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Environmental and Legal Dimensions of Tax Compliance: the Moderation Effect of Technological Factors "Focused on SMEs" in Ghana

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Abstract: ***Purpose: The study examined how environmental and legal framework improved SMEs tax compliance behavior aided with technology assistance. Methodology: A correlational descriptive research design utilizing a multi-stage sampling technique and a structured closed ended questionnaire was adopted for the study. Data was collected from 353 SMEs from the largest administrative region with the largest SMEs population. Smart PLS 4 was used to test the hypothesis of the study. Findings: The findings showed a robust and statistically significant connection between technological factors, legal framework and tax compliance, highlighting the pivotal role of technology in facilitating compliance. However, the exploration of technological factors interactions with environmental factors and legal framework provided valuable insights into their collective influence on tax compliance. Practical implication: The results offer practical guidance for policymakers, SMEs, and researchers, provide theoretical insights in drafting tax compliance frameworks. Originality: The interaction effect of technology is investigated in this study as missing in the extant literature. Prior studies neglected the SMEs sector and focused on large corporate entities.***

Keywords: Technology, Regulatory Framework, SMEs, Environmental, Compliance, Tax

I. INTRODUCTION

Small and Medium-sized Enterprises (SMEs) play an indispensable role in the economic development of nations across the globe (Manzoor et al., 2021). Whether in developed economies like the European Union and the United States or in developing countries such as Sub-Saharan Africa and India, SMEs contribute significantly to employment, innovation, and economic resilience (Disse & Sommer, 2020). As a developing nation striving for sustainable economic growth, Ghana faces unique challenges and opportunities in fostering SMEs' tax compliance (Kouam & Asongu, 2022). In the era of digital transformation, technological advancements are revolutionizing the ways SMEs operate and interact with governments (Bresciani et al., 2021).

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Case studies from various countries offer valuable lessons for Ghana's policymakers. For instance, the mandatory electronic invoicing system adopted by Brazil's Nota Fiscal Electronica (NF-e) has demonstrated enhanced transparency and real-time data sharing with tax authorities, effectively curbing tax evasion (Kowal-Pawul & Przekota, 2021). Australia's utilization of advanced data analytics and AI for "data matching" showcases the potential for efficient tax enforcement through technology-driven approaches (Bishop, 2021). In Ghana, leveraging technology could streamline tax processes, ease compliance burdens, and reduce the scope for evasion (Okunogbe et al., 2023). A localized version of electronic invoicing and the integration of AI-driven data analytics could enhance accuracy, reporting, and transparency (Modgil et al., 2022).

Moreover, Ghana's mobile penetration rate opens avenues for innovative solutions such as smartphone apps and chat bots to provide user-friendly taxpayer support, enabling SMEs to engage with tax regulations conveniently (Richardson, 2023). The success of tax compliance strategies hinges on the broader environmental context within which SMEs operate (Effiom et al, 2018). In Ghana, factors like tax policies, tax rates, incentives, and enforcement mechanisms significantly influence SMEs' tax compliance behaviour. The clarity and complexity of regulations, as well as the accessibility of accurate information, impact SMEs' understanding and willingness to comply (Mbilla,2018). Government trust and cultural norms also shape the tax compliance landscape (Batrancea et al., 2022). As demonstrated by Mexico's eContabilidad system, Ghana can implement technology-driven solutions within its regulatory framework. For instance, mandatory electronic submission of accounting records could enhance transparency, reduce evasion, and improve reporting accuracy (Mosteanu & Faccia, 2020). Moreover, understanding the influence of Ghana's unique cultural norms and economic conditions will guide policymakers in designing tax policies that resonate with SMEs' operational realities (Dziuron et al., 2023). A robust legal and regulatory framework is foundational for ensuring SMEs' tax compliance. By examining case examples from countries like the United States, the European Union, and the United Kingdom, Ghana can gain insights into effective tax identification, reporting, and recordkeeping requirements.

Equally important are measures to prevent inadvertent involvement in illegal financial activities, such as anti-money laundering (AML) regulations.

In Ghana, building upon existing legal foundations, policymakers can implement a structured framework that mandates tax registration, reporting, and adherence to VAT/GST regulations. A clear and comprehensive regulatory structure, combined with accessible educational resources, would assist SMEs in navigating complex tax regulations (Koirala, 2019).

The complex interplay of technological trends, environmental factors, and the legal and regulatory framework could shape the landscape of SMEs' tax compliance in Ghana, as the nation pursues sustainable economic growth. By embracing technology, such as electronic invoicing and AI-driven analytics, Ghana can empower SMEs to navigate tax regulations with greater ease. The accessibility of tools like smartphone apps and chat bots can democratize compliance education and engagement. Cultural norms, economic conditions, and tax policies uniquely impact compliance in Ghana, presenting both challenges and opportunities (Nurkholis et al., 2020). Aligning tax policies with SMEs' realities and fostering trust between government and businesses can incentivize adherence.

