030 | | |
| CN4 | | | | | 0.8412 | | |
| CN5 | | | | | 0.8587 | | |
| NL1 | | | | | | 0.6740 | |
| NL2 | | | | | | 0.7865 | |
| NL3 | | | | | | 0.8368 | |
| NL4 | | | | | | 0.8721 | |
| NL5 | | | | | | 0.8464 | |
| QLT1 | | | | | | | 0.7775 |
| QLT2 | | | | | | | 0.8602 |
| QLT3 | | | | | | | 0.8041 |
| QLT4 | | | | | | | 0.7064 |

*Source: Authors' elaboration.*

## 4.3. Confirmatory factor analysis

The data were further verified by confirmatory factor analysis to assess the suitability of the theoretical model with the actual data collected. The results show that the weight coefficients of all factors are > 0.5 (Figure 2), indicating that the observed variables have reached the level of reliability when analyzing CFA and achieving convergence values. The p-value (Sig) of the Chi-square test is $0.00 < 0.05$, which ensures statistical significance when analyzing CFA, along with the TLI values of 0.940 > 0.9, CFI of 0.94 > 0.9, and RMSEA of $0.059 < 0.1$, indicating that the model is compatible with the actual data.

**Figure 2.** CFA results
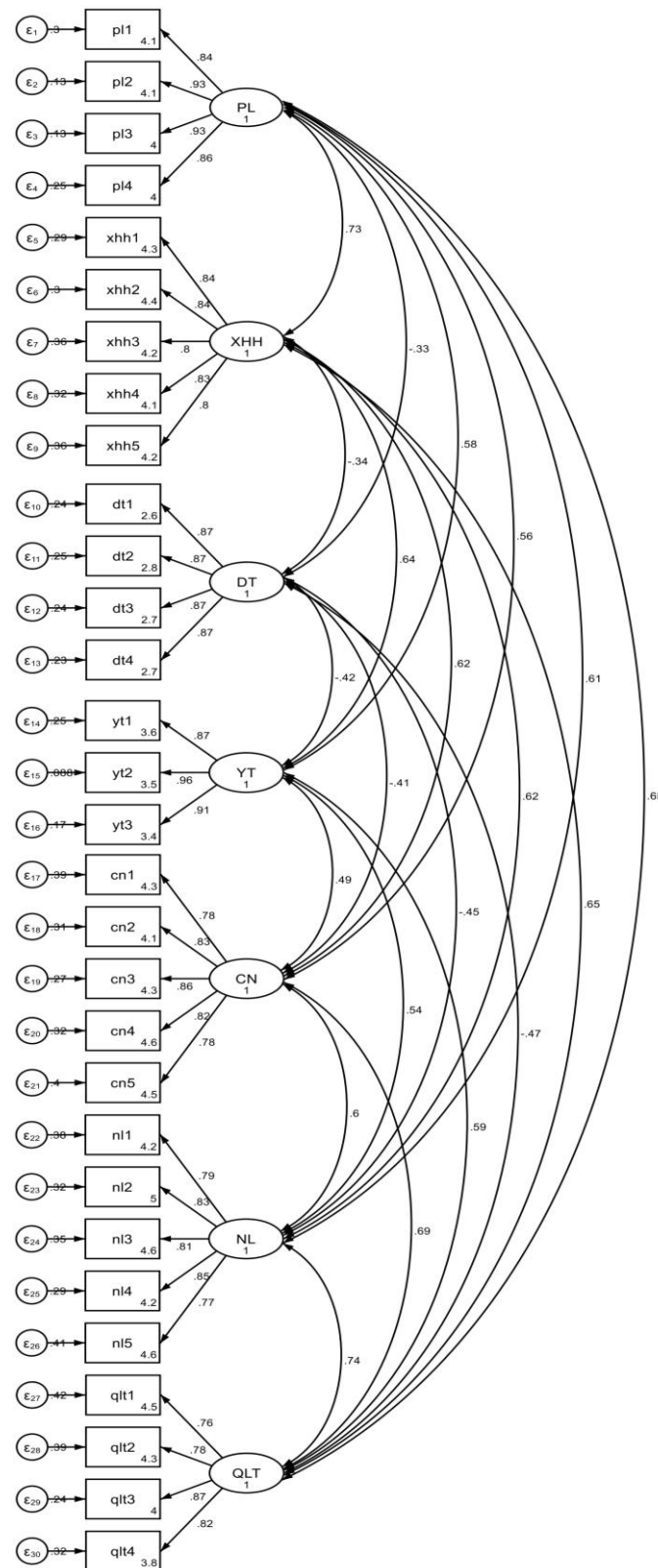
### 4.4. Pearson correlations

The results of the correlation analysis revealed that all independent variables that correlated with the management dependent variable were statistically significant at 5%. According to Table 3, the positive correlation coefficient values of the factors *PL, XHH, YT, CN,* and *NL* with the *QLT* factor indicate a positive relationship. On the contrary, the negative correlation coefficient value of the *DT* factor with the *QLT* factor suggests a negative relationship.

**Table 3.** Pearson correlation

| Variable | PL | XHH | DT | YT | CN | NL | QLT |
|---|---|---|---|---|---|---|---|
| **PL** | 1.0000 | | | | | | |
| | | | | | | | |
| **XHH** | 0.6828 | 1.0000 | | | | | |
| | 0.0000 | | | | | | |
| **DT** | -0.3150 | -0.3132 | 1.0000 | | | | |
| | 0.0000 | 0.0000 | | | | | |
| **YT** | 0.5471 | 0.6069 | -0.4123 | 1.0000 | | | |
| | 0.0000 | 0.0000 | 0.0000 | | | | |
| **CN** | 0.5218 | 0.5659 | -0.3863 | 0.46641 | 1.0000 | | |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | |
| **NL** | 0.5661 | 0.4116 | -0.4116 | 0.5109 | 0.5497 | 1.0000 | |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | |
