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Title: THE CONTRIBUTION OF ELECTRONIC TAX SYSTEM IN TAX COLLECTION IN RWANDA. A CASE STUDY RWANDA REVENUE AUTHORITY.

Specialty or Professional Fields: Master of Professional Accounting

Applicant: KANYABWIRA JEAN CLAUDE

Supervisor: YINGQI, LI

ABSTRACT

The Rwandan government, in collaboration with the revenue body Rwanda Revenue Authority (RRA), started digital transformation in 2012 to enhance tax administration efficiency and contribute to the national development goals. Despite these steps, issues such as tax evasion, late filings and payments, unstable network infrastructure, and low computer application proficiency among taxpayers continue to exist. The combination of challenges faced by the RRA alongside mistakes in tax payments, tax evasion and tax avoidance threats limit the RRA from getting optimal revenue collections. This study was motivated by these challenges and it sought to investigate the contribution of e-tax system on tax collection in in Rwanda a case study Rwanda Revenue Authority.

The study employed secondary data covering the periods prior (1998-2011) and after (2012-2022) the implementation of the e-tax system and primary data collected via questionnaires through stratified random sampling technique to ensure representation across different taxpayer categories and RRA staffs; thus, 150 taxpayers and 50 tax officers were selected for this study, mixed-methods approach that combines quantitative and qualitative research techniques were used. To analyses data collected statistical techniques were used to access the relationship between the electronic tax system and tax collection outcomes and qualitative analysis of interview and open-ended survey responses to explore perception and implementation challenges.

The Statistical Package for Social Sciences (SPSS) was used in the regression analysis and in calculating the results. The findings were presented through tables and the discussion thereafter. The aim of results was to find out the degree to which the electronic tax system assists in the tax collection. The multiple linear regression analysis to assess the combined contribution of the electronic tax system on tax collection by considering three variables including two independent variables such as Technical Skills to use e-tax system, Perception on e-tax, and Tax collection as the dependent variable was used.

The findings established that the implementation of e-tax system had very important positive effect on tax revenue collection. These results, however, provide the basis for emphasizing the need to educate taxpayers, both small and medium, as well as Large taxpayers on the role of perception and technical skills in the use of e-tax systems on the tax collection efficiency. Knowing specifics on these aspects, the government can be able to collect tax revenue more cost effective. To sum up, through the use of the obtained results, the decisions makers can put forward the specific policies that will improve tax administration systems and consequently improve the revenue proceeds collection.

KEY WORDS: Electronic Tax System; Tax Collection; Perception; Technical Skill;

Efficiency of Tax Collection； Tax Payment Risks, Rwanda Revenue Authority

TYPE OF THESIS: Case Study

CONTENTS

LIST OF SYMBOLS

AT	Activity Theory
BI	Behavior Intention
EBM	Electronic Billing Machine
ESW	Electronic Single for domestic taxpayers Window
ICT	Information & Communication Technology
IDT	Innovation Diffusion Theory
IRS	Internal Revenue Service
KRA	Kenya Revenue Authority
MM	Motivational Model
MNOs	Mobile Network Operators
PAYE	Pay as You Earn
MTRS	Medium Term Revenue Strategy
PU	perceived usefulness
RRA	Rwanda Revenue authority
ISS	International sustainability standards
SN	Subjective Norm
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
URA	Uganda Revenue Authority
UTAU	Unified Theory of Acceptance and Use of Technology
VAT	Value Added Tax
GDP	Gross Domestic Product
COSO	Committee of Sponsoring Organizations
ISO	International Standard Organization
CIT	Corporate Income tax
IRS	Internal resource service
EDB	Essays doing business
LGT	Local Government Taxes
PIT	Personal income taxes
WHT	Withholding tax
QMS	Quality management system
HR	Human resource
OECD:	Organization for Economic Co-Operation and Development
ITAS	Integrated Tax Administration System
ETRs	Electronic tax registers

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INTRODUCTION

1.1 Research Background and Meaning

1.1.1 Background

One of the success stories of contemporary African development is Rwanda, which has amassed a remarkable economic and social record in recent decades. An ambitious plan for tax digitization and successful reform implementation has both accompanied and supported the nation's improving performance. Vision 2020, the Rwandan government's reform program, was essential to this development. Among other objectives, it sought "to reduce aid and dependency developing effective strategies to expand the tax base." To advance this aim, the Rwanda Revenue Authority (RRA), the national body in charge of all tax collection, has made significant investments in digital tax services. RRA has made it a priority to streamline tax forms and procedures, giving taxpayers more ease while utilizing third-party tools to collect data for a robust and effective process.

Rwanda Revenue Authority (RRA) as a Rwandan tax administration has a vital responsibility to help the Government to provide efficient service delivery hence the promotion of business expansion; therefore the convenient system was mandatory e-filing and e-payment was adopted as a convenient tool of reducing operational costs of both sides taxpayers and tax administration whereby tax declaration, and payment can happen from anywhere as long as a taxpayer has an electronic device (smartphone, computer, etc..) which is different from a manual system whereby taxpayer must be present at the premises of tax administration with paperwork's for filing and finally to the bank premises for payment consequently hinders business activities for both sides. (Ndayisenga, E.; Shukla, J. 2021)

The difficulty that governments in underdeveloped nations have in raising tax income leads to a discrepancy between what they could raise and what they do. The use of cutting-edge technologies and more effective tax payment ways to eliminate waste is one of these difficulties, according to (Muita, 2011). To save operational expenses and paper waste, the IRS in the USA began accepting electronic filing in 1986. Additional features have been added since then. Electronic Direct Deposit was implemented as a payment method in 1987. Over the years, milestones have been achieved and overturned. In 1990, 4.2 million returns were filed, and in recent years, 1 billion 1040 forms have been electronically filed, setting a record. The IRS's 1969-developed processing system was utilized for e-filing initially, but since 2003, the IRS has been creating a new, improved processing system. In the United States, when the Internal Revenue Service (IRS) originally offered tax return e-filing for tax refunds exclusively, the term "electronic tax filing" was first used (Muita, 2011).

This has now developed to the point where a significant portion of individual taxpayers are already filing online. Malaysia electronic tax system was adopted to facilitate taxpayers to electronic filing and payment of tax liabilities via tax administration official website; however, the taxpayers were not using the system in spite of its two-years existence Malaysians hence this needs sensitization to end-users. Some African countries following the benefits which European, American and Asian countries were getting from e-tax and the outflows link to tax evasion, corruption, crime, and other unlawful activities, and most, if not all, African nations have turned to electronic tax filing, however the extent varies from nation to nation.

Ethiopia, Uganda, Rwanda, South Africa, Kenya, and other nations are examples of those that have adopted the practice to a large extent. Through the recently created e-Tax system, the Ethiopian Revenue and Customs Authority (ERCA) has now significantly benefited the business community and Ethiopia's overall economy. Taxpayers may now electronically file their taxes which is help to reduce errors and Tax payments are quick, simple and anticipated to increase compliance and improve revenue collection. (Solange 2018)

All of Uganda's tax system improvements aim to increase tax administration, compliance, and collection. To this end, Uganda Revenue Authority URA implemented electronic tax filing as a way to increase compliance and lower tax collection expenses. (Lukwata, 2001). Since 1885, when the first tax system was implemented, a colonial regime has existed. As is well known, colonialism exposes the colonized to exploitation while the colonizer country profits from all tax payments. Since the country gained independence, the tax system was only created in 1964. As a result of inefficient government and a dearth of independent tax administration, the country's economy has not grown or become sufficiently independent.

Tribalism in administration and lack of mobilization of internal resources as a result of the 1973 tax reform system forced the nation to rely on foreign aid, loans, and grants to fund its operations. (Mugabe Roger 2021). The nation's tax revenues fell to $132 million in 1996 from $225 million in 1990 as a result of the 1994 genocide in Rwanda, which lost hundreds of thousands of people. The new unity government, led by Paul Kagame's Rwandan Patriotic Front, was also keen to wean itself off its reliance on foreign donors, who had shown themselves unreliable throughout the crisis, in addition to its acute need for money to pay for rebuilding. In order to do this, Kagame's administration had to persuade a traumatized and skeptical populace to pay its rightful amount of taxes (ISS 2011-2017).

The Rwanda Revenue Authority (RRA), a tax body with some autonomy, took the role of the country's previous tax and customs ministries in 1998. Due to a lack of technical expertise, parliament chose Edward Larbi-Siaw, a distinguished Ghanaian economist and lawyer who had previously led the nearby Uganda Revenue Authority, to lead the RRA. The restoration of the tax base, the provision of tax incentives to stimulate production for domestic and foreign investors, and improving tax administration efficiency are the three main phases of Rwanda's tax reforms.

