SYSTEM AUTOMATION, TAX OBLIGATION COST AND VALUE ADDED TAX COMPLIANCE AMONG SMALL AND MEDIUM ENTERPRISES IN DAGORETTI SOUTH SUB COUNTY

BY

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DECLARATION

Declaration by Candidate

This research project is my original work and has not been presented for a degree award in any other University.

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Declaration by supervisors

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DEDICATION

This work is a tribute to my family for their support, motivation, encouragement, and best wishes during the research period. I also dedicate it to my colleagues and friends for their tremendous assistance during the period we have been studying together.

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ABSTRACT

Actual revenues and expected revenue always differ with large gap margin resulting in lower-than-expected revenue collection. Kenya Revenue Authority has invested in various technological systems to provide a convenient and efficient way to improve revenue collection, transparency in fiscal administration and management of local and national tax authorities. This study's purpose is to determine the moderating effect of Tax obligation cost on the relationship between system automation and value added tax compliance among small and medium enterprises in Dagoretti south Nairobi, Kenya. The research was guided by four specific objectives: Tax Invoice Management system, Value Added Tax automated assessment, online filing procedure and digital payments on Value Added Tax compliance among small and medium enterprises in Dagoretti South Nairobi County, Kenya. The study was guided by four theories: Ability to pay Theory, Unified theory of acceptance and use of technology and Innovation diffusion theory and Transaction Cost Theory. The study was adopted explanatory design and the target ~~a~~ population was1781 small and medium enterprises Dagoretti South Nairobi. A sample size of 326 was drawn from this population and a response rate of 81% was recorded since 265 questionnaires were correctly filled and submitted. Primary data collection was employed using structured questionnaires. The data was analyzed using descriptive, inferential statistics and multiple linear regression analysis. The study found that there is a significant positive effect of Tax Invoice Management system. Value Added Tax automated assessment. Online filing procedure. Digital payments and VAT compliance (β=0.249, p-value =0.00001100<0.05,) (β=0.267, p-value =0.00013500<0.05) (β=0.133, p-value =0.00013500<0.05) (β=0.045, p-value =0.0431<0.05) respectively. The study further found that there is a negative and significant effect of tax obligation costs on VAT compliance (β= -0.032, p-value =0.00012355<0.05.) The study further found that there is a negative and significant effect of VAT compliance. The study found that tax obligation costs moderates the relationships between Tax Invoice Management system, Value Added Tax automated assessment, online filing procedure, digital payments and VAT compliance (ΔR^2 =0.006, β= -0.010, p-value =0.039855<0.05), (ΔR^2 =0.008, β= -0.160, p-value =0.0000<0.05), (β= -0.127, ΔR^2 =0.0000, p-value =0.00001133<0.05), and (β= -0.034, ΔR^2 =0.0001, p-value =0.0063300) respectively. The study recommends that KRA should enhance and promote the use of TIMS among SMEs. The Government of Kenya should invest in further development and implementation of automated VAT assessment systems to increase VAT compliance. KRA should streamline and simplify the online filing procedure to encourage higher VAT compliance rates. The Government should promote and support the adoption of digital payment methods to enhance VAT compliance. Lastly, the KRA and Government should implement measures to reduce tax obligation costs, such as offering subsidies for tax management systems and providing access to professional tax advisory services. Future research may be conducted to determine the impact of tax reforms on Value Added Tax compliance.

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ABBREVIATIONS

GDP	-	Gross Domestic Product
KRA	-	Kenya Revenue Authority
OECD	-	Organization for Economic Cooperation and Development
SMEs:	-	Small and Medium Enterprises
TIMS:	-	Tax Invoice Management System
TOT:	-	Turnover Tax
TSO:	-	Tax Service Office
VAA:	-	VAT Automated Audit
VAT:	-	Value Added Tax

DEFINITION OF KEY TERMS

Online filing procedure involves using pre-approved software like the iTax system to submit returns electronically (Mcluskey & Huang, 2019). This method, endorsed by tax authorities such as the Kenya Revenue Authority (KRA), facilitates the process through digital templates and direct uploads.

Small and Medium Enterprises is a business that has an annual revenue of between 8 to 10 million Kenyan Shillings, assets worth at least 4 million Kenyan Shillings, and employs between 5 and 150 individuals (World Bank, 2019). These businesses often lack specialization and are typically managed by a small team, which can include the owners.

System automation is the application of technology in aiding tax compilation and compliance (Iordachi & Timus, 2017). Also investing in modern information and communication technologies in order to integrate and share information leading to efficient and effective systems.

Tax Compliance is the taxpayers' ability and willingness to adhere to tax laws by accurately declaring income and paying the correct amount of taxes on time (IRS, 2009). This includes following administrative rules for filing and paying taxes, such as timely submission of tax returns, accurate income reporting, claiming appropriate deductions, and timely tax payments (Marti, 2010).

Tax Invoice Management System process is an improvement of the current electronic tax register by enabling automatic reporting of tax invoice transactions (KRA, 2020). It captures input and output declarations and reconcile with payments and claims. This system enables automatic reporting of tax invoice transactions.

Value Added Tax (**VAT**) is tax imposed on goods sold, collected by the KRA on behalf of the Kenyan government, and is charged at 16% of the total sale price. It must be paid monthly, no later than the 20th of the following month (KRA, 2019).

Value added Tax automated assessment is the process involves comparing input VAT data from both buyers and sellers to identify discrepancies (Kenya Revenue Authority, 2022). This online application within the i-Tax system verifies VAT returns and declarations for eligible taxpayers. All taxpayers with existing PIN numbers under the VAT threshold must comply, allowing for the capture of additional data and verifying the authenticity of declarations to prevent tax evasion.

Tax obligation cost refers to the total financial requirement that a taxpayer, whether an individual or a business, is legally obligated to pay under the law Gale, (2002).

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter presents the background of the study, the problem statement, the objectives of the study, the research hypotheses, and significance of the study, and the scope of the study.

1.1 Background of the Study

Globally, governments are responsible for providing essential services to citizens. While tax collection is not the only revenue source, it is crucial for raising and spending funds that impact fiscal and social development significantly. Effective tax collection is vital for sustainable fiscal growth and reducing reliance on foreign aid (OECD, 2016). Lyme and Oats (2016) argue that taxes are essential for a country's growth, providing revenue for government spending, redistributing wealth, and regulating the economy to foster a favorable business environment. Le Minh (2017) describes Value Added Tax (VAT) as a tax applied at each stage of production and distribution, becoming a final tax for household consumption.

The introduction of VAT in sub-Saharan nations like Benin, Côte d'Ivoire, Guinea and Kenya in the 1980/90s there is adequate proof to demonstrate that VAT is a significant supporter of the absolute government charge income (Ajakaiye, 2019). The revenue collected will be used to finance a considerable part of government functions among them planning of social management and guiding the national development agenda. Revenue collection has faced significant challenges in various countries globally but the challenges are prominent in the developing countries as compared to the developed nations (Torgler, 2018). Developed countries, for example, the USA and Canada have

developed successful revenue collection frameworks consequently limiting revenue collection problems (Awitta, 2011). Creating viable avenues in revenue collection has been a significant issue in tax revenue collection (Brown et al., 2015).

Income taxes serve as the primary source of revenue for many governments, particularly in developing nations. The amount of money collected for governmental expenses largely hinges on various factors, most notably the willingness of citizens to adhere to tax laws. When taxpayers fail to follow these legal requirements, it is generally viewed as an act of non-compliance (Kirchler, 2017).

The consistence to tax needs that two types of compliance which are either are either administrative or technical compliance. The administrative category alludes that one has to not only comply with every regulatory provision but also paying the obligation. Technical compliance refers to the tax law as being technically viable, such as in the calculations of taxes as well as comprehending the provisions of tax laws in remitting their obligations (Brown & Mazor, 2013).

Tax refers to an obligatory commitment to the government's income which is administered on the workers' salaries and wages and business benefits or profits obtained from goods or service provision. A tax is not wilful, however, an implemented commitment demanded according to administrative expert. In the numerous past years, Kenya has not been meeting its revenue collection budgeted targets from both internal and external businesses. This forced the Kenya Revenue Authority establishment in 1995 with a sole aim to secure the collection of income and mix the various bodies that existed. KRA was relied upon to come up with a more viable and leakage proof tax framework to eliminate, and/or reduce the issue of tax evasion and seal the numerous

escape clauses in the tax collection system and getting more taxpayers into the tax bracket (Ngotho and Kerongo, 2014).

According to Nyaga et al. (2016), the degree of compliance impacts revenue collection process by the mandated revenue collection bodies. Lack of taxes remittance is a major obstacle of revenue generation in most developing economies. Kenya is classified among developing economies fighting with the problem of rebelliousness by the tax payers. In spite of the ongoing tax restructuring systems in the Central government, many African continent countries are described by several tax system structures which are not comprehended by the tax payers. This signifies that the changes will bring about an enormous improvement in the revenue collection process. Kenya Revenue Authority is still confronting numerous challenges as far as the collection of revenue is concerned. Bikas & Andruskaite (2013) notes that elevation amount of obliviousness and defiance from taxpayers has been a test in the revenue collection process in Kenya. This challenge represents a significant problem since government activities and functions will be affected, investment wrecked and more so, the public will be adversely impacted by being denied extremely important management.

Developing countries are required to develop and actualize strategies that will help in reducing the unfortunate reliance on foreign reserves. The government of Kenya has been seeking tax reforms in structuring the tax system that will be feasible in supporting the government without shortage in financing and lesser burden on the taxpayer. To support the functions for the national government and the county governments in Kenya, there is a demand for expansion of revenue generation strategies. Use of IT forms one of the strategies that can be employed by KRA to help the national government generate enough revenue to share between the national and devolved

governments. For instance, incorporating Information Technologies (IT) in tax activities is likely to enhance tax authority activities in various ways such as enrolling taxpayers, filing returns, and processing payments as well as the process of issuing assessments.

VAT is referred to as a consumption tax which is charged on various goods and services from the production to the distribution stages. VAT is charged on taxable goods and services supplied within Kenya, and the importation of goods and services that qualify for taxation. The tax collected by the registered organizations and individuals and subsequently remitted to KRA, however, the weight is moved to the consumers through more expensive rates. The Value Added Tax (VAT) in Kenya is governed by the VAT Act Cap 476. Tax compliance refers to the adherence of taxpayers to the regulations set by tax authorities, such as filing returns online and paying the taxes due, to ensure efficient revenue collection.

Introduced in 1990, VAT aimed to broaden Kenya's tax base and increase revenue. Administered by the Kenya Revenue Authority (KRA) under the Value Added Tax Act 2013, VAT is an indirect consumption tax applied to goods and services at various stages of production and distribution.

Taxpayers registered for VAT act as intermediaries, collecting and remitting VAT to the government. The VAT paid on inputs is claimed as a credit when taxpayers report the output VAT on their sales (VAT Act 2013, Sec 17). Suppliers of exempt goods and services, listed in the first schedule of the VAT Act 2013, do not charge VAT on their supplies and cannot claim credits for VAT paid on their purchases. Additionally, the VAT system includes zero-rated goods and services, listed in the second schedule,

where businesses charge a 0% VAT rate but can deduct input tax on those purchases (VAT Act 2013, Sec 17) KRA, (2015).

Policy and VAT laws are formulated by the government, with the KRA responsible for their implementation. Professionals provide services to ensure compliance, businesses act as VAT collection agents, and the public is affected by the VAT rate, influencing their spending and government revenue usage. VAT accounts for approximately 23% of the government's total tax revenue (KNBS, 2014).

Value Added Tax compliance has become the significant regulatory methodology for both individual and corporate taxation in developed economies. The world has faced unique rate of development spanning from 1980s in the field of technology. The innovation has facilitated how the tax compliance has influenced how tax administration (Teltscher, 2002).

In developing economies such as Kenya, maintaining tax compliance is a significant challenge due to frequent changes in tax laws. These changes create complexities that many taxpayers find difficult to navigate without adequate knowledge. Consequently, Kenya is often categorized among nations struggling with non-compliance. Ensuring an efficient and effective tax administration system is essential to improving compliance and enhancing revenue collection.

The advent of system automation has caused significant changes in the tax environment most notably in Kenya here electronic tax commonly referred to as the I-tax system is being adopted across multiple corporations. As is the norm, the adoption of technology results in efficiency in the fundamental processes and this occurrence is no different when it comes to ensuring VAT compliance in Kenya. Indeed, the use of platforms such

as ESD and ETR systems should lead to improved compliance amongst large corporations since through the use of I-tax systems there exists reduced errors in the filing procedures, improved efficiency, reduction in the life of tax and augmentation in multitasking levels of tax officers (Kanbur & Keen, 2014).

A unique characteristic of utilizing an I-tax system is the fact that a central database system is used whereby all proceedings related to tax activities are captured. These activities include valuation, billing, collection and enforcement. Accordingly, the use of an I-tax system enables an organization gain a holistic perception of its tax compliance. Moreover, through the use of I-tax system it ensures other benefits such as enhanced tax policy evaluations, improved performance management and increased auditor efficiency. Therefore, it is recommended that corporations arrange for training sessions for employees which would ultimately guarantee a high level of tax compliance.

Eichfelder and Schorn (2021) highlight that taxpayers incur costs in meeting legal requirements and fulfilling their tax obligations. Tran-Nam, Evans, and Walpole (2020) identify that tax compliance costs include both social costs and taxpayer compliance costs. The government also incurs administrative costs during tax collection and recovery processes. Social costs encompass efficiency losses, also known as deadweight losses, and administrative expenses. The combined administrative and social costs constitute the operating burden of compliance**.**

1.1.1 Small and Medium Enterprises in Kenya

Small and Medium Enterprises have played a significant role in the economic development of Kenya. Over the years, Small and Medium Enterprises have contributed to job creation, income generation, poverty reduction, and the overall growth of the

Kenyan economy. The Kenya National Bureau of Statistics states that Small and Medium Enterprises (SMEs) represent over 90% of all businesses in Kenya, employing approximately 7.5 million people, and contributes approximately 40% of the country's GDP. SMEs continue to play a vital role in employment creation, innovation, and economic diversification in Kenya.

Many of these SMEs have roots tracing back to Indian laborers who remained in Kenya after constructing the Mombasa-Lake Victoria railway and became entrepreneurs. During the pre-independence era, small businesses existed in various forms, such as traditional artisanal activities and small-scale agricultural enterprises. These businesses were primarily focused on meeting local demand and providing basic goods and services, especially through barter. The sector saw significant growth post-independence when the government implemented 'Africanization' policies to encourage Kenyan Africans to establish businesses (Ronge et al., 2002).

After Kenya gained independence in 1963, the government recognized the importance of small businesses in economic development and enacted policies to promote local entrepreneurship. Examples of these measures was the establishment of the Industrial and Commercial Development Corporation (ICDC) to provide financial and technical assistance to SMEs. The sector gained further prominence following the 1972 International Labor Organization (ILO) report, becoming a focal point of development discussions (Mullei and Bokea, 1999).

During the 1980s and 1990s, Kenya pursued economic liberalization, opening its markets to foreign investments and reducing government intervention. This period witnessed a surge in small businesses as the private sector expanded. However, SMEs

faced challenges such as limited access to credit, inadequate infrastructure, and regulatory barriers.

Starting from the early 2000s however, the Kenyan government introduced various policies and initiatives to support SME development. The Micro and Small Enterprise Act of 2012 aimed to create an enabling environment for SMEs by streamlining registration processes, promoting access to finance, and establishing business development services. Additionally, the government launched the Youth Enterprise Development Fund (YEDF) and the Women Enterprise Fund (WEF) to provide financial support to young entrepreneurs and women-led businesses.

The rapid advancement of technology and digitalization has had a transformative impact on SMEs in Kenya. The advent of mobile money platforms like M-PESA has revolutionized financial transactions, making it easier for small businesses to access finance and conduct business operations. E-commerce platforms have facilitated online trading and expanded market reach for SMEs. The COVID-19 pandemic, which began in 2020, had a significant impact on SMEs in Kenya, as it did globally. Lockdowns, restrictions, and reduced consumer demand affected business operations and led to job losses. However, the government and various organizations implemented support programs and initiatives to mitigate the impact and assist SMEs in sustaining their operations, for example, lowering of VAT rates from 16% to 14% during the pandemic period.

1.2 Statement of the Problem

Value Added Tax (VAT) compliance remains a challenge in both developed and developing nations, influenced by a multitude of factors rather than any single issue (Azmi et al., 2016). One significant factor driving efficiency in tax processes is

digitalization, which aims to simplify and streamline compliance (Azad et al., 2019). Barnier (2022) describes VAT as a tax on consumption applied to goods and services at every stage of the supply chain, from production to final sale.

A survey conducted by the Kenya Revenue Authority (2018) revealed that over 54% of small-scale traders in Kenya did not comply with VAT obligations. Furthermore, the Kenya National Bureau of Statistics (2019) reported that a significant majority, 67%, of SMEs in Kenya were not adhering to VAT regulations, despite government efforts to improve compliance.

VAT is an integral tax head that KRA uses to collect revenue. Having been assigned 16% of the KRA July - June 2021/2022 target that is 221 billion of the 1.403 trillion KRA has invested in various technology systems with the aim of improving VAT compliance and thus its overall compliance among the SMEs. Despite these efforts, there still a gap between the actual revenue VAT collection and target VAT compliance. Despite the improved overall KRA revenue compliance in the 2021/2022 financial year KRA failed to meet its VAT set target of 221billion performing at 95% with a collection of 210.691billion. The East and South Tax service station located along Mombasa Road, which largely handles SMEs, performed the least in VAT at 84% with a collection of 14.9billion against a target of 17.9billion. (KRA, 2022).

The poor VAT compliance has greatly been caused by missing traders that arose early 2016 when the authority realized that taxpayers were claiming input VAT with no authentic purchase documents presented. In fact, with a robust investigative process, it was realized that some taxpayers were indeed in the business of issuing Tax Invoices. This prompted KRA in 2019 to introduce the VAT System (VAA) leveraging on the I-Tax platform to enhance compliance (KRA, 2022).

This indicates a pressing need for the government and tax authorities to reassess their strategies to promote tax compliance and meet revenue targets. This study aims to investigate the moderating effect of compliance costs on the relationship between system automation and VAT compliance among small and medium enterprises in Dagoretti South, Nairobi, Kenya.

1.3 Objectives of the Study

1.3.1 General Objective of the Study

The general objective of this study was to determine moderating effect of tax obligation cost on the relationship between system automation and value added tax compliance among small and medium enterprises in Dagoretti south Nairobi, Kenya

1.3.2 Specific Objectives

The specific objectives of the study were:

1. To determine the effect of Tax Invoice Management system on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya
2. To establish the effect of Value Added Tax automated assessment on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya
3. To determine the effect of online filing procedure on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya
4. To find out the effect of digital payments on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya

5. To determine the moderating effect of tax obligation cost on the relationship between:

5a. Tax Invoice Management system and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya

5b. Value Added Tax automated assessment and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya

5c. Online filing procedure and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya

5d. Digital payments and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya

1.4 Research Hypotheses

The research hypotheses that were tested in the study were:

H_{01}: Tax Invoice Management system have no significant effect on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya.

