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The Moderating Role of Regulatory Framework on the Relationship Between Digital Infrastructure and Tax Collection Efficiency

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Abstract

The study's primary objective was to ascertain how the regulatory environment, using the Kenya Revenue Authority as a case study, influences the relationship between digital infrastructure and tax collection. An explanatory research design was employed in this study. The target group consisted of 11,340 Kenya Revenue Authority employees who work in Nairobi County and are headquartered in Times Tower. The sample size was 161 employees of KRA who were selected using a stratified random sampling. The study collected primary data. The main data collection tools included a questionnaire. After the data is collected, it will be input into Excel first and cleaned and sorted. The data was then coded in Statistical Package for Social Sciences (SPSS) software, which will be used in analyzing the data. The data analysis methods for this study were descriptive correlation and regression analysis. Results showed that eTIMS had a positive and significant effect on tax collection at the Kenya Revenue Authority ($\beta = 0.334$, $p = 0.000$). In addition, digital reporting had a positive and significant effect on tax collection at the Kenya Revenue Authority ($\beta= 0.349$, $p=0.000$). This research emphasizes how crucial it is to spend money on digital infrastructure in order to make tax procedures easier to understand and more efficient, which would increase taxpayer compliance. By offering insightful information on how to enhance and improve the use of iTax, the current study's findings significantly advance the field of knowledge. The findings of the current study are particularly significant to the several stakeholders that are interested in promoting the complete adoption of the iTax system, including tax consultants, academics, and iTax policy makers. Through marketing and training, the Kenya Revenue Authority must devise plans to boost the number of taxpayers using the iTax system.

Keywords: *Online tax system, regulatory framework, digital infrastructure, and tax collection*

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1. Introduction

Governments finance public services and infrastructure through tax collection, which entails collecting money from individuals and corporations. Implementation of tax legislation to achieve the necessary compliance is crucial to government tax collection (Ndirangu, 2022).

Adopting digital infrastructure is one of the methods that has been used worldwide to improve tax revenue collection. Revenue is defined by KRA as any monetary amount received or imposed in accordance with the codified laws outlined in the First Schedule, including but not limited to taxes, duties, fees, levies, charges, penalties, fines, and penalties. Digital infrastructure adoption can potentially increase tax revenue collection by improving financial inclusion, streamlining payment systems, and enhancing transparency (Kamara, 2021).

One way to improve tax administration and thereby increase revenue collection is to implement digital infrastructure, according to an IMF Staff Discussion Note (IMF, 2023) that emphasizes this point. Research lends credence to the idea that digitizing government services, particularly tax administration, might boost efficiency through better taxpayer identification, easier detection of tax cheating, and increased revenue collection (Okunogbe & Tourek, 2024). Expanding dependable digital connectivity, increasing tax administrations' spending on information and communication technology, and making sure tax officials have enough training and experience can all boost revenue yields from digitalizing revenue administration, according to a recent study (Nose & Mengistu, 2023).

Huge opportunities remain for tax administrations to efficiently integrate with transparent, inclusive, and replicable Deep Packet Inspection (DPI) solutions. Direct public access (DPI) could be implemented by tax administration systems themselves, allowing for direct use of tax data for a range of reasons, including accessing loan services and other government services.

According to Musau (2023), a regulatory framework moderates the relationship between digital infrastructure adoption and tax collection by providing legal clarity and structure for the digital economy, which influences the effectiveness of digital tools in increasing tax revenue. Without appropriate regulation, widespread digitalization could lead to opportunities for tax evasion and complexity, as seen in cross-border digital transactions. Effective regulation, however, fosters compliance by defining digital business models, improving transparency, and enhancing e-government services. This allows for the mitigation of digital risks, the expansion of the tax base, and ultimately, increased tax collection (Oduol, 2023).

Globally, Kwon, Lee, and Park (2020) find a direct link between the introduction of digital infrastructure and the increase in tax revenues. This essential relationship highlights the potential role of digital infrastructure in effectively combating tax evasion by providing a mechanism for more efficient tax collection. China has heavily invested in digital infrastructure to modernize and enhance its tax collection system, leading to increased efficiency and compliance. This digital transformation has improved tax administration, particularly in supporting voluntary compliance and identifying risks. The digital economy has positively impacted tax revenue, especially VAT and CIT, but also introduced challenges related to cross-regional transactions and tax mismatches (Zhu, 2021).

