GNOSI: **An Interdisciplinary Journal of Human Theory and Praxis**
Volume 6, Issue 1, January -June, 2024
ISSN (Online): 2714-2485

Optimizing tax administration: A comprehensive analysis of the effect of e-filing tax system on taxpayers' compliance burden in Tanzania

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(**Received**: January-2024; **Accepted**: March-2024; Available **Online**: March-2024)

ABSTRACT
Employing partial least squares structural equation modeling (PLS-SEM), the study examines the effects of tax system quality factors on corporate taxpayers' usage of the e-filing tax system. Additionally, it explores the relationship between e-filing tax system usage and tax compliance burden. The analysis is based on survey data collected from 250 medium and large taxpayers, who were already engaged in online VAT return filing before 2020. The findings reveal that system quality and service quality significantly influence extent of taxpayers' usage of the e-filing tax system, leading to a subsequent reduction in the tax compliance burden. The study contributes to academic knowledge by applying a modified version of DeLone and McLean's Information System Success model to assess the success of e-filing in an environment characterised by mandatory adoption. The practical implications highlight the necessity for tax authorities to implement measures aimed at improving the user-friendliness and service-oriented functionalities of the e-filing tax system. This research holds significance as it provides valuable insights into enhancing the effectiveness of the e-filing tax system within a mandatory adoption context, offering guidance for policymakers and tax authorities to improve tax compliance and overall system performance.

Keywords: Tax; e-filing; e-government; IS Success Model; tax compliance burden.

INTRODUCTION
Advances in information technology, followed by an increased need for time and cost efficiency, have forced many countries to embrace e-government because of its potential to improve the government's service delivery and increase citizens' access to information and participation in government affairs (Veeramootoo, Nunkoo, & Dwivedi, 2018). One

of the most common e-government services is the electronic filing of tax returns (e-filing), which allows the automated exchange of information between taxpayers and tax authorities (Bellon, Dabla-Norris, Khalid, & Lima, 2022; Bhuasiri, Zo, Lee, & Ciganek, 2016). Due to its capacity to enhance efficiency, convenience, and transparency within the tax system, e-filing has been extensively embraced by numerous governments, both in developed and developing nations, including Tanzania. The incorporation of this innovative system enables tax administrations to function in a manner fundamentally distinct from the laborious paper-based system, owing to its heightened capability to collect, process, and exchange information.

The e-filing promises a number of advantages for tax authorities, including a reduction of administrative costs, integration of tax return filing and payment systems and the provision of real-time and accurate information that facilitates compliance checks (Otu & Nabiebu, 2022; Bellon et al., 2022; Teo & Wong, 2005). For firms, e-filing saves taxpayers' time, reduces frequent tax officers' inspections and informal interactions, increases confidentiality, and improves data processing, thus making it a potential candidate to reduce firms' tax compliance burden (Islam, Yusuf, Yusoff, & Johari, 2012; Okunogbe & Pouliquen, 2022; Yilmaz & Coolidge, 2013).

Previous research has established that the provision of a customer-centric e-filing that meets customer expectations (Otu, 2022; Mokone, Eyitayo, & Masizana-Katongo, 2018) and the diverse needs of stakeholders (Anthopoulos, Reddick, Giannakidou, & Mavridis, 2016) can help reduce compliance burdens (Alm, Cherry, Jones, & McKee, 2010; Eichfelder & Kegels, 2014). The business taxpayers perceive system quality, information quality, and service quality as important factors affecting the e-filing tax system usage and net benefits that can be realised from e-filing (Chen, Jubilado, Capistrano, & Yen, 2015; Nguyen, Pham, Hoang, Do, & Fuller, 2023).

Tanzania's government partially replaced paper-based filing for value-added tax (VAT) with e-filing in 2010, and ten years later it was rolled out to cover income tax returns. The paper-based filing system constantly suffered from low compliance levels due to higher compliance costs. For example, in the 2017–18 financial year, the Tanzania Revenue Authority (TRA) recorded very low compliance levels of 28.7% and 24.8% for corporate tax and personal income tax, respectively (URT, 2019). There were several reasons, but difficulty in accessing complete, accurate, and understandable tax information was identified as a main driver for high compliance costs among large firms (URT, 2017). On the other hand, small and medium enterprises cited the complicity of procedures for filing tax returns and the tax payment process, as well as high compliance costs (URT, 2013).

In order to address the taxpayers' concerns, the Government of Tanzania implemented the e-filing in two phases (2010 and 2020) with the intention of reducing the complexity of the tax system and making it easy for taxpayers to comply with tax laws. In the second phase, the government made it a requirement for all taxpayers to file their tax returns electronically. Unlike voluntary adoption, mandatory adoption, particularly in developing countries, does not consider taxpayers' concerns in relation to capability in computer usage and knowledge about e-filing and its process (Woldemariam Birru, 2022; Yilmaz & Coolidge, 2013). In addition, unreliable internet connectivity and electricity are recurring problems in developing countries that tend to curtail effective usage of e-filing and the full realisation of its benefits (Yilmaz & Coolidge, 2013). However, since the implementation of the second phase in mid-2020, little is currently known about the impact of the e-filing on compliance burdens as well as the effects of the quality dimensions of the system on effective usage among taxpayers.