| **QLT** | 0.6039 | 0.5954 | -0.4259 | 0.5486 | 0.6147 | 0.6745 | 1.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | |

*Source: Authors' elaboration.*

## 4.5. Structural equation model and hypotheses testing

The research team used the SEM analysis tool to test the research hypotheses. The results show that the proposed model is suitable for the actual data when testing the Chi-square with p-value = 0.000 < 0.05, also CFI = 0.947, TLI = 0.940 are all greater than 0.9, and RMSEA = 0.059 < 0.1. In Table 4, it can be seen that *XHH* factors have the greatest impact and have a positive impact on *YT*. Besides, the *DT* factor has a negative impact on *YT*. In addition, factors such as *YT*, *PL*, *CN*, and *NL* all have a positive impact on *QLT*, of which the *NL* factor has the greatest impact. All of the initial hypotheses proposed by the research team are acceptable when the coefficients in the scale are greater than 0.

**Table 4.** Structural equation model

| Standardized | | Coefficient | OIM Std. Err. | z | P > |z| | [95% conf. interval] | |
|---|---|---|---|---|---|---|---|
| **YT** | PL | 0.2759 | 0.0679 | 4.06 | 0.000 | 0.1428 | 0.4090 |
| | XHH | 0.4571 | 0.0636 | 7.19 | 0.000 | 0.3325 | 0.5817 |
| | DT | -0.2483 | 0.0521 | -4.77 | 0.000 | -0.3504 | -0.1426 |
| **QLT** | YT | 0.1747 | 0.0572 | 3.05 | 0.002 | 0.0625 | 0.2869 |
| | PL | 0.2511 | 0.0665 | 3.77 | 0.000 | 0.1206 | 0.3815 |
| | CN | 0.3851 | 0.0623 | 6.18 | 0.000 | 0.2630 | 0.5071 |
| | NL | 0.4744 | 0.0626 | 7.58 | 0.000 | 0.3517 | 0.5971 |

*Source: Authors' elaboration.*

## 5. DISCUSSION

Through the process of analyzing data using the SEM linear structure method as presented in the above section, the research results indicate a positive relationship between factors, including the state legal regulations and policies of tax on e-commerce, taxpayer awareness, application and development of technology, and quality of tax human resources on the effectiveness of tax administration in e-commerce activities. In particular, the variable of taxpayer awareness is positively affected by legal regulations and tax policies on e-commerce, as well as tax socialization activities. On the other hand, e-commerce tax collection characteristics have a negative impact on this factor.