Due to the diminished importance of physical presence and the lack of confidence around the proper accounting of company income, the rise of the digital economy in Asia poses difficulties for the design of worldwide tax systems. A lot of international tax regulations aren't relevant anymore because of how businesses operate in this economy. There are three main obstacles in the digital economy. To start, the continued applicability of rules based on physical presence (nexus rules) is being called into question by developments in technology and the growing number of ways in which companies can do business online (Avendano & Rosenkranz, 2020). Local tax authorities often lack the resources and knowledge necessary to update rules

regarding permanent establishment status. Second, the extensive use of data and the ability of companies to monetize this raises questions about whether data and the value they generate are appropriately captured for tax purposes. Third, advances in digital products and service delivery have made it more difficult to properly characterize income under newer business models (Hendriyetty, Evans, Kim, & Taghizadeh-Hesary, 2023).

Japan is just one of several countries where the digital economy is constantly changing. For transactions made by non-resident providers through their platforms, digital platforms in Japan are obligated to collect and pay 10% Consumption Tax. According to the new regulation, marketplaces are now considered suppliers and are therefore responsible for collecting and remitting the Japanese Consumption Tax from domestic consumers (B2C) rather than foreign service providers (Aso & Rademacher, 2022).

According to Akintoye (2024), Nigeria's tax-to-GDP ratio is rather low when compared to global standards, even though it is the biggest economy in Africa. Having said that, there has been an uptick in tax revenue as of late. The implementation of digital infrastructure has been significantly linked to this. Digital technology's incorporation into Nigeria's tax administration has enhanced tax revenue collection, especially in CIT and CGT, according to Adedoyin, Sanni, and Ittah (2025). Furthermore, regulatory framework adoption facilitated data sharing and digital transactions.

In order to streamline the online registration process and enable the connection of national ID numbers with tax identity numbers, the Uganda Revenue Authority connected its registration system with that of the National Identity and Registration Agency. This led to over 350,000 taxpayers, the majority of whom were not legal entities, registering with the revenue authorities in 2022. Furthermore, qualitative findings indicate that the service is highly satisfactory (Besigomwe, 2025). In a similar vein, the Ghana Revenue Authority worked with the National Identification Authority to easily send identity information to the revenue authority, allowing the revenue authority to use a digital infrastructure for tax registration. According to Asmah, Ampong, Bibi, and Ofori (2025), the total number of tax registrations in 2021 and 2022 increased by a factor of three because of this decision by the revenue authority.

To keep up with the ever-changing digital economy, the Kenyan government has implemented new taxes to make sure everyone pays their fair share. The failure of conventional tax systems to collect money from online purchases is the impetus for this change. The introduction of digital taxes in Kenya is driven by the need for revenue generation, fair taxation, and economic sovereignty (Mpofu & Moloi, 2022). For example, electronic documentation and reporting have replaced paper-based invoicing with the Electronic Tax Invoice Management System (ETIMS). In addition, to enhance efficacy in tax administration, the Kenya Revenue Authority (KRA) introduced the iTax system in 2014. iTax is a web-based platform specifically developed for managing Domestic Taxes in Kenya (Amara, 2022).

On the other hand, Kenya's digital infrastructures are badly governed. This is the case even though they could be utilized for evil purposes, including terrorist financing, unlawful gaming, tax avoidance, cybercrime, and online fraud. Consumers in Kenya face a number of financial risks due to the country's continuing reliance on digital infrastructures in the absence of a robust regulatory framework. Not having a legal framework to control virtual currencies also means that crimes like tax evasion, money laundering, unregulated gambling, and terrorism could go unpunished (Munyua, 2021).

The research took place at the KRA. In order to collect taxes and update the country's taxation structure, an Act of Parliament passed in 1995 established the Kenya Revenue Authority. KRA is responsible for assessing, collecting, and enforcing taxes. The Minister of Finance oversees KRA, a state parastatal. Approximately 95% of the government's revenue is currently collected by KRA. Because of a structural reorganization, KRA is now responsible for five different types of taxes: customs, excise, sales, income, and corporate. In order to achieve the revenue targets set by the national budget, KRA focuses on efficient means of collecting funds (Ndirangu, 2022). As the national tax administrator, the KRA is responsible for collecting all taxes and providing advice to the government on tax matters and any other matters that the Cabinet Secretary responsible for finance may order in accordance with the laws that are in writing (Githinji, 2021). Tax revenues in Kenya, however, have, for various reasons, frequently failed to meet the expected collection targets. The tax authority has been required to develop policies to enhance tax management and achieve the set goals (Njenga, 2019).