While much has been written about the e-filing and tax compliance burden, however, there are several areas of research that remain largely unexplored. First, the

results of prior research on the relationship between e-filing adoption and use and compliance burden are inconclusive, particularly in developing countries, with some studies documenting evidence of increased compliance costs for firms adopting e-filing tax system (Otu & Enyia, 2015; Yilmaz & Coolidge, 2013). These contexts are characterised by poor infrastructure and low firms' capabilities, which in turn adversely affect firms' effective usage of the e-filing tax system. As a result, e-filers suffer from an increasing tax compliance burden.

Second, prior research has focused on the root causes of tax compliance burden (Eichfelder & Hechtner, 2018; Eichfelder & Kegels, 2014; Marcuss et al., 2013), adoption of e-filing tax system (Singh, Kar, & Vigneswara Ilavarasan, 2019; Woldemariam Birru, 2022), and determinants of e-filing services' continuance usage intention (Abdul et al., 2023; Ramdhony, Liébana-Cabanillas, Gunesh-Ramlugun, & Mowlabocus, 2023). Chen et al. (2015) highlight that e-government success depends on its continuous usage, which is in fact contingent upon quality factors. However, prior research on the effects of system quality factors based on the Information System (IS) Success Model (DeLone & McLean, 1992, 2003) on e-filing tax system usage in the context of developing countries has received limited scholarly attention (Chen et al., 2015).

Third, although the IS-Success Model is a well-established theoretical lens for examining the adoption, usage, and net benefits of e-government services, the literature on its application to the e-filing among business taxpayers is limited. Empirical evidence is mostly restricted to the analysis of individual taxpayers' adoption and continued usage (Chen et al., 2015; Ramdhony et al., 2023; Veeramootoo et al., 2018).

To address the above gaps and contribute knowledge to the existing body of literature, this study investigates the effects of quality factors on e-filing usage and how such usage impacts compliance burdens in the context of taxpayers. Building on the updated version of the IS-Success Model developed by DeLone and McLean (2003), this study tests the proposition that quality factors influence e-filing tax system usage, which in turn reduces tax compliance burden. Using a sample of 250 business taxpayers with many years of experience of filing VAT returns online, the findings indicate that service quality and system quality are positively related to business taxpayers' usage of the e-filing. Furthermore, the findings indicate that the use of e-filing leads to a reduction in tax compliance burden among business taxpayers.

The study makes three important contributions to the existing literature. First, this research fills the gap in the literature by uncovering the relationship between e-filing tax system usage and tax compliance burden in the context of mandatory adoption. These results support the claim that sufficient time is needed for taxpayers to effectively learn how to use the system in order to realise the benefits (Yilmaz & Coolidge, 2013). Second, we contribute to the literature on the impact of quality factors on the e-filing by showing that service and system quality factors are drivers for increased use of the system, which is a necessary condition for reducing tax compliance burden among business taxpayers. Third, the study shifts attention from individual taxpayers to a new cohort of business entities, which are largely ignored by the existing literature.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Although the Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Unified Theory of Acceptance and Use of Technology (UTAUT), and Diffusion of Innovation (DOI) have been prominent theories with considerable empirical support in examining the intention to use or continuous usage of e-government systems, the IS-Success Model, however, has been proposed as a suitable candidate to examine the usage and success of e-government services both in mandated and voluntary settings (Jeyaraj, 2020; Veeramootoo et al., 2018). The model provides the basis for which individuals and

organisations can evaluate the perceived net benefits of using an information system (DeLone & McLean, 2004; Saptono et al., 2023; Wang & Liao, 2008). From the taxpayer's perspective, net benefits are defined in terms of reduced compliance burden (i.e., cost and time savings and error reduction) resulting from the simplified workload of filling out and submitting tax forms and tax payment (Chen et al., 2015; Nguyen et al., 2023).

The DeLone and McLean IS-Success model (DeLone & McLean, 2003), made up of six interrelated dimensions of IS quality (i.e., system quality, information quality, service quality, use, system use, and net benefits), forms a comprehensive framework to measure the performance of any information system after the adoption stage. The model has been widely applied in the performance evaluation of new health information systems (Cho et al., 2015; Petter & Fruhling, 2011; Wei, Tang, Kao, Tseng, & Wu, 2017), education systems (Dalle, Hastuti, Mahmud, Prasetia, & Baharuddin, 2020; Tahu & Yuesti, 2021), e-commerce systems (Angelina et al., 2019), and e-filing tax systems (Saptono et al., 2023). These studies treat system quality, information quality, and service quality constructs as direct and indirect (through user satisfaction) antecedents and net benefits as outcomes of continued usage, respectively. The three quality factors may affect usage individually or collectively. The fact that taxpayers use an e-filing system to simplify tax filing and payment, system quality, service quality, and information quality are critical factors determining the variance in taxpayers' usage of the system.

In addition, most of these studies on the e-filling have been conducted in voluntary adoption settings where user satisfaction plays a central role in determining the intention to continue using the system. However, in a context where the use of an e-filing tax system is mandatory, user satisfaction is likely to play a lesser to insignificant role in determining continued usage, nor does it make a substantial contribution to the net benefit (Ojo, 2017). This means taxpayers are obliged to use the system regardless of whether their satisfaction levels are high or low. For that reason, the user satisfaction dimension is excluded from the study.

HYPOTHESES DEVELOPMENT

Service quality and e-filing tax system usage

Service quality refers to the quality of overall support rendered by the tax authority—developers of an e-filing system—to the users of the system (Hambali, 2020). It encompasses competence, follow-up service, empathy, reliability, and responsiveness (Alzahrani, Mahmud, Ramayah, Alfarraj, & Alalwan, 2019). The system meeting these service quality criteria is said to satisfy the user's needs and can exert a greater influence on their usage of the e-filing tax system (Ramdhony et al., 2023).