H_{02}: Value Added Tax automated assessment have no significant effect on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya**.**

H_{03}: Online filing procedure has no significant effect on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya.

H_{04}: Digital payments has no significant effect on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya.

H_{05}: There is no significant moderating effect of compliance costs on the relationship between:

H_{05a}: Tax Invoice Management system and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya.

H_{05b}: Value Added Tax automated assessment and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya.

H_{05c}: Online filing procedure and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya.

H_{05d}: Digital payments and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya.

1.5 Significance of the study

This study was beneficial to policy makers, Tax authorities and future researchers. The findings from this study inform policymakers of the potential benefits system automation in relation to VAT compliance, as well as the identification of critical issues. The findings help develop evidence-based policies that can improve VAT compliance and enhance revenue collection.

Tax authorities benefits from understanding the specific barriers and facilitators to VAT compliance among SMEs in Dagoretti south. This understanding helps in designing targeted interventions, such as simplified procedures, enhanced guidance, and

educational campaigns, to promote compliance and streamline tax administration processes.

Future researchers able to use the study's empirical review as a springboard for developing a theory of system automaton and VAT compliance. It enabled sharing of findings and engaging in scholarly discourse with others in the field. This dissemination of knowledge helps to promote collaboration and innovation among scholars. The study is of significance to SMEs, as it provides insights into the potential consequences of non-compliance with VAT regulations. The findings encourage taxpayers to comply with tax regulations and adopt good taxation practices.

1.6 Scope of the study

The purpose of this research was to determine the moderating effect of tax obligation cost on the relationship between system automation and value added tax compliance among small and medium enterprises in Dagoretti south Nairobi, Kenya. The choice of Dagoretti south small and medium enterprise was important to foster accelerated economic growth, there was need to consider the issues affecting the businesses. Particular interest, the study focused on Tax Invoice Management system, Value Added Tax automated assessment online filing procedure and digital payments on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya. The moderator was tax obligation cost, the study was done among SMEs operating in Dagoretti South who use the various technological systems in their day-to-day operation. The target population was 1781 SMEs from Dagoretti South.

1.7 Limitations of Study

The study had a challenge with non-response bias due to the fact that A sample size of 326 was drawn from this population and a response rate of 81% was recorded since 265 questionnaires were correctly filled and submitted.

The study used questionnaire data that was close ended, this had a limited scope of responses related to the study latent constructs.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents review of past papers on the relationship between system automation on Value Added Tax compliance. It encompasses several key areas, including a theoretical review, a conceptual framework, a review of study variables, an empirical review, and identification of research gaps.

2.2 Review of the Study Concepts

The study looked at the concept of Value Added Tax compliance, Tax Invoice Management system; Value Added Tax automated assessment, online filing procedure and digital payments as well as tax obligation cost.

2.2.1 The Concept of Value Added Tax compliance

Value Added Tax (VAT) is a tax levied on the value added at each stage of production and distribution by the final seller (Radhakrishnan, 2008). Introduced in Kenya in 1990 to broaden the tax base and enhance government revenue, VAT is administered by the Kenya Revenue Authority (KRA) under the Value Added Tax Act of 2013. This consumption tax applies to goods and services at every production and distribution level, with VAT-registered taxpayers acting as intermediaries who collect and remit the tax to the government.

When registered taxpayers declare the VAT on their sales, they can claim a credit for the VAT paid on their inputs (VAT Act 2013, Sec 17). Suppliers of exempt goods and services, as outlined in the first schedule of the VAT Act 2013, do not charge VAT on their supplies and cannot claim credits for VAT paid on their purchases. The system also includes zero-rated goods and services, listed in the second schedule, where

businesses apply a 0% VAT rate but can deduct the input tax paid on those purchases (VAT Act 2013, Sec 17).

This tax applies to taxable goods and services produced domestically or imported. Businesses or individuals whose taxable supplies exceed Kshs. 5 million annually must register for VAT, though voluntary registration is allowed for those below this threshold to promote fair competition. As Radhakrishnan (2018) explains, VAT is charged on the value added by the last seller. The current VAT rates include 16% for most taxable supplies, 8% for petroleum products effective from September 21, 2018, and 0% for zero-rated supplies listed in the second schedule of the VAT Act 2013. Suppliers, excluding those dealing in exempt goods and services, can claim input tax incurred within six months during their trade (VAT Act 2013, first schedule).

Tax compliance involves accurately declaring income, timely filing returns, and paying the due taxes. James and Alley (2021) define tax compliance as the willingness of taxpayers to adhere to tax laws and regulations voluntarily, without enforcement. In Malaysia, Kasipillai and Abdul-Jabbar (2006) found high compliance levels among SMEs, with 97% demonstrating tax knowledge, facilitated by accessible tax education through free public lectures. Conversely, a study in Australia by McKerchar and Hansford (2020) revealed that many small businesses were unaware of their tax knowledge deficiencies, leading to unintentional non-compliance. This finding aligns with evidence from Malaysia, where individual taxpayers often made unintentional errors while filing tax returns (Loo et al., 2018).

2.2.2 The Concept of Tax Invoice Management system process

TIMS is an upgrade to the existing Electronic Tax Register (ETR) system, which was introduced in 2005. It aims to address the shortcomings of the ETR system by

integrating with trader systems at the point of sale, thereby tracking VAT transactions from their inception. Secondly, TIMs standardize and ensures the authentication of a tax invoices issued by VAT traders, which verifies the validity of inputs claimed in the VAT returns.

According to Section 43 of the Value Added Tax Act 2013, every business registered under Section 34 must maintain accurate records of all transactions, either electronically or otherwise. The Commissioner may require businesses to use an ETR in a specified form to facilitate the assessment of transactions and determine tax liabilities. To enhance compliance, the Kenya Revenue Authority (KRA) is rolling out the Tax Invoice Management System (TIMS), which will automate the reporting of invoice transactions. This initiative is currently undergoing public consultation, as mandated by the constitution, before full implementation.

Lastly, TIMs is a module for storage of tax invoice and transmission to KRA on a real time basis as it is seamlessly integrated to the iTax systems thus enables auditing and review of VAT returns filed by taxpayers (KRA 2021). The acceptance of TIMs machines bought and utilized by VAT traders measured the effectiveness of TIMs on VAT compliance through the accurate pre-filled monthly VAT returns submitted to I-tax.

The new system will store transaction and income tax data from retailers, periodically documenting it for internal sales service. Upon receiving the retailer's tax information, the system will automatically debit the retailer's account for the amount of sales tax collected. This process ensures that all trade transactions and sales tax collected by retailers from customers are reported to both local and federal governments, and the sales tax amounts are automatically collected from retailer accounts. This prevents

retailers from withholding the collected sales tax. Each customer will receive a tax-paid receipt as proof that the tax will be remitted to the appropriate authorities (Siringi, 2021).

2.2.3 The Concept of Value Added Tax automated assessment

Many governments operate VAT collection on a self-assessment basis, where companies calculate the VAT payable on their purchases and sales. However, previous research indicates that this voluntary compliance system can be manipulated, as taxpayers may delay or evade payment, resulting in revenue loss for the government (Gangl, Hofmann & Kirchler, 2020).

The VAT Auto Assessment (VAA) system is designed to detect discrepancies between reported VAT inputs and outputs, thereby broadening the tax base and increasing revenue collection. Effective implementation of this system could significantly reduce tax evasion by identifying undeclared income and fictitious documents. Although the KRA planned to implement the system in 2018, it appears that it has been rolled out on a trial basis (OECD, 2021). VAT-registered taxpayers receiving discrepancy notices must resolve issues within 30 days or face assessment. This resolution process requires coordination between buyers and suppliers, often complicated by the timing and inclusion of transactions in VAT returns.

Nazarov, Mikhaleva, and Chernousova (2019) studied the impact of automating tax administration systems using secondary data from journals and content analysis. Their findings indicated that technology provides real-time tax data, enabling the assessment of non-compliance and improving overall tax compliance. The study concluded that real-time tax systems significantly boost compliance.

2.2.4 The Concept of online filing procedure

According to the Decision of the Director General of Taxes in 2018, the Electronic Notification Letter is explained in Article 1 as a system where "Taxpayer may submit electronic Notification Letter through Application Service Provider Company appointed by the Director General of Taxes. E-Filing is an electronic taxpayer filling and submitting service (SPT) of Taxpayer to the Directorate General of Taxes by utilizing internet communication network. Pandiangan (2019) describes the e-filing system as a method for submitting the Notification Letter (SPT) online and in real-time. Parwito (2019) identifies three dimensions that influence the adoption of the e-filing system: compliance expectancy, effort expectancy, and social expectancy.

The procedure for filing taxes online involves submitting tax documents or returns via the internet, typically eliminating the need for paper forms. This system leverages internet technology, the World Wide Web, and specialized software to facilitate various aspects of tax administration and compliance. The specifics of electronic taxation systems vary by country, resulting in different names for these systems. Gellis (2019) refers to it as electronic tax filing, while the United Nations (2017) calls it online taxation payment, and Turner and Apelt (2019) term it e-tax lodgement.

2.2.5 The Concept of tax digital payment

Digital tax payment is the process of paying taxes electronically using digital platforms such as online banking, mobile apps, or electronic fund transfers. This method allows taxpayers to conveniently fulfill their tax obligations without the need for physical visits to tax offices or manual paperwork (Harris, 2022).

The Kenya Revenue Authority has faced challenges in meeting its tax collection targets, resulting in substantial financial losses that hinder county-level economic development, growth, and service delivery improvements (Wambua, 2021). To combat corruption and improve financial efficiency and payment processes, the introduction of Electronic Payment (E-Payment) systems has been implemented. Globally, there has been a notable rise in electronic payment systems designed to address revenue losses caused by corruption and to streamline payment procedures (Tee & Ong, 2022). Technological advancements have significantly enhanced the efficiency and sustainability of revenue collection efforts for governments around the world.

Mbogo (2010) identified several key factors contributing to the successful adoption of mobile payments by micro-business operators. The research highlights that the convenience, accessibility, affordability, support, and security of mobile money transfer technologies are crucial in influencing the intention and actual use of these services by micro businesses. These factors play a vital role in helping these businesses thrive and grow. Wanyonyi and Bwisa (2019) explored how digital payments impact the performance of micro and small enterprises (MSEs). Their findings indicate that MSEs utilize mobile money for various purposes, including business-to-business (B2B) transactions with suppliers, customer-to-business (C2B) payments, and debt collection for credit sales. The use of mobile payments in these contexts has been shown to enhance the performance of micro enterprises.

2.2.6 The Concept of tax obligation cost

The expenses associated with meeting tax obligations have sparked considerable interest among scholars, government officials, and business entities. This line of research was notably advanced by Sandford, who analyzed the burden of complying

with capital gains tax and other taxes for taxpayers in the United Kingdom (UK) (Sandford, Godwin, and Hardwick, 2019). Sandford (2020) described tax obligation costs as the expenses involved in tax compliance. Recognizing that high compliance costs can reduce a country's competitiveness in terms of tax attractiveness, public service agencies have increasingly focused on finding ways to simplify their tax systems.

Tax obligation costs encompass expenses related to acquiring and organizing necessary information, hiring internal auditors, and purchasing materials and supplies (Organization for Economic Cooperation & Development, 2019). In a study by Eragbhe and Modugu (2019), the estimated burden of tax compliance for SMEs in Nigeria was evaluated. This research looked into various components, including internal compliance costs, external compliance costs, and incidental burdens such as bribery and psychological stress.

The expenses associated with tax compliance have also attracted attention from a wide range of stakeholders, including academics, policymakers, and businesses. In pioneering studies conducted during the 1970s and 1980s, Sandford examined the cost of complying with VAT and other taxes for UK taxpayers (Sandford, Godwin, and Hardwick, 2019). Sandford (2020) defined tax obligation costs as the expenses incurred during tax compliance. Given that high compliance costs can undermine a country's tax attractiveness, there has been a growing interest among public services in simplifying tax legislation systems to reduce these costs.

2.3 Theoretical Review

Various scholars wrote the following theories on the employing of electronic Tax systems in the world. The study was guided by Ability to pay Theory which was the

main Theory, Unified theory of acceptance and use of technology, Innovation diffusion theory and Transaction Cost Theory.

2.3.1 Ability to pay Theory

The ability-to-pay principle in taxation asserts that taxes ought to be assessed based on an individual or entity's financial capacity. This concept suggests that individuals, businesses, and corporations with greater earnings are not only capable of contributing more but also have a responsibility to do so. The core notion behind this philosophy is that all taxpayers should make a proportionate sacrifice when fulfilling their tax obligations. Since wealthier individuals have comparatively less reliance on each dollar they possess, the expectation is that paying higher taxes does not significantly burden them. Essentially, this framework promotes a fairer tax system, where the financial contribution is aligned with one's economic resources. According to Chigbu, Eze and Ebimobowei (2021). Individuals should pay taxes in respect of their ability to pay such that they are not overburdened by the taxes.

The ongoing discussion about taxation underscores the crucial role government revenue plays in building and sustaining the infrastructure of society. This funding is vital for developing essential services such as roads, fiber-optic communication systems, a capable military, public schools, and a flourishing market economy. These public assets lay the groundwork for both individual and community success, allowing citizens to achieve and maintain their prosperity. Nevertheless, proponents of progressive tax systems face criticism for their perceived unfairness. Detractors argue that these systems can penalize hard work and success, discouraging individuals from seeking higher incomes. In response to this criticism, some advocate for a flat tax system, which they believe would promote greater fairness and equity.

Within this framework, the most fitting types of taxation typically encompass personal levies, including income tax, net worth tax, consumption tax, and inheritance tax. However, economists often find themselves at odds regarding the best methods to evaluate an individual's capacity to pay taxes. Central to this debate are several key viewpoints. For example, some economists argue that property ownership, reflecting the total value of assets and accumulated wealth, is a reliable measure of one's financial ability. This stance, however, is often contested, as individuals with high incomes might choose not to invest in property, thereby escaping taxation. Moreover, other economists propose that tax obligations should be based on personal spending habits, suggesting that individuals with higher expenditures should incur larger tax liabilities. This approach implies a direct link between the amount spent and the corresponding tax rate.

The argument against using expenditure as a measure of tax capacity is fundamentally flawed and inequitable. Individuals who support larger families naturally incur higher costs compared to those with smaller households. If we use spending as the criterion for determining tax obligations, a person with many dependents would end up paying more than someone with fewer family responsibilities, which seems unjustifiable. Most economists advocate that income should serve as the primary metric for assessing an individual's ability to contribute to taxes. It seems fair that if one person earns significantly more than another, they should be expected to contribute a larger share to government revenue. Consequently, modern tax systems around the globe recognize income as the most appropriate standard for evaluating a person's capacity to pay taxes. Critics argue that the concept of "ability" is subjective and difficult to measure. Two individuals with similar incomes might have vastly different financial obligations

(family support or medical costs), affecting their actual ability to pay. The theory doesn’t always account for these unique circumstances.

2.3.2 Unified theory of acceptance and use of technology

This theory, developed by Venkatesh et al. (2003), seeks to clarify user motivations when interacting with information systems and their resulting behaviors. It identifies four key elements that significantly affect the adoption of a new information system: the expectation of performance, the anticipated effort required, social influences, and the conditions that facilitate use. Additionally, these factors are influenced by variables such as gender, age, experience, and the voluntary nature of user participation. For instance, younger users with a background in information technology are often more inclined to perceive a new system as beneficial for their tasks, finding it user-friendly due to their technical skills, and are likely to encourage their peers to adopt the same system.

The theory was crafted by analysing and synthesizing ideas from eight previous frameworks, including the well-known Technology Acceptance Model. While this model has been utilized in numerous research studies, it has also faced criticism, particularly when compared to the Technology Acceptance Model (Venkatesh & Zhang, 2010). The Unified Theory of Acceptance and Use of Technology emphasizes the significance of a firm's economic context, industry structure, and internal organization as critical elements for the company's growth and development. This theory highlights the transition from manual processes to automated systems, which streamline tasks and enhance efficiency. Management introduces these information systems to address specific operational needs effectively. Consequently, many organizations have shifted from traditional manual methods to modern information systems, showcasing the benefits of automation (Venkatesh, 2016).

The development of a company typically follows a series of phases, which include the initial stage, the growth phase, the peak period, and the decline phase. These phases are also applicable when introducing information technology to handle various tasks. During the growth phase, a company's capital tends to rise, while in the peak phase, it stabilizes before eventually declining. Unfortunately, during this decline, many businesses may be forced to shut down. Concurrently, expenses often rise in tandem with both capital and output. Modern technological frameworks, such as business information systems, are designed to process data and generate necessary outputs efficiently (Venkatesh, 2016).

The concept of technology acceptance and utilization has been explored by various researchers who conducted extensive studies to validate their findings. These studies illustrate how small businesses can evolve into larger entities by leveraging sophisticated technology and computerized systems, leading to increased output, capital, and expenditures. As companies expand their market reach, they produce a greater variety of products and face rising labor costs, all of which are signs of their growth within the industry. The organization functions cohesively to achieve its objectives by employing various strategies and processes (Gupta 2008). Entrepreneurs initiate their ventures by conceptualizing their business ideas, organizing them effectively, and implementing those plans, ultimately leading to the successful development of their business concepts.

The business creator is the originator of innovative concepts and the strategies for growing a company, and it's essential for them to consider feedback. The implementation of information systems has an impact on organizations, generally yielding favorable outcomes (Gupta 2011). In Kenya, various elements like the age of

users, their educational background, and the willingness to adopt these systems will significantly affect how information systems are utilized. These considerations are essential during the development of such systems to ensure they are user-friendly and face minimal pushback upon their launch. Critics argue that UTAUT was primarily validated within organizational settings, which may limit its applicability in other contexts, such as consumer or personal-use settings. The constructs and factors influencing technology adoption may differ significantly for personal versus professional use, reducing the model's generalizability.

2.3.3 Innovation Diffusion Theory

Introduced in 1962, the Innovation Diffusion Theory underwent refinement by Rogers (1995). This theory delves into understanding the mechanisms by which novel concepts and technologies permeate through a social structure (Rogers, 1962). Unlike other change theories centered on persuading individuals, Innovation Diffusion focuses on the organic evolution or "reinvention" of products and behaviors to better suit the needs of various groups and individuals (Les Robinson, 2019). In this framework, the emphasis is not on changing people themselves, but rather on enhancing and adapting innovations over time (Rogers, 2018).

The diffusion of innovations occurs as innovations are communicated through specific channels within a social system over time (Rogers, 2018). According to Ismail (2006), this theory posits four essential components for successful innovation transfer between users. Additionally, it underscores the pivotal role of human capital in the adoption of new technologies (Rogers, 2003). Organizations, recognizing the efficiency gains of new technologies compared to older versions, actively engage in their development to enhance operational efficiency.