Regarding the mediating variable of taxpayer awareness, most of the previous studies, typically Nguyen (2017), have agreed with the research results of the authors that legal regulations and policies of tax on e-commerce positively impact taxpayer awareness. The studies have commonly argued that legal tax policies on e-commerce need to be improved and simplified to reduce the academic content in legal documents, thereby enhancing the ability of all citizens to grasp knowledge and understanding of tax obligations. In theory, the state legal policy system should always ensure fairness, simplicity, and transparency. However, in practice, this is always a difficult problem for policymakers because the tax system would become more complicated when meeting the condition of equality (Fullerton & Metcalf, 1997; Gale & Holtzblatt, 2003).

In addition to simplified academic elements in the legal policies, promoting propaganda and tax socialization also have a positive impact on taxpayers' compliance awareness (Giang, 2023; Lutfi et al., 2023). Tax socialization is considered an intervention variable in taxpayers' compliance awareness, helping to increase taxpayer awareness, understanding, and knowledge of tax declaration, calculation, and payment procedures. Therefore, strengthening tax socialization is necessary to promote taxpayers' compliance awareness, thereby reducing tax evasion behaviors.

In contrast to the impact of the above two factors, the characteristics of e-commerce tax collection negatively impact taxpayers' compliance awareness because of the digital nature of the e-commerce sector has created a difference in traditional tax administration and tax administration for e-commerce activities (Mas & Varala, 2021). The authors of this research agree with the conclusions of Garkushenko and Thiel (2018), Moreno and Brauner (2019), and Qinyuan et al. (2024), who stated that the key issue creating challenges in tax collection from e-commerce activities is the non-physical spatial nature of the Internet. This results in greater difficulty for tax officers in determining IP addresses, permanent establishments, taxable entities, tax bases, and taxing authorities across countries. These challenges could enable taxpayers to avoid their tax obligations and commit tax evasion without being detected by the tax authorities. Therefore, the taxpayers' compliance awareness decreases if these difficulties increase. However, some previous research has

opposed the results in this report, arguing that the taxpayers' awareness is positively affected by the characteristics of e-commerce tax collection (Nguyen, 2009; Sapiei et al., 2014).

Regarding the effectiveness of tax management on e-commerce, the authors' research indicates that the decisive factor affecting this factor is the quality of human resources in the tax sector. To achieve good management efficiency, the primary issue that must be addressed is the educational level and expertise of tax officials. Only when tax officials have solid qualifications and skills in their profession can they carry out management processes accurately, completely, and transparently; therefore, the effectiveness of tax management on e-commerce is promoted to ensure optimal revenue for the state budget (Akindele, 2011; Serim et al., 2014; Mwangi et al., 2018; Vu & Le, 2024). Furthermore, qualified tax officials can ensure professional attitudes and the ability to explain, persuade, and resolve practical situations effectively. As a result, tax officials can help increase taxpayer awareness and voluntary cooperation in fulfilling their obligations (Gangl et al., 2012; Alm et al., 2012). Besides, in the context of modernizing infrastructure, the application and development of technology are effective tools (Murzina & Shemyakina, 2021). The results of this study align with studies that identify a positive relationship between the application and development of technology and the effectiveness of tax management on e-commerce, typically the study of Shagari (2014). On the other hand, Porter and Millar (1985) have affirmed in their research the competitive advantage of information technology when enhancing the effectiveness of tax management without hindering the development of businesses in e-commerce activities.