The primary goal of taxpayers using an e-filing is to simplify the process of filing tax returns and paying tax, and it is expected that tax officials will be prompt in supporting taxpayers and resolving their issues. Services such as updating account information, responding to inquiries, and providing feedback, including good customer care, individualised information, and customer attention, are crucial and can significantly save taxpayers' time and money (Cao, Zhang, & Seydel, 2005). Millenia, Kristianti, and Dhia Prawati (2022) note that a higher level of service quality promotes effective users' e-filing tax system usage, but a bad support system creates havoc among taxpayers while fueling an increased tax compliance burden.

Previous research has established that service quality has both a direct and indirect positive effect on taxpayers' e-filing tax system usage (S. M. Lee & Lee, 2012; Ramdhony et al., 2023; Saptono et al., 2023). Taxpayers find it more appealing to use the system when they receive better IT support, caring and good customer care, as well as prompt responses to system breakdowns and slow internet speeds from the tax

authority (Cao et al., 2005). Therefore, it is assumed that better services provided to taxpayers raise their levels of usage of the system and minimise the amount of resources and time spent on tax compliance activities.
H1: Service quality positively influence taxpayers' e-filing tax system usage

System quality and e-filing tax system usage
System quality refers to users' perception of the technical performance of an IS and can be effectively assessed in terms of usability, user-friendliness and easy to use (Saptono et al., 2023; Wang & Liao, 2008). It indicates the extent to which the system is reliable and easily used with minimal encounter of problems (Albay, 2020). Ramdhony et al. (2023) note that good system quality provides users with necessary mechanical efficiency for easy and fast access to information, while ensuring maximum security and safety of users' information. Evidence suggests that the high quality of a system invokes users' usage of the e-filing tax system, hoping that their interaction with the system would enable them to save time and cost. Previous research has established that system quality has a positive influence on users' usage of the system (Alzahrani et al., 2019; Cho et al., 2015; Dalle et al., 2020; Ojo, 2017).

In the context of e-filing, good system quality is demonstrated by existence of few technical problems that cannot prevent timely preparation and filing tax returns. A number of studies have also revealed specific association between system quality and e-filing tax system usage (Ramdhony et al., 2023; Veeramootoo et al., 2018). Thus, it is hypothesized that:
H2. System quality positively influence taxpayers' e-filing tax system usage.

Information quality and e-filing tax system usage
Information quality captures the characteristics of the system content, usually reflecting the users' evaluation of the system performance in terms of its accuracy, relevance, clarity, usefulness and completeness of the information accessed from an online service (DeLone & McLean, 2003; Millenia et al., 2022). A high level of quality information improves users' experience with the system, but low information quality causes inconveniences to users, sometimes leading to higher information processing costs (Veeramootoo et al., 2018).

Taxpayers evaluate information quality in terms of how well an e-filing provides information that can aid them to file their tax returns and pay tax online conveniently and with little to no external assistance (Millenia et al., 2022). The taxpayers tend to attach high levels of trust to an e-filing tax system that appears to provide convenient, complete and accurate information on how to file tax returns in a better way, while minimizing the chances of committing errors (Islam et al., 2012; Millenia et al., 2022). Evidence suggests information quality is one of the crucial components explaining usage intensity of the system. For example, the studies of Wang and Liao (2008) in Taiwan and Millenia et al. (2022) in Indonesia find that information quality has a significant and positive effect on e-filing system usage. Therefore, the following hypothesis is proposed:
H3: Information quality positively influences taxpayers' e-filing tax system usage.

E-filing tax system usage and tax compliance burden
It is a requirement that all taxpayers comply with tax regulations, but when the amounts of resources utilised for compliance activities are excessively high, then compliance becomes a burden to taxpayers and a constraint on business performance (Abdul Mansor & Mohd Hanefah, 2008; Matarirano, Chiloane-Tsoka, & Makina, 2019). Notably, frequency of tax returns and interactions with tax officials, complexity of the tax system

in terms of preparing and filing tax returns, and paying tax are regarded as drivers of increased tax compliance burden (Castro & Lopes, 2023).

Past research has indicated that an e-fling tax system reduces compliance burden by getting rid of significant costs associated with paper-based systems, including printing, postage, or physical delivery, and archiving copies (Bellon et al., 2022). The system provides taxpayers with opportunities for realising savings in money, time, and efforts in preparing and filing tax returns and paying tax (Eichfelder & Hechtner, 2018; Okunogbe & Pouliquen, 2022). A recent study by Bellon et al. (2022) in Peru indicates that e-filing has helped businesses cut down on invoicing costs from $0.56 per paper invoice to $0.20 per e-invoice. Okunogbe and Pouliquen (2022)'s study in Tajikistan finds that e-filing adoption helped firms reduce the amount of time spent on preparing and filing tax returns by 40% (i.e., 5 hours each month). Similarly, the study of Yilmaz and Coolidge (2013) in South Africa finds that e-filing usage is associated with a 22.4% and 21.8% reduction in compliance costs and time spent on VAT compliance, respectively. In this regard, it is hypothesised that:

H4: E-filing tax system usage significantly influence reduction of tax compliance burden