The integration of technology into Ghana's regulatory structure, coupled with measures like anti-money laundering, can further strengthen the compliance framework. This synergy among technological advancements, an adaptive legal framework, and an understanding of environmental dynamics presents Ghana with an opportunity to foster SME growth, innovation, and resilience. As these elements converge, it emphasizes the necessity of strategic harmonization for a prosperous future built upon sustainable economic development and a thriving SME sector.

In the realm of tax compliance behaviour, particularly in the context of developing countries like Ghana, it is crucial to understand the challenges and opportunities associated with taxation as a vital revenue source for governments (Peprah et al., 2020). Many developing nations grapple with issues related to low tax compliance and inefficient tax administration (Sebele-Mpofu et al., 2021). These challenges have been widely documented in various studies and reports, with a significant portion of uncollected taxes attributed to non-compliance (Auksztol & Chomuszko, 2020).

Effective tax compliance is essential for governments to manage their debt levels, ensure efficient revenue collection, and maintain sustainable economic growth (Yunusovich et al., 2021). To achieve this, developing countries must implement strategies that encourage tax compliance and improve tax administration systems (Okpeyo et al., 2019).

Economists like James Poterba emphasize the role of technology, including accounting software and automated systems, in simplifying tax tracking, minimizing errors, and encouraging voluntary compliance among small and medium-sized enterprises (SMEs) through user-friendly interfaces (Sialm & Zhang, 2020). However, Joel Slemrod highlights that technology can also enable complex evasion tactics, necessitating adaptable enforcement strategies (Keen & Slemrod, 2017). Raj Chetty suggests that technology-backed behavioural nudges, such as reminders and social norms messaging, can align taxpayer behaviour with compliance objectives (Chetty et al., 2014). Stewart's research (2022) emphasizes how technology is reshaping compliance norms, potentially enhancing accuracy and transparency among SMEs.

Complex tax systems can lead to non-compliance among SMEs due to difficulties in navigating intricate regulations (Nutman et al., 2022). Okwara's research (2020) underscores the role of trust in tax compliance, stating that SMEs are more likely to comply when they trust that taxes will be used fairly by the government. De Giovanni et al. (2023) highlights how cultural norms and perceived detection likelihood influence tax evasion choices. Wolfe (2020) suggests applying behavioural economics' "nudge" theory to tax communications for encouraging SME compliance. Isaiah's work (2022) emphasizes the link between tax morale, fairness perceptions, and fellow citizens' compliance, shaping SMEs' willingness to comply.

In Ghana, several research studies have examined tax compliance among SMEs from various angles (Carsamer & Abbam, 2023; Okpeyo, Musah, and Gakpetor, 2019; Amanamah, 2016; Amaning et al., 2021; Nartey, 2023; Susuawu et al., 2020). Carsamer and Abbam (2023) explored the potential influence of religion on tax compliance, while Okpeyo, Musah, and Gakpetor (2019) examined various factors impacting compliance behaviour. Amanamah (2016) delved into underlying factors contributing to tax compliance among SMEs. Additionally, studies by Amaning et al. (2021), Nartey (2023), and Susuawu et al. (2020) have focused on topics such as the efficacy of taxpayer education, compliance behaviour of SMEs, and the influence of service quality.

However, there remains a significant gap in the literature that warrants exploration, specifically in the context of Ghana. This rapidly growing area can provide valuable insights into the dynamics of tax compliance within emerging economies, considering factors like technological trends, environmental considerations, and legal frameworks. A localized study in Ghana can offer a nuanced understanding of the challenges and opportunities in tax compliance and potentially serve as a benchmark for other countries facing analogous circumstances. This research gap highlights the importance of future studies in this area.

II. LITERATURE REVIEW

A. Theoretical Foundation

Exploring the intricacies of tax compliance among Small and Medium-sized Enterprises (SMEs) in Ghana is a multifaceted endeavour. In this context, it is crucial to establish a robust theoretical framework to effectively dissect the various factors that influence the tax compliance behaviour of SMEs. This study justifies the selection of three interconnected theories: The Theory of Planned Behaviour (TPB), Institutional Theory, and the Innovation Diffusion Theory (IDT) to underpin our research on the impact of technological trends, environmental factors, and the legal and regulatory framework on SMEs' tax compliance.

This theoretical framework not only aligns with our specific research objectives but also bridges the gaps between environmental factors, the legal and regulatory framework, and technological trends in the tax compliance landscape.

Our primary objective was to assess the influence of current technological trends on tax compliance among SMEs in Ghana. To achieve this goal, we drew upon the Theory of Planned Behaviour (TPB) and the Innovation Diffusion Theory (IDT), connecting these theories to provide a comprehensive understanding of the subject. The OECD (2010) defines diffusion as the gradual process through which a successful innovation becomes widely accessible for relevant applications, primarily driven by the adoption of new technologies.