The Rwanda Revenue Authority (RRA) was founded in 1997 to raise domestic income and manage the country's limited resources throughout its economic recovery. With concurrent institutional and legislative framework improvements, RRA's performance has been steadily improved. With the introduction of the VAT in 2001, the decrease of the CIT to 30 percent in 2005, and membership in the EAC in 2009, the initial changes attempted to broaden the tax base.

With the introduction of the E-Tax site in 2011 and the Electronic Billing Machine (EBM) in 2012, RRA has improved its use of technology and decreased the cost of conducting business (MTRS MINECOFIN 2018). Therefore, this research intended to see the Contribution of electronic tax filing system in tax compliance and tax collection in Rwanda. In this research we identified the difference between E-Filing, or electronic filing and paper or manual filling system. The act of submitting tax returns online is known as electronic filing. On the other hand, paper filing involves filling out hard copies and mailing tax forms.
For example, in the United States, the Internal Resource Service usually receives electronically submitted returns in one or two days, while it takes significantly longer to mail a paper return. With online e-Filing, you may reduce error by having the computations done for you. Additionally, you have the option to e-File using a computer program or software. The majority of computer applications and software will identify any mistakes in data entering before you finish the e-Filing procedure. Additionally, electronic returns are typically simpler to fix in the event of a mistake(https://www.patriotsoftware.com)[1].

1.1.2 Meaning

The term "tax compliance" has been defined in a variety of ways. Tax compliance was characterized by (Nakitende, Moureen 2019) as accurately estimating one's own tax liability, timely filing and reporting of required tax information, and timely payment of such taxes without facing enforcement action.[2]. This definition reflects three dimensions of tax compliance as noted by (Wasao, 2014): filing, reporting, and payment compliance. Filing

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[1] E-File vs. Paper File | Advantages & Disadvantages. https://www.patriotsoftware.com/blog/accounting/e-file-vs-paper-file

[2] Nakitende, Moureen. "Electronic Tax System and Tax Compliance in Uganda: A Case Study of Nakawa Division." 2019, https://core.ac.uk/download/347207536.pdf.

compliance refers to whether the taxpayer submitted the correct forms to the revenue authority. Reporting compliance refers to whether the return was accurate, while payment compliance refers to whether the taxpayer paid his/her reported tax liability in a timely manner. Therefore, a taxpayer would be called non-compliant if the three dimensions are not properly accomplished, (Wasao,2014).

E-filing systems give tax officials access to more accurate and up-to-date information, allowing them to process transactions more quickly. Electronically filed returns have significantly lower error rates than paper returns, which reduces the need for fines and other punitive measures to encourage compliance. Tax officers can deliver assessments and refunds more rapidly because to the more efficient handling that electronic returns provide, and taxpayers can immediately find out if their returns have been accepted by the tax authorities. Return processing expenses can be reduced via e-filing, freeing up administrative resources for other purposes including customer support, audits, and non-compliance monitoring (Nakitende, Moureen ,2019).

Academics and policymakers have long suggested that it may be simpler to tax electronic payments than cash. Contrary to cash transactions, financial intermediaries conduct electronic transactions, establishing a paper trail that tax authorities can use to determine tax liabilities (Rogoff 2016, OECD 2017, Awasthi and Engels chalk 2018). If accurate, this is great news for poor nations where government money is severely constrained and transactions are becoming more electronic (Pomeranz and Vila-Belda 2019). There are reasons to question whether the switch to electronic payments will result in a rise in tax compliance, though. Tax compliance does not always increase when fiscal authorities have greater knowledge about tax liabilities.

Existing evidence has shown that governments do not always have the capacity to use third-party information effectively (Almunia, M, J Hjort, J Knebelmann, and L Tian 2021), and that firms may react strategically to keep their tax liabilities low. Whether electronic payments increase tax revenues is thus an empirical question, and empirical evidence on the subject is scarce.

1.2 Research Objective and Question

1.2.1 Problem Statement

In the past, the Rwanda Revenue Authority (RRA) employed a paper-based tax declaration method, which caused a lot of taxpayers to complain about lengthy lines at RRA offices on the due day. The delay in tax declaration and tax payment on time by taxpayers caused the lose most of RRA tax income and increase Taxpayer claim. This manual tax administration system, which is characterized by low tax collection, delays, bad record keeping, and corruption, prevented Rwanda from reaching its budgetary goals.

In order to improve service delivery, the RRA introduced an electronic tax filing system that allows taxpayer to fill their tax returns electronically. And also, it easy for RRA to keep and know all necessary information about tax payer. This system is cost-effective for both the RRA and tax payers due to the decreased operational costs, such as transportation and stationary costs. Even, the Rwandan government, through its tax administration Rwanda Revenue Authority (RRA), began a series of reforms aimed at having a digital tax administration in 2012 with the goals to have an effective tax administration in the area and globally by educating the system to taxpayers whereby consider tax liability as a contribution to national development in addition to decreasing the cost of tax administration instead of considering tax as a forced obligation.

However, there are still issues of tax compliance, taxpayers claim about penalties associated with late declaration and late payment. And also, issues associated with the computerized tax administration system such as an unstable network and poor computer skills and lack of electronic declaration and payment skills by taxpayers, furthermore issues of errors in tax payment and as well as tax payment risk which leads tax evasion and tax avoidance making it difficult for RRA to meet their desired real income. Therefore, the researcher is motivated by the aforementioned issue to examine the contribution of electronic tax filing system in tax compliance and tax collection in Rwanda by focusing on the following research questions:

1.2.2 Research Questions

1. What are the effects of taxpayers' perception and technical skills towards using electronic tax filing?
2. Can electronic tax collection help tax authorities find errors in the process of tax payment, reduce tax payment risks, improve the efficiency of tax collection, improve tax compliance, and better serve taxpayers

1.2.3 Research Objectives

1. To assess taxpayers' perception and technical skills towards using electronic tax filing.
2. To evaluate the effectiveness of electronic tax collection in addressing errors in the tax payment process, reducing tax payment risks, improving tax collection efficiency, enhancing tax compliance, and enhancing taxpayer service.

1.3 Research Significant and Practical Value of the Topic

The implementation of e-filing and e-payment systems offers numerous advantages to taxpayers, thus enabling them to conveniently file and settle their taxes from any location at any time, thus eliminating the requirement to physically visit tax offices or banks, which is really great. This shift to electronic platforms not only streamlines the tax process for individuals and businesses, which is indeed very important, but it also facilitates access to information and other online transactions, enhancing overall convenience and efficiency. Furthermore, the adoption of electronic filing systems presents significant benefits to tax authorities, including greatly reduced costs, better efficiency in tax collection, and a decrease in workload, which is really beneficial. Through this research, the Rwanda Revenue Authority can assess the effectiveness of its electronic filing system, identify areas where improvement is needed, and implement corrective measures to be better at serving the taxpayers, because this is very necessary, ultimately enhancing compliance and tax collection outcomes, which are of great importance.

Moreover, this research holds paramount importance for the researcher's academic pursuits, serving as a cornerstone for achieving the Executive Master of Professional Accounting from the Shanghai National Accounting Institute under the Ministry of Commerce, People's Republic of China Scholarship. Beyond personal advancement, the findings of this super interesting study will totally contribute to the existing literature, providing valuable and insightful insights for future researchers, like really anyone who is interested in understanding the big impact of electronic filing systems on tax compliance and revenue collection. By definitely shedding light on the benefits and totally undeniable challenges associated with e-filing, this research really aims to contribute to informed decision-making processes and, you know, the continued improvement of tax administration systems worldwide.

1.4 Research methodology

This study investigated how the Electronic Tax Filing System affects tax revenue collection in Rwanda using a mixed-methods approach that combines quantitative and qualitative research techniques were used. While the qualitative method examined stakeholders' perspectives and experiences regarding the system's efficacy in enhancing tax management procedures, the quantitative method evaluated the Electronic Tax Filing System's quantitative influence on tax collection.

1.4.1 Research Design

The research design is primarily explanatory, aiming to understand the relationship between the Electronic Tax Filing System and tax compliance/tax collection outcomes while also exploring the underlying mechanisms through qualitative inquiry.

Population: Taxpayers registered under the Electronic Tax Filing System in Rwanda.

Sampling: A stratified random sampling technique has been employed to ensure representation across different taxpayer categories; thus, 150 taxpayers and 50 tax officers were selected for this study, ensuring diverse perspectives are captured.

Data Collection: Structured questionnaires has administered to collect quantitative data on tax compliance levels, tax collection efficiency, and perceptions of the Electronic Tax Filing System's impact.

Data Analysis: Statistical techniques such as regression analysis will be used to analyze the quantitative data and assess the relationship between the Electronic Tax Filing System and tax collection outcomes.