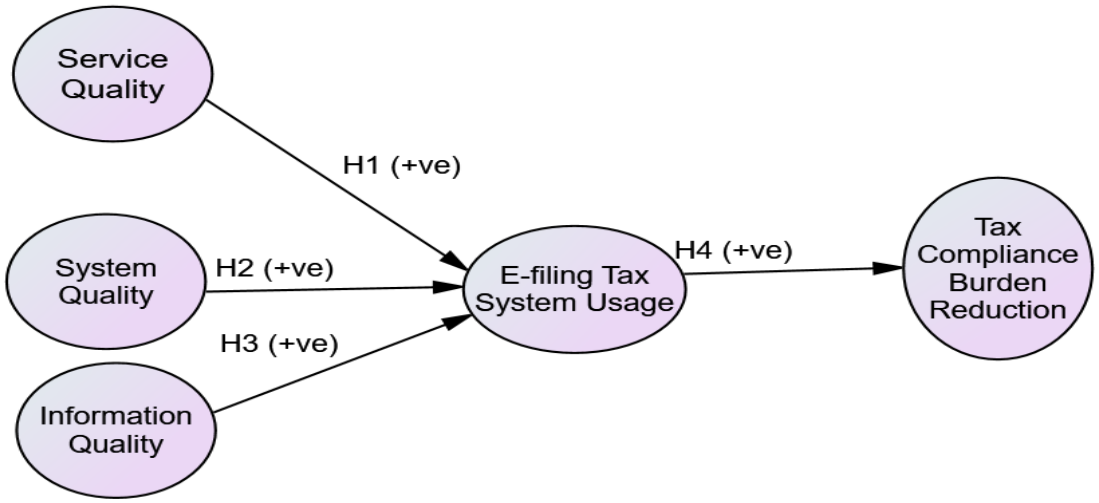

Figure 1: Modified IS Success model

METHODS AND DATA

Measurement of constructs

The measurement scales for quality factors, e-filing tax system usage, and tax compliance burden were selected from the existing literature. All items representing the constructs were measured on a 5-point Likert scale ranging from *5 for strongly agree* to 1 for *strongly disagree*. The items measuring information quality (7 items: INQ1–INQ7), service quality (5 items: SEQ1–SEQ5), system quality (5 items: SYQ1–SYQ5), e-filing tax system usage (6 items: ESU1–ESU6) and tax compliance burden (4 items: TCB1–TCB4) were adopted from prior research (Chen et al., 2015; Veeramootoo et al., 2018) and modified to reflect the study context. Validation of the measurement scales involved two tax policy experts, one tax consultant, and two academicians, followed by pre-testing with 20 taxpayers. The suggestions received from the two phases of exercises formed the basis for refining the measurement instrument.

Data collection

The data utilised in this study were obtained through a cross-sectional survey carried out in Dar es Salaam Metropolitan City, Tanzania. Dar es Salaam was chosen due to its status as the country's primary commercial hub, boasting the highest Gross Domestic Product (GDP) (URT, 2022), and hosting a significant proportion of large and medium taxpayers. The sampling framework for the study comprised business entities with prior experience utilising the e-filing. Both online and face-to-face surveys were utilised to administer questionnaires. A total of 968 questionnaires were distributed, out of which 639 were returned, reflecting a response rate of 66%. However, 250 questionnaires were received from firms that had been utilising the e-filing prior to 2020. These firms, having prior experience with e-filing, required minimal effort from the Tanzania Revenue Authority for transitioning.

The questionnaire consisted of six sections. The initial section collected information regarding the firms' characteristics and included a filter question prompting respondents to specify whether their company had previously utilised an online system to file VAT returns before 2020. Subsequent sections focused on measuring information quality, service quality, and system quality, while the fifth and sixth sections addressed questions pertaining to e-filing tax system usage and compliance burden, respectively.

DATA ANALYSIS AND RESULTS

Descriptive characteristics of the sample

The descriptive characteristics of the sample are presented in Table 1, providing insights into various attributes of the respondents. The analysis reveals that 20% of the sample consisted of large taxpayers, while the majority, accounting for 80%, represented entities from the Domestic Revenue Department. In terms of sector distribution, respondents from the Tertiary sector constituted the largest proportion at 57%, followed by the Secondary sector at 22%, the Quaternary sector at 18%, and the Primary sector at 4%.

Furthermore, a significant majority of respondents, comprising 77.0%, indicated that they had attended e-filing training, underscoring the importance of training initiatives in enhancing familiarity and proficiency with electronic filing systems. Conversely, 23% of respondents reported not having received e-filing training, suggesting a potential area for targeted intervention or support. Regarding business ownership, the data indicate that the vast majority of respondents, constituting 84%, were from local enterprises, while multinational enterprises represented 16% of the sample. This distribution highlights the predominance of local businesses within the surveyed population.

Overall, these findings offer valuable insights into the composition and characteristics of the sample, shedding light on key aspects such as business size, sector representation, ownership structure, and participation in e-filing training initiatives. Such information is crucial for understanding the dynamics of electronic tax filing adoption and its implications for different segments of the business community.

Table 1: Summary of descriptive characteristics of the sample

Attribute	Percent
Business size	
Medium taxpayers	80.0
Large taxpayers	20.0
Business age	
0 – 10 years	48.0
11 – 25 years	44.0
Above 25 years	8.0
Business sector	
Tertiary	57.0
Secondary	22.0
Quaternary	18.0
Primary	4.0
Business ownership	
Local enterprise	84.0
Multinational enterprise	16.0
E-filing training	
Yes	77.0
No	23.0

Common Method Variance

Several procedural and statistical measures were taken to assess and mitigate the common method variance (CMV). The procedural methods used to minimise CMV included protection of the anonymity of respondents' identities and confidentiality of the information collected (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). We also performed Harman's single factor test, and five distinct constructs emerged, accounting for 76% of the total variance. The first unrotated construct accounted for 26%, which was below the 50% threshold recommended by Rajapathirana and Hui (2018). Therefore, these results provided assurance that CMV was not an issue at all in the present study. Following Anderson and Gerbing (1988), we applied a two-stage approach to assess the model using SmartPLS version 3. While the first stage assessed the reliability and validity of the measurement, the second stage involved hypothesis testing using the bootstrapping methodology.

