THE IMPACT OF iTAX ON REVENUE COLLECTION: A CASE STUDY OF NAIROBI CITY COUNTY

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REG. NO: X50/12770/2018

A RESEARCH PROJECT SUBMITTED TO THE UNIVERSITY OF NAIROBI, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS IN ECONOMICS.

NOVEMBER 2021

DECLARATION

This research project is my own work and not yet submitted to any university or institutions for the award of a degree.

Signature……  **……...Date……**30th Nov 2021**…….**

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This research project has been submitted for examination with my approval as the University **Supervisor**

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Signature………  ……...**Date**15/11/2022…….

ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my supervisor Doctor Kennedy Osoro for this would not be possible without his gracious support. Many thanks to him for showing me the steps to follow and continuous support in completing my project.

I would also like to extend my gratitude to my lecturers and the university fraternity as a whole for providing me good environment and facilities to complete this project.

DEDICATION

I dedicate this project to God Almighty my creator, my strong pillar, my source of inspiration, wisdom, knowledge and understanding. He has been the source of my strength throughout this program and on His wings only have I succeeded. I also dedicate this work to my Father; George Amara who has encouraged me all the way and has made sure that I give it all it takes to finish that which I have started. To my lovely daughter, Etana Agnes who have been affected in every way possible by this quest. Thank you. My love for you all can never be quantified. God bless you.

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ACRONYMS

ETR:	Electronic Tax Register
FY:	Financial Year
GDP:	Gross Domestic Product
ICT:	Information and Communication Technology
IMF:	International Monetary Fund
iTaPS:	Integrated Tax Application Preparation System
KRA:	Kenya Revenue Authority
PAYE:	Pay as You Earn
PIN:	Personal Identification Number
SPSS:	Statistical Package for Social Sciences
TDT:	Technological Determinism Theory
TOT:	Turnover Tax
USA:	United States of America
VAT:	Value Added Tax
ZIMRA:	Zimbabwe Revenue Authority

ABSTRACT

The aim of the study was to determine the effect of iTax adoption and ETR inclusion in iTax system on revenue collection from Nairobi City County. Stratified sampling was used to select 222 respondents from the tax body for the study. Data collection done using structured questionnaires. Frequency statistics used for determining the distribution of the demographics. Descriptive statistics used to check for whether the respondents agreed or disagreed on iTax adoption and ETR adoption questions. Correlation analysis used to test for the relationship between iTax adoption and introduction of ETR. Multiple regression models were to assess the effect of ETR inclusion and iTax adoption on tax collected by KRA in Nairobi City County. The statistical analysis revealed that both before and after iTax introduction, iTax adoption influences revenue collection by the Nairobi City County positively. Furthermore, the expected inclusion of ETR into the iTax platform is also associated with a possible decline in the revenues collected by the county's revenue collection systems. Nonetheless, it was witnessed that only iTax adoption proved statistically significant on the revenues collected after iTax unlike before iTax was adopted ($p<0.05$). However, the revenues collected by KRA was always positive, before and after iTax adoption across the respective financial years.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Kenya Revenue Authority (KRA), established by Act of Parliament Cap. 469, is a body mandated to collect taxes on behalf of the government of Kenya. The realized revenue is directed to governmental expenditure, across different state parastatals and departments. In the past years, KRA utilized a traditional system of tax administration. In this system, the taxpayers made individual efforts to the KRA, to file their annual returns. The process seemed inefficient since there were several hiccups, both on the taxpayer and KRA, resulting in massive losses from the system as the taxpayers were supposed to physically submit their returns directly to the authority. Furthermore, corporations (corporate taxes), VAT, rental income and customs taxes were physically filed by their tax agents or a representative (KRA, 2015). The system was marred with irregularities especially on accountability, as the manual receipts from KRA could get redundant over time.

The adoption of technological advancement in revenue administration and collection has resulted in a series of transformations to both the taxpayers and the tax authorities. According to Ernest & Young (2016), the advancement has realized global efficiencies and accountability on the entire process. The modern provisions are characterized by improvement in tax management, efficiency and accountability of the system. Globally, retrieval of tax information by individual taxpayers has been made possible as each taxpayer has access to their tax profiles, aiding communications with the tax authorities. The structure also shows significance in tax compliance and obligation tendencies, through the interfaces in place to improve tax information across the users. However, the technological platforms prove sophisticated with complex archives and databases connected to it, with complex programmed interfaces tailored to meet all the taxpayers' needs. Electronic

platforms are key for online tax management and administration, connecting taxpayers and the authorities.

Mwambia (2015) claimed that application of innovation in both collection, administration and management of revenue led to better operations in the entire system. The process as applied in Malaysia has realized low costs and efficiency of taxpayers meeting their obligations. However, the country faced a myriad of challenges especially resistance from users in terms of the security and confidentiality of their information. Some of the citizens cry foul of improper awareness created by the government, during the adoption of the electronic tax platform. This has been a challenge, reducing the uptake of the online system, to meet the anticipated tax targets. The e-tax platform nonetheless, led to increased revenue collection in the country, with far-reaching positive effects on the annual revenues collected in the country.

According to Liang & Lu (2013) and Rana & Dwivedi (2015), the e-tax filing system is an initiative that enhances the use of both information and communication technologies as seen in the Middle East. Saudi Arabia for instance, has shown increased uptake of e-tax filings, to promote access and delivery of information from the government to its citizens. The recipient of these dynamics comprises of employees, citizens, and other local and international agencies located in Saudi Arabia. Nonetheless, the success of most of e-governmental projects in Saudi Arabia for instance e-tax filings rely on both the citizens who are the direct beneficiaries of the services and the ICT systems in place. The uptake of the system is rapid, with most of the Middle East countries adopting the platform, to streamline their tax administration and collection activities.

In this digital era, citizens around the world; from both developed and developing nations are becoming more aware of ICT platforms (DeLone & McLean, 2016; Veeramootoo, Nunkoo, & Dwivedi, 2018). The e-governmental services such as filing of tax returns and application of

national documents are increasingly becoming accepted in the societies. The resultant e-filing services comprise of document preparation, tax obligation, certifications such as compliance and remittance of tax returns at the designated financial periods under one service platform.

According to Edward (2009), revenue collection faces several setbacks across different countries around the world. However, most of these challenges are more in the developing countries as compared to the developed nations. These differences were attributed to the presence of systems to fast-track accountability and efficiency of revenue collection by their respective governments. Developed countries such as USA and Canada display one of the most effective tax revenue collection systems, minimizing possible hurdles along the way (Beekes & Brown, 2008). These observations are based on the robust revenue collection systems employed, to ensure accountability and transparency of their operations.

The Treasury Department in the US comprising of federal governments, state and local governments collected over $5.98 trillion revenue in 2015 (USA Treasury Department, 2015). Of these values, the most dominant source were the income taxes comprised of 37 percent of the revenue. Social insurance comprised of 25 percent of the totals, ad-valorem tax payments at 22 percent of the cumulative collections, business revenues standing at 8 percent of the realized revenue and fees charged from different activities in the US. In the 2015 financial year (FY), most of the revenue emanated from corporate, individual and income taxes at a proportion of 57% of the cumulative revenue collected by the federal governments. The social insurance collections were set at 34 percent of the total federal revenue. These collections amounted to approximately 33% of the GDP of the respective federal governments in the US. From the statistics, the federal governments in the United States collects over 17.5 percent of the total GDP as the states collecting around 9 percent of the total collection. The local governments make the least collection in

revenue, as at 2015 periods. The major aid in the efficient collection of the taxes in the federal, local and state governments is the online tax collection systems in operations. These governments have developed systems, widely appreciated by the citizens, with ease of use and understanding, to manage all their tax concerns over the years. Electronic tax filing platforms have been used by the citizens, to ease collection of taxes by the US governments, increasing tax revenue margins met annually.