1.4.3. Research process and methods

A thorough investigation was conducted to look at how electronic tax systems affect Rwanda's tax collection. In order to comprehend the theoretical framework and current empirical evidence about the adoption and impact of electronic tax systems globally, a thorough review of the literature was first conducted. Afterwards, primary data was gathered by means of surveys and interviews with Rwandan taxpayers, government officials, and tax authorities.

The study examined the process of putting electronic tax systems into place, noting difficulties such infrastructure constraints and the need for capacity building. The study also evaluated how well these solutions worked in Rwanda's setting to increase revenue collection efficiency, lower tax evasion, and improve tax compliance. By means of a thorough examination of both qualitative and quantitative data, the study offered valuable perspectives on the noteworthy impact of electronic tax systems on augmenting tax collecting procedures in Rwanda, thereby supporting the nation's economic growth and fiscal stability.

1.5 Conceptual Framework and Hypothesis

The research investigates the contribution of electronic tax system in tax collection in Rwanda, two influencing factors such as perception to taxpayers to use the system and technical skills to use it were investigated to see their impact on tax collection in Rwanda.in this research process, Secondary data was collected on tax collection efficiency before and after the e-tax implementation, while primary data was collected to analyses both perception and technical skills of tax payers to use the system which have a significant influence on tax collection in Rwanda. To analyses data collected statistical techniques were used to access the relationship between the electronic tax system and tax collection outcomes and qualitative analysis of interview and open-ended survey responses to explore perception and implementation challenges. Research findings indicated that there is a significance relationship between electronic tax system and tax collection efficiency.

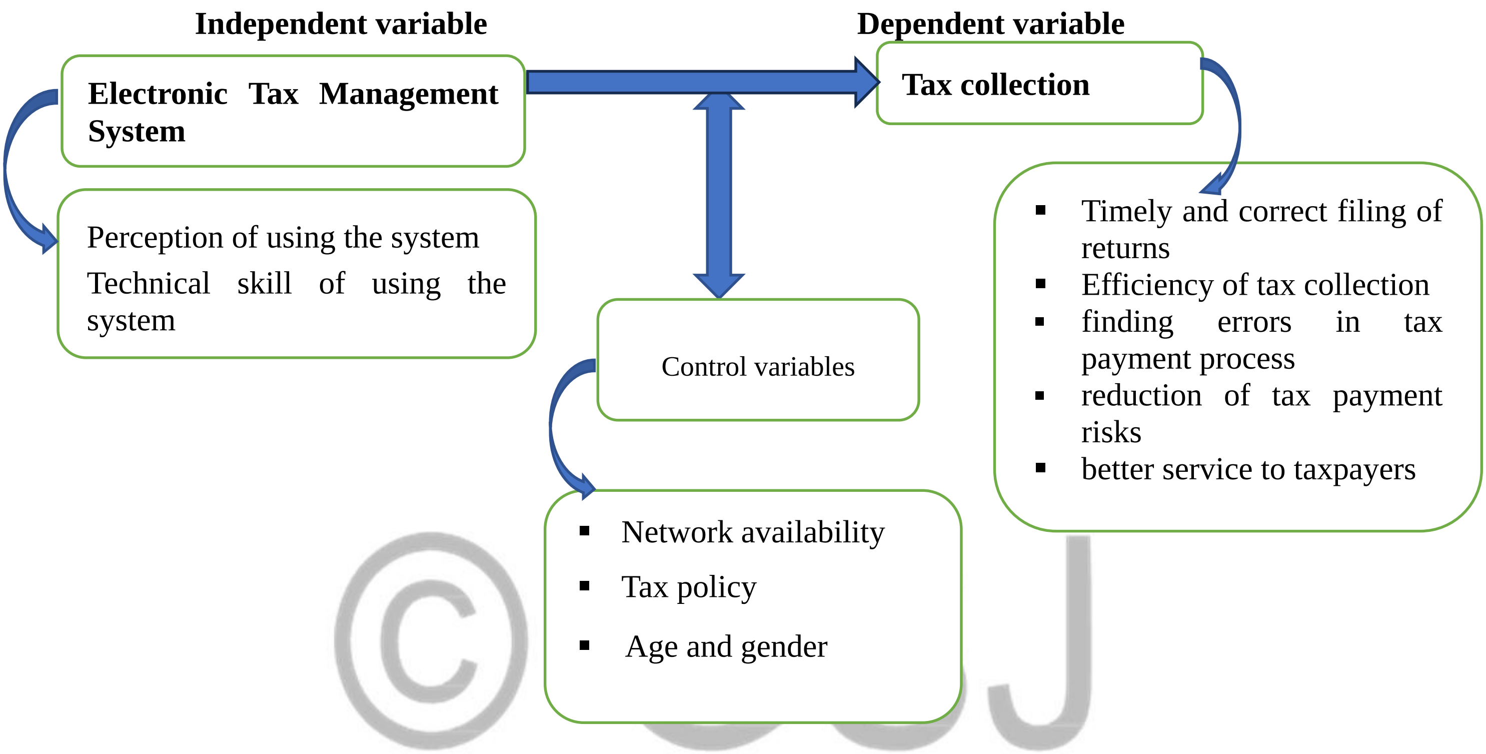


Figure 1-1: The relationship between the variables

Hypothesis for assessing the contribution of electronic tax system in tax collection in Rwanda:
Null hypothesis (Ho): the use of electronic tax system has not significantly impacted the increase in tax collection
Alternative hypothesis(H1): the use of electronic tax system has significantly contributed to the tax collection.

1.6 Organization of the Research

Here's the organization of dissertation presented in a more structured and polished manner:

Chapter One: Introduction
Chapter One of the dissertation provides a foundational framework for the study, offering readers insight into its goals, parameters, and essential background information.
It acts as a guide, outlining the purpose and structure of the research. All its component together provides a comprehensive overview of the research, helping readers understand its context, objectives and methodology.

Chapter Two: Literature Review

Chapter Two delves into a comprehensive review of existing literature pertinent to the dissertation topic. It explores relevant theories, models, and fundamental concepts essential for understanding the research context.

Chapter three: The history and Current Status of Tax Administration in Rwanda
The purpose of this chapter is to clarify the many roles that the Rwanda Revenue Authority plays in the field of tax administration by offering a thorough examination of its activities and duties.

Chapter Four: Leveraging Electronic Tax Collection Systems
Chapter Four highlighted the significant benefits and implications of using electronic tax collection systems. It explores how such systems can help tax authorities in tax collection improvement, to reduce tax payment risk, to find errors and to improve taxpayers' compliance.

Chapter Five: Data Analysis and Interpretation
Chapter Five, this chapter highlighted in in details the findings, and interpretation of data collected during the course of the study both secondary data and primary data was analyzed using tables and figures.

Chapter Six: Conclusion, Recommendations, and Takeaways
In this chapter, concluding remarks, practical recommendations, key takeaways as well as area of father research were presented. It synthesizes the findings, addresses research objectives, and offers insights for future research or practical implementation.

1.7 Research Scope and Limitation

The scope and limitation of this study is sub divided into subject scope, geographical, time and content/variable. The purpose of the study was to examine the contribution of the Electronic Tax System in tax collection in Rwanda. The study covered over a 20-year period from 2002 to 2022.in this case research was divided into two distinct segments, the initial ten years preceding the implementation of e-filing (2002-2012), followed by the subsequent ten years during which the RRA, executed digital tax administration reforms (2012-2022).

The study focused on assessing compliance levels, identifying tax payment risks, and evaluating taxpayer perceptions towards the electronic filing system as well as skills to use the system, aiming to comprehend its impact on collection. Both taxpayers and the tax administration staffs in Rwanda were engaged in the research. However, limitations arose due to insufficient information regarding the period preceding the introduction of the electronic filing system, which could have provided additional insights into the evolution of tax practices and attitudes prior to digitization unless the information collected is enough to make conclusion and recommendation.

2 THEORY AND LITERATURE REVIEW

2.1 Introduction

This chapter offers a comprehensive review of literature organized around themes derived from the specific objectives and research questions. Within this framework, the researcher examines the works and perspectives of various scholars and writers pertaining to the variables under study. The discussion in this chapter delves into theories, models, and relevant literature related to the study variables, with a particular emphasis on exploring the impact of Electronic Tax Management Systems on revenue collection.