Research by the National Bureau of Economic Research (NBER) has shown that taxes exert a significant impact on innovation, potentially having profound consequences on technological progress and overall growth. Supporting this notion, the World Bank (2022) suggests that digital technologies can alleviate many challenges associated with tax compliance, emphasizing the potential for innovation diffusion theory to pinpoint the factors influencing the adoption and dissemination of new tax compliance innovations. For example, Ferreira, Vale, and Corrêa (2022) applied innovation diffusion theory to investigate the adoption of the Uber platform, highlighting the role of diffusion theory in understanding how customers embrace innovation. Meanwhile, Barnay, Davis, Dimson, Gibbs, and Korn (2018) underscore the relevance of innovation diffusion theory in identifying the innovations reshaping tax administration, including digitalization, data analytics, behavioural insights, and collaboration. TPB, on the other hand, posits that individual behaviour is shaped by attitudes, subjective norms, and perceived behavioural control (Kashif et al., 2018). In the context of technological trends, TPB allows us to explore SMEs' attitudes toward technology adoption for tax compliance. For instance, when examining the implementation of electronic invoicing systems and AI-driven analytics in tax compliance, TPB aids in comprehending how SMEs' attitudes influence their compliance behaviour (Altin & Yilmaz, 2022). Drawing lessons from regions with similar technological adoptions, a study conducted in Brazil revealed that the mandatory electronic invoicing system, Nota Fiscal Electronica (NF-e), significantly improved transparency and real-time data sharing with tax authorities, leading to a reduction in tax evasion (Bora et al., 2021). Furthermore, Bani-Khalid et al. (2022) applied TPB to gauge the intentions of owner-managers in SMEs in Jordan concerning their compliance with tax regulations. The study demonstrated that attitudes, subjective norms, and perceived behavioural control played significant roles in predicting tax compliance intentions.

In sum, TPB and the diffusion of innovation theory serve as valuable lenses through which we can explore whether positive attitudes toward technological adoption, coupled with effective innovation diffusion strategies, lead to enhanced tax compliance among SMEs in the Ghana, bridging the gap between technology adoption and tax compliance behaviour. Our second objective was to evaluate the impact of environmental factors, such as economic conditions and government policies, on tax compliance behaviour within the Ghanaian context. In this endeavour, we turn to the invaluable perspective of Institutional Theory, Innovation Diffusion Theory, and the Theory of Planned Behaviour. The Institutional theory underscores how organizations and individuals conform to established institutional norms and rules (Tu & Wu, 2021). Horodnic's work (2018) reinforces the relevance of Institutional Theory in understanding tax morale, which is often shaped by the interplay between formal and informal institutions. It calls attention to the significance of bridging the gap between these two dimensions to combat low tax morale effectively. The International Monetary Fund (IMF) (2015) further emphasizes the role of political institutions in bolstering tax capacity building, thereby influencing tax compliance behaviour. Constitutive institutions, regulatory institutions, and enforcement institutions are deemed pivotal in this process. Exploring how SMEs respond to government policies and economic conditions through tax compliance, as highlighted by Chen et al. (2022), opens avenues to understand the intricate relationship between external factors and compliance behaviour. Drawing from international examples, we observe Mexico's eContabilidad system mandating electronic submission of accounting records, leading to enhanced transparency and reduced evasion (Mosteanu & Faccia, 2020). Transitioning to the Theory of Planned Behaviour (TPB), Nurwanah, Sutrisno, Rosidi, and Roekhudin (2018) delve into the influence of moral obligation on tax non-compliance behaviour among individual taxpayers in Indonesia.

Their findings underscore the significance of moral obligation as a predictor of tax compliance behaviour. Similarly, Bellová and Špírková's study (2021) in the Czech Republic, employing TPB and structural equation modelling, identifies attitudes, subjective norms, and perceived behavioural control as significant determinants of tax compliance behaviour. Building on the concept of innovation diffusion, Dom, Custers, Davenport, and Prichard (2022) suggest its application in identifying factors influencing the adoption and diffusion of new tax compliance innovations. This includes digital technologies, which have the potential to alleviate various challenges associated with tax compliance. Sartipi's work (2020) further elucidates the four key elements of innovation diffusion theory: innovation, communication channels, time, and social systems. These elements prove instrumental in analysing the diffusion of new tax compliance innovations, such as digital technologies, and their impact on compliance behaviour. Shiau et al. (2018) offer insights into the central role of Innovation Diffusion Theory (IDT) in understanding adoption factors, innovation characteristics, communication channels, and temporal aspects of innovation diffusion, as evidenced in the context of OpenStreetMap (OSM) adoption in STEM education. In sum, this multifaceted approach, drawing on Institutional Theory, Theory of Planned Behaviour, and Innovation Diffusion Theory, offers a holistic framework to investigate the complex dynamics of tax compliance behaviour in the face of environmental influences.

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Objective three of the study was to examine the effectiveness of the legal and regulatory framework in promoting tax compliance among SMEs in Ghana. This objective maintains a strong connection with Institutional Theory, as the legal and regulatory framework is an integral part of the institutional environment (Ranta et al., 2018). For example, in the United States, an effective legal and regulatory framework is crucial to ensure tax compliance among SMEs (Nyarku & Oduro, 2018).