IMF (2005) pointed to the evidence of black economies across the developing countries, harming the expected revenue limits, from such nations. These challenges result in the form of tax evasion and improper utilization of the black money in the economy as it goes untaxed. Rise in illegal activities targeted to generate revenue for different groups such as terrorism, drug trafficking, human trafficking and terrorism generate incomes that go unaccounted for in such economies. The effects of such practices have led to imposition of extra taxes on products and services in such countries, to accomplish their exact revenue target. The outcome of these practices has led to regressive tax models, resulting in increased pressure on the trustworthy taxpayers, resulting to tax imbalances within the society.

Moreover, more funds from such countries are moved abroad, leaving these developing countries with limited resources, hence continued economic imbalance. To avert such challenges, the governments of developing countries through their revenue authorities are struggling with ways of creating online tax profiles for each taxpayer, to avert possible risks associated with loss of revenue. These provisions are in line with the global digital platforms in use by most of the governments, used to streamline management and their entire operations for higher revenue targets.

In India, tax collection has faced several challenges, as depicted on the case of other developing economies around the world (Rai, 2004). Indian small-scale businesses and industries face a series of exemptions on taxation, on both income and commodity taxes. However, these businesses face challenge on meeting the threshold for these advantages since the targets set for them are quite high. The problem has resulted in more small-scale businesses in Indian cities, to avoid hefty taxes charged on them. The effect of evasion by these small-scale traders have resulted in less Value Added Taxes (VAT) collected from the businesses. Furthermore, settling of tax disputes within these countries face more challenges, hence the need for speedy processes to aid problems between the taxpayers and the revenue authorities responsible for offering such solutions. The adoption of online tax platforms in India has proved helpful in managing tax challenges between the clients (taxpayers) and the servers (revenue bodies). The system has shown better insights in terms of efficiency and reduction in the number of tax defaulters as the authorities have the ability to assess the tax situation of its citizens around the country.

Fati, (2014) on a study to investigate the measures in place to eliminate hurdles on tax collection regarding property income in Ghana displayed the absence of accounting systems of each of the property owners in the country. The situation across these countries demonstrated unstable revenue collection systems in place, leading to poor tax revenue streams from property taxes. Furthermore, there existed no invoices and payments between the revenue authorities and the property owners in the country. In addition, tax collection processes were done manually, with possible losses from inefficient operations such as fraud, resulting in losses. To manage these challenges, Ghanaian government introduced an online tax filing system, joining other nations with the provisions of its citizens to make online tax payments. The launch of the Ghana Revenue Authority's Integrated Tax Application Preparation System (iTaPS) was done in April 5th 2019, to improve the

tax collection processes in the country (Domi, 2019). The essence of this system established in Ghana was tailored to offer solutions for businesses and individual taxpayers, by significant interaction with the governmental systems to aid managing their tax needs (Essilfie-Afful, 2018). Furthermore, this system also aids at improving the tax evasion instances realized around the country.

In Zimbabwe, Zhou (2013) undertook a study on the existing process, systems and setbacks associated with revenue collection in the country. The results presented instances of a number of reforms within public revenue collection especially from the establishment of national revenue authority in 2001 from Income Tax Return Forms to Final Deduction Systems, VAT inclusion in 2004 and Toll Gate systems in 2009. On 28 June, 2015 Zimbabwe Revenue Authority (ZIMRA) flung an e-services platform, designed in collaboration with SAP and Microsoft. The system as in other developed countries enables taxpayers to get in touch with ZIMRA on their tax issues. This created a virtual tax office for both the government and its citizens (Obert et.al, 2018). However, since inception, the effect of the e-services on the revenue authority has not yet been determined. The electronic filing of taxes by the taxpayer's behavior forms the major concern of these individuals, concerning the past tax revenue collection challenges faced by the government. The system expected to reduce losses, regarding tax compliance and collection measures. The study left gaps on the influence of the e-service platforms or tax filings on compliance for both the willing and unwilling taxpayers within the country.

In Tanzania, Frazen (2007) in their study in Daresalaam revealed that the country's public officials were effective in tax remittance as opposed to their counterparts in the private sector. The country indicates instances of variances between the expected and actual tax revenues collected, from tax evasion claims. The study presented the need for inclusive systems, incorporating both the public

and the private sector in proper tax collection practices. Fjeldstad and Haggstad (2012) in conclusion, mentioned that there are a series of methods required by the Tanzania government to improve overall accountability of the respective officers charged with collection of revenue. The smooth operations in collection of revenue from the government was proposed to take place in areas of proper political good-will and introduction of an online platform to link the tax payers and the revenue authority in the country.

In Kenya, the Kenya Revenue Authority launched the iTax platform in 2015. The platform enhances utilization of the internet to meet tax compliance requirements and eventual revenue collection (Njenga, 2019). The system works in the sense that each individual taxpayer; resident or non- resident employed, investing or doing business in the country is required to generate their Personal Identification Numbers (PIN) for submission of their returns; VAT, Excise and PAYE. The system works with verification systems having the ability to authenticate the taxpayer information and tax compliance details (Migot & Paul, 2019). Furthermore, the system also enables persons to apply for their PIN, reprint the PIN certificates, apply for compliance certificates, file income tax, generate VAT certificates, apply for standards for Kenya bureau of standards (KEBS) and general ledgers on individual tax information (KRA public notice on iTax system 24th February, 2014). However, the application of iTax proves successful in the urban areas with proper internet connections and required infrastructure. This has proved a challenge in most areas, calling for more studies and recommendations aimed at improving the coverage and uptake of iTax platform and provisions in Kenya.

1.2 Problem statement

The inception of iTax into the collection of revenue in Kenya has experienced a number of milestones. The development has led to increased revenue collection amounting to Kshs. 1.580 trillion in FY 2018/2019 as compared to Kshs. 1.435 trillion in the FY 2017/18 (Wawire, 2020). These changes are associated with the digitalized tax collection platforms and robust measures by the authority to fast track its operations on all tax payers, by cornering defaulters and tax evaders. Furthermore, the existing tax reforms have led to growth in the revenues realized by KRA over the years (Nyaga, 2019). However, the study showed that there were unclear levels of awareness on the taxpayers regarding the application of the existing online platforms. Kinyua, (2019) further indicated that most of the taxpayers frequented cyber cafes, to receive iTax services, at the expense of doing it on their own despite of having the required infrastructure to undertake the filings.

Musyoka, (2019) indicated that some of the taxpayers failed to comply, as tax evasion was not fully solved by the online platforms. The study proposed for more attention on the existing and non-registered persons to confirm their status on the different online platforms, to improve the amount of revenue collected. Nzioka (2019) also backed the findings, as excise tax suffered greater challenges, since evasion is on the rise in that tax category, as compared to the other tax groupings. The problem resulted in low revenues rise gathered from excise taxes, as compared to the other categories of taxpayers. This called for more insightful investigation on the cause of the pattern, for better solutions to the taxpayers, to improve the levels of revenue collected annually. Furthermore, Lokaram & Rugachi (2019) pointed out the problems of transparency on some areas of taxation, such as adoption of the ETR technology. The machines had no proper linkage with the online platform, hence a greater gap for increased tax revenue collection.

There emerge a number of questions of whether there is a homogenous increment in revenue collection by KRA across different levels (Income tax, VAT, Corporate, rental and Excise). The differences are expected in terms of the evidence of existing tax evasion practices, no incorporation of existing ETR systems into KRA iTax platform, and level of awareness of the systems to the users. These concerns are expected to have some significant effect on the revenue collection practices undertaken by KRA.

The adoption of technological advancement in revenue administration and collection has resulted in a series of transformations to both the taxpayers and the tax authorities. The modern provisions are characterized by improvement in tax management, efficiency and accountability of the system. Globally, retrieval of tax information by individual taxpayers has been made possible as each taxpayer has access to their tax profiles, aiding communications with the tax authorities. This necessitates the need for this study, to evaluate the actual impacts of iTax on the revenue collection process in Nairobi City County. The concerns of non-inclusion of ETR across the iTax platform is assumed to have some impacts on the revenue collections made by KRA. This motivates the study further to unravel the implications of ETR linkage to itax on revenue collection in Nairobi City County. This necessitates the need for this study, to evaluate the actual impacts of iTax on the revenue collection process in Nairobi City County.