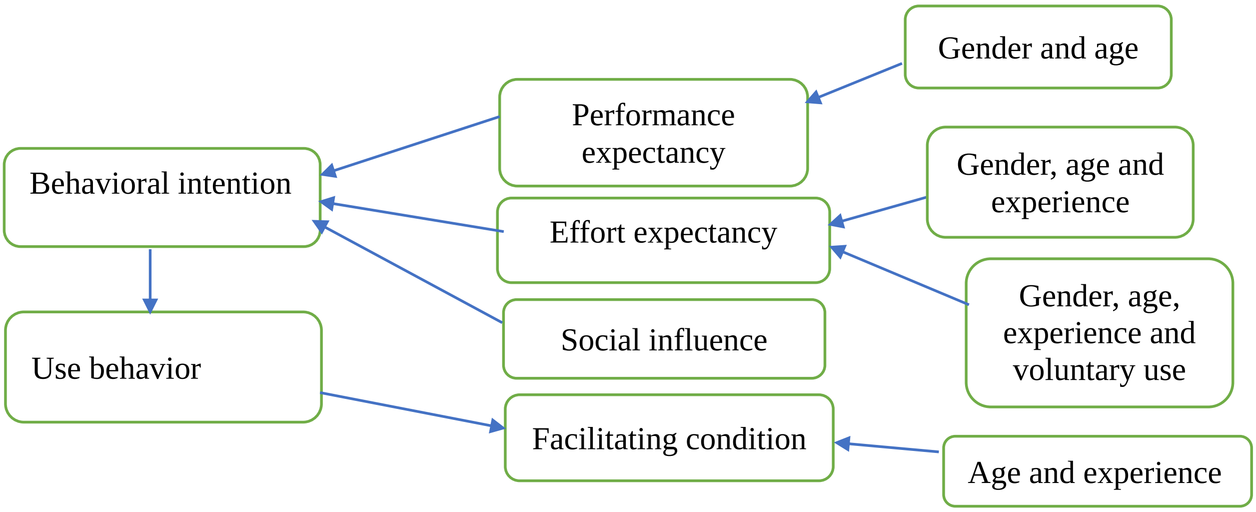
2.2 Research Theories models

In this section, the researcher used existing research theories on adoption of technology and tax collection which used by various scholars including the following: Unified Theory of Acceptance and Use of Technology (UTAUT), Motivational Model (MM), Technology acceptance model (TAM), Diffusion of Innovation (DOI) Theory, and Theory of Reasoned Action (T.R.A), and Risk management model. I hope that these theories are suitable for this study because they explain taxpayer's behaviour when adopting new technology. Online filing being new technology to use was explained well by these theories on adoption process.

2.2.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

The goal of this model, as developed by Venkatesh and others, is to explain users' initial plans or intention to use an information system and their following usage behavior. Understanding one's desire to use and real usage of an information system is the aim of UTAUT (Venkatesh et al, 2003). According to the theory, usage purpose and behavior are directly influenced by four important constructs: performance expectancy, effort expectancy, societal impact, and facilitating circumstances. The effect of the four main constructs on usage purpose and behavior is said to be moderated by factors such as gender, age, experience, and voluntariness of use. (Venkatesh, V, D. F, 2003).

The Rwanda Revenue Authority (RRA) initially encountered difficulties getting tax payers to accept technology; however, after sensitization and the government imposed strict requirements to abide by the tax policy of filing and paying taxes using ICT technologies of the internet, mobile devices, and electronic billing machines, the clients eventually accepted the system.



Source: (Venkatesh Et Al., 2003).

Figure 2-2: Unified Theory of Acceptance and Use of Technology (UTAUT)

Van Raaij and Schepers criticized the UTAUT as being less parsimonious than the previous technology acceptance model and TAM2 because its high R^2 is only achieved when moderating key relationships with up to four variables. They also called the grouping and labeling of items and constructs problematic because a variety of disparate items were combined to reflect a single psychometric construct. However, after mobilization and the government imposed strict conditions to abide by the tax policy of filing and paying taxes using ICT technologies.

2.2.2 Technology acceptance model (TAM)

According to (Davis, 1989), The Technology Acceptance Model posits that there are two factors that determine whether a computer system was accepted by its potential users: (1) perceived usefulness, and (2) perceived ease of use. The key feature of this model is its emphasis on the perceptions of the potential user. That is, while the creator of a given technology product may believe the product is useful and user-friendly, it will not be accepted by its potential users unless the users share those beliefs. It has been an important issue for IT managers and researchers to determine which factors make an individual select a new IT. The answer is that regardless of how many enterprises invest in establishing new and more efficient IT systems, the system's effectiveness can only be realized if the users clearly understand and use it. The figure below is a diagrammatic representation of the theory.

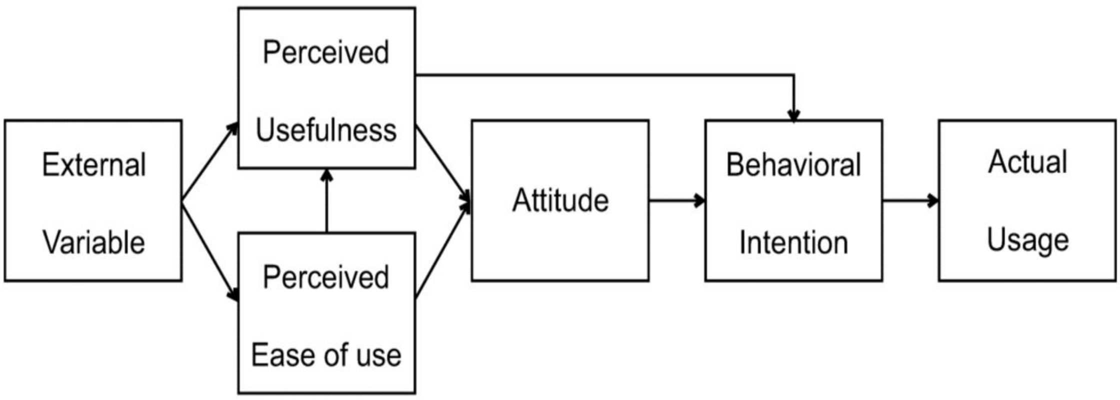


Figure 3-2: Technology Acceptance Model (TAM) by(Davis 1989)

Through an analysis of existing literature on IT utilization, Zmud identified two cognitive and attitudinal pathways influencing system success, with individual differences categorized into three variables: perceived style, character, and population statistics/situation. This examination revealed that situational variables of individual differences include education discipline, user experience, and user ability. As a result, it is believed that the adoption of e-filing systems is advantageous, providing significant benefits to both taxpayers and the government.

2.2.3 Theory of Reasoned Action (T.R.A)

According to the Theory of Reasoned Action (TRA), a person's behavior is influenced by their purpose to carry out the behavior, which is dependent on their attitude toward the behavior and subjective standards. (Fishbein & Ajzen, 1975). This means that the theory of reasoned action (TRA) is aimed to explain the relationship between attitudes and behaviors within human action. It is mainly used to predict how individuals behave based on their pre-existing attitudes and behavioral intentions. Therefore, an individual's decision to engage in a particular behavior is based on the outcomes the individual expects will come as a result of performing the behavior. The figure below is a diagrammatic representation of the theory.

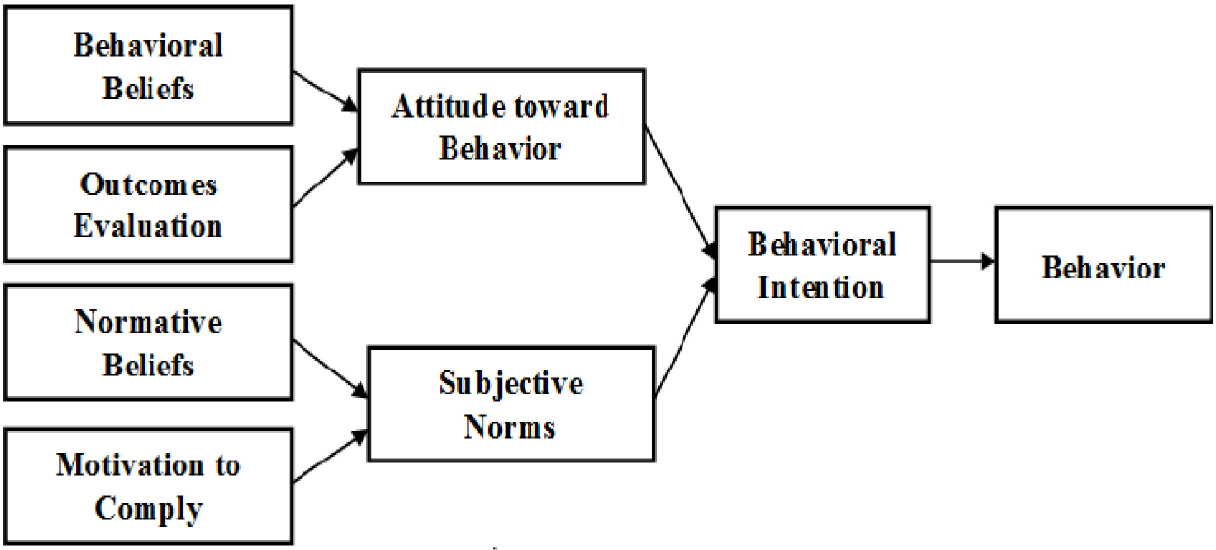


Figure 4-2: Theory of Reasoned Action – TRA (Fishbein & Ajzen, 1975)

In Rwanda the adoption of using ICT was not easy because of some challenges include lack of enough ICT infrastructure, lack of staff capacity in terms of trainings, and staff attitude towards technology adoption. The same as E-filling adoption, challenge was not only to the Government but also to taxpayer, like lack of knowledge, internet problem, its infrastructures such as phone, computers. Currently most of the population’s mind behavior about the use of technology have been. However, it is believed that electronic tax filing and payment system is success in helping both government and Taxpayer in improving tax compliance and tax collection in the country.