A clear and comprehensive regulatory structure, combined with accessible educational resources, assists SMEs in navigating complex tax regulations. By applying Institutional Theory, we can scrutinize the effectiveness of the existing legal and regulatory framework in Ghana and how it shapes SMEs' tax-compliance behaviour. The Innovation Diffusion theory also has a stake in the matter. Kergroach and Bianchini (2021) suggest that programs for improving the diffusion of technology have shifted from a supply focus to raising the capacity of SMEs to absorb technology. The study highlights the importance of the legal and regulatory framework in shaping the capacity of SMEs to absorb technology and innovate. Pagalung and Habbe's (2021) study employed the Theory of Planned Behaviour (TPB) to examine tax compliance within the SME sector. They utilized attitude, subjective norms, and perceived behavioural control as variables to pinpoint the factors influencing tax compliance behaviour among SMEs. The study unearthed several significant findings: it revealed that attitude toward behaviour, subjective norms, and perceived behavioural control strongly influence tax compliance intentions among SMEs. Subjective norms emerged as the most influential factor, followed by perceived behavioural control and attitude toward behaviour. The study underscores the TPB's utility in identifying and addressing factors affecting tax compliance among SMEs, offering insights for interventions to enhance compliance. In essence, the study underscores the pivotal role of attitude, subjective norms, and perceived behavioural control in shaping tax compliance behaviour in the SME sector, with TPB serving as a valuable tool for this purpose.

While these three theories provide a solid theoretical framework, it is essential to acknowledge their limitations. For instance, TPB primarily focuses on individual attitudes and may not fully capture external influences (Conner, 2020). Institutional Theory, while comprehensive, may not delve into individual psychological factors as deeply as TPB does. Moreover, the Diffusion of Innovation Theory primarily emphasizes technological adoption but may not account for institutional and individual factors (Zhang et al., 2020). However, these limitations are interconnected. TPB's focus on individual attitudes complements Institutional Theory's emphasis on external pressures, allowing us to examine how individual attitudes interact with institutional norms. Additionally, the Diffusion of Innovation Theory bridges the gap between individual and environmental factors by exploring technological adoption, which is influenced by both factors. In conclusion, our chosen theoretical framework combines the strengths of TPB, Institutional Theory, and the Diffusion of Innovation Theory while acknowledging their limitations.

This multi-theoretical approach aligns seamlessly with our research objectives, allowing us to explore the intricate interplay between environmental factors, legal and regulatory framework, and technological trends in shaping SMEs' tax compliance behaviour in Ghana. By integrating these theories, we ensure a comprehensive understanding of the factors that influence tax compliance, ultimately contributing to effective policy development and sustainable economic growth.

III. EMPIRICAL REVIEW

A. Current Technological Trends and Tax Compliance Among SMEs

Erin (2021) conducted a qualitative study on the effects of digitizing tax administration to reduce compliance costs for Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. Key among the findings is that digitization of tax administration positively enhances the role of the digital economy, leading to improved services, especially in tax administration. Despite digitalization efforts, MSME taxpayers continue to grapple with challenges, as tax services, the tax system, tax rates, and sanctions still pose burdens. Bellon et al. (2022) evaluated the repercussions of e-invoicing on firm tax compliance and performance in Peru, revealing that the adoption of e-invoicing results in an increase of over 5% in reported firm sales, purchases, and value-added within the first year. This suggests that digital tools like e-invoicing should be complemented with additional reforms to enhance revenue mobilization.

Also, Etim, Jeremiah, and Dan (2020) examined the influence of digitalization of the economy on tax compliance in Nigeria, unwavering that tax compliance tends to decrease in a digitalized economy. Challenges associated with digitalization of the economy and tax compliance are exacerbated by multi-sided platforms. Similarly, Daniel and Esther (2019) found that the level of awareness of electronic tax significantly affects tax compliance among small and medium-scale enterprises (SMEs) in Lagos. They also discovered that the adoption of electronic tax systems can enhance tax compliance among SMEs. In another study titled "The Effects of E-Services on Revenue Collection and Tax Compliance among SMEs in Developing Countries: A Case Study of Zambia," conducted by Mukuwa and Phiri (2019), delved into the impact of e-services on revenue collection and tax compliance among small and medium enterprises (SMEs) in Zambia. Their study revealed that the introduction of e-services has led to a noteworthy increase in revenue collection and tax compliance among SMEs. The study established a strong correlation between SMEs' behavioural intentions and their actual utilization of e-services. Again, no specific study has investigated the interaction effect of technological factors on the relationship between environmental factors, legal framework and tax compliance in Ghana.

In light of these enlightening findings, the researchers proposed that tax authorities should continue their efforts in promoting awareness about e-services and ensure the provision of necessary infrastructure to facilitate compliance among SMEs.

B. Environmental Factors and Tax Compliance among SMEs

Umar, Derashid, Ibrahim, and Bidin (2018) undertook a study exploring the nexus between public governance quality and tax compliance behaviour in developing nations. Their findings reveal that public governance quality is closely intertwined with tax compliance behaviour in developing countries, with socioeconomic conditions serving as a mediator in this relationship. Socioeconomic conditions emerge as a more comprehensive and practical measurement metric than the traditionally considered public goods and spending.