On the other hand, beyond the relationship between the legal policies of tax on e-commerce and taxpayer awareness, the author's research also shows that the legal policy system positively impacts the effectiveness of tax management on e-commerce. Consistent with this research result, Slemrod et al. (2001) and Li and Lin (2016) have affirmed that a strict and transparent system can help increase the effectiveness of tax collection. Although the law is considered a tool for state management, with policies and documents that are highly deterrent and mandatory. However, if policymakers only focused on sanctions for management, it would cause significant pressure in society. In the long term, it could gradually undermine the effectiveness of tax management and lead to public opposition. Therefore, along with the state's legal policy systems, raising taxpayers' compliance awareness is a crucial element in improving tax administration efficiency (Gale & Holtblatt, 2003). The results of the authors' study also demonstrate that taxpayers' compliance awareness has a positive impact on the effectiveness of tax management on e-commerce, which is consistent with previous research, such as Nur-Tegin (2008), Rendy and Irawati (2019), Pham (2019), and Giang (2023).

## 6. CONCLUSION

In essence, e-commerce business activities are still based on the exchange of purchase and sale transactions. Therefore, the current legal framework essentially applies the same tax laws for both traditional and e-commerce businesses. However,

specific guidelines and regulations are needed for tax collection in e-commerce, such as requiring individuals and organizations engaged in e-commerce and social media platforms to register, declare, and pay taxes fully. Additionally, there should be clear regulations on the responsibilities of electronic trading platforms to provide transaction information to tax authorities and declare and pay taxes on behalf of individual and household businesses operating on these platforms. Thus, it is necessary to supplement and improve regulations and policies related to tax administration on e-commerce and enhance information exchange with foreign tax authorities (those that have signed Double Tax Avoidance Agreements). This approach aims to reduce tax evasion, tax fraud, and transfer pricing. Furthermore, it is essential to actively enhance the professional capacity of tax officials. The key factor is to improve the quality of human resources in the tax sector. In addition to professional qualifications, tax officials need to have a positive, professional attitude and regularly practice professional ethics. Therefore, the tax industry should raise recruitment standards to meet the necessary criteria in foreign languages, information technology, and specialized knowledge in e-commerce. Regular seminars, training courses, and workshops with domestic and foreign experts should also be organized to train different groups of tax officials.

Furthermore, in the era of digitalization and modernization in management, the development and research of advanced technologies such as blockchain and AI are necessary. Although the decentralized nature of blockchain was created to eliminate intermediaries, including banks, (which makes cooperation with commercial banks in providing transaction information potentially challenging), blockchain is not limited to public systems such as Bitcoin or Ethereum but can also be deployed through private blockchain or consortium blockchain models, where banks can participate and share data under a common control mechanism. In the context of e-commerce tax management, the application of blockchain to connect data between banks can help increase transparency and reduce tax fraud. Therefore, cooperation with commercial banks to provide transaction information and account balances when there are signs of tax law violations is essential; At the same time, coordinate with the Ministry of Industry and Trade to exchange a list of registered e-commerce service providers to check and handle violations according to regulations. In particular, it is possible to consider building a virtual assistant chatbot to support tax consulting, answer taxpayers' questions, and raise tax awareness for taxpayers.

E-commerce has erased territorial boundaries and transformed the world into a global community over the past two decades, leading to numerous challenges and limitations in tax management. Enhancing management effectiveness is essential for nations, requiring the state and government to take action to improve the quality of human resources in the tax sector, implement effective policies and measures to improve management, and raise taxpayer awareness. This study contributes to enhancing the tax collection system, minimizing corruption, and developing a high-quality workforce for the nation. The present research becomes a foundation for future studies in optimizing the tax administration framework in the digital economy.

However, this study has some limitations. The research is limited to Vietnam and does not include cross-country comparisons, which could provide broader policy insights. Additionally, due to resource constraints, qualitative approaches such as in-depth interviews or longitudinal studies were not conducted, which could offer deeper perspectives on tax compliance behavior. Future studies may address these limitations by incorporating a mixed-methods approach and expanding the sample scope to include more diverse e-commerce business models.

Future research could expand by conducting international comparative analyses, exploring case studies of successful tax administration models, and assessing the long-term impact of policy changes on compliance rates. Additionally, evaluating the effectiveness of different tax policies for various e-commerce business models, including cross-border e-commerce platforms, could provide valuable practical insights for policymakers. A particular focus on emerging technologies such as blockchain and artificial intelligence in taxation, especially how these technologies enhance transparency and tax enforcement efficiency, would also be a promising direction.

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