2.2.4 Diffusion of Innovation (DOI) Theory

The Diffusion of Innovation (DOI) Theory, formulated by EM Rogers (1962), is among the oldest concepts in the social sciences. Originally applied in communication studies, it elucidates how an idea or product gains traction and spreads over time within a particular population or social system. Innovation adoption is not a social process that happens all at once in a system; rather, it develops gradually, with some people being more inclined to accept innovations than others. The distinction between early and late adopters emphasizes how crucial it is to comprehend the traits of the intended audience when introducing a new idea in order to promote acceptance. In this framework, innovation, communication channels, time, and social systems are the four essential components influencing the diffusion of innovations. In the context of Rwanda's adoption of e-filing technology, it represents a relatively new practice, akin to an innovation for each individual utilizing internet technology.

2.2.5 Risk management model

Towards the end of the 20th century, risk management began to gain prominence as a critical tool in both policy and business literature, permeating various facets of commercial and public sector management, as noted by Power (2004). Although tax risk management was once considered a subset of general risk management, it is now recognized as a distinct discipline in its own right. (Elgood, Paroissien, and Quimby 2005) assert that operational risk, compliance risk, and financial accounting risk are integral components of risk management applicable to multinational corporations with subsidiaries operating across different jurisdictions.

Arlinghaus (1998) defines tax risk as the potential deviation of tax outcomes from expectations due to various factors, including legal system intricacies, legislative changes, shifts in business assumptions, heightened audit frequency, interpretational uncertainties, and actions by the tax function that may lead to negative publicity for the company. Therefore, while tax depreciation is expected to be deductible from taxable profits in subsequent years, the extent of this tax benefit remains uncertain due to challenges in predicting the company's tax position or potential legislative amendments. This uncertainty presents an economic and technological tax risk with potentially unpredictable financial consequences. Tax risk encompasses various aspects that can be evaluated using frameworks such as The Committee of Sponsoring Organizations of the Treadway Commission (COSO), which considers all company decisions, actions, and operational uncertainties in assessing tax risk comprehensively.

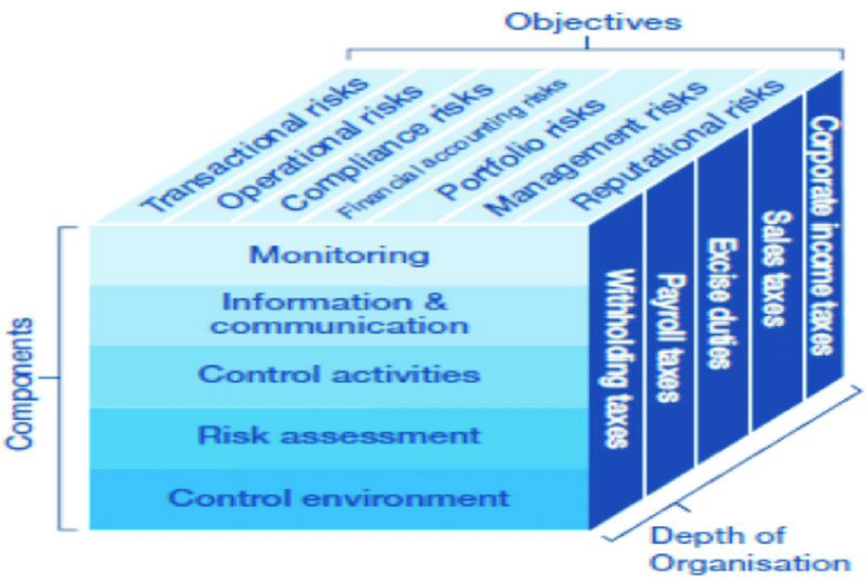


Figure 5-2: Depicts a tax risk management model analogous to the COSO model, sourced from Elgood et al. (2004).

Cozmeia and ùerban (2014) identify specific risk areas in tax management. ***Transactional risk*** pertains to uncertainties in particular transactions, especially those deemed high-risk, such as restructurings, reorganizations, and mergers. ***Operational risk*** involves potential losses due to internal processes, personnel, system failures, and external factors, including ambiguity in applying tax regulations to routine activities like expanding into foreign markets or adopting new technologies. ***Compliance risk*** encompasses aspects like tax return preparation and legislative, legal, tax technical, and regulatory risks.

Electronic filing systems are seen as a tax risk management approach by aligning enforcement strategies with taxpayer behavior to mitigate risks such as ***registration***, ***filing, payment, and declaration errors*** (Fiscalis Guide, 2006, p.13). It is believed that e-filing can enhance tax collection and compliance by reducing errors and risks in tax payments. While tax laws are complex, electronic filing can simplify the process by automating calculations, flagging errors, prompting for missing information, and assisting in claiming credits and deductions.

2.3 Review of related Literature

2.3.1 Electronic filing system and traditional tax system

The advancement of information technology has led to a global focus on online tax systems, particularly in developing countries, as seen in the increasing adoption of electronic tax revenue collection methods (Nisar, 2006). E-filing systems offer numerous benefits, such as improved efficiency and accuracy for tax officers due to the availability of better information (Jahirul, 2011), as well as cost savings and resource reallocation for administrative tasks like auditing and customer service (Geetha & Sekar, 2012).

Traditional paper-based tax processes present various challenges, including high compliance costs and limited analytical capabilities for tax agencies. Oyebola Okunogbea and Fabrizio Santorob (2023) emphasized the importance of traditional enforcement measures alongside new technologies to combat tax evasion effectively. Electronic filing and payment systems not only aid in addressing tax evasion and corruption but also contribute to achieving market equilibrium, reducing the informal economy, and promoting equitable business opportunities (Oyebola Okunogbea & Fabrizio Santorob, 2023). For instance, the Rwanda Revenue Authority (RRA) has utilized electronic filing and payment systems to streamline tax processes and improve compliance. This technology has made tax filing and payment more convenient and transparent for citizens and businesses, leading to easier audits and enhanced revenue collection (researcher, 2023).

2.3.2 E-filing and tax compliance

Research on the relationship between e-filing and tax compliance has garnered attention due to the widespread adoption of electronic tax filing methods (Becker & Lacktorin-Revier, 2008). Previous studies have highlighted the situational nature of ethics, indicating that personal ethics strongly influence tax compliance (Becker & Lacktorin-Revier, 2008). While Muturi & Kiarie (2015) found that online tax systems impact tax compliance among small taxpayers, Gwaro et al. (2016) concluded that the stability of online tax return systems does not significantly affect tax compliance levels. Additionally, computer literacy levels were found to play a significant role in influencing tax compliance.

Geetha & Sekar (2012) discovered that users generally express satisfaction with e-filing facilities; however, individual taxpayers often lack awareness of e-filing and e-payment procedures. Schaupp, Carter & Hobbs (2009) revealed that performance expectancy, social influence, facilitating conditions, and optimism bias significantly impact the intention to e-file. Lastly, Korir (2011) emphasized that taxpayers' attitudes toward the tax system are influenced by various factors, which ultimately shape their behavior and encourage tax compliance (Korir, 2011).

2.3.3 Tax payer Attitudes and Tax Compliance.

Wenzel (2004) emphasizes that the interaction between tax authorities and taxpayers plays a crucial role in shaping taxpayer attitudes. Alm et al. (2006) further assert that trust in the state enhances positive attitudes and commitment to tax payment, ultimately leading to voluntary compliance in reporting and fulfilling tax obligations. Understanding the drivers of taxpayer behavior toward compliance or noncompliance is complex, but research by Dr. Valerie Braithwaite suggests that taxpayers adopt sets of values, beliefs, and attitudes, known as "motivational postures," influenced by various factors. The Organization for Economic Co-Operation and Development (OECD) research report (2004) suggests that revenue authorities can strategically manage compliance programs by understanding taxpayer motivation theories and factors influencing compliance behaviors. By analyzing compliance behavior, authorities can address the root causes of non-compliance rather than merely treating symptoms, leading to longer-term compliance outcomes.