For instance, the implementation of an electronic tax filing system reduces operational costs and enhances the overall performance of tax departments. Li & Sui (2011) argue that the Diffusion of Innovation theory elucidates how ideas, products, and technologies diffuse throughout social systems. However, the adoption of automated tax platforms by entities like the Kenya Revenue Authority (KRA) may encounter resistance from taxpayers, particularly due to perceived complexities in their use. Not all taxpayers possess the necessary ICT skills, which can hinder widespread adoption. IDT outlines adoption as a linear, five-stage process (knowledge, persuasion, decision, implementation, and confirmation). Critics argue that this is overly simplistic, as adoption can be non-linear, cyclical, or influenced by external factors not captured by these stages. Real-world adoption often involves revisiting stages or encountering external pressures that IDT does not account for

2.3.4 Transaction Cost Theory

Proposed by Williamson (1981), Transaction Cost Theory is integral to corporate governance and agency theory. It posits that costs arise when a firm engages external parties to perform tasks, such as employing tax agents for filing returns. The theory emphasizes that governance structures are shaped by the net impacts of internal and external transactions, rather than solely contractual relationships with shareholders outside the firm. Transaction costs encompass various elements: search and information costs, negotiation and decision-making costs, and monitoring and enforcement costs.

The organizational structure of a company influences its ability to manage transactions and thereby control costs. Management often seeks to internalize transactions to mitigate these costs, minimizing risks and uncertainties related to prices and quality. Unlike agency theory, which focuses on protecting shareholder ownership rights, the

corporate governance challenge posed by Transaction Cost Theory lies in efficiently and effectively managing firm transactions (Williamson, 1991). Taxpayers encounter transaction costs associated with compliance, in addition to financial expenses. Firms that can minimize these costs are more likely to respond positively to credible, non-coercive nudges (Hoy, McKenzie & Sinning, 2021).

According to the theory, organizational design plays a crucial role in determining the burden of compliance costs, particularly in taxation. Strategies that enhance tax compliance can help reduce the costs associated with non-compliance. Transaction Cost Theory thus supports the notion of variable compliance costs, acknowledging the complexities and nuances involved in regulatory adherence. TCT focuses primarily on minimizing transaction costs, which critics argue is overly simplistic. Decisions about firm boundaries are often influenced by factors beyond cost considerations, such as strategic positioning, control, innovation, or company culture

2.4 Empirical Review

This section examines past studies and discussions to explore the impact of automating systems on Value Added Tax compliance among small and medium enterprises in Dagoretti South, Nairobi, Kenya.

2.4.1 Tax Invoice Management System process and Value Added Tax compliance

The primary aim of the Electronic Tax Invoice (ETI) initiative is to enhance VAT compliance, reduce VAT fraud, and boost tax revenues. The system seeks to achieve these goals through real-time validation of invoices at the point of sale before issuance to customers and transmission to the Kenya Revenue Authority (KRA). It aims to improve accuracy in managing automated VAT data by addressing invoice discrepancies, verifying invoice data to minimize fraud, standardizing tax invoices and

receipts, and simplifying VAT return filing with pre-filled forms. For taxpayers, the ETI system aims to foster trust between customers and businesses, promote a fair business environment, simplify VAT return filing with pre-filled forms, and expedite VAT refund processing (KRA, 2021).

The Kenya Revenue Authority launched the Electronic Tax Invoice system on August 1, 2021, mandating all VAT-registered entities to comply with the Value Added Tax (Electronic Tax Invoice) Regulations of 2020 within twelve months from the rollout date (KRA, 2021).

The transition period of twelve months as stipulated by the VAT (ETI) Regulations ended on July 31, 2022. However, administratively, taxpayers have been granted additional time until September 30, 2022, to acquire and activate their Electronic Tax Registers (ETR) devices, as provided for in Regulation 13. This extension allows KRA to address any technical challenges that may arise during implementation. As at 22 October 2022, 38,442 TIMS machines had been bought and are being utilized countrywide with 8,744 TIMS bought by PINs registered in East and South of Nairobi station. 73% of the target population are currently using the TIMS machines. (KRA, 2022).

Bellon et al., (2019) conducted a study on the impact of electronic invoicing (e-invoicing) on corporate tax compliance and performance using administrative tax data and quasi-experimental variations in the implementation of VAT electronic invoicing in Peru. Their findings indicated that e-invoicing led to an increase of more than 5% in reported firm sales, purchases, and value-added within the first year of adoption. This effect was more pronounced among smaller firms and sectors with higher rates of non-compliance, suggesting that e-invoicing promotes compliance by reducing the costs

associated with compliance and strengthening deterrence. Despite these positive effects on tax collection, the effectiveness of the reform was limited by deficiencies in Peru's VAT refund system, highlighting the need for complementary reforms alongside digital tools like e-invoicing to enhance revenue mobilization.

According to the OECD (2018), businesses utilize software technologies to evade taxes, particularly through the manipulation of electronic cash registers and other point-of-sale systems in retail outlets and restaurants. While these systems are generally assumed to maintain accurate records, the installation of specialized "sales suppression" software enables them to facilitate complex tax fraud schemes. This poses a significant risk across all countries, resulting in substantial losses in government tax revenues. For instance, it has been estimated that sales suppression in Canadian restaurants alone could lead to tax losses amounting to $2.4 billion annually.

Kabochi, Mwaniki, and Ogara (2019) observed that Rwanda implemented Electronic Tax Registers (ETRs) in 2014, introducing more advanced technology compared to other East African countries. Rwanda adopted a system where Electronic Billing Machines (EBMs) installed at taxpayer premises are linked to the Rwanda Revenue Authority (RRA) via telecommunication SIM cards. This setup allows the tax authority to monitor issued invoices in real-time and store transaction records in the RRA archive system, accessible to taxpayers. Through this technological upgrade, Rwanda successfully increased its VAT revenue by 25%.

Locally, Kabochi (2019) asserts that the Kenya Revenue Authority (KRA) implemented the Tax Invoice Management System (TIMS) to enhance VAT compliance through technology. The TIMS integrates trader systems such as electronic tax registers, point-of-sale terminals, and ERP billing/invoicing systems with KRA's

iTax platform. This integration aims to monitor the issuance of electronic tax invoices effectively. By providing real-time access to issued invoices, TIMS helps curb tax evasion and improve efficiency in tax administration. The adoption of technology as a compliance tool was deemed necessary to bolster VAT compliance efforts and combat tax evasion effectively.

2.4.2 VAT Automated Assessment and Value Added Tax compliance

In the United States, the government has introduced various strategies and laws to enhance VAT compliance among taxpayers. These strategies include mandating tax withholding at the income source, meaning that organizations purchasing goods or services deduct VAT and remit it to the government (Brockmann, Genschel, & Seelkopf, 2016). Another strategy involves empowering revenue agencies with enforcement capabilities, including the imposition of penalties on those who violate tax laws.

Adeyeye (2019) explored how technological innovation impacts tax administration in Nigeria. Using structured questionnaires, data was collected from 219 employees of the Federal Inland Revenue Service. Analysis was conducted using ANOVA, regression, and descriptive statistics models. The study revealed that information technology enhanced tax administration by providing real-time control over tax processes.

Kenya introduced VAT in 2003, suspended it in 2011, and reintroduced it in 2014. Governed by the VAT Act 2013, the Finance Act 2014 amended the Act by introducing Section 25A, which reinstated the Withholding VAT (WHVAT) system at a rate of 6% effective from September 19, 2014. Bonga (2017) noted that reforms were initiated to modernize tax policies in response to changes in the operational environment.

Evnevich and Ivanova (2020) investigated the link between digital technologies and tax monitoring in Russia. Using both primary and secondary data, with questionnaires for primary data and secondary data from the Federal Tax Service's statistics, the study found that automating tax control systems significantly boosted audit efficiency and reduced informal tax schemes, leading to higher compliance and increased tax revenue.

In Kenya, the Finance Act 2015 further amended Section 25A, allowing the Commissioner to appoint any person as a withholding VAT agent. Initially, only government institutions, parastatals, banks, financial institutions, cooperative societies, insurance companies, and regular exporters were designated as withholding VAT agents.

2.4.3 Online Filing Procedure and Value Added Tax compliance

The concept of online tax filing began in the United States when the Internal Revenue Service (IRS) started offering e-filing for tax refunds only (Muita, 2021). This system has grown significantly, with around one in five individual taxpayers now filing electronically. Over the years, numerous enhancements have been added to the program. Today, electronic filing has expanded to many developed countries, including Australia, Canada, Italy, the United Kingdom, Chile, Ireland, Germany, France, the Netherlands, Finland, Sweden, Switzerland, Norway, Singapore, Brazil, Mexico, India, China, Thailand, Malaysia, and Turkey (Ramayah et al., 2019). Developing countries such as Uganda, Nigeria, Rwanda, and Kenya are also adopting electronic tax filing (Muita, 2021).

Akram, Malik, and Shareef (2018) conducted a study on the impact of online tax filing on tax collection in Saudi Arabia. The research aimed to understand how technology affects online tax filing and its subsequent impact on tax collection. Data was gathered

through a web-based survey from 409 users of online tax filing services. The data was analyzed using covariance-based structural equation modeling. The study concluded that online tax filing significantly influenced tax collection in Saudi companies.

Globally, the tax landscape is evolving rapidly. The advancement of Information and Communication Technology (ICT) poses challenges to tax revenue systems (Muita, 2021). Tax authorities must maintain a modern and responsive tax administration system. Since the 1990s, many tax authorities, particularly in developed countries, have leveraged ICT to adopt electronic tax filing (Lai et al., 2019). Electronic filing represents a contemporary method for tax authorities to interact with taxpayers.

According to Andarias (2019), electronic filing relies on technology, including computers, the internet, and software applications. Effective e-filing can be measured by its ability to achieve desired outcomes. According to Fu et al. (2006), these measures include reducing the lifespan of tax processes, enhancing efficiency, minimizing procedural errors, increasing the multitasking capacity of tax officers, and assisting taxpayers in complying with regulations. A key component of e-filing is having a single database encompassing all aspects of taxable activities, such as valuation, billing, collection, and enforcement. Recognizing the impact of tax operating costs is not new; Adam Smith introduced the principles of good tax practice—equity, certainty, convenience, and economy—in 1776.

In South Africa, e-filing involves the digital submission of tax returns. This system offers several benefits, such as extending the submission deadline to January of the following year instead of October of the current year (Ferreira, 2008). However, challenges include the software requirements of the SARS program, which used Adobe Acrobat 8 software, necessitating a Pentium II computer, which was not widely

available at the time of implementation. Additionally, comprehensive online help menus and site navigation posed challenges (Lai & Choong, 2020).

2.4.4 Digital payment and Value Added Tax compliance

Tax authorities that mandate tax payments via mobile phones have seen significant increases in the amounts collected. For instance, Mauritius experienced a 12% boost in tax revenue after incorporating mobile phones into their tax collection system (Scharwatt, 2020). This suggests that utilizing mobile phones for tax administration is likely to enhance tax collection. Australia is another country that has implemented this system for managing municipal taxes (Turner et al., 2019). Conversely, Turkey's tax strategy focuses on simplifying tax laws and aligning them with European Union regulations.

Ndayisenga and Shukla (2019) explored the impact of an electronic tax management system on revenue collection in Rwanda. The study examined variables such as internet payment systems, mobile payment systems, and electronic billing systems. Using a descriptive research design, they targeted 120 respondents, sampling 75 of them. Data was gathered from both primary and secondary sources. The findings indicated that mobile payments significantly improve timely payments and reduce operational costs, offering the convenience of paying from any location.

Lukwata (2021) investigated the effect of electronic payment systems on tax compliance and collection in Uganda. Utilizing a survey research design, the study sampled 38 respondents, including importers, clearing agents, and Uganda Revenue Authority (URA) officials. Data was collected via self-administered questionnaires. The results showed that the electronic payment system enhanced tax compliance by making it easier for taxpayers to accurately assess their obligations and pay on time.

Additionally, the system simplified the work of URA staff and marginally increased tax collection.

Okiro (2015) examined the impact of the E-Payment System on revenue collection by the Nairobi City County Government. Adopting a descriptive research design, the study involved all 18 Nairobi County departments. Due to the manageable size of the target population, all departments participated in data collection through structured self-administered questionnaires. The study concluded that the introduction of the e-payment system significantly improved revenue collection performance in Nairobi City County.

2.4.5 Moderating effect of Tax obligation cost

The burden of compliance refers to the expenses and efforts that taxpayers must undertake to adhere to tax regulations (Sandford, Godwin & Hardwick, 2019). These compliance costs encompass a variety of "hard core" expenses, such as the labor and time required to fulfill tax obligations. This includes the time spent by businesses to understand and manage their tax responsibilities, costs associated with hiring tax professionals or experts, and additional expenses for necessary systems, software, and travel.

Not all compliance costs are financial. Some are psychological, stemming from the stress and anxiety of meeting tax deadlines, the fear of non-compliance, and the significant penalties that come with it. These psychological burdens can cause considerable frustration for taxpayers. Businesses often face substantial challenges in striving to be tax-compliant. To alleviate this, tax authorities occasionally assist, especially regarding the filing of returns at locations like Huduma Centres across the

country. However, despite these efforts, many businesses still experience significant burdens due to the high demand for these services.

2.5 Research Gaps

The gaps established in the literature had signs of methodological, conceptual and contextual knowledge gaps. Bellon, Chang, Dabla-Norris, Khalid, Lima, Rojas, and Villena (2019) conducted a study on the effects of e-invoicing on business tax compliance and performance, utilizing administrative tax data and a quasi-experimental approach in the phased implementation of VAT electronic invoicing in Peru. Their findings revealed that e-invoicing led to an increase in reported sales, purchases, and value-added by more than 5% within the first year of its adoption. This impact was most pronounced among smaller firms and sectors with higher non-compliance rates, indicating that e-invoicing improves compliance by reducing compliance costs and bolstering enforcement. However, since the study was based in Peru, there is a contextual gap when considering its application to other regions.

Akram, Malik, and Shareef (2018) explored the impact of online tax filing on tax collection in Saudi Arabia. The research aimed to understand how technology influences online tax filing and its subsequent effect on tax revenue. A web-based survey was used to gather data from 409 users of online tax filing services. The analysis, conducted through covariance-based structural equation modeling, demonstrated that online tax filing significantly affected tax collection among Saudi companies. This study used a covariance-based structural equation model, whereas the current study will employ a multiple linear regression model, highlighting a methodological gap.

Kabochi (2019) suggested that to enhance VAT compliance through technology, the Kenya Revenue Authority (KRA) implemented the Tax Invoice Management System

(TIMS). This system is designed to regulate the issuance of invoices by integrating trader systems, such as electronic tax registers, point of sale systems, and ERP billing/invoicing systems, with KRA's iTax platform. The primary goal is to monitor the transmission of electronic tax invoices. The integration of TIMS and iTax is expected to improve tax administration efficiency and offer a user-friendly experience for taxpayers. By providing KRA with real-time access to invoices issued by traders, TIMS aims to significantly reduce tax evasion. The study focused on VAT compliance through use of technology hence conceptual gap.

2.6 Conceptual Framework

A conceptual framework is a visual representation that illustrates the interconnections between the study's independent and dependent variables (Mugenda & Mugenda, 2003). It clearly depicts how these variables are related to one another. The independent variables are the tax invoice management system, which was measured by Perceived usefulness and benefit of TIMs machines, Accurate pre-filled VAT returns VAT Automated Assessment which was measured through VAT transaction and VAT credits. Online filing procedure which was measured by Use filing template and Uploading template. In this context, the moderating effect considered was the compliance cost, which includes expenses for bookkeeping and hiring agents. The dependent variable in this study is Value Added Tax (VAT) compliance, which was measured through metrics such as tax collected, the number of registered taxpayers, and the number of returns filed.

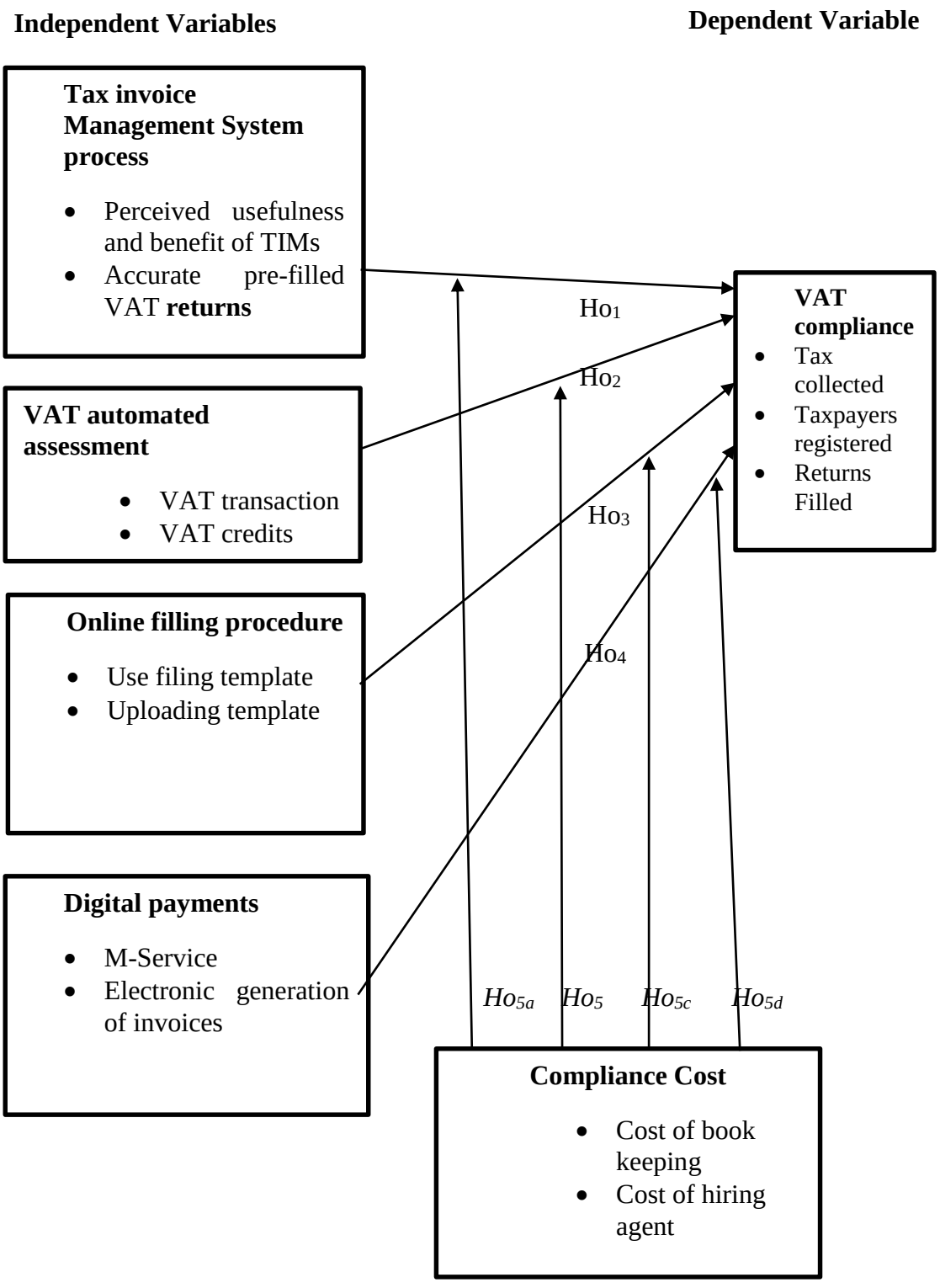

Figure 2.1: Conceptual Framework

Source: (Researcher, 2024)

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter outlines the methodology used in this study, encompassing the research design, data collection methods, and data analysis techniques. Additionally, it covers how data will be presented, the sources and types of data to be collected, the model illustrating the relationship between study variables, and the operationalization of these variables.