Measurement Model Assessment

The partial least squares structural equation modelling (PLS-SEM) technique was applied to test the proposed model. PLS-SEM was a preferable technique for this study because it places minimal restrictions on normality assumptions and the sample size and can handle complex structural models with multiple exogenous and endogenous constructs and indicators (Hair, Risher, Sarstedt, & Ringle, 2019).

The measurement model was examined for reliability through factor loadings and internal consistency. As can be seen in Table 2, the factor loadings of almost all indicators exceeded the minimum threshold of 0.70 recommended by Hair et al. (2019) for

acceptable item reliability. Internal consistency was assessed through Cronbach's alpha (CA) and composite reliability (CR). The values of CA and CR for all constructs were above 0.70, indicating acceptable reliability (Hair et al., 2019). Convergent validity assessment was done using Average Variance Extracted (AVE), and the results indicated that the AVE value of each construct exceeded 0.5, a proposed lower limit for convergent validity (Fornell & Larcker, 1981).

Discriminant validity was evaluated by applying the Fornell-Larcker criterion (Fornell & Larcker, 1981) and the heterotrait-monotrait (HTMT) ratio criterion. The Fornell-Larcker criterion compares a construct's AVE to the squared correlations (SCs) of the construct with other constructs in the model. Discriminant validity is assumed when the AVE exceeds the SCs of the construct with other constructs. Under the HTMT ratio criterion, discriminant validity is demonstrated when the value is less than the cut-off value of 0.85 (Hair Jr, Howard, & Nitzl, 2020) for conceptually distinct constructs. As seen in Table 3, all AVEs were greater than SCs, and HTMT values were lower than a suggested threshold value of 0.85, thus confirming discriminant validity.

Table 2: Assessment of reliability and convergent validity

Construct indicators	**Factor loading**	**CA**	**CR**	**rho_A**	**AVE**
Service quality (SEQ)		0.825	0.876	0.853	0.587
SEQ1: E-filing provides prompt response to questions	0.787				
SEQ2: E-filing provides simplified services	0.833				
SEQ3: E-filing tax system provides standardized services	0.820				
SEQ4: E-filing tax system provides on-time services	0.722				
SEQ5: E-filing tax system provides customized services	0.652				
System quality (SYQ)		0.869	0.905	0.877	0.656
SYQ1: E-filing is easy to use	0.851				
SYQ2: E-filing is easy to navigate and accomplish tasks quickly	0.845				
SYQ3: E-filing can be accessed immediately	0.834				
SYQ4: E-filing provides helpful instruction for performing tasks	0.764				
SYQ5: E-filing provides logical sequence of tasks	0.750				
Information quality (INQ)		0.889	0.912	0.907	0.596
INQ1: Information provided by e-filing is up-to-date information	0.758				
INQ2: Information provided by e-filing is easy to read and understand	0.790				
INQ3: Information provided by e-filing is accurate	0.715				

INQ4: Information provided by e-filing is relevant	0.787				
INQ5: Information provided by e-filing meets our needs	0.796				
INQ6: Information provided by e-filing is reliable	0.801				
INQ7: Information provided by e-filing is sufficient	0.753				
E-filing system usage (ESU)		0.893	0.919	0.900	0.655
ESU1: Using e-filing has improved our performance filing tax returns	0.845				
ESU2: Using e-filing has enabled easy and comfortable communication with tax officials	0.791				
ESU3: Using e-filing provides opportunity for completion of multiple tasks	0.654				
ESU4: E-filing tax system has enabled us to become a compliant taxpayer	0.877				
ESU5: Using e-filing has enhanced our productivity in filing tax returns	0.863				
ESU6: Using e-filing has improved our effectiveness in filing tax returns	0.806				
Tax compliance burden reduction (TCB)		0.867	0.909	0.878	0.714
TCB1: E-filing tax system makes filing of tax returns convenient and less costly	0.832				
TCB2: E-filing system lessens the time spent on meeting tax compliance obligations	0.827				
TCB3: E-filing system simplifies tax reporting and payment	0.858				
TCB4: E-filing system simplifies the process of determining tax liability	0.863				

Table 3: Assessment of discriminant validity

	SEQ	SYQ	INQ	ESU	TCB
SEQ	0.766[a]				
SYQ	0.274 (0.322)[b]	0.810[a]			
INQ	0.501 (0.595)[b]	0.211 (0.231)[b]	0.772[a]		

ESU	0.292 (0.325)[b]	0.274 (0.299)[b]	0.191 (0.200)[b]	0.809[a]	
TCB	0.466 (0.542)[b]	0.466 (0.397)[b]	0.347 (0.380)[b]	0.498 (0.551)[b]	0.845[a]

[a]Fornell-Larcker (√AVE)
[b]HTMT ratio

Structural Model Assessment

In assessing the structural model assessment presented in Figure 2, we examined the statistical significance of the path coefficients and their size effects (f^2), variance inflation factor (VIF) and coefficients of determination of endogenous latent constructs (R^2) (Hair et al., 2019; Hair Jr et al., 2020). VIF was used to assess multicollinearity and its values were lower than recommended upper threshold of 3.0 (Hair et al., 2019), demonstrating absence of collinearity issues.