Picur et al. (2006) discuss three theoretical perspectives: economic models, uncertainty models, and norms of compliance models to explain tax compliance levels. Economic models suggest that taxpayers aim to maximize financial gains while weighing the risks of evasion and detection. Uncertainty models expand on this by acknowledging the uncertainty surrounding penalty provisions and audit possibilities. Norms of compliance models explore how tax culture influences taxpayer behavior standards.

2.3.4 Tax Compliance Costs

Tax Compliance costs are costs incurred by the costs borne by businesses and individuals (. Taxpayers) as a result of their obligations to the relevant tax laws in force in a country. Corporation tax compliance costs, as defined by Sapiei, N.S., and M. Abdullah (2014), are the costs associated with the resources that corporate taxpayers must use to comply with tax regulations. Tasks related to tax compliance for firms include filing tax returns, obtaining the needed receipts, maintaining accurate records, and obtaining the data required to perform these responsibilities correctly. Dealing with tax auditors and settling disputes with tax authorities take time, which can also be assessed as a compliance cost in this scenario when taxpayers are selected by the tax authority for audits and investigations.

Sandford, Godwin & Hardwick (1989) classify corporate taxpayers' tax compliance costs into three categories: internal, external, and psychological. Internal costs involve expenses related to in-house staff, such as accountants, handling tax affairs, while external costs include payments to external professionals for tax advisory services. Psychological costs encompass stress and dissatisfaction arising from compliance with tax laws and regulations. These expenses reflect the time and resources required for tax compliance, as noted by Vaillancourt & Clemens (2008), underscoring the financial and psychological burdens placed on taxpayers.

2.3.5 E-filing system quality, security and E-filing information quality

Three essential components of electronic tax filing processes are the quality of the e-filing system, security, and e-filing information.

E-filing System Quality: This pertains to the electronic filing system's general functionality, dependability, and usability. According to Schaupp, Carter, and Hobbs (2009), an excellent electronic filing system guarantees easy navigation, little downtime, and user-friendly interfaces, all of which improve taxpayer satisfaction and compliance.

Security: To prevent unauthorized access, modification, or theft of important taxpayer information, security precautions are crucial in electronic filing systems. A safe e-filing environment must have strong encryption methods, secure authentication procedures, and strict access limits Gwaro et al. (2016).

Information Quality for Electronic Filing: This refers to the correctness, comprehensiveness, and applicability of the data submitted electronically.

To compile and submit their tax information appropriately, taxpayers rely on e-filing services. Smooth tax compliance procedures are made possible by high-quality e-filing information, which lowers errors and discrepancies Geetha & Sekar. (2012). But building taxpayer trust and encouraging voluntary compliance with tax laws requires guaranteeing the caliber, security, and integrity of e-filing systems and data.

2.2.6 Electronic Tax Payment System

It has been demonstrated that e-filing solutions improve the accuracy and efficiency of tax administration procedures. Yılmaz, F., & Coolidge, J. (2013) emphasizes that e-filing improves the volume and quality of data that tax officers have access to, which speeds up transactions, reduces error rates, and expedites the issuing of assessments and refunds. E-filing also lessens the need for fines and other punitive actions, which saves money on administrative expenses and frees up resources for other uses like customer support and auditing.

The Nigerian government implemented the Integrated Tax Administration System (ITAS) in 2015 by the Federal Inland Revenue Service with the goal of updating tax administration and moving away from manual methods in compliance processes, this helps to automate a number of fundamental tax procedures, such as filing returns and registering, paying, auditing, and assessing. Despite the potential benefits of electronic payments for tax compliance, there are uncertainties regarding their impact. Rogoff. (2016), OECD. (2017), and Awasthi and Engels chalk. (2018) suggest that electronic transactions could simplify tax administration due to the paper trail they create. Almunia et al. (2021) contend, however, that businesses may deliberately avoid tax liabilities and that governments might not be able to make efficient use of third-party information. New empirical data on the effect of electronic payments on tax compliance in West Bengal, India, is presented by Warwick et al. (2022) underscoring the need for more study to fully comprehend the connection between tax revenues and electronic payments.

2.2.7 Challenges E-tax service systems in tax administration.

The utilization of computers has introduced challenges in tax administration that have received insufficient attention despite the overall positive impact of computerization on organizational performance. Despite Revenue Authorities' successful adoption of E-tax service systems, they continue to grapple with several persistent challenges:

1. Affordability remains a concern, particularly for taxpayers who are unfamiliar with

online tax preparation and filing processes. While there are options for free submission of tax returns, navigating these systems often requires a learning curve. Some taxpayers find the process daunting and may opt to seek professional assistance, whether through traditional paper-based methods or technological means Kamana (2016).

2. The lack of internet access poses a significant barrier to the widespread adoption of E-tax service systems. Although online portals are available, not all taxpayers have reliable internet connectivity, especially in rural areas. This disparity primarily benefits urban businesses and hampers the system's adoption in rural regions, where internet access is limited Kamana (2016) noted. The unreliable network further complicates service delivery for Revenue Authorities.
3. Trust, security, and privacy concerns persist among taxpayers regarding the use of their data during online transactions. The possibility of data breaches and internet vulnerabilities exacerbates these fears, leading to biases and distrust among taxpayers. Mukasa et al. (2011) highlights how incomplete knowledge about tax system operations can influence attitudes and perceptions of fairness. Despite assurances, authorities have struggled to convince the public that their information is secure and inaccessible to unauthorized parties.

2.4 Other empirical Studies

Various studies have examined the impact of electronic tax systems in different countries. (Sagas, Nelimalyani, and Kimaiyo, 2015) conducted research on the effect of electronic tax registers (ETRs) on revenue collection in Kenya's western region. Their findings revealed that 75% of respondents believed ETR machines helped reduce tax evasion, while 86% noted their contribution to increased revenue collection due to their efficiency.

In a study by Wawire (2016) focusing on Kenya's tax system, tax buoyancy and income-elasticity were analyzed through regression of tax revenues on their respective tax bases. The study concluded that the tax system had shortcomings in generating necessary revenues. However, it was criticized for not considering other determinants affecting tax revenue, such as external circumstances, and for not disaggregating tax revenue data by source, making it difficult to ascertain the contributions of different tax bases to the treasury. Additionally, it overlooked the time series properties of the data used.

Efunboade (2014) investigated the impact of electronic tax systems on tax administration in Nigeria, particularly in response to declining revenues from crude oil exports. The study highlighted the significant role of electronic tax systems in increasing internally generated revenue by enhancing compliance, productivity, and overall economic activity in the country. However, it emphasized the need for concerted efforts to adopt electronic tax system technologies to drive tax administration forward. The implementation of electronic tax systems is identified as a catalyst for accelerated growth and poverty reduction in Nigeria and across the African continent. A key recommendation stemming from this research is the urgent need for legislative action to reduce or eliminate import taxes on essential information technology hardware. This includes computers, servers, printers, biometric scanners, and other related devices. Such regulatory changes are crucial to facilitate greater accessibility and affordability of technology, thereby enabling wider adoption of electronic tax systems. By eliminating entrance barriers and encouraging the use of digital tools, governments can increase the effectiveness of tax administration, spur economic growth, and lessen poverty in the area.

In the context of Malaysian tax e-filing, (Azmi and Kamarulzaman ,2010) study investigated the relationship between perceived risk and its features within the Technology Acceptance Model (TAM). The research emphasized the growing significance of e-government services, particularly tax e-filing, in many countries. Despite its rapid adoption, there remains a lack of trust in the system, especially in developing nations, due to high perceived risks among the general population. The study identified various risks, including performance, psychological, time, and privacy risks, which may hinder the adoption of e-filing systems, particularly for taxpayers lacking IT proficiency. Recommendations included the development of risk-reducing measures, such as enhanced security features, to promote the use of electronic filing systems. (Lubua, E. W, 2016) argued in his research that revenue collection is vital for a nation's economy. He focused on Tanzania and demonstrated how e-transparent services can enhance voluntary tax compliance among Small and Medium Enterprises (SMEs). The study highlighted factors such as employee honesty, business experience, knowledge of tax rules, and the use of relevant ICT technologies by the revenue authority to improve voluntary compliance.

Similarly, (Muita , 2010) conducted research on the acceptance and use of e-filing systems among Large Taxpayers in Kenya. The study emphasized the importance of infrastructure, user abilities, and the tax authority's readiness to promote tax compliance-based technology. (Dowe ,2008) further emphasized the prerequisites for successful e-filing and e-payment systems, including reliable internet service, cooperative financial institutions, an IT-oriented public, and adequate financing.