3.2 Research Design

The research design provides a structured approach to collecting, measuring, and analyzing data (Kothari, 2004). This study adopted an explanatory research design, which is ideal for elucidating the nature of certain relationships and exploring causal connections between variables. This design is suitable because it allows for generalizing findings to a larger population (Schindler & Cooper, 2003).

3.3 Target Population

Blumberg et al. (2003) describe the target population as the entire group of individuals or objects that a study focuses on. According to Kothari (2004), a population includes a defined group of individuals, objects, households, or entities under investigation. A well-defined population is essential for generalizing study findings. This research targeted 1781 business owners in Dagoretti South (KRA, 2023).

3.4 Sample and Sampling Technique

Saunders et al. (2011) define a sample as a subset of the target population. A sample, if appropriately sized and selected using suitable techniques, can provide insights about the entire population. Gay (2012) suggests that for correlation research, a sample of 30

or more cases is needed. Various formulas exist for calculating sample sizes, but this study used Slovin's formula due to its simplicity, scientific basis, and applicability to large populations. Therefore, the sample size for 1781 SMEs in Dagoretti South was calculated accordingly.

$$n = \frac{N}{1 + N(e^2)}$$

Where n= Number of samples, N= Total population and e = Error tolerance

Where: N is the target population (1781), e is the standard error of estimate (5%) at 95% confidence level and hence n is the sample size (207).

$$n = \frac{1781}{1+1781\ (0.05^2)}$$

$$n = \frac{1781}{1+4.452}$$

$$n = \frac{1781}{5.452}$$

$$n = 326$$

The study targeted the 326 SMEs Dagoretti South which was chosen through random sampling technique.

3.5 Data Collection Instruments

This study made use of primary data instruments, particularly, the questionnaire. The researcher used a questionnaire since they compel the respondents to give information as accurate as possible (Maxwell, 2012). The questionnaire included statements rated on a Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree). These questionnaires were distributed to SMEs, with assurances of confidentiality given to respondents.

3.6 Data Collection Instruments and Procedure

Data collection instruments are tools or techniques used to gather information from members in study of Blumberg at al. (2003). This study depended on primary information which was gathered by the utilization of questionnaires which was controlled to the sampled respondents. The questionnaires were utilized as a result of its economy, its capacity to guarantee secrecy. It also gives time to subjects to consider reactions. The questionnaires were comprised of closed-ended questions administered in the form of a Likert scale and they were self-administered in nature.

3.7 Pilot Study

The researcher conducted a pilot study to ensure that the data collected using the questionnaire intended to be used give legitimate and unwavering quality of data collected. According to Cooper & Schindler (2006), a pilot test should range from 1% to 10% of the sample size. A pilot sample of 32 SMEs from Machakos Town was used to test the reliability of the research instruments. The pilot study is significant in research as it ensures that the research measures whether the research instruments can give the required outcomes to meet the objectivity of the research.

3.7.1 Reliability

The study employed Cronbach's alpha to assess data reliability (de Vaus, 2012). Reliability refers to the consistency of measurements, or the extent to which an instrument yields the same results under consistent conditions. A reliability test was conducted to determine whether the data collection instruments could produce reliable and accurate results, with a Cronbach's alpha value of 0.70 or higher considered acceptable.

3.7.2 Validity of Research Instruments

As per Lune and Berg (2016), validity is the degree to which a test measures what is needed. It is used to test the accuracy of the data to make the research credible. Validity was assessed in three major forms: content validity, criterion validity, and construct validity (Blumberg et al., 2008). This study focused on content validity, ensuring that the questionnaire content was thoroughly reviewed by supervisors. Feedback from these reviews was used to enhance content validity. Factor analysis was utilized to measure validity, ensuring that the data accurately represented what the study intended to measure. Content validity was further assessed by determining the extent to which the questionnaire items represented the full range of relevant topics (Cooper & Schindler, 2014).

3.8 Diagnostic Test

Regression analysis relies on certain foundational assumptions being met, such as normality and multicollinearity.

3.8.1 Normality Test

Normality implies that the data is symmetrically distributed without extreme outliers, meaning it isn't skewed or exhibiting abnormal peaks. This even distribution around the mean is critical for multiple regression analysis (Osborne & Waters, 2014). For accurate results, it is assumed that errors follow a normal distribution, and residual values form a bell-shaped curve (Keith, 2006). If the variables don't follow this pattern, it can skew the relationships and impact the significance tests (Osborne & Waters, 2014). Normality can be tested using methods like Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors, and Anderson-Darling. Among these, the Shapiro-Wilk test is regarded as

the most effective (Razali & Wah, 2011). Data is considered normal if test results are above 0.05 ($p > 0.05$).

3.8.2 Multicollinearity

Multicollinearity refers to a high correlation among predictor variables, which can undermine the accuracy of regression models (Neter et al., 2012). For reliable regression outputs, predictor variables should be independent. When multicollinearity is present, it makes the predictors interdependent, leading to misleading results. In this research, the Variance Inflation Factor (VIF) was used to detect multicollinearity. A VIF below 10 indicates low multicollinearity, suggesting all input variables can be included in the analysis.

3.8.3 Homoscedasticity test

Homoscedasticity means that the variance of the errors is consistent across all levels of an independent variable. According to Lani (2010), an error in regression is the deviation of a data point from the regression line. Linear regression assumes that this spread, or the error term, is uniform across the graph. If this assumption is violated, the regression results may be unreliable due to biased coefficients. A p-value greater than 0.05 indicates that the error spread is constant, signifying homoscedasticity.

3.8.4 Linearity test

The purpose of linearity tests is to determine if the relationship between the main variable and the other variables in a regression model is linear or not. The Ramsey's RESET test, established by Ramsey in 1969, is frequently employed to identify non-linear associations. It checks if the model is set up as a straight line. Complex relationships between variables can cause the calculated coefficients to be wrong and the predictions to be off. If the p-value is greater than 0.05, then linearity is not violated.

But if the p-value is less than 0.05 When this requirement is not satisfied, linearity is not adhered to.

3.9 Data Analysis and Presentation

The questionnaires were inspected in order to identify errors such as wrong responses and unfilled spaces left by the respondents. Since the study adopted a descriptive research design, both descriptive statistics and inferential statistics was used to analyse the data. The study employed hierarchical linear regression in the data analysis of the variables.

The hierarchical linear regression is given by the equation below,

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_4 + \varepsilon \ldots\ldots\ldots (i)$

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 M + \varepsilon \ldots\ldots. (ii)$

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 M + \beta_6 X_1 * M + \varepsilon \ldots\ldots (iii)$

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 M + \beta_6 X_1 * M + \beta_7 X_2 * M + \varepsilon \ldots\ldots (iv)$

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 M + \beta_6 X_1 * M + \beta_7 X_2 * M + \beta_8 X_3 * M + \varepsilon ...(v)$

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 M + \beta_6 X_1 * M + \beta_7 X_2 * M + \beta_8 X_3 * M + \beta_9 X_4 * M + \varepsilon \ldots\ldots. (vi)$

Where:

Y = Value Added Tax compliance

β_0 = Constant Term

β_1, β_2 and $\beta_3 \ldots_n$ = Beta coefficients of the independent variables

X_1 = Tax Invoice Management system

X_2 = Value Added Tax automated assessment

X_3 = Online filing procedure

X_4 = Digital payments

M = Tax obligation cost as a moderator

$X_1 * M$ = Tax Invoice Management system process * Tax obligation cost

$X_2 * M$ = Value Added Tax automated assessment * Tax obligation cost

X_3*M = Online filing procedure * Tax obligation cost

X_4*M = Digital payments * Tax obligation cost

ε = Errors term

3.10 Measurement of Variables

In this study, the process of managing the tax invoice system (TIMs) is an independent variable, assessed through perceived usefulness and benefits, and the accuracy of pre-filled VAT returns, as indicated by Villena (2019). Data is gathered via a 5-point Likert scale questionnaire and analyzed using regression and correlation analysis. Similarly, the automated assessment of Value Added Tax (VAT) is another independent variable, focusing on VAT transactions and credits, based on Bonga (2017), with data collection and analysis following the same methods. The online filing procedure, assessed through the use of a filing template and the process of uploading templates as described by Ramayah et al. (2016), also serves as an independent variable and employs a 5-point Likert scale questionnaire, with subsequent regression and correlation analyses. Digital payments, evaluated through mobile services and electronic invoice generation, as noted by Scharwatt (2020), follow the same data collection and analysis methodology. Compliance cost, another independent variable, includes the cost of bookkeeping and hiring agents, as identified by Slemrod (2019), using similar instruments and methods. Age is considered through demographic data, with analysis methods including regression and correlation. The dependent variable in this study is VAT tax compliance, measured by tax collected, taxpayers registered, and returns filed, according to KRA (2016), using a 5-point Likert scale questionnaire and analyzed with regression and correlation techniques.

Table 3.1: Operationalization of the study variables

Variable	Type	Indicators	Source	Data collection instrument and scale	Analysis Method
Tax Invoice Management system process	Independent Variable	• Perceived usefulness and benefit of TIMs machines • Accurate pre-filled VAT returns	Villena (2019)	5-point Likert Scale Questionnaire	• Regression analysis • Correlation analysis
Value Added Tax automated assessment	Independent Variable	• VAT transaction • VAT credits	Bonga (2017)	5-point Likert Scale Questionnaire	• Regression analysis • Correlation analysis
Online filing procedure	Independent Variable	• Use filing template • Uploading template	(Ramayah *et al.*, (2016).	5-point Likert Scale Questionnaire	• Regression analysis • Correlation analysis
Digital payments	Independent Variable	• M-service • Electronic generation of invoices	Scharwatt , (2020).	5-point Likert Scale Questionnaire	• Regression analysis • Correlation analysis
Compliance cost	Independent Variable	• Cost of Book keeping • Cost of hiring agent	Slemrod (2019)	5-point Likert Scale Questionnaire	• Regression analysis • Correlation analysis
VAT Tax compliance	Dependent Variable	• Tax Collected • Taxpayers Registered • Returns filed	KRA (2016)	5-point Likert Scale Questionnaire	• Regression analysis • Correlation analysis

3.11 Ethical Issues

Ethical research practices are paramount to ensure no emotional or physical harm comes to the participants (Roberts, 2015). Ethics encompass the standards and norms expected in a society. This study was conducted with strict adherence to ethical guidelines. Necessary permissions were obtained from the Kenya Revenue Authority, the University, and the National Commission for Science, Technology and Innovation. Participants were treated with respect, and all collected data was used solely for

academic purposes, maintaining confidentiality at all times. Personal information was handled with the utmost care to ensure privacy.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter delves into the survey findings to enhance our comprehension of the study. It aims to provide insights into how the cost of tax obligations moderates the relationship between system automation and value-added tax (VAT) compliance among small and medium enterprises (SMEs) in Dagoretti South, Nairobi, Kenya.

4.2 Response Rate

The response rate of the study demonstrates the level of participation and the reliability of the data collected. The calculation requires dividing the count of survey participants by the count of individuals who were requested to take part in the survey. Out of the 326 questionnaire that were issued, only 265 respondents correctly filled and submitted the questionnaires indicating an 81 % response rate, as shown in table 4.1. The complexity or length of the questionnaire might have discouraged potential respondents, and privacy concerns regarding the confidentiality and use of their information might have deterred some individuals. Technical issues, such as not receiving the questionnaire or problems with accessing or submitting it, could have led to non-response.

Table 4.1: Response Rate Analysis

	Frequency	**Percentage (%)**
Response	265	81%
No Response	61	19%
Issued	326	100%

(Source: Research 2024)

4.3 MCAR Analysis

A MCAR (Missing Completely at Random) test was performed to assess whether the nature of missing data might lead to selection bias. If data are MCAR, both the missing and observed data are representative of the entire population. Hence, when data are MCAR, the standard statistical summaries derived from the observed data remain accurate (Fisher, 2016). If p-value > 0.05 suggests that the missing data can be considered Missing Completely at Random. For all variables on table 4.2 tested (VAT compliance, tax invoice management system, VAT automated assessment, online filing procedure, digital payments, and tax obligation cost), the p-values are greater than 0.05. Therefore, we fail to reject the null hypothesis for each variable, suggesting that the missing data in each case can be considered Missing Completely at Random (MCAR). This implies that the missingness does not follow any systematic pattern related to the variables, and any analysis can proceed without concerns of bias from the missing data.

Table 4.2: Little's MCAR test

	Value Added Tax compliance	**Tax Invoice Management system**	**Value Added Tax automated assessment**	**online filing procedure**	**digital payments**	**tax obligation cost**
Chi-Square (χ^2) statistic:	15.253	10.556	11.256	22.00	33.15	15.411
Degrees of Freedom (df):	21	21	21	21	21	21
P-value:	0.322	0.211	0.102	0.55	0.1589	0.333

(Source: Research 2024)

4.4 Pilot test

A pilot sample size was 32 SMEs from Machakos Town who helped the researcher to test the reliability of the research instruments, the pilot test showed that Tax Invoice

Management system, Value Added Tax automated assessment, online filing procedure, digital payments, tax obligation cost and Value Added Tax compliance is reliable since the Cronbach's alpha results indicates >0.7.

4.5 Reliability test

To ensure the reliability of the data, a reliability test was conducted using Cronbach's alpha, as recommended by DeVaus (2012). Reliability refers to the consistency of a measurement tool, indicating the degree to which it produces stable and consistent results under the same conditions with the same subjects. Table 4.3 indicates that VAT compliance has Alpha value of 0.982>0.7, Tax Invoice Management system, has Alpha value of 0.942>0.7, Value Added Tax automated assessment has Alpha value of 0.925>0.7, online filing procedure has Alpha value of 0.841>0.7. digital payments has Alpha value of 0.970>0.7, lastly tax obligation cost has Alpha value of 0.902>0.7, Values higher than 0.7 indicate high levels of reliability in the questionnaire responses for each of the variables.

Table 4.3: Reliability Tests

Variable	Cronbach's Alpha	N of Items
VAT compliance	0.982	5
Tax Invoice Management system	0.942	7
Value Added Tax automated assessment	0.925	5
online filing procedure	0.841	5
digital payments	0.970	5
tax obligation cost	0.902	5

(Source: Research 2024)

4.6 Demographics Data

The demographics data was used and summarized on table 4.4 to Gender Distribution:

The gender distribution among the respondents is relatively balanced. Out of 265 participants, 127 are female, making up 47.9% of the sample, while 138 are male, accounting for 52.1%. This slight male predominance indicates a near-equal representation of both genders, which helps in minimizing gender bias in the analysis.

The educational qualifications of the respondents are diverse, with the most common qualification being a degree, held by 59 individuals (22.3%). This is closely followed by diploma holders, comprising 55 respondents (20.8%). Those with a master's degree constitute 48 participants (18.1%), and those with secondary education make up 53 respondents (20.0%). Additionally, 50 participants (18.9%) fall into the 'Others' category, which may include various other qualifications not explicitly listed. This distribution suggests a well-educated sample with a significant proportion of respondents holding advanced degrees, indicating a potentially high level of expertise and knowledge among the participants.

The experience levels of the respondents in terms of years in business are also varied. The largest group consists of those with 4 to 6 years of experience, representing 71 participants (26.8%). This is followed closely by those with 7 to 10 years of experience, numbering 67 (25.3%), and those with less than 3 years, comprising 66 respondents (24.9%). Individuals with more than 10 years of experience form the smallest group, with 61 participants (23.0%). This spread of experience levels indicates a diverse range of business tenure among the respondents, providing insights from both relatively new and highly experienced business individuals.

Employee numbers show a range, with most firms having between 301 and 400 employees (24.2%), reflecting a broad spectrum of business sizes and experience levels.

Overall, the demographic data indicates a well-rounded and diverse sample in terms of gender, educational background, and business experience. This diversity is beneficial for obtaining comprehensive insights and ensuring that the analysis captures a wide array of perspectives.

Table 4.4: Demographics Data

		Count	Percent %
Gender	Female	127	47.9%
	Male	138	52.1%
Leve Of Education	Degree	59	22.3%
	Diploma	55	20.8%
	Masters	48	18.1%
	Others	50	18.9%
	Secondary	53	20.0%
Length in Business	4 to 6 years	71	26.8%
	7 to 10 years	67	25.3%
	Less than 3 years	66	24.9%
	More than 10 years	61	23.0%
Number of Employees	Between 100 and 200	60	22.6%
	Between 201 and 300	50	18.9%
	Between 301 and 400	64	24.2%
	Less than 100	40	15.1%
	More than 400	51	19.2%

(Source: Research 2024)

4.7 Descriptive Statistics

Descriptive statistics are employed to examine and summarize research data in a straightforward way. The investigation clarifies the implications of the data on specific metrics such as mean, variability, and distribution.

4.7.1 Descriptive statistics on Tax Invoice Management system

Table 4.5 indicates provide insights into the overall perception and effectiveness of TIMS among respondents. Our business maintains accurate Tax Invoice Management system from an approved KRA Vendor. Respondents generally agree (Mean = 3.93) that their business maintains an accurate Tax Invoice Management system from an approved KRA Vendor. The standard deviation (1.018) indicates a moderate level of variability in responses. The negative skewness (-0.637) suggests that more respondents lean towards agreeing or strongly agreeing. The kurtosis value (-0.524) indicates a distribution that is slightly flatter than normal.