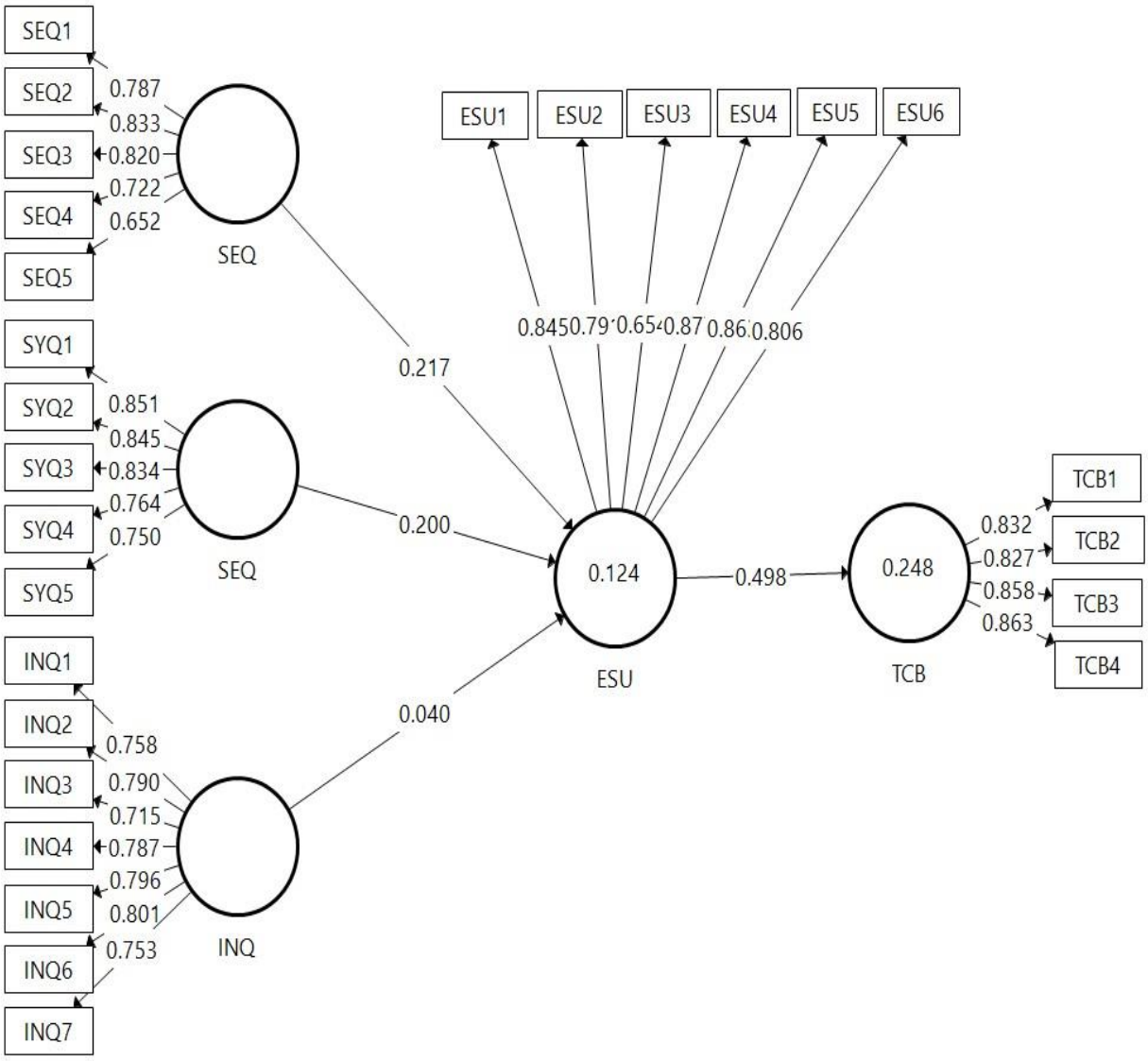

Figure 2: Structural model

The significance of path coefficients was evaluated by running a bootstrapping procedure with 5000 subsamples. The results of hypotheses testing are reported in Table

4. The results show that the relationships of service quality (β = 0.217; $p < 0.01$) and system quality (β = 0.20*;* $p < 0.01$) with e-filing tax system usage were found to be significant and positive. Thus, H_1 and H_2 were supported. However, the results did not support hypothesis H2 that proposed a positive relationship between information quality and e-filing tax system usage because the results were not statistically significant (β = 0.04; $p > 0.05$). As expected, hypothesis H4 proposing the relationship between e-filing tax system usage and tax compliance burden reduction was found to be positive and statistically significant ((β = 0.498; $p < 0.001$). Thus, hypothesis H4 was supported.

The effect size test (f^2) aimed at showing whether the effect of exogenous latent constructs on endogenous latent constructs produced values of Cohen's f^2 that exceeded an acceptable lower benchmark of 0.02 (except INQ, $f^2 = 0.001$), thereby confirming satisfactory explanative power for the endogenous latent constructs (Henseler, Ringle, & Sinkovics, 2009; C. Lee, Hallak, & Sardeshmukh, 2016). In assessing structural model prediction, the results indicated that the quality factors altogether explained 12.5% variation in e-filing tax system usage ($R^2 = 0.125$) and e-filing tax system usage 24.8% of the variance in tax compliance burden reduction ($R^2 = 0.248$). These coefficients are acceptable in the social science studies because the objective of social science research is to assess the relevance of the predictors (Ozili, 2023).