Several studies identified various factors influencing tax compliance behavior (Mannan, 2020; Ntiamoah, Sarpong, and Winful, 2019; Tilahun, 2019; Naeem and Gulzar, 2021; Dibie and Raphael, 2020). Mannan (2020) empirical investigation scrutinized the factors influencing compliance among individual income taxpayers in Bangladesh. The study showed that Fairness, tax penalties, and perceptions of government spending exhibit positive and significant relationships with compliance. Ntiamoah, Sarpong, and Winful (2019) delved into the impact of economic variables on tax compliance intentions among self-employed individuals in Ghana. Their findings provide valuable insights: Frequent audits, lower tax rates, and higher income positively influence tax compliance intentions, while higher fines exert a negative effect. Economic variables are seen to exert a moderate but positive influence on tax compliance intentions in developing economies. Similarly, Tilahun (2019) research focuses on the determinants of tax compliance decisions. The study identifies several key factors that such as Penalties, tax system fairness, tax rates, the probability of detection, and audit likelihood that affect tax compliance decisions.

Also, Dibie and Raphael (2020) study examines tax policy compliance and impediments to effective tax administration in Nigeria. The study results revealed that lack of tax knowledge and low levels of education exhibit strong positive relationships with tax compliance in Nigeria, Corruption demonstrates a robust positive correlation with tax evasion. The study highlights various negative correlations, including the inadequate use of information technology in tax administration, lack of government incentives, and a challenging economic environment. Moreover, Naeem and Gulzar (2021), investigated the voluntary tax compliance behaviour of individual taxpayers, considering various economic, social, behavioural, and institutional factors. Tax compliance simplicity emerges as a dominant factor impacting tax filing, overshadowing perceptions about government spending.

Extant literature indicates that, the link between environmental factors and tax compliance is understudied (Damerji and Salimi, 2021) and therefore the justification for further studies in Ghana, especially among SMEs.

C. Legal and Regulatory Framework and Tax Compliance Among SMEs

Peprah, Abdulai, and Agyemang-Duah (2020) highlighted significant factors influencing tax compliance among Micro, Small, and Medium Enterprises (MSMEs). These factors encompassed a lack of tax education, high tax rates, low-income levels, and elevated household consumption. The study also identified challenges in tax administration, such as limited institutional capacity, insufficient resources, negative public attitudes toward tax payments, lack of collaboration among tax agencies, and political interference. Also, Nyarku and Oduro (2018) identified various impediments to the growth of Small and Medium Enterprises (SMEs) in Ghana. This included bureaucracy, an unstable policy environment, unfriendly customs and trade regulations, tight monetary and credit policies, corruption, and burdensome tax regimes, as well as challenges related to workforce and labour regulations. To foster SME growth, the authors stressed the importance of establishing robust legal and regulatory systems.

Another study conducted by Thompson, Agyapong, Mmieh, and Mordi (2018) identified multiple factors affecting the growth of SMEs in Ghana. These factors encompassed education levels, energy supply reliability, access to external financing, competitive pressures, inflation, and government policies. To ensure consistent SME growth in Ghana, the authors recommended sustained energy supply, revisions of lending and borrowing regulations, favourable fiscal policies, measures to address unhealthy competition, establishment of adequate training centres for entrepreneurs, and regulation of land acquisition. Similarly, Twum et al. (2020) also investigated the relationship between tax compliance and various factors among SMEs in the context of a developing country. Their findings indicated that knowledge of tax rights and responsibilities, awareness of employment income taxation, and awareness of tax sanctions had a positive and significant impact on tax compliance. The study recommended tax education as a means to enhance tax knowledge and improve compliance among SMEs in developing countries.

The studies above delved into tax compliance among Small and Medium-sized Enterprises (SMEs) across diverse contexts, spanning Indonesia, Peru, Nigeria, Ghana, and Zambia. These studies comprehensively analyse various independent variables, encompassing digitalization, socioeconomic factors, tax education, corruption, institutional challenges, and policy recommendations. The key findings underscore that digitalization can have a positive impact on tax compliance, while specific socioeconomic conditions shape compliance behaviour. Furthermore, these studies emphasize the role of tax education in fostering compliance and highlight how corruption and institutional challenges can impede it. Despite the valuable insights offered by these studies, a crucial research gap becomes evident. This gap centres on the absence of comprehensive research that investigates the intricate interplay among these independent variables, particularly within the specific context of Ghana. It is imperative to gain a nuanced understanding of how current technological trends intersect with the unique environmental factors, regulatory framework, and institutional challenges specific to Ghana to influence tax compliance behaviours among SMEs.

Addressing this research gap is vital for cultivating a holistic comprehension of the multifaceted factors impacting tax compliance, particularly within Ghana. It would further guide policymakers in crafting effective strategies to elevate compliance rates across varied regions and economic landscapes within the country.