TIMS has helped us to accurately pre-filled VAT returns. The respondents strongly agree (Mean = 4.20) that TIMS has helped accurately pre-fill VAT returns, with a relatively low standard deviation (0.910) suggesting less variability in responses. The distribution is negatively skewed (-0.954), indicating a higher concentration of positive responses. The kurtosis (0.038) is close to zero, suggesting a distribution close to normal. The business issues an ITR invoice to all VAT transactions. Respondents generally agree (Mean = 4.04) that their business issues ITR invoices for all VAT transactions, with moderate variability (Standard Deviation = 1.011). The negative skewness (-0.742) shows a trend towards agreement, and the kurtosis (-0.501) indicates a slightly flatter distribution. Our business uses the ITR receipts to monitor and measure sales. There is a strong agreement (Mean = 4.17) that businesses use ITR receipts to monitor and measure sales. The low standard deviation (0.893) signifies low variability in responses. The skewness (-1.039) is more negative, indicating a higher frequency of agreement or strong agreement, and the kurtosis (0.761) suggests a peak distribution with less spread. I know the usefulness and benefit of TIMS machines. Respondents strongly agree (Mean = 4.24) on their awareness of the usefulness and benefits of TIMS

machines. The standard deviation (0.901) is low, showing consistency in responses. The skewness (-1.090) indicates a strong bias towards agreement, and the kurtosis (0.393) suggests a distribution that is relatively peaked. Our business enjoys input tax while trading with registered VAT suppliers. There is general agreement (Mean = 4.04) that businesses enjoy input tax benefits when trading with registered VAT suppliers. The standard deviation (0.984) indicates moderate variability. The negative skewness (-0.725) suggests a trend towards positive responses, and the kurtosis (-0.434) indicates a distribution that is slightly flatter. TIMS has enabled me to automatically access invoice transactions. Respondents strongly agree (Mean = 4.22) that TIMS enables automatic access to invoice transactions. The low standard deviation (0.924) suggests low variability. The skewness (-1.175) is highly negative, indicating frequent agreement or strong agreement, and the kurtosis (0.866) indicates a peak distribution with less spread. Overall, the aggregate mean of 4.12 indicates a strong agreement with the statements regarding the benefits and effectiveness of TIMS. This suggests that respondents have a positive perception of the system's impact on their business operations.

Table 4.5: Descriptive statistics Tax Invoice Management system

	N	Mean	Std. Deviation	Skewness	Kurtosis
Our business maintains accurate Tax Invoice Management system from an approved KRA Vendor.	265	3.93	1.018	-.637	-.524
TIMS has helped us to Accurately pre-filled VAT returns		4.20	.910	-.954	.038
The business issues an ITR invoice to all VAT transactions.		4.04	1.011	-.742	-.501
Our business uses the ITR receipts to monitor and measure Sales.		4.17	.893	-1.039	.761
I know the usefulness and benefit of TIMs machines		4.24	.901	-1.090	.393
Our business enjoys input tax while trading with registered VAT suppliers.		4.04	.984	-.725	-.434
TIMS has enabled me to automatically access invoice transactions.		4.22	.924	-1.175	.866
Aggregate Mean		4.12			

4.7.2 Descriptive statistics on Value Added Tax automated assessment

Table 4.6 presents the descriptive statistics for various statements related to the Value Added Tax (VAT) automated assessment, our business supplies goods to or render services to a VAT Agent The average response for this statement is 3.73, indicating that respondents tend to agree that their business supplies goods to or renders services to a VAT agent. The standard deviation is 0.921, showing moderate variability in responses. The skewness value of -0.527 suggests a slight leftward skew, indicating that more respondents lean towards agreement. With a kurtosis of -0.485, the distribution is slightly platykurtic, suggesting a relatively flat distribution of responses compared to a normal distribution. A percentage of the income during a VAT transaction is deducted at source and remitted to KRA. The mean response is 4.01, suggesting that respondents

agree that a percentage of income during VAT transactions is deducted at the source and remitted to the Kenya Revenue Authority (KRA). The standard deviation is 0.866, indicating relatively low variability among responses. The skewness of -0.790 shows a moderate leftward skew, indicating that more respondents strongly agree with this statement. The kurtosis of 0.176 indicates that the distribution of responses is close to normal, with slightly more responses in the tails. We have been contacted by KRA to declare a sale due to information from the database. The mean of 4.09 indicates that respondents agree, on average, that they have been contacted by KRA to declare sales based on database information. The standard deviation is 0.833, suggesting low variability in responses. With a skewness of -0.680, there is a moderate leftward skew, showing that many respondents strongly agree with this statement. The kurtosis value of -0.064 indicates a distribution close to normal, with a slight flattening. Value Added Tax Automated Assessment has enhanced our relationship with KRA. The mean response of 4.00 indicates that respondents generally agree that the VAT automated assessment has enhanced their relationship with KRA. The standard deviation is 0.786, showing relatively low variability in responses. The skewness value of -0.418 suggests a slight leftward skew, indicating a tendency towards agreement. With a kurtosis of -0.288, the response distribution is slightly platykurtic, indicating a flatter distribution compared to a normal curve. The business enjoys VAT credits while filing VAT returns. The average response is 3.95, which indicates agreement that businesses enjoy VAT credits while filing returns. The standard deviation is 0.777, indicating low variability among responses. The skewness of -0.397 shows a slight leftward skew, suggesting a tendency towards agreement. The kurtosis value of -0.191 suggests a distribution slightly flatter than normal.

The aggregate mean of 3.96 across all statements indicates a general tendency towards agreement on the positive impacts and processes related to VAT automated assessment.

Table 4.6: Descriptive statistics Value Added Tax assessment

	N	Mean	Std. Deviation	Skewness	Kurtosis
Our business supplies goods to or render services to a VAT Agent	265	3.73	.921	-.527	-.485
A percentage of the income during a VAT transaction is deducted at source and remitted to KRA.		4.01	.866	-.790	.176
We have been contacted by KRA to declare a sale due to information from the database		4.09	.833	-.680	-.064
Value Added Tax Automated Assessment has enhanced our relationship with KRA.		4.00	.786	-.418	-.288
The business enjoys VAT credits while filing VAT returns.		3.95	.777	-.397	-.191
Aggregate Mean		3.96			

4.7.3 Descriptive statistics on online filing procedure

Table 4.7 indicates descriptive statistics for the online filing procedure questionnaire items are as such Filing template is user friendly, cost effective, and reliable, The mean score for this item was 4.20 (SD = 0.910), indicating that respondents generally agreed that the filing template is user-friendly, cost-effective, and reliable. The negative skewness of -0.954 suggests that responses were skewed towards the higher end of the scale, meaning most users rated this item positively. The kurtosis value of 0.038 indicates a distribution close to normal.

Online filing enables users to upload the template and do tasks more quickly: This item had a mean score of 4.04 (SD = 1.011), showing that respondents agreed that online

filing facilitates quicker task completion. The skewness of -0.742 indicates a slight skew towards higher ratings, and the kurtosis of -0.501 suggests a distribution that is somewhat flatter than normal.

Amending VAT returns is faster: With a mean score of 3.98 (SD = 0.992), respondents were generally positive about the speed of amending VAT returns, although slightly less so compared to other items. The skewness of -0.611 indicates a minor skew towards higher ratings, and the kurtosis of -0.615 shows a flatter than normal distribution. Accounting reports necessary for VAT are compatible with my systems reports: This item received a mean score of 4.14 (SD = 0.953), indicating that respondents agreed that accounting reports necessary for VAT are compatible with their system reports. The skewness of -0.997 indicates a pronounced skew towards higher ratings, and the kurtosis of 0.323 suggests a distribution that is slightly peaked compared to a normal distribution. Online filing systems do not divulge users their personal information: The mean score for this item was 3.69 (SD = 0.918), showing a more neutral to positive response regarding the security of personal information in online filing systems. The skewness of -0.500 indicates a moderate skew towards higher ratings, while the kurtosis of -0.527 indicates a flatter than normal distribution. Overall, the aggregate mean across all items was 4.01, reflecting a general agreement among respondents that the online filing procedure is effective, reliable, and secure.

Table 4.7: Descriptive statistics online filing procedure

	Mean	Std. Deviation	Skewness	Kurtosis
Filing template is user friendly, cost effective and reliable	4.20	.910	-.954	.038
Online filing enables users to upload the template and do tasks more quickly	4.04	1.011	-.742	-.501
Amending VAT returns is faster	3.98	.992	-.611	-.615
Accounting reports necessary for VAT are compatible with my systems reports	4.14	.953	-.997	.323
Online filing systems do not divulge users their personal information	3.69	.918	-.500	-.527
Aggregate Mean	4.01			

4.7.4 Descriptive statistics on digital payments

Table 4.8 shows that iTax has facilitated the viewing of real-time transactions and digital payment details within the taxpayer's ledger account, allowing for timely actions: The mean score for this item was 3.93, indicating that respondents generally agree with the statement. The standard deviation was 0.780, suggesting moderate variability in responses. The skewness of -0.411 indicates a slight negative skew, meaning that more responses leaned towards higher agreement. The kurtosis value of -0.155 suggests a distribution that is relatively flat compared to a normal distribution. Digital Payment has enabled me to file and pay using KRA M-Service: The mean score was 4.02, showing a general agreement among respondents. The standard deviation was 0.830, indicating moderate variability. Skewness was -0.549, reflecting a moderate negative skew, with a tendency towards higher agreement. Kurtosis was -0.238, indicating a somewhat flat distribution. Electronic generation of invoices has reduced chances of evading payment of tax: The mean score was 4.01, suggesting that respondents agree with this statement. The standard deviation was 0.800, again showing moderate variability. The skewness was -0.512, indicating a slight negative skew towards agreement. The kurtosis value of -0.159 indicates a relatively flat distribution.

iTax has enabled KRA officers to raise additional assessments with regards to digital payments: The mean score was 3.92, indicating general agreement. The standard deviation was 0.798, suggesting moderate variability. The skewness of -0.525 indicates a slight negative skew, with responses leaning towards higher agreement. The kurtosis value of 0.249 indicates a distribution that is slightly more peaked than normal.

I find digital payments simple and easy to use: The mean score was 4.00, showing that respondents generally agree with this statement. The standard deviation was 0.816, indicating moderate variability in responses. The skewness was -0.505, reflecting a slight negative skew towards agreement. The kurtosis value of -0.244 suggests a relatively flat distribution.

Overall, the aggregate mean for all items was 3.98, reflecting a general agreement across all statements related to digital payments.

Table 4.8: Descriptive statistics digital payments

	N	Mean	Std. Deviation	Skewness	Kurtosis
I-Tax has enabled me to see real-time transactions and digital payments details in taxpayer ‘s ledger account and act accordingly	265	3.93	.780	-.411	-.155
Digital Payment has enabled me to file and pay using KRA M-Service		4.02	.830	-.549	-.238
Electronic generation of invoices has reduced chances of evading payment of tax		4.01	.800	-.512	-.159
I-Tax has enabled KRA officers to raise additional assessment with regards to digital payments		3.92	.798	-.525	.249
I find digital payments simple and easy to use		4.00	.816	-.505	-.244
Aggregate Mean		3.98			

4.7.5 Descriptive statistics on Tax obligation cost

Table 4.9 indicates or the items related to tax obligation cost Too much time lost in tax calculations: Participants (N = 265) reported a mean score of 3.61 (SD = 1.116) for this item. The skewness of the data distribution is -.159, indicating a slight negative skew, and the kurtosis is -1.330, suggesting a relatively flat distribution with slightly light tails. Cost of hiring professionals tax agents is expensive to the firm: The mean score for this item is 3.95 (SD = 1.093). The skewness is -.649, indicating a moderate negative skew, and the kurtosis is -.785, suggesting a distribution slightly flatter than the normal distribution with slightly light tails. The cost incurred when filing returns is generally high: Participants rated this item with a mean score of 4.06 (SD = 1.077). The skewness is -.810, indicating a moderate negative skew, and the kurtosis is -.542, suggesting a distribution slightly flatter than the normal distribution with slightly light tails. The cost of keeping records is generally high: The mean score for this statement is 4.01 (SD = 1.087). The skewness is -.746, indicating a moderate negative skew, and the kurtosis is -.650, suggesting a distribution slightly flatter than the normal distribution with slightly light tails. Cost of compliance discourages compliance: Participants reported a mean score of 3.88 (SD = 1.059) for this item. The skewness is -.547, indicating a slight negative skew, and the kurtosis is -.781, suggesting a relatively flat distribution with slightly light tails. The aggregate mean for all items related to tax obligation cost is 3.90.

Table 4.9: Descriptive statistics tax obligation cost

	Mean	Std. Deviation	Skewness	Kurtosis
Too much time lost in tax calculations	3.61	1.116	-.159	-1.330
Cost of hiring professionals tax agents is expensive to the firm	3.95	1.093	-.649	-.785
The cost incurred when filing returns is generally high	4.06	1.077	-.810	-.542
The cost of keeping records is generally high.	4.01	1.087	-.746	-.650
Cost of compliance discourages compliance.	3.88	1.059	-.547	-.781
Aggregate Mean	3.90			

4.7.6 Descriptive statistics on Value Added Tax compliance

Table 4.10 indicates for statements I have registered for Value Added Tax, the mean response for this item is 3.93, with a standard deviation of 1.029. This suggests that respondents generally agree with this statement, although there is some variability in responses. The skewness of -0.654 indicates a slight negative skew, meaning that more respondents chose options above the mean, while the kurtosis of -0.455 implies a relatively flat distribution, indicating lighter tails than a normal distribution. I file Value Added Tax returns on time This item has a mean of 4.13 and a standard deviation of 1.029, indicating a general agreement among respondents, with less variability compared to the first item. The skewness of -0.953 indicates a more pronounced negative skew, showing that a majority of respondents tend to agree or strongly agree. The kurtosis of -0.050 suggests a distribution close to normal but slightly flatter. I pay the tax liability that arises from my VAT obligation without failure The mean here is 4.09 with a standard deviation of 1.015, reflecting a strong agreement among respondents with some variability. The skewness of -0.884 indicates a notable negative skew, showing a tendency towards higher agreement levels. The kurtosis of -0.095

signifies a distribution that is close to normal but slightly flat. I compute and pay my VAT correctly and in good time as stipulated by the law This statement has a mean of 4.08 and a standard deviation of 1.006. Respondents generally agree with this statement, with minimal variability. The skewness of -0.879 shows a significant negative skew, indicating higher agreement levels. The kurtosis of -0.052 suggests a distribution near normal, albeit a bit flat. I pay the correct amount of Value Added Tax The mean response is 4.09, with a standard deviation of 1.013, indicating general agreement among respondents. The skewness of -0.880 reflects a significant negative skew, pointing to a higher tendency towards agreement. The kurtosis of -0.093 denotes a distribution close to normal but slightly flat. The aggregate mean across all items is 4.06, which indicates a general agreement with the statements related to VAT compliance.

Table 4.10: Descriptive statistics Value Added Tax compliance

	Mean	**Std. Deviation**	**Skewness**	**Kurtosis**
I have registered for Value Added Tax	3.93	1.029	-.654	-.455
I file Value Added Tax returns on time	4.13	1.029	-.953	-.050
I pay the tax liability that arise from my VAT obligation without failure	4.09	1.015	-.884	-.095
I compute and pay my VAT correctly and in good time as stipulated by the law	4.08	1.006	-.879	-.052
I pay the correct amount of Value Added Tax	4.09	1.013	-.880	-.093
Aggregate Mean	4.06			

4.8 Factor analysis Validity test

The KMO test assesses the suitability of data for factor analysis by examining the coherence of the variables. The test score goes from 0 to 1, and if it's higher than 0.5,

it's good for factor analysis. The KMO test values should be higher than 0.6 for an okay analysis, higher than 0.7 for a good analysis, higher than 0. 8 for a very good analysis. - Bartlett's test is utilized when the p-value is under 0.05 Bartlett (1954). Table 4.11 indicates that KMO for VAT compliance is 0.876>0.7, and Bartlett's test p-value =0.000<0.05, the Tax Invoice Management system has KMO 0.779>0.7, and Bartlett's test p-value =0.000<0.05, also VAT automated assessment has KMO 0.817>0.7, and Bartlett's test p-value =0.000<0.05, For online filing procedure has KMO 0.728>0.7, and Bartlett's test p-value =0.000<0.05, Digital payments has KMO 0.838>0.7, and Bartlett's test p-value =0.000<0.05. Lastly tax obligation cost has KMO 0.864>0.7, and Bartlett's test p-value =0.000<0.05. The KMO and Bartlett's test results for each variable indicates that the factor analysis is a suitable methodology for dimension reduction.

Table 4.11: KMO& Bartlett's test

	Value Added Tax compliance	**Tax Invoice Management system**	**Value Added Tax automated assessment**	**online filing procedure**	**digital payments**	**tax obligation cost**
KMO	0.876	0.779	0.817	0.728	0.838	0.864
Bartlett's test for sphericity (sig)	0.000<0.05	0.000<0.05	0.000<0.05	0.000<0.05	0.000<0.05	0.000<0.05
Items	5	7	5	5	5	5

4.8.1 Dimension Reduction

Jha (2021) Methods of dimensionality reduction are valuable when analyzing data that is noisy and has numerous dimensions. They work by putting the data into a simpler space while keeping important features. Questionnaire data contains different item statements for which have different scales of correlations representing the variables.

The Reduction method factor analysis using principal components to determine the best factors to use for dimensions of the variable data. They indicate how much a variable contributes to a particular factor. Higher loadings suggest a stronger association between the variable and the factor. Here's a detailed elaboration of the factor loadings for each factor based on table 4.12:

Value Added Tax Compliance (VATC): VATC1: 0.889, VATC2: 0.984, VATC3: 0.987, VATC4: 0.982, VATC5: 0.985 All the VAT compliance indicators (VATC1 to VATC5) have high loadings, indicating that these variables strongly correlate with the VAT Compliance factor. This suggests that they all contribute significantly to the factor representing VAT compliance.

Tax Invoice Management System (TIMS): TIMS1: 0.834, TIMS2: 0.854, TIMS3: 0.911, TIMS4: 0.874, TIMS5: 0.849, TIMS6: 0.862, TIMS7: 0.847 The tax invoice management system variables (TIMS1 to TIMS7) have loadings ranging from 0.834 to 0.911, suggesting they all have a strong association with the TIMS factor. These high loadings imply that each variable substantially contributes to the underlying factor representing the efficiency and effectiveness of the tax invoice management system.

Value Added Tax Automated Assessment (VATAA): VATAA1: 0.806, VATAA2: 0.906, VATAA3: 0.807, VATAA4: 0.950, VATAA5: 0.937, The automated assessment indicators (VATAA1 to VATAA5) have high loadings (all above 0.8), which indicates they are highly correlated with the VATAA factor. This implies these variables significantly represent the automated assessment system's effectiveness. Online Filing Procedure (OFP): OFP1: 0.823, OFP2: 0.907, OFP3: 0.914, OFP4: 0.831 OFP5: 0.381, The online filing procedure variables (OFP1 to OFP4) have high loadings (above 0.8), indicating they are closely related to the online filing procedure factor.

OFP5 has a much lower loading (0.381), suggesting it is less correlated with this factor compared to the other variables. Digital Payments (DP): DP1: 0.946, DP2: 0.955, DP3: 0.964, DP4: 0.945, DP5: 0.919The digital payment variables (DP1 to DP5) exhibit very high loadings, all above 0.9. This indicates a very strong association with the digital payments factor, showing that these variables are crucial in defining the effectiveness and adoption of digital payment systems.