He mentioned that the implementation process for electronic tax systems begins with the development of a strategic business plan – documenting the ideas and actions, desired outcomes and the time frame for each component, considering the strengths and weaknesses of the tax administration and environmental opportunities and threats. The plan should also document the implementation strategy including the implementation approach. Many countries have taken a gradual approach by allowing voluntary e-filing and e-payment for select segments of the taxpayer base, e.g. individuals or companies only, in the initial stages to allow for live testing of the system.

(Maisiba and Atambo 2016) examined the impact of Rwanda's computerized tax administration system, demonstrating its effectiveness in facilitating timely tax payments at lower costs. (Olurankinse, F.; Oladeji, O. E. 2018) studied self-assessment and e-taxation payment systems in Nigeria, highlighting their positive correlation with revenue production and tax compliance among corporate organizations. (Daniel Akpubi and Olusola Igbekoyi, 2019) researched the effect of electronic tax filing system costs on tax compliance among SMEs in Lagos state, revealing the significance of taxpayer awareness and the impact of compliance costs on system utilization.

3 HISTORY AND CURRENT STATUS OF TAX ADMINISTRATION IN RWANDA

3.1 Introduction

Overall, the Rwanda Revenue Authority plays a crucial role in revenue mobilization and administration, aiming to contribute to the economic development of Rwanda through effective and equitable revenue collection practices

Establishment: The Rwanda Revenue Authority was established under Law No 15/97 of 8 November 1997. It operates as a quasi-autonomous body with the responsibility of assessing, collecting, and accounting for various revenues, including taxes, customs duties, and other specified revenues.

Mandate: The primary functions of the RRA include administering and enforcing laws related to tax, customs, and other specified revenues. It also collects non-tax revenues and provides advice to the government on tax policy matters. Additionally, the RRA is tasked with performing other duties related to tax administration as directed by the Cabinet.
Vision: The vision of the Rwanda Revenue Authority is to become a "world-class efficient and modern revenue agency, fully financing national needs." This vision indicates a commitment to achieving high standards of efficiency and modernization in revenue collection to meet the financial requirements of the nation.
Mission Statement: The mission of the RRA is to "mobilize revenue for economic development through efficient and equitable services that promote business growth." This mission emphasizes the role of the authority in generating revenue to support economic development while ensuring fairness and efficiency in its services. It also highlights the importance of fostering business growth within the country.
Organization structure: The RRA is governed by a Board of Directors under a Board Chairperson who is appointed by the Prime Minister on the recommendation of the Cabinet. The Board is responsible for the formulation and implementation of the day-to-day policies of the RRA. Here below is a figure showing organization structure of RRA:

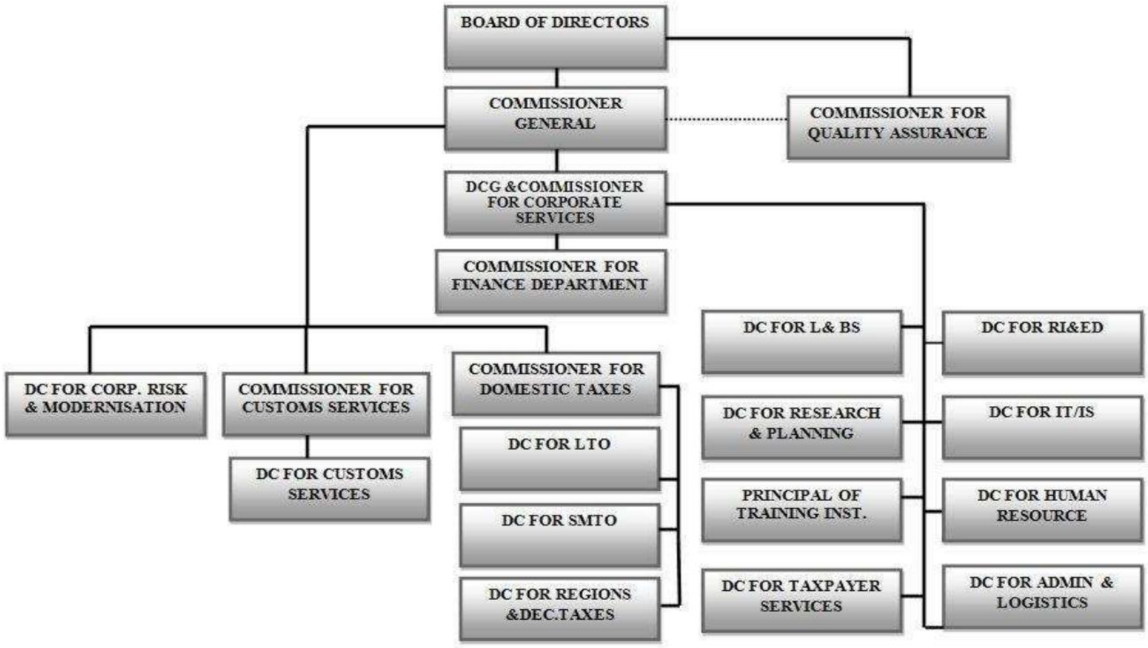


Figure 6-3: Organization structure of RRA

3.2 Registration taxpayer process

In Rwanda, the first step to become a taxpayer is to register businesses with the Register General either online through the Rwanda Development Board (RDB) portal or directly through the Rwanda Revenue Authority (RRA) in certain circumstances. After getting registered taxpayers issued a unique Taxpayer Identification Number (TIN) which facilitates their compliance with tax obligations. While business registration is primarily conducted online through the RDB portal to leverage the aftercare and investment promotion services provided by RDB, assistance is available both online and at RDB and Business Development Fund (BDF) offices.

Additionally, RDB and RRA systems are integrated to ensure a streamlined registration process and clear understanding of tax responsibilities. Despite the option for assisted registration at various offices, taxpayers benefit from the convenience of online registration, supported by resources like the RRA Tax Handbook and assistance hotlines provided by RDB and RRA. It is noteworthy that business registration in Rwanda is free of charge, whether done online, at RDB and BDF offices, or through private internet cafés, although the latter may charge a fee for their services[3].

Figure 7-3: Business registration process in Rwanda

3.3 The requirement to register a business in Rwanda

In the Rwanda Development Board (RDB) business registration system, there are three main categories for business registration: 'Domestic' company, 'Enterprise' for individuals, and 'Foreign' company. Registering as 'Domestic' is applicable for domestic companies or subsidiaries of foreign companies. 'Enterprise' registration is suitable for sole traders or partnerships, particularly for businesses with a turnover less than FRW 10,000 per day. 'Foreign' registration is for companies already established and registered abroad that intend to operate in Rwanda, excluding domestic subsidiaries of foreign entities.

The documentation requirements vary based on the business category. For 'Domestic' companies, necessary documents include Rwanda National ID or Passport for all shareholders, directors, company secretaries, and accountants, along with notarized articles of association if applicable. For 'Individual Enterprise' registration, only a Rwanda National ID or Passport is required. 'Foreign' companies need additional documentation such as a notarized power of attorney, articles of association, certificate of incorporation from the country of registration, and a company resolution for establishing a branch in Rwanda. All documents must be scanned and attached during the business registration application

3 https://ondemandint.com/company-registration-in-rwanda/

process.

- **Researcher's comment**

With choices for online registration through the Rwanda Development Board (RDB) portal or in-person registration at RDB and Business Development Fund (BDF) offices, Rwanda's business registration procedure is made to be both easily accessible and efficient. The efficiency and clarity of understanding tax responsibilities is ensured by the integration of Rwanda development board and Rwanda Revenue Authority (RRA) systems. The government has demonstrated its commitment to aiding taxpayers during the registration process by helping both online and at physical locations, in addition to tools like the RRA Tax Handbook and assistance hotlines. In addition, free business registration whether done online or in person promotes diversity and lowers entrance barriers for business owners. All things considered, this strategy promotes an atmosphere that is favorable to Rwandan company expansion and development.

3.4 How Taxpayers Register for Different Taxes and Fulfill Declaration and Payment Requirements?

Upon registering a business in Rwanda, all businesses are automatically enrolled for Income Tax, which could be either Personal Income Tax (PIT) or Corporate Income Tax (CIT), based on the number of shareholders involved. If the business has a single shareholder, it is registered for PIT, whereas multiple shareholders lead to registration for CIT.
Additionally, businesses are required to register for Trading License Tax and Public Cleaning Service Fees at LGT tax centers immediately after their business registration process is completed. A Trading License Tax certificate, obtained after declaring and paying the Trading License Tax, is mandatory for all profit-oriented activities.
Moreover, taxpayers registered for Trading License Tax must consistently declare and settle Public Cleaning Service Fees on a monthly basis. Furthermore, during the registration process, certain inquiries prompt the registration of tax accounts for other tax types like Value Added Tax (VAT) and Pay as You Earn (PAYE). Subsequent to registration, taxpayers are obliged to submit tax declarations for all registered tax types from the date of their registration. Even if there is no business activity within the initial or subsequent tax periods, the submission of declarations remains mandatory to avoid penalties.