1.1 Problem Statement

Tax collecting has a long history of negative connotations. However, levies are crucial since without them, there would be no funds to construct public infrastructure that aids businesses and the general public to be more industrious (Aondo, 2019). Raising tax revenue is essential for countries to fund their development needs and foster economic growth. Tax policies can also address equity concerns and support sustainable growth (Gatuyu, 2020). Tadesse (2024) notes that digital infrastructure adoption can facilitate broader access to financial services, potentially bringing more individuals and businesses into the formal economy, thereby expanding the tax base.

Despite the adoption of digital infrastructure in Kenya, the tax revenue collection remains very low. In the financial year 2022/2023, KRA collected Ksh. 2.166 trillion in tax against a target of Kshs. 2.273 trillion, falling short of the target by Ksh 107 billion (KRA, 2023). In the first half of the 2024/25 financial year (ending December 2024), Kenya's Value Added Tax (VAT) collections saw a 4.3% decline, the first since the pandemic, falling to Sh304.1 billion from Sh317.8 billion in the same period of 2023. The tax collection challenges can be associated with the rise in digital infrastructures (Fakunmoju et al., 2022).

1.2 Research Objectives

i. To examine the effect of the Electronic Tax Invoice Management System (ETIMS) on tax collection at the Kenya Revenue Authority.
ii. To assess the effect of Digital Reporting for Tax Evasion on tax collection at the Kenya Revenue Authority.
iii. To determine the moderating role of the regulatory framework on the relationship between digital infrastructure and tax collection at the Kenya Revenue Authority.

2. Literature Review

2.1 Theoretical Review

2.1.1 Optimal Theory of Taxation

In 1927, Ramsey published an article titled "A Contribution to the Theory of Taxation" that laid the groundwork for the optimal taxation theory. From an economic perspective, the idea was pioneering in its emphasis on taxation and GDP growth. The main goal of optimum taxation theory is to create and execute a tax system that reduces inefficiencies and market

distortions. Market inequality is inevitable, according to the theory, but inefficient tax systems should be penalized to the maximum extent possible.

There are three guiding ideas that optimal tax theory uses to construct its framework. As a first guiding concept, a tax system should be established that incorporates several models to eradicate inefficiencies. This idea was significant since reducing inefficiencies associated with the excise duty system was one of the primary objectives of the EGMS system, which was put into place in 2013. Taxpayers will respond to their tax responsibility, according to the second principle, which is based on the model of taxation. The government should assess its tax policy regularly, according to the third principle (Piketty & Saez, 2012).

Thus, this idea can be used in this research. This is because it aims to determine the tax structure that would produce the intended revenue and income distribution with the least amount of inefficiency, that is, that will not impede market participants from engaging in Pareto optimum exchanges or business dealings that benefit both sides.

2.1.2 Technology Acceptance Model Theory

Davis created the technology acceptance model in 1989. In particular, the theory sheds light on the reasons behind users' acceptance or rejection of IT and provides a framework for predicting and bolstering adoption in the financial markets. Two main concepts, perceived utility and perceived facility, form the basis of the Technology Acceptance Model, which aims to explain why users adopt technology (Wright, 2017).

Davis's idea was based on earlier research, including Silva's (2015) idea of Reasoned Action. The idea has been updated over time to take into consideration fresh information in the field of technology. Together, Holden and Karsh (2010) have also been able to highlight the model's significance in elucidating the long-term issue of a particular technology's acceptability. One of the most popular models for analyzing user acceptance characteristics is the Technology Acceptance Model, or TAM (Davis et al., 1989).

The degree to which a person thinks that putting in place a particular technology will enhance his or her performance in the financial environment or other business-related services is known as technological use. The TAM model states that adoption decisions are influenced by users' attitudes and the underlying reasons they use technology. Regarding blockchain technology, user attitudes are influenced by their ideas about the technology, which are comprised of their perceptions of its usefulness and how easy it is to use (Fitriyani & Sfenrianto, 2016).

This research study incorporated the Technology Acceptance Model (TAM) to relate to the digital infrastructure. The Technology Acceptance Model (TAM) can be effectively applied to understand and predict how well digital infrastructure in the Kenya Revenue Authority (KRA) was adopted by its users, primarily taxpayers and internal staff. In order to find out what people think about these digital technologies and how easy they are to use, KRA can create plans to get more people to utilize them.

2.1.3 Institutional Theory

Scott (1995) put out the idea of institutional theory. According to institutional theory, in order for companies to obtain legitimacy and stay in business, they conform their structures and activities to match the prevailing social norms and expectations. It emphasizes how organizations strive for legitimacy by conforming to institutional pressures, including rules, norms, and expectations from their broader environment. These pressures can lead to

isomorphism, where organizations become increasingly similar over time as they adopt common practices.