1.3 Research Questions

1. What is the effect of iTax adoption on revenue collection patterns in Nairobi City County?
2. What is the effect of ETR incorporation to iTax platform on revenue collection in Nairobi County?

3. What are the policy implications based on iTax adoption to revenue collection in Nairobi City County?

1.4 Research objectives

The main objective of the study is to determine the impact of iTax on revenue collection in Nairobi City County, Kenya. More specifically to:

1. To determine the effect of iTax adoption on revenue collection patterns in Nairobi City County.
2. To determine the effect of ETR incorporation to iTax platform on revenue collection in Nairobi City County.
3. To draw policy implications based on the findings of this study.

1.5 Significance of the study

First, the study will help understand the existing impact of iTax on revenue collection in Nairobi City County, Kenya, by adding to the existing body of research. The recommendations from the findings shall be used to aid academic decision making on Kenyan taxation platforms and their operations. Besides, the incorporation of ETR technologies into iTax is expected to spur more research in the future, regarding the quantitative impact it yields on Kenya Revenue Authority (KRA).

Secondly, the research is expected to offer the revenue authority (KRA) with findings created by lack of interlinkage between the ETR machines and iTax platform. The project shall come a long way to influence the existing systems, by creating room for more revenues. Each transaction done

through an ETR machine shall be noted by iTax, to ease accountability and losses realized due to non-transparent transactions that go unnoticed.

Thirdly, national treasury shall also benefit from the project, as it shall enable development of effective policies on revenue administration, in collaboration with KRA. The recommendations shall influence existing tax policies to the planner (national treasurer), on budgetary allocations and expected revenues for specified financial years, since inception of iTax back in 2015. This builds on the fact that there exists great variance between the forecast revenue and actual revenues across the Kenyan devolved governments since the onset of devolution.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter entails theoretical literature, supporting concepts on taxation and tax collection by governments. Moreover, it also presented empirical literature regarding past studies on similar objectives, similar to the anticipated study. Furthermore, gaps are also identified from the literature, and later summarized to define the suitability of this study.

2.2 Theoretical Literature

2.2.1 Technological Determinism Theory

The proponents of Technological Determinism theory (TDT) define it as a reductionist form of theory that states that technology is a force or social structure that aids change. TDT results in dynamics within the structure, culture and reporting lines of an organization. This extends to the norms and other significant such as nature of operations within a firm or company. The theory is built on two major assumptions, which influence technological determinism. First, the belief in the sense that technical aspects of society prove appropriate conditions influencing the patterns of social existence. Secondly, it also assumes that changes in technology is the most important aspect of other changes within the society. However, despite technology having an impact on the society, class interest, pressures from the economy, political factors, and general perceptions on organization and education background also influence the society in a number of ways. TDT has been debated over a long period on applicability in social sciences to understand societal behavior from the perspective of technology.

A number of critics have emerged, stating that technology itself is determined by social determinants. Both technology and social structures coevolve within an emergent, nondeterministic processes, as the impact realized from any form of technology rely on the

implementation determined socially. The application of technology to ease operations across different sectors such as revenue collection is a great application of the TDT theory. The theory is quite helpful in the wake of iTax system adopted by KRA to manage and collect relevant taxes. In essence, the theory offers the possible linkage between technology, revenue collection and social systems in Kenya. However, the theory fails to cover the fiscal aspect, yet this is key for understanding of tax operations and matters. This led to the need for the second theory; fiscal exchange theory.

2.2.2: Fiscal Exchange Theory

Fiscal Exchange theory was designed by Alm back in 1995. The theory was founded on the assertion that taxpayers have mixed views on consideration of self-interest as compared to contribution done on matters that interest the community. The taxpayers with increasingly more tax paying attitude and cooperation with the tax authorities leads to increased willingness on tax contribution (Alm, 1995). Increased expenditure by governments is a motivator to tax compliance as the citizens receive the demanded goods and services easily and in an efficient manner. Individuals often pay taxes based on valuation they have on the goods from the government in recognition that the resultant payments are able to finance the needed goods and services desired. The presence of positive paybacks is viewed as a motivator to taxpayers comply without force, voluntarily. Despite most of the taxpayers have no ability to assess the value of the goods and services offered for the taxes paid, it is assumed that they have general perceptions on them and others regarding trading with the governments. Tax compliance decisions relies on the income levels of a taxpayer, audit by the tax authorities and the deterrent in place to improve tax collection.

This theory is relevant to this study since it addresses the possible causes of tax evasion among taxpayers and their perceptions on taxes. The essence of the theory aids in understanding the

possible individual taxpayer concerns regarding payment of relevant taxes to relevant authorities. In collaboration with the TDT theory, they help access the relevance and significance of iTax on revenue collection in Kenya. This makes them applicable for this study, to meet the underlying study assumptions and provisions, for better decision making.

2.3 Empirical Literature

2.3.1 Impacts of iTax adoption on Revenue collection

Musyoka, (2019) noted that the adoption of iTax has led to increased compliance among the tax payers, hence increasing the levels of revenue collected in Kenya. The study proposed for more attention on the existing and non-registered persons to confirm their status on the different online platforms, to improve the amount of revenue collected. Nzioka (2019) also backed the findings, as excise tax suffered greater challenges, since evasion is on the rise in that tax category, as compared to the other tax groupings. The problem resulted in low revenues rise gathered from excise taxes, as compared to the other categories of taxpayers. This called for more insightful investigation on the cause of the pattern, for better solutions to the taxpayers, to improve the levels of revenue collected annually. Furthermore, Lokaram & Rugachi (2019) pointed out the problems of transparency on some areas of taxation, such as adoption of the ETR technology. The machines had no proper linkage with the online platform, hence a greater gap for increased tax revenue collection.

There emerge a number of questions of whether there is a homogenous increment in revenue collection by KRA across different levels (Income tax, VAT, Corporate, rental and Excise). The differences are expected in terms of the evidence of existing tax evasion practices, no incorporation of existing ETR systems into KRA iTax platform, and level of awareness of the systems to the

users. These concerns are expected to have some significant effect on the revenue collection practices undertaken by KRA.

The adoption of technological advancement in revenue administration and collection has resulted in a series of transformations to both the taxpayers and the tax authorities in Kenya and around the world (Lokaram & Rugachi, 2019). The modern provisions are characterized by improvement in tax management, efficiency and accountability of the system. Globally, retrieval of tax information by individual taxpayers has been made possible as each taxpayer has access to their tax profiles, aiding communications with the tax authorities. In this case, it is quite clear that the adoption of iTax has led to increased revenue collection through KRA in Kenya.

The varied economic activities within the informal sectors account for a bulk of the taxes that ended up not being collected. Adediran et.al (2013) and Nwaiwo & Okoro (2018) revealed that incomes from the businesses outside the formal sector results to over four times more than what emanates from the formal sector. In this case, Cobb Douglas model was used to include all the informal sectors as an indicator of the taxes collected. The utility function was used in checking for the nature of utility associated with the taxes collected. Tax evasion was used as an inhibitor of the total tax output across the economy. The study was done on a sample of 50 businesses within the formal and informal sector to understand the extent of tax evasion in Nigeria. Correlation analysis was used to test for the relationship. It was realized that tax evasion had a negative effect on tax collection across Nigeria ($r=-0.687$). In the formal sector, most of the income comes from income tax based on the proportion of persons within active employment. Furthermore, value added tax (VAT) also adds to these numbers, increasing the actual values of taxes collected by the respective governments around the world. The informal business however, fail to contribute their incomes based on poor record keeping on their financials and uncertainty associated with their

earnings quarterly, semi-annually and annually. Furthermore, most of these informal sectors have no record of tax registration associated with them, to ease collection of the relevant taxes, resulting in lower revenues collected by the government in the form of taxes. Adoption of electronic tax systems within Nigeria led to increased tax base among the tax collector. As a result, there was an indication of efficacy of the electronic tax collection measures in improving the taxation levels realized within the country since inception.