Table 4: Estimates of direct paths

Hypothesis	**Direct effect**	**Path coefficient**	***t*-value**	***Effect size (f^2)***	***Result***
H1	SEQ →ESU	0.217**	3.037	0.039	Supported
H2	SYQ → ESU	0.200**	3.261	0.042	Supported
H3	INQ → ESU	0.040	0.649	0.001	Not supported
H4	ESU → TCB	0.498***	9.181	0.329	Supported

Note: Significance (two tailed test): ***significant at $p \leq 0.001$ **significant at $p \leq 0.01$; *significant at $p \leq 0.05$
SEQ = Service quality; SYQ = System quality; INQ = Information quality; ESU = E-filing tax system usage; TCB = Tax compliance burden

The possible existence of indirect effect of service quality (SEQ) and system quality (SYQ) on tax compliance burden (TCB) was analysed using a two-step bootstrapping approach (Hair et al., 2019). The results presented in Table 5 revealed a significant indirect effect of SEQ (β =0.108; $p < 0.01$*)* and SYQ (β =0.100; $p < 0.01$*)* on TCB through SE. Since the direct effects of SEQ and SYQ on ESU were statistically significant, it can therefore be concluded ESU mediated partially the relationship between service quality and system quality and tax compliance burden.

Table 5: Estimates of indirect paths

Indirect effect	**Path coefficient**	***t*-Value**
SEQ → SE → TCB	0.108**	2.632
SYQ → SE → TCB	0.100**	2.896
INQ → SE → TCB	0.02	0.630

Note: Significance (two tailed test): ***significant at $p \leq 0.001$ **significant at $p \leq 0.01$; *significant at $p \leq 0.05$

SEQ = Service quality; SYQ = System quality; INQ = Information quality; SE = System engagement; TCB = Tax compliance burden

DISCUSSION OF FINDINGS

The objective of this study was to examine the impact of quality factors on e-filing tax system usage and its role in alleviating the tax compliance burden in Tanzania. Employing an updated version of the DeLone and McLean IS-Success model, the research aimed to assess the relationships among model variables. Specifically, the study sought to elucidate the influence of service quality, system quality, and information quality on e-filing tax system usage, as well as the relationship between e-filing tax system usage and tax compliance burden within the context of mandatory e-filing adoption, an area that has been underexplored, particularly among business taxpayers in developing countries.

Utilising survey data collected from business taxpayers in Tanzania, the findings indicate that service quality (H1) and system quality (H2) emerge as crucial factors influencing taxpayers' e-filing tax usage, whereas information quality (H3) is found to be insignificant in this regard. Additionally, the study demonstrates that the adoption of an e-filing contributes to a reduction in the tax compliance burden (H4).

Notably, the significant and positive effect of service quality on taxpayers' e-filing tax system usage aligns with previous research conducted in settings where e-filing is mandatory (S. M. Lee & Lee, 2012), yet contrasts with findings from other studies (Veeramootoo et al., 2018). This suggests that higher-quality services offered in relation to an e-filing system reinforce taxpayers' utilisation of the system. A system with quality service enables taxpayers to fulfil their tax obligations with ease and minimal obstacles, thereby enhancing the benefits, such as cost and time savings, derived from using the system (Islam et al., 2012).

Regarding the aspect of system quality, the study reveals a significant and positive correlation between system quality and system usage. This finding aligns with previous research findings (Ramdhony et al., 2023; Veeramootoo et al., 2018), indicating that taxpayers place considerable importance on system quality when utilising the system for tax return filing purposes. Taxpayers demonstrate a preference for an e-filing tax system characterised by reliability, user-friendly functionalities offering prompt and easy access to information, and robust security measures (Albay, 2020). Such a system minimises instances of failures or late filings, thereby reducing associated penalties.

It is noteworthy that the impact of information quality on taxpayers' usage of the system is deemed insignificant, a result consistent with prior investigations(S. M. Lee & Lee, 2012; Veeramootoo et al., 2018). This insignificance can be attributed to taxpayers with prior experience of using e-filing tax system possessing a comprehensive understanding of the technology's utilization, thereby rendering information quality less crucial compared to service and system quality (Ramdhony et al., 2023). This phenomenon is conceivable as tax-related information typically remains static, and once taxpayers obtain accurate and pertinent information for their tax reporting, they can effectively apply it without the need for subsequent reference or guidance from tax officials (Hambali, 2020).

Finally, the study's results underscore the significant role of e-filing in alleviating taxpayers' tax compliance burden. This finding is pivotal as it corroborates the notion that e-filing offers numerous benefits to taxpayers, including error reduction in tax returns as well as savings in terms of finances, time, and effort (Bellon et al., 2022; Okunogbe & Pouliquen, 2022). These advantages are particularly pronounced among taxpayers with extensive experience of utilising the e-filing tax system, as their familiarity

with the process facilitates effective system utilisation through a process of experiential learning (Yilmaz & Coolidge, 2013).