Tax suggesting a strong correlation with the tax obligation cost factor. TCC1, however, has a much lower loading (0.328), indicating it is not as strongly associated with this factor compared to the others. Overall, these factor loadings obligation cost (TCC): TCC1: 0.328, TCC2: 0.979, TCC3: 0.962, TCC4: 0.970, TCC5: 0.968, Most of the tax obligation cost indicators (TCC2 to TCC5) have very high loadings (above 0.96), suggesting a strong correlation with the tax obligation cost factor. TCC1, however, has a much lower loading (0.328), indicating it is not as strongly associated with this factor compared to the others. Overall, these factor loadings show which variables are most important in defining each factor, helping to understand the structure and relationships within the data.

Table 4.12: Principal Components Factor Analysis

	Value Added Tax compliance	Tax Invoice Management system	Value Added Tax automated assessment	online filing procedure	digital payments	tax obligation cost
I have registered for Value Added Tax	0.889					
I file Value Added Tax returns on time	0.984					
I pay the tax liability that arise from my VAT obligation without failure	0.987					
I compute and pay my VAT correctly and in good time as stipulated by the law	0.982					
I pay the correct amount of Value Added Tax	0.985					
Our business maintains accurate Tax Invoice Management system from an approved KRA Vendor.		0.834				
TIMS has helped us to Accurately pre-filled VAT returns		0.854				
The business issue an ITR invoice to all VAT transactions.		0.911				
Our business uses the ITR receipts to monitor and measure Sales.		0.874				
I know the usefulness and benefit of TIMs machines		0.849				
Our business enjoys input tax while trading with registered VAT suppliers.		0.862				
TIMS has enabled me to automatically access invoice transactions.		0.847				
Our business supplies goods to or render services to a VAT Agent			0.806			
A percentage of the income during a VAT transaction is deducted at source and remitted to KRA.			0.906			
We have been contacted by KRA to declare a sale due to information from the database			0.807			
Value Added Tax Automated Assessment has enhanced our relationship with KRA.			0.950			
The business enjoys VAT credits while filing VAT returns.			0.937			
Filing template is user friendly, cost effective and reliable				0.823		
Online filing enables users to upload the template and do tasks more quickly				0.907		
Amending VAT returns is faster				0.914		
Accounting reports necessary for VAT are compatible with my systems reports				0.831		
Online filing systems do not divulge users their personal information				0.381		
iTax has enabled me to see real-time transactions and digital payments details in taxpayer ‘s ledger account and act accordingly					0.946	
Digital Payment has enabled me to file and pay using KRA M-Service					0.955	
Electronic generation of invoices has reduced chances of evading payment of tax					0.964	
iTax has enabled KRA officers to raise additional assessment with regards to digital payments					0.945	
I find digital payments simple and easy to use					0.919	
Too much time lost in tax calculations						0.328
Cost of hiring professionals tax agents is expensive to the firm						0.979
The cost incurred when filing returns is generally high						0.962
The cost of keeping records is generally high.						0.970
Cost of compliance discourages compliance.						0.968

(Source: Research 2024)

4.9 Statistical Assumptions

The Statistical assumptions tests for normality, linearity, heteroscedasticity, and multicollinearity. Were used to determine the suitability of data for regression analysis.

4.9.1 Normality test

The Shapiro-wilk test for normality was conducted and shown on table 4.13 indicating that tax invoice management system has p-value of 0.221>0.05, Value Added Tax automated assessment has p-value of 0.331>0.05, online filing procedure has p-value 4of 0.551>0.05, digital payments has p-value of 0.351>0.05, tax obligation cost has p-value of 0.663>0.05, The SME age, and SME size have p-values of 0.122>0.05, and 0.663>0.05 respectively. The results indicate that the data is normally distributed as stated by Osborne & Waters (2014).

Table 4.13: Tests of Normality

	Kolmogorov-Smirnov[a]			**Shapiro-Wilk**		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Tax Invoice Management system	.194	265	.223	.840	265	.221
Value Added Tax automated assessment	.195	265	.445	.835	265	.331
online filing procedure	.195	265	.779	.828	265	.551
digital payments	.199	265	.662	.817	265	.351
tax obligation cost	.215	265	.633	.837	265	.663
SME age	.224	265	.331	.852	265	.122
SME size	.280	265	.211	.777	265	.663

a. Lilliefors Significance Correction

4.9.2 Linearity test

The linearity test was utilized to determine if there is a linear association between changes in one variable and another variable. If the p-value is greater than 0. 05 implies a linear connection between factors. If the p-value is less than 0.05 suggests that there is no linear connection. Table 4.14 demonstrates a linear relationship between the

independent and dependent variables. The p-value for deviation from linearity is 0.988, which is greater than 0.05.

Table 4.14: Linearity test

			Sum of Squares	df	Mean Square	F	Sig.
VATCompliance *	Between Groups	(Combined)	139.940	3	46.647	46.682	.000
		Linearity	139.916	1	139.916	140.023	.000
		Deviation from Linearity	.024	2	.012	.012	.988
	Within Groups		260.800	261	.999		
	Total		400.740	264			

4.9.3 Heteroscedasticity test

The heteroscedasticity test on table 4.15 showed F-statistic of 0.707, and p-value pf 0.6442>0.05 indicating that the assumption for homoscedasticity is not violated.

Table 4.15: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.707029	Prob. F(6,258)	0.6442
Obs*R-squared	4.286785	Prob. Chi-Square(6)	0.6379
Scaled explained SS	6.634312	Prob. Chi-Square(6)	0.3560

(Source: Research 2024)

4.9.4 Multicollinearity test

Multicollinearity tests determine if there is a strong relationship among the independent variables in a regression model. Using the VIF can help to uncover any issues stemming from an abundance of closely related variables in a regression analysis. It tells us if there is high level of relationships between independent variables in the data. (Neter et al., 1996). VIF<10, and tolerance >0.1 indicates low multicollinearity. Tax Invoice Management system has VIF and tolerance of 1.862 and 0.537 respectively, Value Added Tax automated assessment system has VIF and tolerance of 1.874 and 0.534

respective. Online filing procedure has VIF and tolerance of 1.653 and 0.605 respectively. Digital payments has VIF and tolerance of 1.244 and 0.804. Tax obligation cost has VIF and tolerance of 4.738 and 0.211 respectively.

Table 4.16: Multicollinearity test

	Tolerance (1/VIF)	VIF
Tax Invoice Management system	0.537	1.862
Value Added Tax automated assessment	0.534	1.874
online filing procedure	0.605	1.653
digital payments	0.804	1.244
tax obligation cost	0.211	4.738

(Source: Research 2024)

4.10 Correlation Analysis

The correlation matrix was used to determine the relationships between the all the variables within the regression model. Table 4.17 shows that Tax invoice management system has a positive and significant relationship with VAT compliance at 58.2% p-value =0.000<0.05. Further VAT automated assessment has a positive and significant relationship with VAT compliance at 59.1% p-value =0.000<0.05. Online filing procedure has a positive and significant relationship with VAT compliance at 55.1% p-value =0.000<0.05. Digital payment has a positive and significant relationship with VAT compliance at 40.6% p-value =0.000<0.05. The tax obligation cost has a negative and significant relationship with VAT compliance at -63.1% p-value =0.000<0.05.

Table 4.17: Correlation Matrix

	A	B	C	D	E	F
VAT Compliance	1					
TIMS	.582** .000	1				
VAT automated assessment	.591** .000	.599** .000	1			
online filing procedure	.551** .000	.513** .000	.505** .000	1		
digital payments	.406** .000	.233** .000	.330** .000	.182** .003	1	
tax obligation cost	-.631** .000	-.523** .000	-.526** .000	-.494** .000	-.375** .000	1

(Source: Research 2024)

4.11 Regression Analysis

The study sought to determine the direct effects of Tax Invoice Management system, Value Added Tax automated assessment, online filing procedure and digital payments on VAT compliance.

4.11.1 Model summary

The model summary on table 4.18 indicates that system automation has a strong positive and significant relationship with VAT compliance at 72.3%. The Coefficient of determination indicates that Tax Invoice Management system, Value Added Tax automated assessment, online filing procedure and digital payments causes a 52.2% variation in VAT compliance, the remaining 47.8% is caused by factors not analysed in the model.

Table 4.18: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.723	0.522	0.517	0.85903

a. Predictors: (Constant), digital_payments, online_filing_procedure, TIMS, VAT_auto mated_assessment,

4.11.2 ANOVA

The ANOVA table 4.19 shows that the effects of Tax Invoice Management system, Value Added Tax automated assessment, online filing procedure and digital payments causes a significant variation on VAT compliance since F-statistic of 47.096, and p-value =0.000<0.05.

Table 4.19: Analysis of Variance

	SS	df	MS	F	Sig.
Regression	209.478	6	34.913	47.096	0.000
Residual	191.262	258	0.741		
Total	400.740	264			

4.11.3 Standardized Coefficient Regression analysis effect of system automation on VAT compliance

The regression model indicates the standardized beta coefficient indicating the direct effect of the system automation variables on VAT compliance and the significance of the effects. The regression model equation is

$$Y = 0.127 + 0.199C_1 + 0.169C_2 + 0.267X_1 + 0.145X_2 + 0.253X_3 + 0.015X_4$$

Table 4.20 shows that Unit change in tax invoice management system causes a 0.267 increase in VAT compliance, A unit change in VAT automated assessment causes a 0.145 increase in VAT compliance. Further research indicates that a unit change in online filing procedure causes a 0.253 increase in Vat compliance. Further insights shows that an increase of 0.015 in VAT compliance is caused by a unit change in digital payments.

Table 4.20: Coefficient Regression Analysis

	Standardized Coefficients β	Std. Error	Unstandardized Coefficients β	t	Sig.
(Constant)	0.127	0.045		2.822	0.006
Tax Invoice Management System	0.267	0.031	0.270	8.613	0.000
VAT automated assessment	0.145	0.032	0.148	4.531	0.000
online filing procedure	0.253	0.037	0.256	6.838	0.000
digital payments	0.015	0.006	0.014	2.500	0.014

Dependent Variable: VAT Compliance

4.12 Hierarchical regression analysis

The Hierarchical regression model is used to investigate how tax obligation cost moderates the effects of Tax Invoice Management system, Value Added Tax automated assessment, online filing procedure and digital payments on VAT compliance.

Baron & Kenny (1986) argues that the first step entails doing a regression to determine the effects of the independent variables on the dependent variable, analysing the nature and the significance of the effects, if the effects satisfy the objectives of study.

The second steps involve determining the combined effects of the independent variables and the moderator variable on the dependent variable, the effect of the moderator is tested for significance and if p-value <0.05 then the moderator is sufficient for the hierarchical regression.

The process of doing a hierarchical model starts by first creating interaction terms which are created by multiplying the standardized scores for each of the independent variable and the moderator x1*M, x2*M x3*M x4*M.

After creating new variables, the regression models are added hierarchically by adding each interaction terms progressively until the last interaction term is added to the final model.

The final step involves checking whether the interaction terms have significant effects on the dependent variables, if p-value <0.05, then the moderator moderates the effect of the independent variable on the dependent variable. Figure 4.1 shows the hierarchical model process.

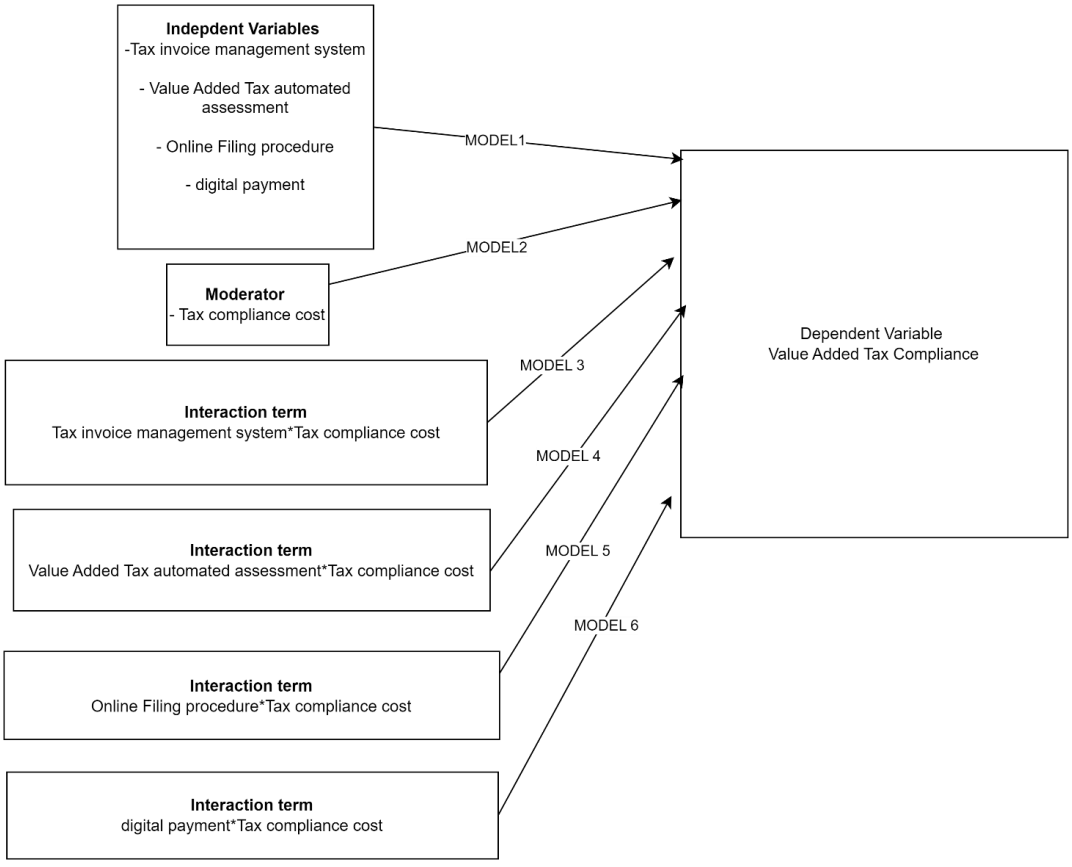

Figure 4.1: Hierarchical regression

Source: (Baron &Kenny 1986)

4.13 Hypotheses Testing

The hypotheses tested as summarized in table 4.24 were as follows;

The first hypothesis, $H0_1$, posited that the Tax Invoice Management System has no significant impact on VAT compliance among SMEs in Dagoretti South, Nairobi County, Kenya. The study revealed that the Tax Invoice Management System positively and significantly influences VAT compliance, with a p-value of 0.00001100, which is less than 0.05. Thus, the null hypothesis was rejected.

The second hypothesis, HO_2, suggested that automated VAT assessments have no significant effect on VAT compliance among SMEs in Dagoretti South, Nairobi County, Kenya. The findings indicated that automated VAT assessments positively and significantly affect VAT compliance, with a p-value of 0.00013500, which is less than 0.05. Consequently, the null hypothesis was rejected.

The third hypothesis, $H0_3$, stated that the online filing procedure has no significant impact on VAT compliance among SMEs in Dagoretti South, Nairobi County, Kenya. The study found that the online filing procedure positively and significantly influences VAT compliance, with a p-value of 0.0431, which is less than 0.05. Thus, the null hypothesis was rejected.

The fourth hypothesis, $H0_4$, proposed that digital payments have no significant effect on VAT compliance among SMEs in Dagoretti South, Nairobi County, Kenya. The results showed that digital payments positively and significantly impact VAT compliance, with a p-value of 0.0465111, which is less than 0.05. Therefore, the null hypothesis was rejected.

The fifth hypothesis, H_{05}, examined whether the tax obligation cost moderates the relationship between VAT compliance and several factors:

$H0_{5a}$: The study found that tax obligation costs significantly moderate the relationship between the Tax Invoice Management System and VAT compliance, with a p-value of 0.0398550, which is less than 0.05, leading to the rejection of the null hypothesis.

$H0_{5b}$: It was determined that tax obligation costs significantly moderate the relationship between automated VAT assessments and VAT compliance, with a p-value of 0.0000, which is less than 0.05, resulting in the rejection of the null hypothesis.

$H0_{5c}$: The findings indicated that tax obligation costs significantly moderate the relationship between the online filing procedure and VAT compliance, with a p-value of 0.00001133, which is less than 0.05, leading to the rejection of the null hypothesis.

$H0_{5d}$: Digital payments and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya. The study found that tax obligation costs significantly moderates the relationship between Online filing procedure and Value Added Tax compliance p-value =0.00633000<0.05 the null hypothesis is rejected.

Table 4.21: Hierarchical Regression Results

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
[Constant]	.127(.045)	.658(.106)	.507(.182)	.412(.194)	.449(.195)	.415(.201)
Tims	.267(.031) **	.246(.029) **	.274(.040) **	.231(.051) **	.259(.054) **	.249(.056) **
Vatas	.145(.032) **	.139(.030) **	.138(.030) **	.204(.056) **	.263(.070) **	.267(.070) **
Ofp	.253(.037) **	.232(.035) **	.229(.035) **	.225(.035) **	.136(.051) **	.133(.051) **
Dpay	.015(.006) **	.022(.010) **	.022(.010) **	.023(.011) **	.025(.012) **	.045(.021) **
Tobc		-.113(.018) **	-.061(.022) **	-.030(.010) **	-.045(.021) **	-.032(.010) **
Tims*Tobc			-.039(.012) **	-.015(.007) **	-.025(.012) **	-.010(.004) **
Vatas*Tobc				-.079(.017) **	-.157(.024) **	-.160(.024) **
Ofp*Tobc					-.124(.027) **	-.127(.027) **
Dpay*Tobc						-.034(.011) **
R^2	0.523	0.534	0.540	0.548	0.548	0.549
Δ in R^2	-	0.011	0.006	0.008	0.000	0.001
F statistic	47.096	42.133	37.599	34.296	30.745	28.007
F-Sig	0.000	0.000	0.000	0.000	0.000	0.000

Tims: Tax Invoive Management System, *Vatas:* VAT Automated Assessment, *Ofp:* Online Filing Procedure, *Dpay:* Digital Payments, *Tobc:* Tax Obligation Cost (standard error)

4.13.1 Model Summary with Moderator

The Model Summary on table 4.21 shows a progressive decrease in correlation between the predictor variables and the predicted variables in Model I there is a positive correlation at 72.3%, and at model 6 there is a positive correlation between the system automation the cost tax obligation cost and VAT compliance at 66.4%. The R square changes indicate a positive and significant change in variation indicating that there is significant moderating effect of tax obligation cost on the relationship between system automation and VAT compliance. The general model 6 indicates that after moderation through tax obligation cost the Tax Invoice Management system, Value Added Tax automated assessment, online filing procedure and digital payments causes a 54.9% variation in VAT compliance. The remaining 45.1% variation is caused by factors not captured in the model.

4.13.2 ANOVA with moderation

Table 4.22 Shows the Analysis of variance, model 1 shows a significant variation was caused on VAT by the predictor variable before moderating the effects. F statistic 47.096, p-value =0.000. The progressive F statistic indicates a decrease in variation since model 6 after moderation the F-statistic is 28.007, p-value =0.000<0.05 indicating that the model is statistically significant in explaining the variation caused on VAT compliance by introducing tax obligation cost as the moderator.