According to Njoroge (2015), Scott (1995) distinguished between regulative, normative, and cognitive pillars as the primary institutional elements that govern and shape organizational behavior. Organizations are given clear instructions via regulation in the form of laws, regulations, incentives, and punishments, whereas norms direct conduct via a less formal system of values and principles. The cognition pillar includes cultural elements that govern choice, often without receiving conscious thought. Because it emphasizes how institutions interact to limit and enable organizational behavior in reaction to external constraints, institutional theory can contribute to strategy implementation (Kinuu, 2014).

One argument against institutional theory is that different organizations in the same setting react differently to social pressure. In practice, though, some organizations appear to be able to withstand institutional pressures, perhaps because of the impact of institutional entrepreneurs (Kessler, 2013). Entrepreneurs at the institutional level are special because of their capacity to see through the persuasive power of popular opinion and stand firm against it. As a matter of strategy, some establishments can withstand transformation. According to Scott (2004), companies can respond to institutional demands in various ways, such as conforming or even changing them. This is because institutional theory sees organizations as active participants, not passive observers.

Consequently, the moderating variable is based on institutional theory. How both official and informal institutions influence the creation and execution of regulatory frameworks can be better understood with the help of this theory. It examines the influence of rules, norms, and cultural contexts on regulatory processes and outcomes, highlighting how these factors can both enable and constrain effective regulation.

2.2 Empirical Review

This study by Masunga, Mapesa, and Nyalle (2020) examined the impact of Tanzania's electronic tax system on the country's large taxpayers' ability to pay their fair share of taxes. The research relied on secondary data collected from two time periods: the first, from 2006 to 2011 (before the e-tax system), and the second, from 2012 to 2017 (after the system was in place). After the fact, researchers used a paired sample test to compare pre- and post-e-tax system means to determine if the difference is zero or statistically significant. The findings demonstrate that there is a positive and statistically significant relationship between the use of the e-tax system and the generation of tax income. Additionally, tax revenue is positively affected by an increase in the number of registered large taxpayers.

Researchers Onuselogu and Onuora (2021) looked at how online tax payments affected Nigeria's revenue collection. To improve tax collection in Nigeria, this study considers the potential of adopting and implementing an electronic system. The focus of this study is therefore to assess whether the introduction of the electronic tax system in Nigeria will produce high tax collection when it is compared with the manual system. Because it required comparing data from before and after computerized tax collections to identify any significant change, the paired t-test data analysis technique was employed. The actual secondary data gathered showed a decrease in tax collection within the study period, which is in line with expectations caused by the emergence of electronic tax systems. There is a notable disparity between pre- and post-

e-tax non-oil tax receipts. However, when looking at the oil tax, it is clear that there was a difference, albeit it is not statistically significant.

The study by Koech and Muna (2025) examined the Kenya Revenue Authority's (KRA) experience with electronic tax invoice administration and revenue collection. In order to determine the relationship between the variables, it used a descriptive research strategy was used. Staff capacity and user adoption were highlighted by the findings. The study found that staff capacity was also important, but that it was hindered by problems including understaffing, a lack of specialized technical assistance, and old infrastructure. Research showed that although eTIMS did a better job of collecting taxes, other variables, such as an intuitive interface, knowledgeable employees, and ongoing participation from taxpayers, were crucial to the program's success.

Socoliuc (2024) conducted a fundamental analysis of the role that digital technologies play in the battle against tax evasion. Within this framework, our research aims to comprehend the influence of digital technologies on the battle against tax evasion by conducting a thorough literature review on the subject and an examination of the laws pertaining to tax evasion. It was shown in the qualitative analysis that tax administrations can improve their ability to collect taxes and promote long-term economic growth by implementing new technology that helps identify and stop tax evasion attempts.

The digitalization of tax administration and compliance was the subject of Hesami, Jenkins, and Jenkins's (2024) systematic literature review, which centered on E-Invoicing and prefilled returns. Findings from the extensive literature review highlight the critical role of these technologies in cutting down on administrative expenses and tax compliance. Less financial burden on firms, especially during development, and better tax administration are two benefits highlighted by the results. The study's focus on how e-invoicing and prefilling systems improve tax tracking has led to more effective global tax practices.