Theoretical implications

The study contributes to the existing literature in several ways. Firstly, it enhances our understanding of the relationship between e-filing and tax compliance burden in Tanzania. By leveraging DeLone and McLean's IS-Success model (DeLone & McLean, 2003), we empirically demonstrate that e-filing holds the potential to alleviate the tax compliance burden, particularly in the long term. Our findings corroborate the assertion made by Yilmaz and Coolidge (2013) that taxpayers require ample time to acclimate to the system through a process of experiential learning in order to fully reap its benefits in terms of reducing the tax compliance burden. Our results indicate that the adoption of e-filing is linked with a reduction in the tax compliance burden among business taxpayers with extensive experience of utilising e-filing tax system. Furthermore, incorporating the relationship between tax system usage and compliance burden as an outcome in our conceptual model advances our understanding of this unique yet largely overlooked relationship, which has been disregarded by the majority of studies on e-government (Ramdhony et al., 2023; Veeramootoo et al., 2018) and information systems (Alzahrani et al., 2019).

Secondly, our findings reveal that service quality and system quality significantly influence taxpayers' system usage, whereas information quality does not exhibit similar significance in a context where the use of e-filing is obligatory. These factors act as catalysts for the effective utilisation of the e-filing tax system, subsequently aiding business entities in reducing their tax compliance burden. Thirdly, unlike prior studies that primarily focused on the relationships between system quality factors and continued use among individual taxpayers and citizens (Chen et al., 2015; Ramdhony et al., 2023; Veeramootoo et al., 2018), our study shifts its focus to include business entities, a group that has been largely overlooked in e-government literature. By doing so, the study contributes to our understanding of the system quality factors deemed important by private business taxpayers in influencing their usage of e-filing and the system's contribution to reducing the tax compliance burden.

Practical implications

While the findings hold significance for Tanzania, they might relevant for other developing nations with similar policies of implementing e-filing. It is advised that continuous efforts be made by Tanzania Revenue Authority (TRA) to enhance the system's quality through increased investment in its technical aspects, ensuring seamless system operation, and maximising security to safeguard taxpayers' information. Furthermore, the active involvement of system users in the design process is emphasised to foster mutual trust and minimise potential user-related issues (Veeramootoo et al., 2018).

Service quality, identified as a key predictor of heightened system usage, should also be prioritised for improvement by tax authorities. This can be achieved through the implementation of standardised and simplified services, prompt and effective response mechanisms to inquiries and system issues, addressing challenges such as slow internet speed, providing timely feedback, and offering excellent customer care. Moreover, the study findings emphasise that the adoption of e-filing contributes to a notable reduction in the tax compliance burden in terms of cost, time, effort, and errors. Hence, it is imperative for tax authorities to focus on designing a user-friendly e-filing, as simplicity in design streamlines tax reporting processes and reduces the need for frequent

interactions with tax officials, which are often cited as primary contributors to increased tax compliance burdens.

Limitations and future studies

While this study contributes to our comprehension of the determinants of e-filing use and its potential to alleviate tax compliance burdens, it has several limitations that must be considered when interpreting the results. Firstly, the study sample comprises private business taxpayers that were filing their VAT returns online before 2020, the year when the use of e-filing became mandatory for all taxpayers. The results may exhibit bias when extrapolated to new users of the e-filing, encompassing both business and individual taxpayers. Future research should apply the model to samples from these two groups to elucidate the influence of system quality factors on the system usage and its impact on tax compliance burden.

Secondly, the theoretical underpinning of this study is derived from Delone and McLean's IS Success Model (DeLone & McLean, 2003). However, prior research suggests that integrating the IS Success Model with other theories, such as Trust Theory, provides a more comprehensive understanding of the determinants of system use (Ramdhony et al., 2023; Veeramootoo et al., 2018). Therefore, future studies might consider extending the model by incorporating concepts such as trust in government, technology, e-government websites, and perceived risks to enhance the explanatory power of the model, leading to more valid conclusions (Ramdhony et al., 2023).

Thirdly, as the current study adopts a cross-sectional design with data collected at a single point in time, it fails to capture trends and changes in taxpayers' perceptions of quality factors or relationships among the study variables over different time periods. For instance, government changes in 2020, expanding the scope and making e-filing mandatory for all taxpayers and types of tax returns, could have influenced taxpayers' evaluations of the e-filing tax system. Incorporating a longitudinal research design into future studies is imperative to enhance the validity and reliability of the results.

CONCLUSION

In conclusion, this comprehensive study explores the transformative impact of e-filing tax system on tax compliance burden, focusing on the Tanzanian context, where the government transitioned from paper-based filing to e-filing in 2010 and expanded its scope to cover income tax returns in 2020. The adoption of e-filing, prompted by global advances in information technology and the imperative for time and cost efficiency, holds the potential to revolutionize tax systems, offering advantages for both tax authorities and businesses.

The research, employing a modified DeLone and McLean’s IS-Success model, establishes that service quality and system quality significantly influence taxpayers' usage of the e-filing system, leading to a subsequent reduction in tax compliance burden. Notably, the study bridges a gap in existing literature by shifting the focus to business entities, providing valuable insights into the crucial factors influencing e-filing tax system usage and the system's role in mitigating tax compliance burdens.

The theoretical implications of the study contribute substantially to the understanding of the dynamics between e-filing and tax compliance burdens in Tanzania. By empirically demonstrating the potential of e-filing to alleviate tax compliance burden in the long term, the research validates the need for taxpayers to acclimatise to the system through experiential learning. The inclusion of the relationship between tax system usage and compliance burden enhances our understanding of this overlooked aspect in studies on e-government and information systems. From a practical standpoint, continuous efforts to enhance system quality through technical investments, seamless operation, and

robust security measures are advised. Additionally, the active involvement of system users in the design process is emphasised to build trust and minimise user-related issues.

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