2.3.2 Impacts of ETR incorporation on revenue collection

Electronic tax registers (ETRs) were launched in 2004, based on a gazette notice number 47 issued on 22nd October 2004. Based on the notice, the ETR also termed as printer is termed as a gadget that has been approved by a government for recording and providing financial data on a series of goods and services. Currently, the Kenyan laws have made it a mandatory obligation for all businesses registered for VAT on issuance of tax invoices and or cash sales receipts. These receipts and invoices are supported by the ETR receipts. According to the VAT act Cap 476 (Laws of Kenya), so long as registration has been done for a taxpayer, the VAT certificate should always be displayed, undertake issuance of ETR generated receipts and declaration of correct returns and timely submission of returns online. Non-compliance to these provisions result in fines and penalties from the tax authority. Nonetheless, business having turnover less than five million per year are exempted from registration for VAT and not coerced into using the ETR. On such business, the new tax named turnover tax (TOT) introduced by the Finance Act of 2007 for providing income tax Act cap 470 that was affected on the 1st of January 2008. The tax is applied on the gross sales made by the business at a rate of 3% of the gross turnover of the business.

The ETRs were developed by KRA to aid in establishment of the amount of VAT payable void of constant checks and verification of business records. In the past years, there has emerged concerns

of a number of traders undervaluing their sales to enhance tax evasion, hence the need for the ETRs. Nonetheless, the adoption of ETRs resulted in key opposition during its initial stages of application. Kathuri (2006) pointed that the gadgets had failed in over 21 countries, including Tanzania since the users claimed there a possibility of inaccurate records on the gadgets as there was no provision on return of goods and services. This resulted in a series of studies to understand the effect of the application of ETRs on Value Added Tax (VAT) collections across businesses. The outcome revealed that there were increased tax compliance concerns from the use of ETRs on the businesses. The move improved tax management, as accounting for all the transactions involving VAT was easily monitored and records properly kept.

Tax compliance is a key aspect in the development of ETRs among taxpayers and respective governments. The adoption of ETR aids in generation of knowledge of tax due and acts as a control for compliance control measures. Tax compliance decisions relies on the income levels of the individuals and inspection or audit done by the tax authorities and the deterrent measures provided by the authorities. The adoption of ETR has been used in inspection of tax related transactions. This helps governments understand the tax margins of their respective taxpayers, to understand whether the persons fine the required tax returns or not.

2.4 Summary of Literature

On the analyzed literature, tax has undergone a number of challenges during collection, regardless of the state of geographical region. iTax has been considered a better solution since its inception in 2015. However, there is limited findings on the iTax impacts on revenue collection in Kenya, especially Nairobi City County about challenges such as tax evasion, ITR non-inclusion tax awareness among others. Most of these studies have been done outside the country such as Nigeria (Fakile & Agdebie, 2011), Afghanistan and other developed countries (Modugu & Anyaduba,

2014). This translates to the need to understand the tax evasion impacts on revenue collection within the Kenyan set-up. ETR incorporation was a technological measure introduced to ease recording of the Value Added Taxes (VAT) from taxpayers. This method has been in use for quite sometimes in Kenya. Its effects have always been realized on the transparency at which the taxes have been collected. In the wake of the past studies, there exists no clarity on ETR linkage with iTax platforms (Kathuri, 2006). This has called for the need to understand the impact of ETR's incorporation in iTax on revenue collected. Tax awareness has also remained a challenge, with changes in the KRA and revenue policies (Otundo, 2019). There has been minimal awareness to businesses and income earners on changes in tax policies. This translates to the need to understand the impact of iTax in terms of its associated challenges on revenue collected within Kenya particularly in Nairobi City County.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter entails the actual methodology adopted to meet the desired study objectives as stated in the first chapter. The methods comprise of the appropriate empirical model specification, variable definition and measurement, data types and sources. The method involved maximum utility function, which was used to determine the revenue, collected from different taxpayers as the output.

3.2 Conceptual Framework

Independent variables Dependent Variable

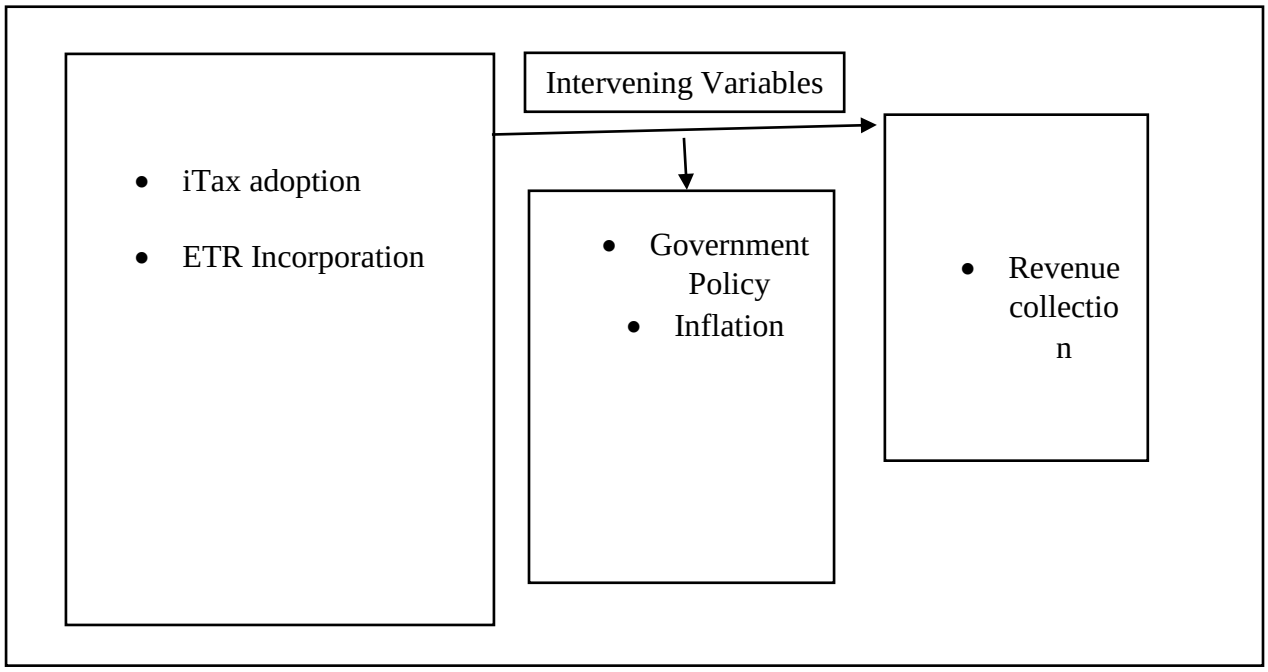

Figure 3.1: Conceptual Framework

Source: Author (2020)

According to the conceptual framework, the independent variables for the study were iTax adoption and ETR incorporation. The dependent variable was revenue collection metrics from Nairobi County records. The study assumes that the independent variables may have some effect

on the dependent variable (revenue collection). This paves the way for this study, to statistically test the study variables and infer them accordingly.

3.3 Theoretical Framework

The study is linked to the standard economic theory that describes taxpayer remittance effects on total tax revenue collected (Zhunio et al, 2012). The supposition attached to the study is that KRA wishes to finance national development projects to a greater extent (Arif & Chaudhry, 2012).

Suppose that the Kenya Revenue Authority (KRA) to maximize utility, U, which depends on relies on iTax adoption and ETR inclusion to the systems.