Opiyo (2022) investigated what factors influence Kenyan e-commerce businesses' adherence to digital service tax regulations. This research used a cross-sectional design. Multiple linear regression and correlation were examples of inferential statistics used in the study, in addition to descriptive statistics. The results of this study show that most online retailers are aware of the digital services tax, and that tax awareness enhances compliance to a moderate degree. According to the report, most online retailers have already registered their firms for the digital services tax and, to a moderate degree, they comply with the tax. When it came to digital tax compliance, there was a positive association between tax awareness and enforcement actions. The results showed that income, attitude, and perception of taxes were not significantly related to digital tax compliance. Among the most important factors identified as indicators of digital tax compliance are tax rates, perspectives and attitudes, income levels, enforcement methods, and tax expertise.

Investigating how digital infrastructure affects local tax enforcement was the primary emphasis of Ain, Yousaf, and Sergi's (2025) study on navigating the digital environment. The study found that local government tax enforcement (the amount of taxes collected from households and businesses by the government) was affected by the exogenous shock of regional disparities caused by the phased implementation of the 'China Broadband Strategy' (CBS) from 2014 to 2016. Using a staggered Difference-in-Differences (DID) and panel data covering 281 prefecture-level cities in China from 2004 to 2020, our empirical study shows that local

government tax enforcement was much better in cities where the CBS intervention was implemented. Through improvements in enforcement methods and cost reduction mechanisms, the study posited that digital infrastructure might directly enhance the ability of local governments to enforce taxes.

The research team of Al Nabhani, Al Masoudi, and Abdel-Gadir (2025) examined the domestic and international legal frameworks for regulating digital infrastructure. This study delves into the worldwide web of regulations, illuminating methods used by various governing bodies in places like the EU, the US, and the GCC. Financial instability, consumer hazards, and regulatory ambiguity are some of the obstacles highlighted, along with the technological, social, and economic motivations that call for complete regulation of digital currencies. To evaluate new laws and their effects on digital currency transactions, this study combines descriptive and analytical methods. The results show that many developed economies are jumping on the bandwagon of digital infrastructure with strong regulatory measures, but GCC nations, like Oman, are taking a more measured and diversified approach, which reflects the sociological and regional complexity of the region.

3. Methodology

An explanatory research design was employed in this study. The target population is all the Kenya Revenue Authority Staff based in Nairobi County at the Headquarters in Times Tower, Nairobi County is 11,340. The sampling frame comprised 11,340 employees of KRA, including senior managers, middle-level managers, and staff. The study only focused on the administrative and permanent staff. The sample size was 161 employees of KRA who were selected using a stratified random sampling. To get this data, we used a drop-and-pick technique. Primary data was gathered for the study. The questionnaire was administered to the employees of the KRA. After the data was collected, it was input into Excel first and cleaned and sorted. The data was then coded in the Statistical Package for Social Sciences (SPSS) software, which was used to analyze the data. The data analysis methods for this study were descriptive and inferential statistics. The descriptive statistics that were analyzed included mean, standard deviation, kurtosis, mode, and skewedness. Inferential statistics comprises both correlations and regression. To determine how strongly related the independent factors were to the dependent variable, researchers employed a correlation analysis. The association between the dependent and independent variables was further investigated using multiple regression analysis. At the 5% threshold of significance, the link was examined.

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4. Results and Discussion

4.1 Descriptive Results

4.1.1 Electronic Tax Invoice Management System (ETIMS) and Revenue Collection

Descriptive results were therefore determined. Descriptive analysis results for the Electronic Tax Invoice Management System (ETIMS) are indicated in Table 1.

Table 1: Descriptive Analysis for Electronic Tax Invoice Management System (ETIMS)

statement	strongly disagree	disagree	neutral	agree	strongly agree	Mean	std.dev
The rates of enrollment for users have risen, with a growing number of taxpayers currently onboarded onto the system.	24.40%	16.80%	12.20%	25.20%	21.40%	3.02	1.51
Business enjoys input tax while trading with registered VAT suppliers.	3.10%	22.10%	5.30%	45.80%	23.70%	3.65	1.16
Most organization uses ETIMs (Electronic Tax Invoice Management System) for electronic invoicing.	6.10%	3.10%	18.30%	53.40%	19.10%	3.76	1.00
The Electronic Tax Invoice Management System is easy to use	2.30%	10.70%	21.40%	54.20%	11.50%	3.62	0.91
There is a reduction in invoicing errors since switching to ETIMs	1.50%	19.80%	11.50%	46.60%	20.60%	3.65	1.07
Electronic invoicing has improved the speed of processing payments	4.60%	3.80%	4.60%	35.90%	51.10%	4.25	1.03

With a mean score of 3.02 and a standard deviation of 1.51, the results demonstrated that more taxpayers are currently enrolled in the system, and that 46.6% of respondents agreed with this statement. With a mean score of 3.65 and a standard deviation of 1.16, the assertion that businesses enjoy input tax while trading with registered VAT suppliers was also supported by the majority of respondents (69.5%). As a bonus, the results demonstrated that 72.5% of the participants agreed with the assertion that the majority of organizations use ETIMs (Electronic Tax Invoice Management System) for electronic invoicing. The mean score was 3.76, and the standard deviation was 1.00.