4.13.3 Coefficient regression analysis with moderation

The General model on table 4.23 indicates the overall hierarchical regression progressively showing the step-by-step addition of interaction terms, the regression equations are such that:

Model (i)

$Y = 0.127 + 0.199C_1 + 0.169C_2 + 0.267X_1 + 0.145X_2 + 0.253X_3 + 0.015X_4$

Model (ii):

$Y = 0.658 + 0.185C_1 + 0.138\ C_2 + 0.246X_1 + 0.139X_2 + 0.232X_3 + 0.022X_4 - 0.133M$

Model (iii):

$Y = 0.507 + 0.188C_1 + 0.148C_2 + 0.274X_1 + 0.138X_2 + 0.229X_3 + 0.022X_4 - 0.061M - 0.039X_1*M$

Model (iv):

$Y = 0.412 + 0.184C_1 + 0.156C_2 + 0.231X_1 + 0.204X_2 + 0.225X_3 + 0.023X_4 - 0.030M - 0.015X_1*M - 0.079X_2*M$

Model (v):

$Y = 0.449 + 0.179C_1 + 0.149C_2 + 0.259X_1 + 0.263X_2 + 0.136X_3 + 0.025X_4 - 0.045M - 0.025X_1*M - 0.157X_2*M - 0.124X_3*M$

Model (vi):

$Y = 0.415 + 0.179C_1 + 0.148C_2 + 0.249X_1 + 0.267X_2 + 0.133X_3 + 0.045X_4 - 0.032M - 0.010X_1*M - 0.160X_2*M - 0.127X_3*M - 0.034X_4*M$

The overall regression model 5 indicates that a unit change in tax invoice management system causes a significant increase in VAT compliance $\beta=0.249$, p-value $=0.000011<0.05$, A unit change in online VAT automated assessment causes a significant increase in VAT compliance $\beta=0.267$, p-value $=0.0001350<0.05$, A unit change in online filing procedure causes an increase in VAT compliance $\beta=0.133$, p-value $=0.0431<0.05$, A unit change in digital payments causes a significant increase in

VAT compliance β=0.045, p-value =0.0465111<0.05. A unit change in tax obligation cost causes a significant decrease in VAT compliance β= - 0.032, p-value =0.00012355<0.05. The study further found tax obligation cost moderates the relationship between tax invoice management system, VAT automated assessment, online filing, digital payments and VAT compliance β= - 0.010, p-value =0.0398550<0.05, β= - 0.160, p-value =0.0000<0.05, β= - 0.127, p-value =0.00001133<0.05, and β= - 0.034, p-value =0.00633<0.05 respectively. The negative betta coefficient indicate that the tax obligation costs reduces the positive effects of system automation on VAT compliance.

4.14 Mod graph Analysis

The Modi Graph is an illustration on how high and low levels of the moderator affects the effects of the independent variable on the Dependent variable at high and low levels of the independent variable Fisher (2020)

Figure 4.2 implies that that while an enhanced Tax Invoice Management System improves VAT compliance overall, the effect is more pronounced for taxpayers with lower tax obligation costs. In other words, the positive impact of a robust Tax Invoice Management System on VAT compliance is stronger when the tax obligation costs are lower, highlighting the moderating role of tax obligation cost in this relationship.

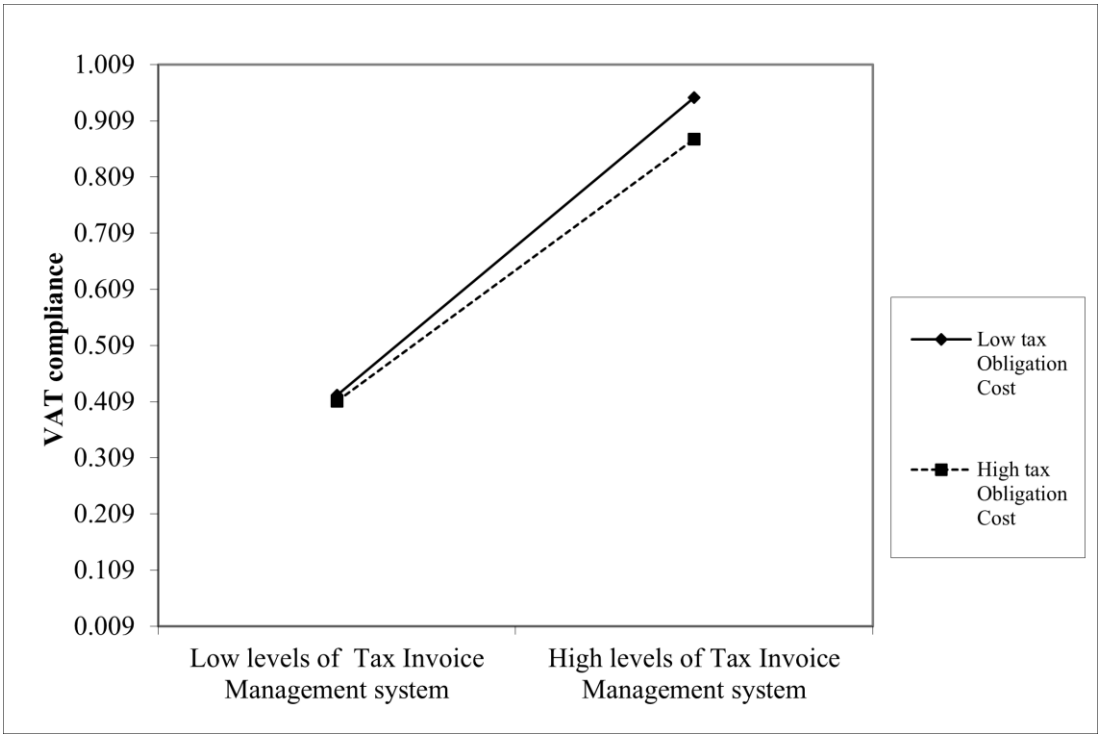

Figure 4.2: Interaction between TIMS and Tax obligation costs

(Source: Research 2024)

The moderating effect of tax Obligation Cost on relationship between Value Added Tax automated assessment and Value Added Tax compliance

Figure 4.3 indicates that an increase in VAT automated assessment is associated with higher VAT compliance, regardless of the tax obligation cost. However, the increase in compliance is more substantial for those with lower tax obligation costs compared to those with higher tax obligation costs. This suggests that while VAT automated assessment improves compliance across the board, its effectiveness is moderated by the cost of tax obligations, being more effective when these costs are lower.

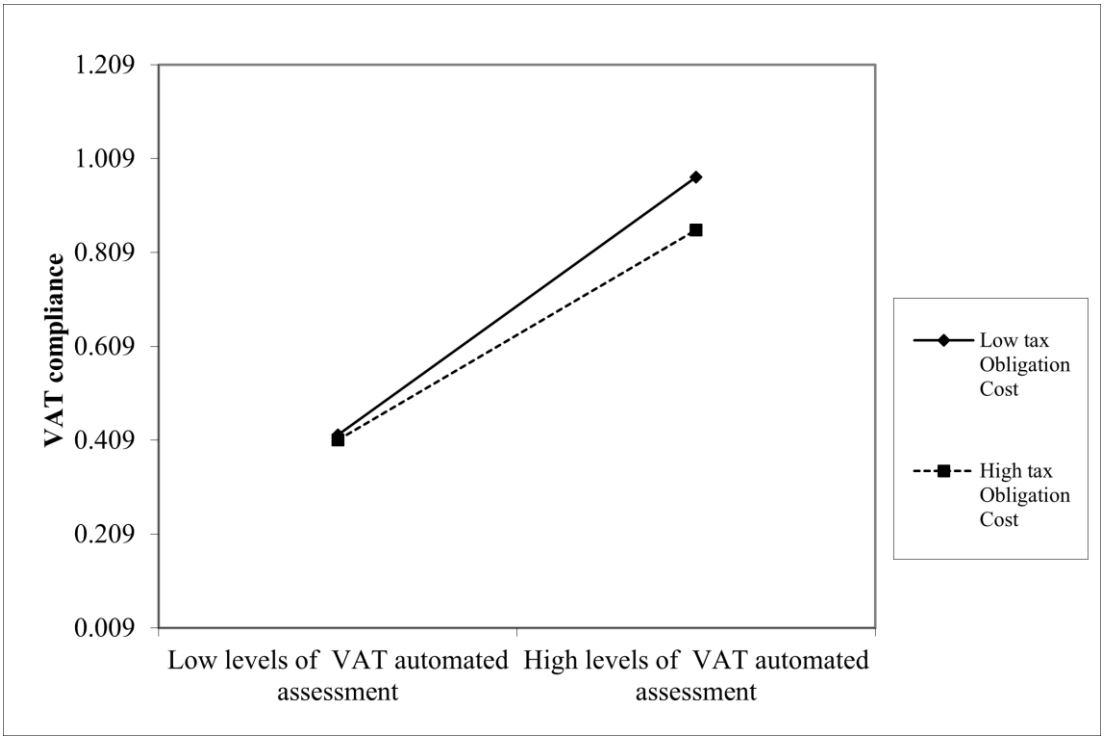

Figure 4.3: Interaction between VAT automated assessment and Tax obligation costs

(Source: Research 2024)

The moderating effect of tax Obligation Cost on relationship between Online filing procedure and Value Added Tax compliance

Figure 4.4 indicates that an increase in online filing procedure is associated with higher VAT compliance, regardless of the tax obligation cost. However, the increase in compliance is more substantial for those with lower tax obligation costs compared to those with higher tax obligation costs. This suggests that while online filing procedure improves compliance across the board, its effectiveness is moderated by the cost of tax obligations, being more effective when these costs are lower.

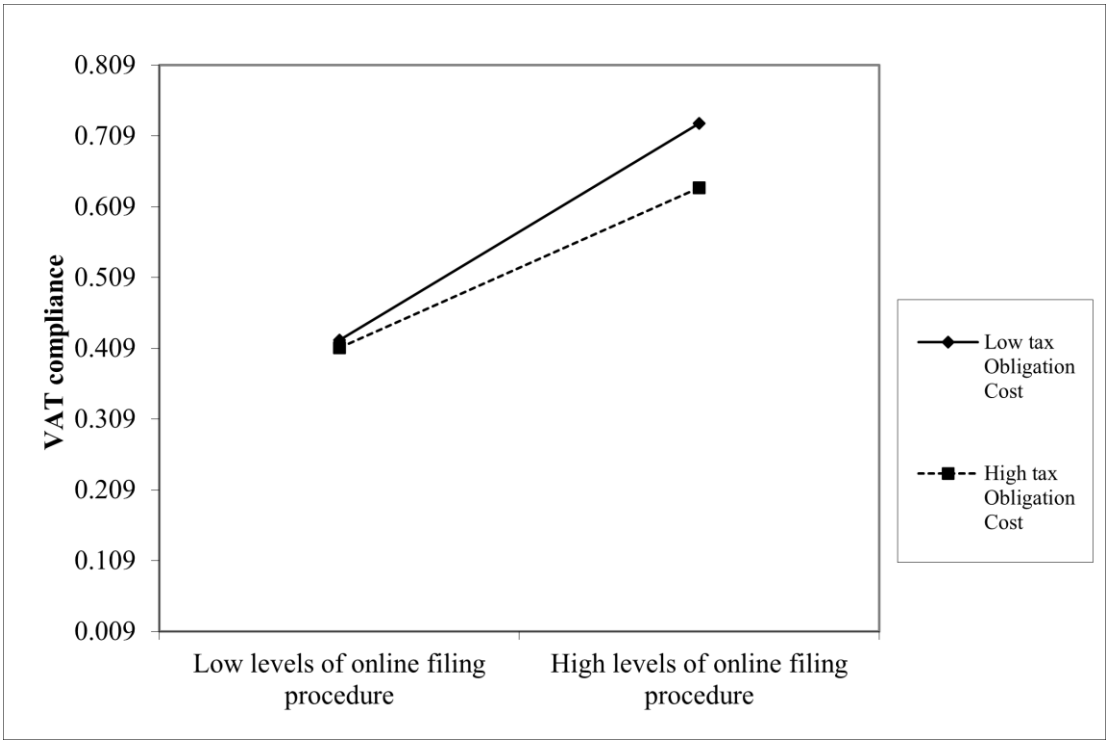

Figure 4.4: Interaction between online filing procedure and Tax obligation costs

(Source: Research 2024)

The moderating effect of tax Obligation Cost on relationship between Digital payments and Value Added Tax compliance

Figure 4.5 indicates that an increase in Digital payments is associated with higher VAT compliance, regardless of the tax obligation cost. However, the increase in compliance is more substantial for those with lower tax obligation costs compared to those with higher tax obligation costs. This suggests that while Digital payments improves compliance across the board, its effectiveness is moderated by the cost of tax obligations, being more effective when these costs are lower.

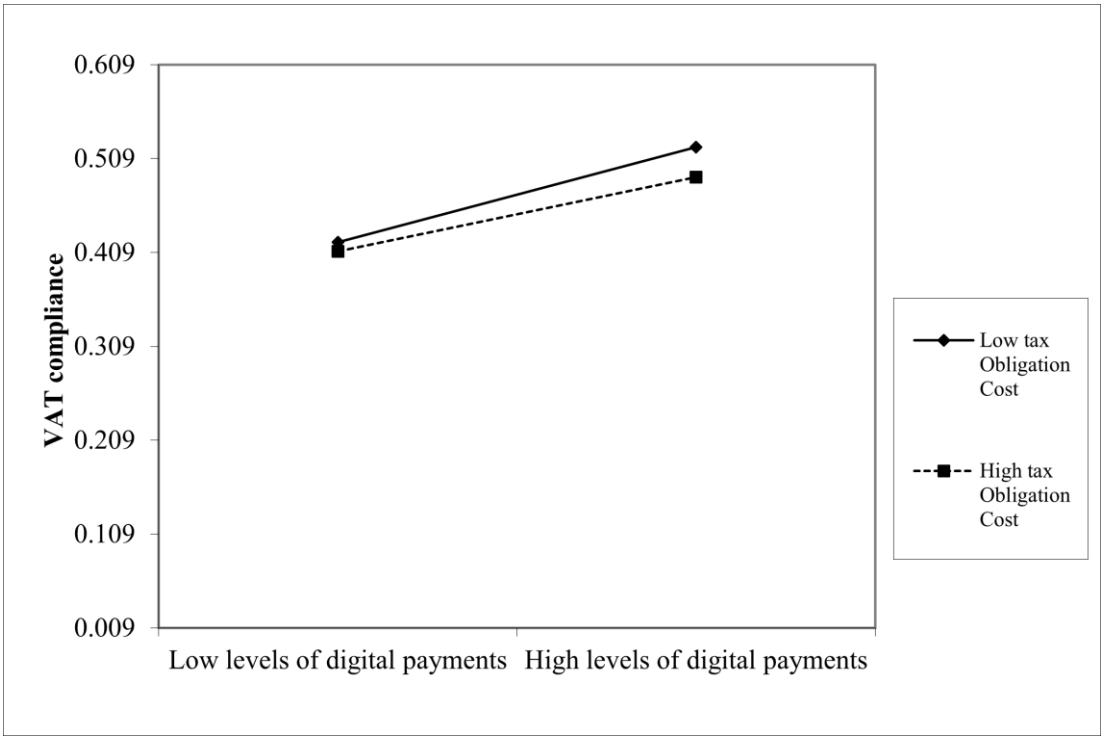

Figure 4.5: Interaction between Digital payments and Tax obligation costs

(Source: Research 2024)

4.15 Discussion of Findings

This portion elaborates on the results and their alignment with the objectives. It also evaluates the findings in relation to the results of other research findings.

4.15.1 Tax Invoice Management system and Value Added Tax compliance

The primary objective of this study was to assess how the Tax Invoice Management System influences VAT compliance among small and medium enterprises in Dagoretti South, Nairobi County, Kenya. The study through a correlation analysis found that Tax Invoice Management system has a positive and significant correlation with Value Added Tax compliance at 58.2% p-value =0.000<0.05. Further investigation indicated that Tax Invoice Management system causes a positive effect on VAT compliance β=0.249, p-value =0.000011<0.05. This underscores the reliability of the TIMS as a crucial determinant in enhancing VAT compliance. The analysis underscores the

importance of the Tax Invoice Management system in bolstering VAT compliance. This research aligns with Kabochi (2019), who suggested that to enhance VAT compliance through technology, the Kenya Revenue Authority (KRA) implemented the Tax Invoice Management System to control the issuance of invoices. This system connects trader systems, like electronic tax registers, point of sale systems, and ERP billing/invoicing systems, with the KRA's iTax platform, aiming to oversee the transmission of electronic tax invoices.

4.15.2 Value Added Tax automated assessment and Value Added Tax compliance

The second objective was to evaluate the impact of automated VAT assessments on VAT compliance among SMEs in Dagoretti South, Nairobi County, Kenya. The study through a correlation analysis found that VAT Tax automated assessment has a positive and significant correlation with Value Added Tax compliance at 59.1% p-value =0.000<0.05. Further investigation indicated that Tax automated assessment causes a positive effect on VAT compliance β=0.267, p-value =0.00013500<0.05. This result implies that the implementation of automated VAT assessment has a substantial positive impact on VAT compliance. Specifically, for every unit increase in the effectiveness or extent of automated VAT assessment, VAT compliance is improvs. This study agrees with Evnevich and Ivanova (2020), who explored the link between digital technologies and tax monitoring and evaluation in Russia. Their research utilized both primary and secondary data, finding that the automation of tax control systems significantly enhanced the efficiency of tax audits and reduced informal tax administration practices. This led to higher compliance and increased tax revenue.

4.15.3 Online filing procedure and Value Added Tax compliance

The third objective was to analyze how the online filing procedure affects VAT compliance among SMEs in Dagoretti South, Nairobi County, Kenya. The study

through a correlation analysis found that online filing procedure has a positive and significant correlation with Value Added Tax compliance at 55.1% p-value =0.000<0.05. Further investigation indicated that online filing procedure causes a positive effect on VAT compliance β=0.133, p-value =0.0431<0.05. The results suggest that improvements or implementations in the online filing procedure lead to a proportional increase in VAT compliance. This study supports the findings of Akram, Malik, and Shareef (2018), who investigated the impact of online tax filing on tax collection in Saudi Arabia. They examined how technology influenced online tax filing and its subsequent effect on tax collection. Their results showed that online tax filing procedures significantly improved tax collection efficiency in Saudi Arabian companies. Similarly, Fu et al. (2006) noted that electronic filing measures should aim to shorten tax processing time, improve efficiency, reduce errors, increase the multitasking capabilities of tax officers, and facilitate taxpayer compliance with tax regulations.