$Maximize\ U = U(E, C), u_1 > 0$……1

Where *U*= Revenue collected

E = ETR inclusion

C = iTax adoption

The KRA collects revenue Y, that was linked to the maximization of their utility through relevant utilization of iTax adoption and ETR inclusion. The constraint of revenue is defined as;

$Y \geq P_e E + P_c C$……2

Where, *Y* = Total revenue received by KRA from tax payers in Nairobi City County (including different transmittals)

P_i = national project i 's price

An appropriate optimization problem is then developed for solving for the value of E, by maximizing equations 1 subject to equation 2 as explained;

$$L = U(E, C) + \lambda(Y - P_e E - P_c C) \text{……..3}$$

From the first-order condition of equation 3, we derive an optimal condition:

$$\frac{U_e}{P_e} = \frac{U_c}{P_c} = \lambda \text{……4}$$

$\frac{U_e}{P_e}$ denoted as θ describes how utility changes as a result of a change in iTax adoption while $\frac{U_c}{P_c}$ denoted as $\emptyset$ shows the change in utility level resulting from a change in the revenue consumed by the national government. This indicates that the Marshallian demand curve for KRA tax collected is defined as:

$$e = 1 - \frac{\emptyset}{\theta}(Y - P_e E - P_c C) \text{…….5}$$

Partial derivative of KRA revenue with respect to ETR adoption is given by;

$$\frac{\partial e}{\partial Y} = -\frac{\emptyset}{\theta} \text{……..6}$$

According to equation 6, the change in ETR adoption from the need to better VAT collections (tax revenue) remains uncertain since it relies on the VAT collected. Furthermore, the changes in iTax adoption in terms of various platforms exhausted to capture tax paid through filing of returns have been considered to have a positive effect on total collected revenue by KRA. The uncertainty in terms of the signs of iTax adoption and ETR inclusion into KRA's revenues collected motivate the essence of the current study (Gyimah & Asiedu, 2015).

The study indicates that revenue collected is measured in terms of the taxes collected before and after iTax was introduced by KRA. The value of taxes will be presented numerically to capture changes in tax across the various tax periods. e^* is the continuous variable used to define the

collected tax revenue as X being the independent variables and ε being the error term. This is defined as;

$$e^* = X\beta + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots 7$$

Where $\varepsilon|X \sim Normal\ (0, \sigma^2)$

Nonetheless, e is considered a discrete tax revenue collected from various tax payers, hence e^* being an estimate of the revenues. This implies that;

$$e = \begin{cases} 0 \ if \ e^* \leq \alpha_1 \\ 1 \ if \ \alpha_1 < e^* \leq \alpha_2 \\ 2 \ if \ \alpha_2 < e^* \leq \alpha_3 \\ \quad . \\ \quad . \\ \quad . \\ j \ if \ \alpha_j < e^* \leq \alpha_{j+1} \end{cases} \quad \ldots\ldots\ldots\ldots\ldots\ldots 8$$

The variables α_1 to α_j are considered as parameters that symbolize the change in tax revenue from one taxpayer to the other. ETR inclusion is measured in terms of a 5-point Likert scale (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree. Any revenue obtained by KRA e is a result of optimizing the utility function for the agency (KRA). A taxpayer pays different taxes based on their income categories and the influence on iTax on their decisions (Boning et.al, 2018). In the event that *e is* the value of the unobserved variable e^* lying between α_1 and α_{j+1}. ETR adoption and iTax adoption are considered as ordinal variables as the tax collected being continous in nature. This translates to the need for a multiple linear regression model to test for the changes in tax revenue collected and its associated factors (iTax adoption and ETR inclusion).

3.4 Empirical Model Specification

To analyze the effect of iTax adoption and ETR inclusion, this study follows the theoretical model from equation 8, to specify the desired empirical model suitable for the study defined as:

$$y = \alpha_0 + \alpha_1 ETR + \alpha_2 iTax + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots 9$$

Where α_0, α_1 and α_2 are co-efficient to be developed from the model, y is the revenue collected before and after iTax and ε is error term used to measure the effect of unobserved factors or white noise from the model.

The dependent variable was revenue collection that was regressed against the independent variables namely iTax introduction, tax evasion, ETR incorporation and tax awareness.

Where:

iTax adoption: Is iTax adoption into KRA's revenue collection systems (Njenga, 2019).

ETR Incorporation: Is expected to have a negative effect on the tax revenue collected by KRA. Incorporation of ETR into KRA iTax profile is expected to reduce the tax base in the country, resulting in slightly lower revenue collection (Wawire, 2020).

3.5 Diagnostic techniques

3.5.1 Test for heteroscedasticity

Tests for heteroscedasticity were used to check whether the regression error variances are equal or not. Breusch-Pagan test for heteroscedasticity was used to check whether the regression residuals were heteroscedastic or not. In statistics, better models are defined as homoscedastic, i.e., have equal variances. The null hypothesis for the diagnostic test was that the model residuals were homoscedastic.

$$H_0 = The\ errors(residuals)\ are\ homoscedastic\ (constant\ variance)$$

$$H_A = The\ errors(residuals)\ are\ heteroscedastic\ (Nonconsant\ variance)$$

When the p-value was greater than 0.05, the study validates the need to reject the null hypothesis hence the errors heteroskedastic.

3.6 Variable definition and Measurement

Table 3.1: Variable definition, descriptions and measurements

Variable	Variable Description	Variable Measurement	Sign/Priori
Dependent variable			
Revenue collection (Y/T)	This is the level of revenue collected by the KRA.	The measurement will involve a 5-point Likert scale for revenue collected assessments	
Independent Variables			
iTax adoption	This is the technology adopted to ease tax collection by KRA in Kenya.	This is measured using a 5-point Likert scale to tests the effectiveness of revenue collection.	Positive (+)
ETR Incorporation (T)	This is the process of inclusion of ETR to iTax systems.	The measurement will involve a 5-point Likert scale to test the effect of ETR incorporation.	Negative (-)

3.7 Data type, Source and Sampling Technique.

This study employed primary data from persons working at different KRA offices within Nairobi City County. Structured questionnaires were used to collect the data for the study in terms of the respective research objectives. The questionnaires were designed based on demographic information, iTax related factors and revenue collection factors. The research employed both simple random sampling and stratified for the selection of the desired samples for use. The data was collected from three KRA centers in Nairobi (North of Nairobi, West and East of Nairobi).

3.7.1 Sample size determination

In determining the sample size of the respondents, Kothari (2004) formula that was initially recommended by Yamane (1967) was the most appropriate for use in this scholarly work. Since the formula has been used for the past four decades, it is then proper to involve it in the determination of the sample size of the current study.

$$n = \frac{N}{1 + N(e)^2} \dots\dots\dots\dots\dots (10)$$

Where;

n= the desired sample size

e =The margin of error set at 5%

N =The population of KRA East of Nairobi officers set at 500.

$$n = \frac{500}{1 + 500 * (0.05)^2} = 222\ respondents$$

3.8 Data Analysis

STATA 15 was used for entering data collected from the field. This data was cleaned and prepared ready for statistical analysis. The first stage of analysis entailed using frequency statistics of the categorical variables involved in the data. The analysis comprised of frequency tables. The frequency statistics were used on demographic information, revenue collection outcomes, tax evasion, tax incorporation, and tax awareness. Later, correlation was employed in testing the relationship between revenue collection outcomes and tax evasion, tax incorporation, and tax awareness. This entailed the use of scatterplots to test for the underlying relationships between the variables (Xu & Huang, 2020). Lastly, multiple regression modelling was employed for modelling the effect of tax evasion, tax incorporation, tax, and tax awareness on revenue collection from KRA data.

3.9 Ethical considerations

First, Participation in the study was voluntary, hence reducing any possible challenges associated with respondents being coerced into the study. Secondly, Ethical Review Board (ERB) from the University of Nairobi was instrumental in reviewing the ethical concerns associated with the research questions attached to the study (Brittain et.al, 2020). Thirdly, the respondents were treated as anonymous to reduce any form of personal identification in completing the study questionnaires. Lastly, the responses from the study were considered confidential and used strictly for the realization of the objectives of the study. The computer used for saving the data was password protected to prevent any access on the responses.

CHAPTER FOUR

4.1 Introduction

This chapter presents the major findings from the study. It encompasses the reliability analysis (Cronbach Alpha values), demographic profile of the respondents, descriptive statistics for the objectives, correlation and multiple regression analysis. Furthermore, tests for constant variances are also included after the presented regression models to answer the purported research hypothesis. All the findings from the study were reported from STATA 15 software adopted for statistical analysis of the obtained research data.