Furthermore, the results indicated that 65.7% of respondents agreed with the statement that the Electronic Tax Invoice Management System is easy to use, with a mean score of 3.62 and a standard deviation of 0.91. Additionally, the findings showed that 67.2% of participants agreed (mean=3.65, standard deviation=1.07) that fewer billing errors have been made as a result of the use of ETIMs. According to the findings, the majority of respondents (87.0%) agreed that electronic invoicing has sped up the processing of payments, with a mean score of 4.25 and a standard deviation of 1.03.

The survey went on to ask respondents to elaborate on the other ways in which etims has affected tax collecting. By using automated monitoring and enforcement approaches, ETIMS increases compliance, eliminates errors, and reduces tax leakages. A notable improvement in the efficiency of tax collection may result from this.

4.1.2 Digital Reporting for Tax Evasion and Revenue Collection

Descriptive analysis results for digital reporting for tax evasion are presented in Table 2.

Table 2: Descriptive Analysis for Digital Reporting for Tax Evasion

Statement	Strongly disagree	Disagree	Not sure	Agree	Strongly agree	Mean	Std.dev
Any type of tax information can be accessed by businesses at any time from the convenience of their offices.	6.90%	11.50%	1.50%	20.60%	59.50%	4.15	1.30
When needed, tax clearance certificates can be retrieved at any time from the KRA webpage.	4.60%	9.90%	4.60%	41.20%	39.70%	4.02	1.12
Businesses are now able to function more effectively thanks to data analytics and proper risk assessment.	15.30%	3.10%	13.70%	38.90%	29.00%	3.63	1.34
Digitization has protected the company from dangers related to tax compliance.	13.70%	3.80%	11.50%	46.60%	24.40%	3.64	1.28
The organization can now spot questionable transactions thanks to digitization, which increases accountability when filing taxes.	10.70%	4.60%	10.70%	44.30%	29.80%	3.78	1.23
Online taxation has reduced filing costs considerably	8.40%	3.80%	14.50%	45.80%	27.50%	3.80	1.14

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The results showed that 80.1% of respondents agreed with the assertion that corporations may receive any type of tax information from the comfort of their workplace at any given moment, with a mean score of 4.15 and a standard deviation of 1.30. Additionally, the results showed that the majority of respondents (80.9% of the total) could download the statement from the KRA portal whenever they needed to, with a mean score of 4.02 and a standard deviation of 1.12. The findings also showed that 67.9% of respondents agreed with the claim that data analytics has enabled firms to operate more effectively through appropriate risk assessment, with a mean score of 3.63 and a standard deviation of 1.34.

Additionally, the results showed that the majority of respondents, or 71.0%, agreed with the statement that digitalization had shielded the business from risks related to tax compliance, with a mean score of 3.64 and a standard deviation of 1.28. Additionally, the majority of respondents (74.1%) agreed with the statement that digitization has improved responsibility in decision-making by enabling the organization to identify unlawful activities, with a mean score of 3.78 and a standard deviation of 1.23. Additionally, the results showed that the majority of respondents, or 73.3%, agreed with the statement that online taxes have significantly reduced filing expenses, with a mean score of 3.80 and a standard deviation of 1.12. We also wanted to find out how respondents thought digital reporting affected efforts to collect taxes and prevent tax evasion. As a result of digital reporting for tax evasion, tax fraud is reduced through improved information collection, control mechanisms, and efficiency, but new chances for tax evasion are also created.

4.1.3 Regulatory Framework and Tax Collection

Descriptive analysis results for the Regulatory framework for tax evasion are presented in Table 3.