IV. MATERIALS AND METHODS

A quantitative correlational research design was adopted for this study. The purpose of the study was to examine the moderation effect of technological factors on the relationship between environmental factors, legal framework and tax compliance in Ghana. The study was conducted across three administrative belts based on the classification of the country into Coastal, forest, and Savanna belts by the Department of Environment and Resource Studies (2013) was used. This ensures that the country is fairly covered since each of the belts has similar economic and demographic characteristics. In all, one region with the highest tax capacity in each belt was purposely selected. In the Coastal belt, Greater-Accra region was selected, the Ashanti region was selected from the Forest belt, and the Northern Region from the Savannah belt. Specifically, the Kaneshie STOs was selected in the Grater-Accra Region, Suame STOs in the Ashanti region and Tamale STO selected from the Northern Region of Ghana based on their tax capacity and population. The study population included all small and medium enterprises (SMEs) in Ghana. The target audience will be small and medium enterprises from Kaneshie STO, Suame STO and Tamale STO. The data for this study were sourced from 353 SMEs from three (3) districts each from the three belts in Ghana with the aid of a questionnaire survey. A multi-stage sampling technique (stratified – purposive - simple random) was adopted in selecting the study sample. Once all the questionnaires were collected, the data went through a cleaning process to correct the missing or inconsistent responses using Microsoft Excel. The data was imported into statistical software, SmartPLS 4 for analysis. In the data analysis phase of this study, two analytical approaches were employed: descriptive and inferential statistical analysis using SmartPLS software version 4.0. Descriptive statistical analysis was utilized to examine the demographic profile of the respondents. Furthermore, inferential statistical analysis, specifically Partial Least Squares Structural Equation Modeling (PLS-SEM), was conducted to facilitate data analysis. SEM was selected as the analytical method for this study due to its capacity to analyze intricate models and produce robust results. SEM also allows for the simultaneous evaluation of multiple relationships between latent and observed variables, making it a potent tool for assessing complex phenomena. The data analysis using SEM encompassed four distinct stages: Preliminary Data Analysis (PDA), Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Moderation Analysis (Bootstrapping). Initially, the responses from the field were collected, coded, and subjected to analysis. Following that, EFA was carried out to evaluate the suitability and sufficiency of the gathered data. Subsequently, CFA was employed to ascertain the reliability and validity of the data. Finally, a Moderation Analysis was conducted to investigate the relationship between the dependent and independent variables.

V. DESCRIPTIVE ANALYSIS OF DEMOGRAPHICS

This data analysis section focuses on the demographics of the respondents, including gender, age range, education level, category of business and number of employees, as shown in Table 1.

Table 1. Analysis of Respondents

Gender	Frequency	Percent
Male	132	37.4
Female	221	62.4
Total	353	100
Age range		
18-33	170	48.2
34-50	142	40.2
51-65	32	9.1
66 and above	9	2.5
Total	353	100
Educational Level		
Informal	47	13.3
Primary	42	11.9
Secondary	99	28
Tertiary	165	46.7
Total	353	100
Category of Business		
Services	151	42.8
Trading	122	34.6
Agri-business	53	15
Manufacturing	27	7.6
Total	353	100
Number of Employees		
Jan-15	253	71.7
16-50	74	21
51-100	26	7.4
Total	**353**	**100**

Source: Owner's Survey

Table 1 outlines the demographics of respondents in a study on the impact of current technological trends, environmental factors, and the legal and regulatory framework on SME tax compliance in Ghana. The table includes 132 males (37.4%) and 221 females (62.1%). This analysis of SME owner demographics reveals intriguing insights into this sector.

Notably, a significant gender disparity is evident, with females comprising a substantial majority at 62.6%, indicating evolving entrepreneurial dynamics. The age distribution is diverse, with a notable presence of young entrepreneurs aged 18-33 (48.2%) alongside older owners in the 34-50 (40.2%) and 51-65 (9.1%) age groups, highlighting the importance of generational perspectives in tax compliance. Regarding education, many owners hold tertiary degrees (46.7%), showcasing varying levels of expertise. Business sectors are diversified, with services (42.8%) and trading (34.6%) dominating, and SMEs primarily employ 1-15 employees (71.1%), highlighting the prevalence of small-scale operations. These demographics offer a foundation for exploring the effect of current technological trends, environmental factors, legal and regulatory framework's impact on SMEs tax compliance and inform tailored policies to promote compliance and entrepreneurship.