4.2 Reliability Analysis

Table 4.2: Reliability analysis

Construct	Number of items	Alpha value
iTax adoption	4	0.771
ETR introduction	4	0.622
All items	8	0.755

According to the reliability analysis, iTax adoption comprised of 4 items. They proved statistically reliable (Alpha=0.771). Furthermore, ETR introduction into the KRA systems was also statistically adequate (Alpha=0.622). All the items used to measure the research objectives proved reliable from the analysis (Alpha=0.755). This was based on the Cronbach Alpha values from the study being greater than 0.6. This implies that the items were desired in answering the anticipated research questions and hypothesis through relevant statistical testing approaches.

4.3 Demographic Information

Table 4.3: Gender distribution of the respondents

Gender	N.	%	Cum. %
Male	116	52.25	52.25
Female	106	47.75	100.00
Total	222	100.00	

The analysis revealed that 52.25% (n=116) were males. This was higher than the females who registered 47.75% (n=106) of the total respondents engaged in the study.

Table 4.4: Age distribution of the respondents

Age bracket	N	%	Cum.%
18-28 years	94	42.34	42.34
29-39 years	103	46.40	88.74
40-50 years	25	11.26	100.00
Total	222	100.00	

On the findings, it was revealed that majority of the employees from KRA targeted were aged between 29 and 39 years at 46.40% (n=103). This was followed by 42.34% (n=94) who were aged 18-28 years. The least in terms of the fraction of respondents were those aged 40-50 years at 11.26% (n=25). This implied that the older respondents were fewer in the study as compared to the youthful population engaged.

Table 4.5: Education distribution of the respondents

Highest Education attained	N	%	Cum.%
Diploma	35	15.77	15.77
Bachelor's Degree	111	50.00	65.77
Masters	63	28.38	94.14
PhD	13	5.86	100.00
Total	222	100.00	

On the analysis, majority of the individuals engaged in the study had Bachelor's Degree as their highest education attained at 50.0 (n=111). This was followed by

28.38% (n=63) who had Master's degree. The third group of individuals were those with Diploma at 15.77% (n=35) as the least of the respondents having PhD at 5.86% (n=13). The findings revealed that majority of the respondents were above Bachelor's degree, showing an elevated literacy level of the employees at the tax body.

Table 4.6: Position distribution among the respondents

Position in the organization	N	%	Cum.%
Supervisor	66	29.73	29.73
Manager	27	12.16	41.89
Officer	115	51.80	93.69
Assistant Manager	14	6.31	100.00
Total	222	100.00	

The analysis showed that majority of the respondents were Officers at 51.80% (n=115). This was closely followed by Supervisors at 29.73% (n=66). The third category of individuals were the Managers at 12.16% (n=27) as the least from the group were Assistant managers at 6.31% (n=14). The findings inform that KRA offices visited had more officers and supervisors as opposed to the managers and their assistants within their jurisdiction.

Majority of the respondents engaged in the study had worked at KRA for a period of 2-4 years at 61.26% (n=136). This was followed by 32.88% (n=73) who had worked for less than a year. The third category of respondents were those who had worked for 5-7 years at 3.15% (n=7). The least of these individuals were those who worked for 8-10 years at 2.70% (n=6). The findings reveal that majority of the respondents had worked for less than 8 years within the parastatal (KRA).

Table 4.7: Respondents' distribution of the period worked at KRA

Number of the years working at KRA	N	%	Cum.%
Less than 1 year	73	32.88	32.88
2-4 years	136	61.26	94.14
5-7 years	7	3.15	97.30
8 -10 years	6	2.70	100.00
Total	222	100.00	

Majority of the respondents engaged in the study had worked at KRA for a period of 2-4 years at 61.26% (n=136). This was followed by 32.88% (n=73) who had worked for less than a year. The third category of respondents were those who had worked for 5-7 years at 3.15% (n=7). The least of these individuals were those who worked for 8-10 years at 2.70% (n=6). The findings reveal that majority of the respondents had worked for less than 8 years within the parastatal (KRA).

4.4 iTax Adoption

Table 4.8: Descriptive statistics for iTax adoption

Variable	Obs	Mean	Std. Dev.
iTax system has led to increased revenue collection from KRA.	222	4.216	1.251
iTax has led to increased tax compliance hence more revenues collected.	222	4.523	.95
KRA has registered higher levels of taxes after iTax as compared to the periods before iTax.	222	3.541	1.231
Management of KRA has enhanced a rise in tax collections through its 4s following up tax compliance concerns from iTax reports	222	4.18	1.309

The findings on iTax adoption revealed that iTax system has led to increased revenue collection from KRA had an average of 4.2 (M=4.216, SD=1.251). iTax has led to increased tax compliance hence more revenues collected had an average of 4.5 (M=4.523, SD=0.950). KRA has registered higher levels of taxes after iTax as compared to the periods before iTax had an average of 3.5

(M=3.541, SD=1.231). Management of KRA has enhanced a rise in tax collections through its 4s following up tax compliance concerns from iTax reports had an average of 4.2 (M=4.18, SD=1.309). Since all the assertions had averages above 2.5, from the ordinal scales used, there was evidence to state that the respondents agreed on the claims presented.

4.5 Introduction of ETR

Table 4.9: Descriptive statistics for the introduction of ETR

Table 6: Descriptive statistics for introduction of ETR

Variables	Obs	Mean	Std. Dev.
Introduction of ETR into iTax will help to capture all income from different sources of taxes hence improving tax collections.	222	4.198	1.079
ETR has not been included into the iTax platform hence affecting revenues collected.	222	3.847	1.299
ETR inclusion into iTax will enhance clarity and better efficiencies on KRA tax revenues.	222	3.968	1.299
Complexity of ETR has made it difficult for KRA to adopt it into iTax hence affecting tax revenues.	222	3.477	1.083

Introduction of ETR into iTax will help to capture all income from different sources of taxes hence improving tax collections had an average of 4.2 (M=4.198, SD=1.079). ETR has not been included into the iTax platform hence affecting revenues collected had an average of 3.8 (M=3.847, SD=1.299). ETR inclusion into iTax will enhance clarity and better efficiencies on KRA tax revenues presented an average of 3.968 (M=3.968, SD=1.299) as Complexity of ETR has made it difficult for KRA to adopt it into iTax hence affecting tax revenues had an average of 3.5 (M=3.477, SD=1.083). According to the summary statistics, all the items on introduction of ETR had averages above 2.5, from the 5-point Likert scale used. This implicates that most of the respondents agreed to the claims on ETR inclusion.

4.6 Correlation analysis

Table 4.10: Correlation analysis

Correlations

		ETR Introduction	iTax adoption
ETR Introduction	Pearson Correlation	1	.391**
	Sig. (2-tailed)		.000
	N	222	222
iTax adoption	Pearson Correlation	.391**	1
	Sig. (2-tailed)	.000	
	N	222	222

**. Correlation is significant at the 0.01 level (2-tailed).

On the analysis, it was noted that there existed a weak positive relationship between ETR introduction and iTax adoption (ρ=0.391). This revealed that the adoption of iTax may also promote the introduction of ETR into the iTax platforms. Moreover, the analysis revealed evidence of a significant relationship between ETR introduction and iTax adoption. Since there was a weak relationship between the variables, there was no evidence of multicolinearity between the independent variables, hence making them suitable for developing regression models.