Table 3: Descriptive Analysis for Regulatory Framework

statement	strongly disagree	disagree	neutral	agree	strongly agree	Mean	std.dev
Mandatory registration of digital service providers is a good measure in enforcing revenue collection in the sector	9.20%	3.80%	8.40%	52.70%	26.00%	3.82	1.14
The licensing requirements of digital infrastructure have been put into place	3.80%	12.20%	17.60%	36.60%	29.80%	3.76	1.12
There is awareness of the digital infrastructure regulations	8.40%	10.70%	13.70%	34.40%	32.80%	3.73	1.26
There is a clear and simple system for digital infrastructure	6.10%	3.80%	4.60%	29.80%	55.70%	4.25	1.12
Regulations changes in the enforcement of digital infrastructure are communicated in good time	5.30%	5.30%	1.50%	25.20%	62.60%	4.34	1.11

The results showed that 78.7% of respondents agreed with the statement that requiring digital service providers to register is an effective strategy to ensure revenue collection in the business, with a mean score of 3.82 and a standard deviation of 1.14. In addition, the results demonstrated that 66.4% of respondents (mean=3.76, standard deviation=1.12) agreed with the assertion that digital infrastructure licensing requirements are now in place. Furthermore, with a mean score of 3.73 and a standard deviation of 1.26, the results demonstrated that 67.2% of the respondents agreed with the statement that there was an understanding of the digital infrastructure requirements.

The findings also showed that 85.5% of respondents (mean=4.25, standard deviation=1.12) agreed with the assertion that the digital infrastructure system is obvious and easy. Additional results demonstrated that 87.8% of respondents (mean=4.34, standard deviation=1.11) agreed with the assertion that changes to legislation governing the enforcement of digital infrastructure are disclosed promptly.

The participants were further asked to show whether the government of Kenya has done enough to support digital infrastructure and what needs to be done to make it available to the masses. While the Kenyan government has made significant strides in developing digital infrastructure, particularly in mobile and internet penetration, there's room for improvement. Kenya is a leader in digital infrastructure in Africa, with a growing digital economy, but challenges remain in ensuring widespread access, digital literacy, and addressing cybersecurity concerns.

4.1.4 Tax Collection

Tax collection was the dependent variable of the study. Descriptive analysis results for Tax collection for tax evasion are presented in Table 4.

Table 4: Descriptive Analysis for Tax Collection

statement	strongly disagree	disagree	Not sure	agree	strongly agree	Mean	std.dev
The amount of taxes collected has been on the rise	6.10%	21.40%	7.60%	37.40%	27.50%	3.59	1.26
The time spent on revenue collections is within the set duration	15.30%	12.20%	10.70%	34.40%	27.50%	3.47	1.40
The cost of collecting the tax is always within the budget	3.80%	14.50%	25.20%	45.00%	11.50%	3.46	1.00
Efficient systems are raising high revenues	13.00%	7.60%	1.50%	67.20%	10.70%	3.55	1.18

The average number of responses was 3.59 with a standard deviation of 1.26, indicating that most respondents (64.9%) agreed with the assertion that tax collections had been increasing. With a mean of 3.47 and a standard deviation of 1.40, the results also showed that 61.9% of the participants agreed with the claim that the time spent on revenue was accurate. Furthermore, the results showed that 56.5% of the respondents agreed with the statement that the cost of collecting taxes is always within the budget, with a mean score of 3.46 and a standard deviation of 1.00. Additionally, the results showed that 77.9% of respondents agreed (mean=3.55, standard deviation=1.18) that there are methods that work well for making a lot of money.

4.2 Inferential Statistics

This section presents both the correlation and regression analysis results.

4.2.1 Correlation Analysis

Correlation analysis was conducted to determine the association between the independent variable (digital infrastructure) and the dependent variable (tax collection). Results are presented in Table 5.

Table 5: Correlation Results

		Tax collection
Tax collection		
Etims	r	.712**
	p	0.000
Digital reporting	r	.757**
	p	0.000

Furthermore, it was demonstrated that Etims and tax collection at the Kenya Revenue Authority were positively and significantly correlated (r=0.712, p=0.000). This suggests that the Kenya Revenue Authority's tax collection was significantly positively correlated with Etims. Last but not least, the Kenya Revenue Authority's tax collection and digital reporting were positively and significantly correlated (r=0.757, p=0.000). This implies that digital reporting for tax evasion had a strong positive correlation with tax collection at the Kenya Revenue Authority.

4.2.2 Multiple Regression Model before Moderation

The study performed multiple regression models to estimate the relationships between the study variables. Regression of coefficient results is presented in Table 6.