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A. Construct Measurement

Table 2. Latent Variables – Correlations

	EF	LR	TC	TF	TF x EF	TF x LR
EF	1	-0.29	-0.09	0.56	-0.18	-0.02
LR	-0.29	1	0.51	-0.07	-0.03	0.35
TC	-0.09	0.51	1	0.22	0.18	0.04
TF	0.56	-0.07	0.22	1	0.26	-0.18
TF x EF	-0.18	-0.03	0.18	0.26	1	-0.34
TF x LR	-0.02	0.35	0.04	-0.18	-0.34	1

Source: Owner's Survey

Table 2 shows the correlation result of latent variables on the effect of current technological trends (TF), environmental factors (EF), legal and regulatory framework (LR) on SMEs tax compliance in Ghana. Notably, a significant positive correlation (0.56) was observed between TF and EF, indicating that as technology advances, so does environmental consciousness in business practices (Liu et al., 2021). Furthermore, a substantial positive correlation (0.51) emerged between LR and TC, underscoring the pivotal role of a robust legal framework in fostering tax compliance (Evans et al., 2023). Our findings also revealed a positive association (0.22) between TF and TC, suggesting that technological advancements can simplify tax-related processes for SMEs (Bhalla, Sharma, & Kaur, 2023). However, the interactions between TF and EF as well as TF and LR displayed nuances, with negative correlations implying that the interplay of technology with legal or environmental factors may not consistently lead to higher tax compliance. These results emphasize the multifaceted nature of tax compliance determinants, advocating for a holistic approach to tax strategies for SMEs in the region.

Table 3: Reliability and Validity Test Result

Variables	Indicators	Factor Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Technological Factors	TF1	0.89			
	TF2	0.90			
	TF3	0.91			
	TF5	0.52			
			0.86	0.89	0.68
Environmental Factors	EF1	0.92			
	EF2	0.91			
	EF3	0.89			
	EF4	0.89			
	EF5	0.88			
			0.94	0.95	0.80
Legal and Regulatory	LR1	0.81			
Framework	LR2	0.84			
	LR3	0.87			
	LR4	0.90			
	LR5	0.88			
			0.91	0.93	0.73
Tax Compliance	TC1	0.85			
	TC2	0.92			
	TC3	0.90			
	TC4	0.90			
	TC5	0.90			
	TC6	0.87			
			0.95	0.96	0.79

Source: Owner's Survey

The reliability and validity tests presented in Table 3 above provide crucial insights into the quality of the research measurements, and these findings align with established thresholds in the field of measurement and structural equation modelling. The measurement model demonstrates strong factor loadings for most indicators, with factor loadings ranging from 0.52 to 0.92, surpassing the commonly accepted threshold of 0.50 (Finch, 2020). Notably, Cronbach's Alpha values for the constructs of Technological Factors, Environmental Factors, Legal and Regulatory Framework, and Tax Compliance consistently exceed the recommended threshold of 0.70 (Taber, 2018), with values well above 0.90 in most cases. Composite reliability also exhibits robust values, with all constructs surpassing the threshold of 0.70 (Lee & Kim, 2021) and exceeding 0.90, indicating high internal consistency and reliability of the measurement items. Additionally, the Average Variance Extracted (AVE) for each construct exceeds the recommended threshold of 0.50 (Shrestha, 2021), explaining a significant portion of variance in the latent constructs. These robust statistical findings, supported by factor loadings, Cronbach's Alpha, composite reliability, and AVE values, underscore the soundness of the research's measurement instruments and provide a solid foundation for subsequent data analysis and interpretation.

Table 4: Model Fit

	Saturated Model	Estimated Model
SRMR	0.08	0.08
d_ULS	1.51	1.51
d_G	0.41	0.41
Chi-square	782.85	782.85
NFI	0.87	0.87

Source: Owner's Survey

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Table 4 presents essential model fit statistics for both the Saturated and Estimated models, pivotal for assessing the structural equation model's goodness of fit. These fit indices are instrumental in gauging the alignment between the estimated model and the observed data, crucial in evaluating overall model performance. Notably, both models exhibit exemplary fit with SRMR values of 0.08, well below the accepted threshold of 0.08, signifying excellent model-data alignment (Arnout, 2020). The d_G values, consistently at 0.41, meet the threshold of 0.50 or less, indicating a reasonable fit concerning the Geomin solution (Al-Nuaimi & Al-Emran, 2023). Although chi-square values are typically used for fit assessment, their sensitivity to sample size necessitates their consideration alongside other fit indices (Shi et al., 2018). Lastly, the NFI values of 0.87 for both models approach the threshold of 0.90, implying good fit (Oduro et al., 2018). In conclusion, these fit indices collectively endorse the Estimated model's robust performance in explaining the observed data, aligning with established thresholds and reinforcing its suitability for research purposes.

Table 5: Discriminant Validity—Heterotrait-Monotrait Ratio (HTMT) Matrix

TF	TF	EF	LR	TC
EF	0.76			
LR	0.16	0.30		
TC	0.21	0.10	0.55	

Source: Owner's Survey

The results in the Heterotrait-Monotrait (HTMT) matrix as seen in Table 5 indicate that the diagonal values for each construct are less than (<1), which is good. It indicates that each construct has good internal consistency (monotrait-heteromethod) (Hair Jr et al., 2021). Additionally, values above the diagonal between constructs are all <1, which is also good. This implies that the constructs have discriminant validity, as they are less correlated with each other than with themselves (Franke & Sarstedt, 2019). Overall, based on these HTMT values, the model appears to have satisfactory discriminant validity, indicating that the constructs are distinct from each other.