4.7 Multiple regression analysis

Table 4.11: Multiple regression of the effects of ETR introduction and iTax adoption on revenue before iTax

Linear regression

Rev before	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	S
ETR Introduction	.298	.345	0.86	.406	-.462	1.058	
iTax adoption	.174	.228	0.76	.462	-.329	.677	
Constant	18.397	.907	20.29	.000	16.401	20.392	*

Mean dependent var	19.819	SD dependent var	0.570
R-squared	0.217	Number of obs	14.000
F-test	6.525	Prob > F	0.00
Akaike crit. (AIC)	25.538	Bayesian crit. (BIC)	27.455

*** p<.01, ** p<.05, * p<.1

On the model, R-squared=0.217, implying that 21.7% of the regression of revenue before iTax on the predictor variables was explained by the model. This generated a rather low

predictive power using the two independent variables (ETR introduction and iTax adoption) to explain changes in the revenues. Furthermore, the model proved statistically significant at 5% level of significance (F=6.525, p=0.000) since the p-value of the F-test statistic was less than 0.05. This informed that the model was viable for predicting the revenues before iTax was introduced.

The effect of ETR introduction and iTax adoption on revenue before iTax was explained using the equation;

$$Revenue\ before = 18.397 + 0.298 * ETR + 0.174 * iTax$$

On the analysis, the intercept had a positive effect on the revenues collected (β=18.397). Since the model was developed after a log transformation of the revenues, the estimated revenue when there was no ETR introduced and no response on Tax adoption is equivalent to $e^{18.397} = Kes.97{,}659{,}744.46$. Moreover, the parameter proved statistically significant at 5% level of significance hence desired for the prediction of revenues before iTax was launched.

Ho: ETR introduction had no significant effect on revenue collected before iTax

H1: ETR introduction had a significant effect on revenue collected before iTax

On the analysis, ETR introduction presented a positive effect on revenue collected before iTax (β=0.298). Furthermore, there was no sufficient evidence to reject the null hypothesis at 5% level of significance (t=0.860, p=0.406) since the p-value was greater than 0.05. The parameter revealed that ETR introduction was no sufficient to explain changes in KRA revenue before iTax was launched.

Ho: iTax adoption had no significant effect on revenue collected before iTax

H1: iTax adoption had a significant effect on revenue collected before iTax

The analysis showed that iTax adoption had a positive effect on the revenues collected before iTax (β=0.174). The parameter showed no evidence to reject the null hypothesis at 5% level of significance (t=0.76, p=0.462). This informed that iTax adoption was not desired for the prediction of the revenues collected by KRA before iTax from the study.

Table 4.12: Multiple regression of the effects of ETR introduction and iTax adoption on revenue after iTax

Linear regression

Rev after	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]
ETR Introduction	-.188	.131	-1.43	.248	-.605	.23
iTax adoption	.035	.088	5.40	.000	-.246	.317
Constant	21.578	.37	58.27	.000	20.399	22.756

Mean dependent var	21.128	SD dependent var	0.167
R-squared	0.407	Number of obs	6.000
F-test	5.031	Prob > F	0.000
Akaike crit. (AIC)	-2.648	Bayesian crit. (BIC)	-3.273

*** $p<.01$, ** $p<.05$, * $p<.1$

From the model findings, R-squared=0.407, implying that 40.7% of the regression of revenue before iTax on the ETR introduction and iTax adoption was explained by the model. This presents an average predictive power using the two independent variables (ETR introduction and iTax adoption) to explain changes in the revenues after iTax was introduced. Moreover, the model was statistically significant at 5% level of significance (F=5.031, p=0.000) since the p-value of the F-test statistic was lower than 0.05. This informed that the model was appropriate for making predictions on revenues after iTax was introduced.

The effect of ETR introduction and iTax adoption on revenue after iTax was explained using the equation;

$$Revenue\ after = 21.578 - 0.188 * ETR + 0.035 * iTax$$

On the analysis, the intercept had a positive effect on the revenues collected (β=21.578).

Since the model was developed from natural log transformation of the revenues after iTax being introduced, the estimated revenue when there was no ETR introduced and no response on Tax adoption is equivalent to $e^{21.578} = Kes.2{,}350{,}749{,}381.467$. Furthermore, the parameter proved statistically significant at 5% level of significance hence appropriate for the prediction of revenues after iTax was launched (t=58.27, p=0.000).

Ho: ETR introduction had no significant effect on revenue collected after iTax

H1: ETR introduction had a significant effect on revenue collected after iTax

On the analysis, ETR introduction presented a negative effect on revenue collected after iTax (β=-0.1880.298). Furthermore, there was no sufficient evidence to reject the null hypothesis at 5% level of significance (t=-1.43, p=0.248) since the p-value was greater than 0.05. The parameter implied that ETR introduction was not appropriate for explaining changes in the revenues after iTax was adopted.

Ho: iTax adoption had no significant effect on revenue collected after iTax

H1: iTax adoption had a significant effect on revenue collected after iTax

The analysis showed that iTax adoption had a positive effect on the revenues collected after iTax (β=0.035). The parameter showed sufficient evidence to reject the null hypothesis at 5% level of significance (t=5.40, p=0.000). This informed that iTax adoption was required for the prediction of the revenues collected by KRA after iTax has been introduced into KRA as explained by the study.

4.8 Regression diagnostic tests

4.8.1 Heteroscedasticity test

For revenue before iTax model

Table 4.13: Breusch-Pagan / Cook-Weisberg test for heteroscedasticity for model 1

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of rev_before

chi2(1) = 1.47

Prob > chi2 = 0.2256

Ho: There is constant variance

H1: There is no constant variance

From the findings, there was no sufficient evidence to fail to reject the null hypothesis at 5% level of significance (chi2(1)=1.47, p=0.2256) as the p-value was greater than 0.05. The outcome justified the assumption of constant variance in the prediction of tax revenues collected by KRA before iTax was launched.

For revenue after iTax model

Table 14: Breusch-Pagan / Cook-Weisberg test for heteroscedasticity for model 2

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of rev_after

chi2(1) = 0.18

Prob > chi2 = 0.6743

Ho: There is constant variance

H1: There is no constant variance

According to the analysis, there was no sufficient evidence to fail to reject the null hypothesis at 5% level of significance (chi2(1)=0.18, p=0.6743) since the p-value was greater than 0.05. The findings implied that the regression assumption on normality of variances was justified, making the model appropriate for predicting the effects of ETR introduction and iTax adoption on revenue collection at KRA.

CHAPTER FIVE

5.1 Introduction

This chapter presents explanations from the obtained findings, based on the study objectives. It comprises of the discussion of the findings, conclusions, recommendations and areas for further studies into the future.

5.2 Summary of the findings

The findings revealed that iTax adoption had a positive effect on the revenues collected before iTax. This indicated that an improvement in iTax adoption among different Kenyan tax payers from KRA had the tendency of increasing the relevant taxes collected from the public. Nonetheless, a decline in iTax adoption had the possibility of reducing the daily, monthly and annual revenues collected by KRA. The parameter showed sufficient evidence to reject the null hypothesis. This informed that iTax adoption was a key construct in explaining the changes in revenues collected by KRA over the past years. In this case, it was evident that no adoption of iTax in the previous years led to lower revenues collected by KRA to fund governmental operations.

Moreover, iTax adoption had a positive effect on the revenues collected after iTax. This informed that the uptake of iTax led to tremendous growth in terms of the revenues collected by KRA. The pattern was also influenced by the levels of operations at KRA, made more efficient by the iTax platform to better tax collection. Moreover, the analyses revealed that introduction of iTax led to a rise in revenue collection, based on the taxes collected by Nairobi City County over the past years. The study informed that the inclusion of the better technologies with increased efficiency to the iTax platform had a potential of increasing the taxes collected at different periods. Technology has been considered as the missing link that had thwarted KRA efforts towards realizing higher taxes collected over the years. The different provisions within the iTax platform has been

celebrated as user-friendly and appropriate in offering customers or tax payers the best services to meet their varied taxation needs. For instance, generation of tax compliance certificates, KRA PIN certificates among other crucial taxation documentation have also been eased, through the platform. This has led to increased compliance to KRA, hence witnessed on the levels of revenue realized by KRA.

ETR adoption had a negative effect on revenue collection at KRA. This indicated that the expectation of ETR inclusion translating to higher taxes being was quite a mirage. The analysis confirmed that the adoption of ETR has to supported by efficient technological systems to improve the tax revenues collected. The parameter also proved statistically insignificant at 5% level of significance as reported from the analysis. This confirmed that ETR adoption was not desired in predicting the changes in tax revenue collected by KRA over the past years.