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Table 6: Regression of Coefficient

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-0.394	0.211		-1.865	0.064
Etims	0.418	0.068	0.334	6.141	0.000
Digital reporting	0.294	0.051	0.349	5.752	0.000

Results revealed that eTIMS had a positive and significant effect on tax collection at the Kenya Revenue Authority (β= 0.334, p=0.000). This implies that an improvement in eTIMS by one unit would lead to an improvement in tax collection at the Kenya Revenue Authority by 0.334. Lastly, digital reporting for tax evasion had a positive and significant effect on tax collection at the Kenya Revenue Authority (β= 0.349, p=0.000). This implies that an improvement in digital reporting for tax evasion by one unit would lead to an improvement in tax collection at the Kenya Revenue Authority by 0.349.

4.2.3 Hierarchical Regression Models

The following Hierarchical Regression models were used in assessing the to determine the moderating role of regulatory framework on the relationship between Electronic Tax Invoice Management System (ETIMS) and tax collection at KRA, and to determine the moderating role of regulatory framework on the relationship between Digital Reporting for Tax Evasion and tax collection at KRA.

Table 7: Coefficients of Regression for the Moderating Effect of the tax regulatory framework

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-0.394	0.211		-1.865	0.064
X1.M	0.122	0.033	0.73	3.707	0.000
X2.M	0.038	0.017	0.292	2.175	0.032

The findings also revealed that the regulatory framework (X1*M) and electronic tax invoice management system (etims) had an interaction term of 0.73 and a p-value of 0.000. This indicates that the regulatory framework had a statistically significant moderating influence on the association between the Kenya Revenue Authority's tax collection and the electronic tax invoice management system (ETIMS).

The results also showed that the interaction term between digital reporting for tax evasion and regulatory framework (X2*M) was 0.292, and the p-value was 0.000. This means that there was a statistically significant moderating effect of the regulatory framework on the relationship between digital reporting for tax evasion and tax collection at the Kenya Revenue Authority.

5. Conclusion

The study also concluded that there was a positive and significant effect between etims and tax collection at the Kenya Revenue Authority. This indicates that the adoption of ETIMS is an effective strategy for enhancing tax collection. According to the study, eTIMS did boost revenue collection, but it was only effective if other elements, such as a user-friendly system design, well-trained staff, and ongoing taxpayer engagement, were also in place. Improved compliance, reduced tax leakages, and minimized errors are all possible outcomes of implementing ETIMS's automated monitoring and enforcement systems. Increased efficiency in collecting funds can result from this.

The study also concluded that there was a positive and significant effect of digital reporting on tax evasion and tax collection at the Kenya Revenue Authority. Therefore, improved digitalization of services had a significant and positive impact on compliance. This finding highlights the importance of investing in digital infrastructure to simplify and streamline tax processes, thereby encouraging greater compliance from taxpayers. Therefore, by strengthening tax collection, identifying taxpayers more accurately, and detecting tax evasion, digitizing the public sector, especially tax administration, can result in significant efficiency improvements.

The study also concluded that the regulatory framework moderated the link between online tax payment, Etims, digital reporting, and tax collection at the Kenya Revenue Authority. However, the regulatory framework did not moderate the relationship between and tax collection at KRA. In addition, a weak regulatory environment can reduce the effectiveness of digital infrastructure, while a robust framework makes digital tools more impactful in reducing corruption, automating processes, and strengthening fiscal integrity.

6. Recommendations

In order to improve tax compliance, it was suggested that the tax authorities implement policies that would encourage more people to use the electronic tax payment system. The findings provided a strong basis for the KRA to continue reinforcing its automated tax system infrastructure, including tax applications, middleware, enterprise systems, and reporting dashboards, to augment its management of the large taxpayer base in Kenya. The reinforcement of the automated tax system is also considered advantageous for the large taxpayers in Kenya who have improved in their compliance with the tax laws, more especially with the intensified program for automated taxpayer reports and statistics that was established to have the strongest impact on tax compliance. As a result, the study recommends the KRA to actively involve the large taxpayers in Kenya as it reinforces its automated tax systems to ensure it captures every one of their needs and concerns, which is also a form of sensitization capable of enhancing sustainable tax compliance.

The KRA should enhance the Electronic Tax Invoice Management System (ETIMS) to improve tax collection in Kenya. Policymakers and relevant stakeholders should focus on further developing and refining ETIMS to ensure that tented camps are better equipped to meet

their tax obligations. It will be beneficial for the Kenya Revenue Authority to raise national knowledge regarding the taxation of the digital economy. In order to inform the general public about the mechanisms in place to impose a digital services tax on the country's online marketplace, the authority should collaborate with other interested parties to develop a number of initiatives for raising awareness, including through media and entertainment platforms.

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