4.15.4 Digital payments and Value Added Tax compliance

The fourth specific objective was to find out the effect of digital payments on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya. The study through a correlation analysis found that digital payments have a positive and significant correlation with Value Added Tax compliance at 40.6% p-value =0.000<0.05. This suggests that as the usage of digital payments increases, VAT compliance also tends to increase. Further investigation indicated that digital payments causes a positive effect on VAT compliance β=0.045, p-value =0.00465111<0.05. Businesses can benefit from adopting digital payment methods not only for the convenience and efficiency they offer but also to ensure better compliance with VAT regulations. Additionally, the study aligns with research highlighting the

benefits of mobile technology in tax collection. For instance, Scharwatt (2020) reported that Mauritius experienced a 12% increase in collected tax revenues after adopting mobile phones for tax collection. Ndayisenga and Shukla (2019) studied electronic tax management systems in Rwanda and found that mobile payment systems significantly improved timely payments and reduced operational costs, offering convenience by allowing customers to pay from any location.

4.15.5 Tax obligation cost on System Automation and Value Added Tax compliance

The fifth specific objective was to determine the moderating effect of tax obligation cost on relationship between, Tax Invoice Management system, Value Added Tax automated assessment, Online filing procedure, Digital payments and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya. The study through a correlation analysis found that tax obligation cost has a negative and significant correlation with Value Added Tax compliance at -63.1% p-value =0.000<0.05. Further investigation indicated that tax obligation cost causes a negative effect on VAT compliance β= -0.032, p-value =0.00012355<0.05. Businesses should be aware that high compliance costs can negatively impact their VAT compliance. Thus, investing in efficient tax management systems or professional tax advisory services could be beneficial.

The study further found that tax obligation cost moderates the relationship between tax invoice management system, VAT automated assessment, online filing, digital payments and VAT compliance β= - 0.010, p-value =0.0398550<0.05, β= - 0.160, p-value =0.0000<0.05, β= - 0.127, p-value =0.00001133<0.05, and β= - 0.034, p-value =0.00633<0.05 respectively. The negative betta coefficient indicate that the tax obligation costs reduce the effects of system automation on VAT compliance. The

negative coefficients indicate that although the system automation positively impact VAT compliance high tax obligation costs reduces their effects on VAT compliance.

Finally, the study concurs with Sandford, Godwin, and Hardwick (2019), who discussed the burden of compliance costs. These costs include the labor and time required to meet tax compliance requirements, monetary expenses for acquiring knowledge about tax obligations, hiring professionals or tax experts, and additional costs for systems, software, and travel.

Table 4.22: Summary of Hypotheses Testing

Hypotheses	Sig	Verdict
H_{01} Tax Invoice Management system have no significant effect on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya	0.00001100<0.05	**Reject H_{01}**
H_{02} Value Added Tax automated assessment have no significant effect on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya	0.00013500<0.05	**Reject H_{02}**
H_{03} Online filing procedure has no significant effect on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya.	0.04310000<0.05	**Reject H_{03}**
H_{04} Digital payments has no significant effect on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya	0.04651110<0.05	**Reject H_{04}**
H_{05a} There is no significant moderating effect of compliance costs on relationship between Tax Invoice Management system and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya.	0.03985500<0.05	**Reject H_{05a}**
H_{05b} There is no significant moderating effect of compliance costs on relationship between Value Added Tax automated assessment and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya	0.00000000<0.05	**Reject H_{05b}**
H_{05c} There is no significant moderating effect of compliance costs on relationship between Online filing procedure and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya	0.00001133<0.05	**Reject H_{05c}**
H_{05d} There is no significant moderating effect of compliance costs on relationship between Digital payments and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya	0.00633000<0.05	**Reject H_{05d}**

(Source: Research 2024)

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section restates the key findings of the study, makes inferences based on the research objectives, and provides recommendations. In addition, it presents possibilities for future research.

5.2 Summary of Findings

5.2.1 Tax Invoice Management system and Value Added Tax compliance

The first specific objective was to determine the effect of Tax Invoice Management system on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya. The study through a correlation analysis found that Tax Invoice Management system has a positive and significant correlation with Value Added Tax compliance, at 58.2% p-value =0.000<0.05. Further investigation indicated that Tax Invoice Management system causes a positive effect on VAT compliance, β=0.249, p-value =0.000011<0.05. This underscores the reliability of the TIMS as a crucial determinant in enhancing VAT compliance. The analysis underscores the importance of the Tax Invoice Management system in bolstering VAT compliance.

5.2.2 Value Added Tax automated assessment and Value Added Tax compliance

The second specific objective was to establish the effect of Value Added Tax automated assessment on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya. The study through a correlation analysis found that VAT Tax automated assessment has a positive and significant correlation with Value Added Tax compliance at 59.1% p-value =0.000<0.05. Further investigation indicated that Tax automated assessment causes a positive effect on VAT compliance, β=0.267, p-value =0.00013500<0.05. This result implies that the implementation of

automated VAT assessment has a substantial positive impact on VAT compliance. Specifically, for every unit increase in the effectiveness or extent of automated VAT assessment, VAT compliance improves

5.2.3 Online filing procedure and Value Added Tax compliance

The third specific objective was to determine the effect of online filing procedure on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya. The study through a correlation analysis found that online filing procedure has a positive and significant correlation with Value Added Tax compliance at 55.1% p-value =0.000<0.05. Further investigation indicated that online filing procedure causes a positive effect on VAT compliance, β=0.133, p-value =0.0431<0.05. The results suggest that improvements or implementations in the online filing procedure lead to a proportional increase in VAT compliance.

5.2.4 Digital payments and Value Added Tax compliance

The fourth specific objective was to find out the effect of digital payments on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya. The study through a correlation analysis found that digital payments have a positive and significant correlation with Value Added Tax compliance at 40.6% p-value =0.000<0.05. This suggests that as the usage of digital payments increases, VAT compliance also tends to increase. Further investigation indicated that digital payments causes a positive effect on VAT compliance β=0.045, p-value =0.00465111<0.05. Businesses can benefit from adopting digital payment methods not only for the convenience and efficiency they offer but also to ensure better compliance with VAT regulations.

5.2.5 Tax obligation cost on System Automation and Value Added Tax compliance

The fifth specific objective was to determine the moderating effect of tax obligation cost on relationship between, Tax Invoice Management system, Value Added Tax automated assessment, Online filing procedure, Digital payments and Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya. The study through a correlation analysis found that tax obligation cost has a negative and significant correlation with Value Added Tax compliance at -63.1% p-value =0.000<0.05. Further investigation indicated that tax obligation cost causes a negative effect on VAT compliance β= -0.032, p-value =0.00012355<0.05. Businesses should be aware that high compliance costs can negatively impact their VAT compliance. Thus, investing in efficient tax management systems or professional tax advisory services could be beneficial.

The study further found that tax obligation cost moderates the relationship between tax invoice management system, VAT automated assessment, online filing, digital payments and VAT compliance. The negative betta coefficient indicate that the tax obligation cost reduces the effects of system automation on VAT compliance. The negative coefficients indicates that although the system automation positively impact VAT compliance high tax obligation cost reduces their effects on VAT compliance.

5.3 Conclusion

The study's main objective was as to determine moderating effect tax obligation cost on the relationship between system automation and value added tax compliance among small and medium enterprises in Dagoretti south Nairobi, Kenya.

The first specific objective was to determine the effect of Tax Invoice Management system on Value Added Tax compliance among small and medium enterprises

Dagoretti South Nairobi County, Kenya, the study found that there is a positive and significant correlation between Tax Invoice Management system with VAT compliance. Implying that improvement in the TIMS functionality improves VAT compliance.

The Second specific objective was to establish the effect of Value Added Tax automated assessment on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya. The study further found that there is a positive and significant relationship between Value Added Tax automated assessment and Value Added Tax compliance indicating that improvements in Value Added Tax automated assessment has a positive impact on Value Added Tax compliance.

The third specific objective was to determine the effect of online filing procedure on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya, the study found that online filing procedure positively impacts VAT compliance.

The fourth specific objective was to find out the effect of digital payments on Value Added Tax compliance among small and medium enterprises Dagoretti South Nairobi County, Kenya. The study found that improving digital payments improves VAT compliance.

The fifth specific objective of this study was to investigate how the cost of tax obligations moderates the relationships between the Tax Invoice Management System, automated VAT assessments, online filing procedures, digital payments, and VAT compliance among small and medium enterprises in Dagoretti South, Nairobi County, Kenya. The findings revealed that the cost of tax obligations significantly moderates

these relationships, indicating that the expenses associated with tax compliance influence how these systems and procedures affect VAT compliance. The negative coefficients indicate that high compliance costs act as a deterrent to the effects of system automation on VAT compliance.

5.4 Recommendations

5.4.1 Policy Implications for Government

The study underscored the need for the government to prioritize continuous investment and upgrading of customs automated systems such as the Integrated Customs Management System (ICMS), Electronic Cargo Tracking System (ECTS), and scanning systems. This investment was crucial for enhancing the efficiency of cross-border trade, reducing delays, and increasing transparency. Furthermore, policies should be developed to enhance the agility of tax agencies through training programs, streamlined procedures, and the adoption of flexible and adaptive management practices. Agile tax agencies are better equipped to respond to the dynamic trade environment and technological advancements. Additionally, establishing and enforcing a robust regulatory framework to support the implementation and operation of these automated systems is essential. This includes data protection laws, cybersecurity measures, and standardized operating procedures to ensure smooth functioning and reliability. Encouraging public-private partnerships is also vital, as collaboration between the government and private sector stakeholders ensures that the customs systems are user-friendly and meet the needs of all parties involved in cross-border trade.

5.4.2 Practical Implications for Management, KRA, or Taxpayers

For practical applications, it is crucial for the management and staff at the Kenya Revenue Authority (KRA) and other relevant agencies to undergo regular training to

keep up with advancements in the Integrated Customs Management System, Electronic Cargo Tracking System, and scanning technologies. Actively engaging with taxpayers and other stakeholders to gather feedback and improve the user experience of these systems is essential. This engagement can include setting up help desks, conducting surveys, and holding stakeholder forums. Establishing clear performance metrics to monitor the impact of these systems on cross-border trade efficiency is also important. This includes tracking key indicators such as processing times, error rates, and compliance levels.

5.4.3 Theoretical Implications

The findings of the study validate the theoretical arguments, particularly the Ability to Pay Theory, Unified Theory of Acceptance and Use of Technology, Innovation Diffusion Theory, and Transaction Cost Theory. The results confirm that the implementation of advanced customs systems and the agility of tax agencies significantly enhance the efficiency of cross-border trade. This study contributed to the existing body of knowledge by empirically demonstrating the moderating role of tax agency agility in the relationship between customs automated systems and trade efficiency. It highlights the importance of considering organizational agility in theoretical models related to trade and customs management. Moreover, the findings suggest the need for an interdisciplinary approach that combines insights from technology adoption theories, organizational agility frameworks, and trade efficiency models to develop a comprehensive understanding of customs management.

5.4.4 Recommendations for Future Research

To build on these findings, future research could explore the broader impacts of tax reforms on VAT compliance. This could involve examining how changes in tax policies

and regulations influence the compliance behavior of businesses and identifying any additional factors that may affect their ability to adhere to tax requirements, while exploring other methodologies on mediation and moderated-mediation.

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APPENDICES

Appendix I: Letter of Introduction

Dear Respondent,

RE: Request to Participate in a Study and Data Collection

I hope this letter finds you well.

My name is IRENE ATIENO CHIAJI, pursuing a Master's degree in tax administration offered by Kenya Revenue School of Revenue Administration (KESRA) in collaboration with Moi University. I am undertaking research on "**MODERATING EFFECT OF TAX OBLIGATION COST ON THE RELATIONSHIP BETWEEN SYSTEM AUTOMATION AND VALUE ADDED TAX COMPLIANCE AMONG SMALL AND MEDIUM ENTERPRISES IN DAGORETTI SOUTH NAIROBI, KENYA**" This letter is to request you to participate in the study by filling the questionnaire. I pledge to you that the information gathered is for academic use only and that I will uphold confidentiality during and after the study.

Kind Regards,

IRENE ATIENO CHIAJI

Appendix II: Questionnaire

This research is meant for academic purpose. Kindly provide answers to the following questions precisely and honestly as possible. The responses will be treated as confidential. Please tick (√) where appropriate or fill in the information required on the space provided.

SECTION A: BACKGROUND INFORMATION

1. **Gender**

Male ☐ Female ☐

2. Level of education

Primary ☐

Secondary ☐

Diploma ☐

Degree ☐

3. How long has the business been in operation?

Less than 3years ☐

4-6 Years ☐

7-10 Years ☐

More than 10 Years ☐

4. How many Employees are employed in your firm?

Less than 100 ☐

Between 100 and 200 ☐

Between 201 and 300 ☐

Between 301 and 400 ☐

More than 400 ☐

SECTION B: TAX INVOICE MANAGEMENT SYSTEM PROCESS

The table below has statements that relate to Tax Invoice Management system process. Indicate whether you – **5 - Strongly agree: 4 - Agree: 3 - Neutral: 2 - Disagree: 1- Strongly disagree**

Statements	**1**	**2**	**3**	**4**	**5**
Our business maintains accurate Tax Invoice Management system from an approved KRA Vendor.					
TIMS has helped us to Accurately pre-filled VAT returns					
The business issue an ITR invoice to all VAT transactions.					
Our business uses the ITR receipts to monitor and measure Sales.					
I know the usefulness and benefit of TIMs machines					
Our business enjoys input tax while trading with registered VAT suppliers.					
TIMS has enabled me to automatically access invoice transactions.					

VALUE ADDED TAX AUTOMATED ASSESSMENT

The table below has statements that relate to Value Added Tax automated assessment. Indicate whether you **5-Strongly agree: 4 - Agree: 3 - Neutral: 2 - Disagree: 1-Strongly disagree**

	1	**2**	**3**	**4**	**5**
Our business supplies goods to or render services to a VAT Agent					
A percentage of the income during a VAT transaction is deducted at source and remitted to KRA.					
We have been contacted by KRA to declare a sale due to information from the database					
Value Added Tax Automated Assessment has enhanced our relationship with KRA.					
The business enjoys VAT credits while filing VAT returns.					

ONLINE FILING PROCEDURE

The table below has statements that relate to online filing procedure. Indicate whether you

5-Strongly agree 4 - Agree 3 - Neutral 2 – Disagree 1-Strongly disagree

	1	**2**	**3**	**4**	**5**
Filing template is user friendly, cost effective and reliable					
Online filing enables users to upload the template and do tasks more quickly					
Amending VAT returns is faster					
Accounting reports necessary for VAT are compatible with my systems reports					
Online filing systems do not divulge users their personal information					

DIGITAL PAYMENTS

The table below has statements that relate to digital payments. Indicate whether you

5-Strongly agree 4 - Agree 3 - Neutral 2 – Disagree 1-Strongly disagree

	1	**2**	**3**	**4**	**5**
iTax has enabled me to see real-time transactions and digital payments details in taxpayer ‘s ledger account and act accordingly					
Digital Payment has enabled me to file and pay using KRA M-Service					
Electronic generation of invoices has reduced chances of evading payment of tax					
iTax has enabled KRA officers to raise additional assessment with regards to digital payments					
I find digital payments simple and easy to use					

VALUE ADDED TAX COMPLIANCE

The table below has statements that relate to Value Added Tax compliance. Indicate whether you **5-Strongly agree: 4 - Agree: 3 - Neutral: 2 - Disagree: 1-Strongly disagree**

Statements	1	2	3	4	5
I have registered for Value Added Tax					
I file Value Added Tax returns on time					
I pay the tax liability that arise from my VAT obligation without failure					
I compute and pay my VAT correctly and in good time as stipulated by the law					
I pay the correct amount of Value Added Tax					

TAX OBLIGATION COST

The table below has statements that relate to Value Added Tax compliance. Indicate whether you 5-**Strongly agree: 4 - Agree: 3 - Neutral: 2 - Disagree: 1-Strongly disagree**

Statements	1	2	3	4	5
Too much time lost in tax calculations					
Cost of hiring professionals tax agents is expensive to the firm					
The cost incurred when filing returns is generally high					
The cost of keeping records is generally high.					
Cost of compliance discourages compliance.					

Thanks for your response and cooperation

Appendix III: KESRA Letter

KENYA REVENUE AUTHORITY

ISO 9001:2015 CERTIFIED

PUBLIC

KENYA SCHOOL OF REVENUE ADMINISTRATION

REF: KESRA/NBI/036

18th June 2024

TO: WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: REQUEST FOR ASSISTANCE TO IRENE CHIAJI OF REGISTRATION NO.: KESRA105/0018/2022 UNDERTAKING MASTERS AT KESRA

This is to confirm that the above named is a student at Kenya School of Revenue Administration (KESRA) Nairobi Campus pursuing Masters in Tax and Customs Administration.

The named student is undertaking Research on TOPIC: **"System automation, tax obligation cost and value added tax compliance among small and medium enterprises in Dagoretti South sub county, Kenya."**

The purpose of this letter is to request for your kind facilitation in enabling the student progress in her research project by allowing access to any relevant information and/or conduct interviews, which are relevant to the project.

Your support to the student in this regard will be highly appreciated.

Thank you.

KENYA SCHOOL OF REVENUE ADMINISTRATION
DEAN OF STUDIES
ACADEMIC AFFAIRS
18 JUN 2024

Damacrine Masira
Manager Academic Research,
KESRA

Tulipe Ushuru, Tujitegemee!

Appendix IV: NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **622739**

Date of Issue: **04/July/2024**

RESEARCH LICENSE

This is to Certify that Ms.. Irene Atieno Chiaji of Kenya School of Revenue Administration, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: SYSTEM AUTOMATION, TAX OBLIGATION COST AND VALLUE ADDED TAX COMPLIANCE AMONG SMALL AND MEDIUM ENTERPRISES IN DAGORETTI SOUTH SUB COUNTY for the period ending : 04/July/2025.

License No: **NACOSTI/P/24/37309**

622739

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

Appendix V: Certificate of Publication

Certificate No: PUBSAJSSE123350IRE

South Asian Journal of Social Studies and Economics

THIS JOURNAL IS PEER REVIEWED AND REFERRED JOURNAL

Certificate of Publication

Manuscript Title: Tax System Automation and Value Added Tax Compliance; The Moderating Role of Obligation Cost

Authored by:

Irene Chiaji, Collins Kapkiyai, Daniel Kirui

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Appendix VI: Plagiarism Awareness Certificate

SR645

ISO 9001:2019 Certified Institution

THESIS WRITING COURSE

PLAGIARISM AWARENESS CERTIFICATE

This certificate is awarded to

IRENE ATIENO CHIAJI

KESRA/105/0018/2022

In recognition for passing the University's plagiarism

Awareness test for Thesis **entitled: SYSTEM AUTOMATION, TAX OBLIGATION COST AND VALUE ADDED TAX COMPLIANCE AMONG SMALL AND MEDIUM ENTERPRISES IN DAGORETTI SOUTH SUB COUNTY** similarity index of 9% and striving to maintain academic integrity.

Word count:24802

Awarded by

Prof. Anne Syomwene Kisilu
CERM-ESA Project Leader Date: 30/08//2024