The outcome of the study was similar to the findings from Domi (2019). This study implied that the inclusion of technology in collection of taxes widened the scope to obtain more taxes. Furthermore, it was also associated with increased efficiency in the tax collection procedures in place to obtain the required levels of own-source revenue. Furthermore, the findings also demonstrated similarity with Essilfie-Afful (2018) as the adoption of iTax aided in reducing instance of tax evasion. The effect of a decline in evasion was clear on the rise in the revenues collected across the various tax periods, to meet the anticipated governmental expenditure needs.

According to the analysis, it was witnessed, ETR introduction presented a negative effect on revenue collected before iTax. Furthermore, the findings revealed that ETR introduction presented a negative effect on revenue collected after iTax. The parameter also proved statistically significant at 5% level of significance. On both before and after the introduction of iTax, it was revealed that the introduction of ETR was expected to yield more revenues for KRA into the future.

The findings obtained were similar to Migot & Paul (2019) in which accountability on the online tax systems was instrumental for increased revenue collection. In this context, the inclusion of ETR codes into the online platforms using integrated network connections linking sales to the tax systems play a pivotal role in influencing taxes collected. Furthermore, Boning et.al (2018) also revealed that ETR inclusion into tax systems influenced the amounts of revenue collected across every financial year. Nonetheless, Fox & Luna (2019) revealed that in some cases, ETR inclusion was associated with double tax compliance from the online and offline systems. This challenge may be sorted using a single online tool in iTax to capture all the VAT remittances obtained from sales made in the course of doing business.

5.3 Conclusions

The analysis reveals that both before and after iTax was introduced, iTax adoption influences revenue collection by the Nairobi City County positively. Furthermore, the expected inclusion of ETR into the iTax platform is also associated with a possible decline in the revenues collected by the county's revenue collection systems. Nonetheless, it was witnessed that only iTax adoption proved statistically significant on the revenues collected after iTax unlike before iTax was adopted. However, the revenues collected by KRA was always positive, before and after iTax was adopted **across the respective financial years.**

5.4 Recommendations

5.4.1 Policy recommendations

- KRA should develop a policy on ETR inclusion within the iTax platform to create room for more accountability on VAT.
- KRA should re-evaluate the efficiency of their income tax policies to assess whether they were responsible for the increase in the taxes collected since iTax was launched.

- KRA should develop a research policy to undertake a series of studies across other counties in Kenya to determine the effect of iTax on own-source revenue across these various countries.
- KRA should revise its policies on technology to reduce any possible tax evasions that may arise from existing loopholes within the iTax platforms.

5.4.2 Academic recommendations

- The study recommends the need to develop periodical study on the effect of iTax on revenue collection across Kenyan counties such as Kisumu, Nakuru and Mombasa.
- There is the need to consider current trends in taxation such as online businesses to determine their contribution to the tax raised by revenue for the various periods.
- The research opens up room for the need to undertake a study on the expected effects of ETR inclusion on revenue collection (VAT) from various tax payers and agencies across major Kenyan cities.

5.5 Areas for future research

- Further studies should be done to assess the relevant of the online business taxes on tax payers across the county (Kenya).
- More studies should be done to test for the effect on ETR inclusion on tax payer responses to better relevant own source revenues across counties in Kenya.
- More studies should be done to determine the causes of tax non-compliance among some tax payers in Kenya.

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APPENDICES

APPENDIX I: Introductory Letter

INTRODUCTORY LETTER

Dear Respondent,

I am a student of University of Nairobi currently undertaking a Master's degree in Economics. I intend to collect information to inform the writing and compilation of the final thesis from you.

The purpose of this study is to establish the impact of iTax on Revenue Collection: A Case Study of Nairobi City County

.

Information collected in this study will purely be used for academic purposes with ultimate care and confidentiality observed.

Please direct any enquiries to: PENINAH AKINYI AMARA

APPENDIX II: RESEARCH INSTRUMENT

Kindly address the questions in the blanks provided. Tick the appropriately [√]

Respondent responses will be considered confidential and used strictly for the thesis, with the respondents' identity treated as anonymous.

PART I: RESPONDENT BIODATA

1. Gender of Respondents Male ☐ Female ☐
2. Age in years

   18-28 ☐ 40-50 ☐

   29 – 39 ☐ 51-61 ☐

   >61 ☐
3. Position in the Organization?

   Chief Manager ☐ 1 Supervisor 2 ☐

   Manager 3 ☐ Officer 4 ☐

   Assistant Manager 5 ☐
4. Highest Education Attained

   Diploma ☐ Masters ☐

   Bachelor's Degree ☐ PhD ☐
5. Number of the years working at Kenya Revenue Authority large tax payer's department in years

   <1 ☐ 2– 4 ☐

   5 – 7 ☐ 8 – 10 ☐

   >10 ☐

What were the revenues earned across the different years before and after iTax?

	Before iTax adoption			After iTax adoption				
Year	2013	2014	2015	2016	2017	2018	2019	2020
Revenue								

How can you rate the adoption of iTax on revenue collection to KRA in Nairobi City County?

Very effective [ ]

Effective [ ]

Neutral [ ]

Ineffective [ ]

Very ineffective [ ]

PART II: ETR INTRODUCTION

Please indicate your rating on the following statement on *i*Tax in terms of revenue collection by Kenya Revenue Authority.

No	Statement	SD	D	N	A	SA
	ETR Introduction					
i	Introduction of ETR into iTax will help to capture all income from different sources of taxes hence improving tax collections.					
ii	ETR has not been included into the iTax platform hence affecting revenues collected.					
iii	ETR inclusion into iTax will enhance clarity and better efficiencies on KRA tax revenues.					
iv	Complexity of ETR has made it difficult for KRA to adopt it into iTax hence affecting tax revenues.					

PART III: iTax Adoption

Please indicate your rating on the following statement on *i*Tax in terms of revenue collection by Kenya Revenue Authority.

No	Declaration	SD	D	N	A	SA
	Revenue Collection					
i	*i*Tax system has led to increased revenue collection from KRA.					

ii	iTax has led to increased tax compliance hence more revenues collected.					
iii	KRA has registered higher levels of taxes after iTax as compared to the periods before iTax.					
iv	Management of KRA has enhanced a rise in tax collections through its officers following up tax compliance concerns from iTax reports.					

Thank you for your responses

Appendix III: University Letter

UNIVERSITY OF NAIROBI SCHOOL OF ECONOMICS

12th March 2021

To Whom It May Concern

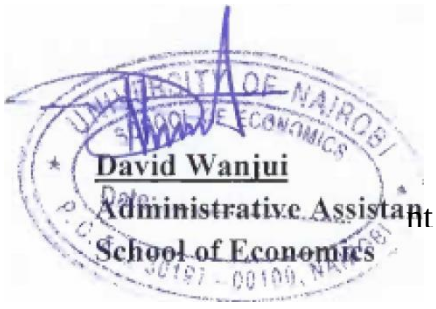
Dear Sir/ Madam,

RE: PENINAII AKINYI AMARA-X50/12770/2018

This is to confirm that the above named is a bonafIde student in the School of Economics, pursuing a Master of Arts in Economies degree.

She is carrying out a research entitled "Impact of Itax in revenue collection in Kenya _ A case study in Nairobi County".

The purpose of this letter is to request you to allow her access any kind of material she may require to complete her research. The information will be used for research purpose only.



David Wanjui
Administrative Assistant
School of Economics

Appendix IV: NACOSTI Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **838635**

Date of Issue: **18/March/2021**

RESEARCH LICENSE

This is to Certify that Ms. PENINA AKINYI AMARA of University of Nairobi, has been licensed to conduct research in Nairobi

on the topic: THE IMPACT OF iTAX ON REVENUE COLLECTION: A CASE STUDY OF NAIROBI CITY COUNTY for the Period ending: 18/March/2022.

License No: **NACOSTI/P/21/9423**

838635

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION

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