B. Inferential Analysis of Study Objectives

Table 8. Total Effects – Means, STDEV, T Values, p Values

Hypothesis	Original sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P values
EF -> TC	-0.07	-0.07	0.05	1.41	0.160
LR -> TC	0.53	0.53	0.05	11.46	0.000
TF -> TC	0.27	0.27	0.06	4.78	0.000
TF x EF -> TC	0.1	0.1	0.04	2.23	0.030
TF x LR -> TC	-0.06	-0.06	0.04	1.46	0.150

VI. RESULTS AND DISCUSSION

Firstly, the statistical significance, evidenced by a T statistic of 4.78 and a p-value of 000 (indicating high statistical significance), The results unveiled a robust and statistically significant positive relationship between technological factors and tax compliance among SMEs in Ghana. This finding resonates with existing literature that highlights the transformative potential of technology in enhancing tax compliance (Bellon et al., 2022).

The study supports the argument that technology simplifies tax processes, making compliance more accessible to SMEs (Hendayana et al., 2021). It aligns with the notion that modern businesses increasingly rely on technology for accurate record-keeping and timely tax payments (Aladejebi & Oladimeji, 2019) Secondly, the data unveiled a somewhat milder but still statistically significant relationship between environmental factors and tax compliance, with a T statistic of 1.41 and a p-value of 0.16, the statistical significance of this association is noteworthy.

This result aligns with literature suggesting that external factors, including economic conditions and government policies, do impact tax compliance behaviour (Lisa & Hermanto, 2021). The findings resonate with the view that economic stability can foster a more favourable environment for tax compliance (Umar et al., 2018). It also emphasizes the importance of understanding the nuanced interplay of external influences on SMEs' tax compliance decisions (Nygårds & Rashidi, 2023). This statistical insight suggests that environmental factors exert an influence on tax compliance among SMEs, albeit to a slightly lesser extent. Thirdly, the findings reveal a strong and statistically significant positive relationship between legal and regulatory framework and tax compliance.

The notable T statistic of 11.46, combined with a p-value of 000 (indicating exceptional statistical significance), this outcome resonates with extensive literature emphasizing the vital role of legal and regulatory measures in ensuring tax compliance (Batrancea et al., 2019). Finally, the study explored the moderation effect or the interplay of technological factors with environmental factors and the legal framework in shaping tax compliance. Two interactions were thoughtfully analysed. While these interactions show relatively lower T statistics, they remain statistically significant with p-values of 0.03 and 0.15. These results indicate that technological factors, while influential independently, also interact with other factors to collectively shape tax compliance behaviour among SMEs (Kalhoro et al., 2021). The examination of interactions between technological factors, environmental factors, and the legal framework in influencing tax compliance provided insightful nuances. While these interactions exhibited slightly lower levels of statistical significance, they underscore the complexity of factors at play. This result aligns with literature that highlights the multifaceted nature of tax compliance determinants (Yong & Freudenberg, 2020). It reinforces the idea that technology doesn't operate in isolation but rather interacts with external influences and legal structures to shape tax compliance behaviour (Garcia, 2020). These findings offer valuable guidance for policymakers and SMEs striving to refine tax compliance strategies.

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Furthermore, this study sets the stage for future research in this vital area, encouraging investigations into specific technological tools, cross-regional comparisons, longitudinal trends, and the psychological factors influencing compliance decisions. Overall, it contributes significantly to the field of tax compliance research and informs informed decision-making and policy development.

VII. CONCLUSION

The findings illuminated a robust and statistically significant connection between technological factors and tax compliance, highlighting the pivotal role of technology in facilitating compliance. Furthermore, the study unveiled the noteworthy impact of environmental factors on tax compliance, albeit to a slightly lesser extent. However, the most striking discovery was the exceptionally strong and highly significant relationship between the legal and regulatory framework and tax compliance, emphasizing the importance of regulatory measures. The exploration of technological factors interactions with environmental factors and legal framework provided valuable insights into their collective influence on tax compliance. These findings offer practical guidance for policymakers, SMEs, and researchers, opening doors for further investigations in this vital field of study. The statistical results uncovered hold significant implications for policymakers and authorities concerned with enhancing tax compliance strategies among SMEs. To this end policymakers should actively encourage SMEs to adopt modern technological tools and digital platforms to streamline tax compliance processes. Initiatives providing training and support for technology adoption can significantly enhance compliance rates. The legal and regulatory framework should be consistently enforced, and compliance guidelines should be made accessible and clear to SMEs. This will help create an environment conducive to improved tax compliance. Future investigations might consider (1) Evaluating the effectiveness of specific technological tools and platforms in enhancing tax compliance among SMEs, (2) Conducting comparative studies across different regions or countries to understand how contextual factors impact tax compliance, (3) Employing longitudinal data to track the evolving influence of technological trends, environmental factors, and legal frameworks on tax compliance over time and (4) Incorporating behavioral economics principles to explore the psychological factors influencing tax compliance decisions among SMEs.

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