This encompasses not only domestic taxes like Income Tax but also Local Government Taxes such as Trading License Tax and Public Cleaning Service Fees. Adherence to these procedures ensures compliance with tax regulations and aids in the smooth operation of businesses within Rwanda.

Figure 8-3: Taxes applicable in Rwanda[4]

[4]https://www.rra.gov.rw/en/publications?tx_news_pi1%5Baction%5D=detail&tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Bnews%5D=1100&cHash=d8753b85361829b7

3.4.1 Domestic Taxes and E-Tax

E-Tax is an online portal through which all domestic tax types can be declared. This can be done online or with the help of staff at RRA offices. RRA has developed the E-Tax system to make it easier for taxpayers to declare and pay domestic taxes. The process of declaring online is the same as the process of declaring with the help of staff at RRA offices. However, there are many advantages for taxpayers to declare online. The only domestic tax type which could cannot be declared online is Capital Gains Tax.

This can only be declared with the help of RRA staff at RRA offices. In certain cases, Income Tax can also be declared on mobile phones using M-Declaration. Local Government taxes can be declared either M-declaration which accessed by dialing *800#. By Local Government Tax System access the E-Tax website at (RRA)[5] or through the RRA website[6] and click 'Pay Domestic taxes here' on the right of the screen. Taxpayers are automatically registered for E-Tax when their business is registered with RDB. Taxpayers are informed of their unique Taxpayer Identification Number (TIN) and E-Tax password by SMS and email using the contact details given when they registered. Upon login, taxpayers can change their E-Tax password and access various services. For those who need assistance with their TIN, RRA offices or the toll-free RRA call center can provide support.

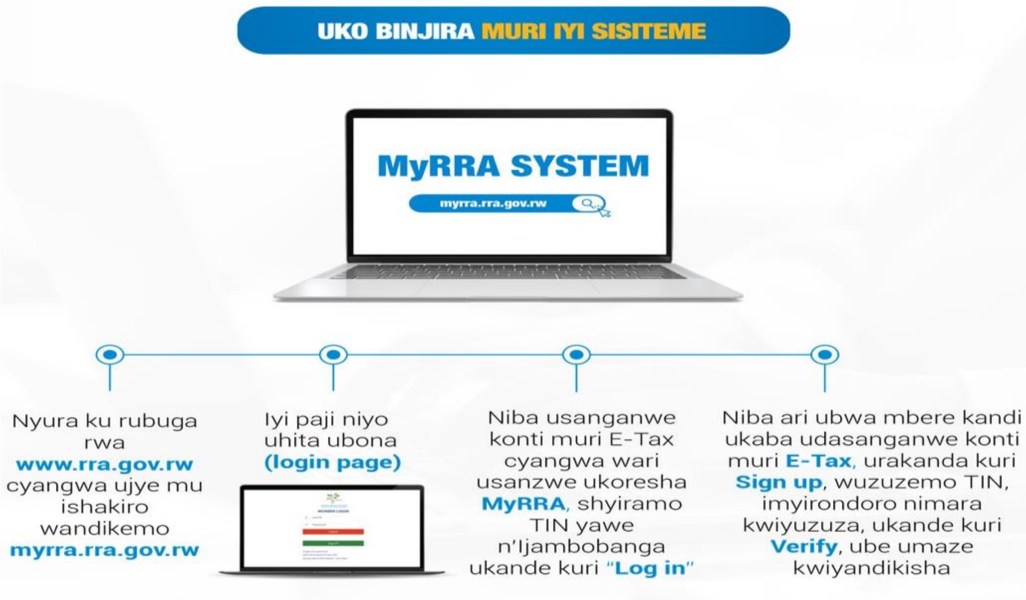


Figure 9-1: Showing how to login in MyRRA system

3.4.2 Domestic Taxes Penalties and Fines

There are penalties and fines for certain offences that are similar for the majority of domestic taxes. The penalties and fines for these offenses are explained in turn below. If a self-disclosure is made by a taxpayer that was previously not registered with the tax administration, the penalties and interest described in this section are waived.
A taxpayer who has failed to submit a tax declaration and payment within the required deadline must still declare and pay, and is subject to:

738e82dfdd9fb9e4

[5] https://etax.rra.gov.rw
[6] http://www.rra.gov.rw

- A fine for late payment, depending on the period: Twenty percent (20%) of the tax due if the time limit for declaration and payment has not been exceeded by thirty (30) days; Forty percent (40%) of the tax due if the time limit for declaration and payment has been exceeded by thirty (30) days but has not been exceeded by sixty (60) days; Sixty percent (60%) of due taxes if the time limit for declaration and payment has been exceeded by sixty (60) days.
- 1.5% interest on a monthly basis
- Fixed administrative fine of: FRW 100,000 for taxpayers with annual turnover below FRW 20,000,000, FRW 300,000 for taxpayers with annual turnover above FRW 20,000,000, FRW 500,000 for taxpayers who have been informed by RRA that they are in the category of 'large' taxpayers.

A taxpayer who declared the requisite tax on time, but did not pay the declared tax is subject to:

- A fine for late payment, depending on the period: Ten percent (10%) of the tax due when the time limit for payment has not been exceeded by thirty (30) days; Twenty percent (20%) of the tax due when the time limit for payment has been exceeded by thirty (30) days but not exceeded by sixty (60) days; Thirty percent (30%) of due taxes if the time limit for payment has been exceeded by sixty (60) days.
- 1.5% interest on a monthly basis

- Fixed administrative fine of: FRW 100,000 for taxpayers with annual turnover below FRW 20,000,000; FRW 300,000 for taxpayers with annual turnover above FRW 20,000,000; FRW 500,000 for taxpayers who have been informed by RRA that they are in the category of 'large' taxpayers.

The penalties for under-declaration depend on whether the taxpayer rectifies their own tax declaration or whether the taxpayer is found by RRA to have declared less than the correct amount.

A taxpayer who submits a declaration, and is found by RRA to have declared lower tax due that is more than 10% of the correct amount but less than 20% of the correct amount, must pay the difference and is subject to:

- A fine of 10% of the amount of the understatement
- 1.5% interest on a monthly basis

A taxpayer who submits a declaration, and is found by RRA to have declared lower tax due that is more than 20% of correct amount, must pay the difference and is subject to:

- A fine of 20% of the amount of the understatement
- 1.5% interest on a monthly basis

A taxpayer who submits a declaration, but realizes that they have declared a lower amount due than the correct amount and conducts self-reassessment after the deadline but before notification of an imminent audit, must pay the difference and A fine of:

- Twenty percent (20%) of the tax due, if the time limit for declaration and payment has not been exceeded by thirty (30) days;
- Thirty percent (30%) of the tax due, if the time limit for declaration and payment has been exceeded by thirty (30) days but not exceeded by sixty (60) days;
- Forty percent (40%) of the tax due, if the time limit for declaration and payment has been exceeded by sixty (60) days;

A taxpayer who submits a declaration, but realizes that they have declared lower tax due than

the correct amount and conducts self-reassessment and pays the correct amount before they are notified of an imminent audit, is not subject to the administrative penalty for under-declaration, Interest is non-compounding. This means that interest is always on the principal amount, i.e. the tax due, there is no interest charged on interest. Interest is charged from the first day after the tax should have been paid until the day of payment, which is included. Every month that begins is considered as a complete month. The interest cannot exceed 100% of the original tax due.
If an offence is repeated on another occasion within five years, the fixed administrative fine is doubled. If the offence is repeated on any other occasions within five years, the fixed administrative fine is quadrupled. Taxpayers are informed by RRA whether they are categorized as small, medium or large taxpayers.

- **Researcher’s comment**

The comprehensive range of domestic taxes in Rwanda, including Income Tax, Value Added Tax (VAT), Excise Duty, and others, serve various purposes from taxing income progressively to ensuring equitable sharing of benefits from natural resources. The implementation of the E-Tax system aims to streamline tax compliance and efficiency for taxpayers by providing online declaration and payment facilities, automatic registration upon business registration, and accessible support services.

However, failure to adhere to tax deadlines incurs penalties and fines, encouraging timely compliance. These penalties and fines vary based on factors such as delay period, taxpayer classification, and extent of under-declaration, reflecting the Rwandan government's commitment to enforcing tax compliance and ensuring revenue integrity.

3.5 Key Challenges associated with revenue collection in RRA

Despite its good performance, Rwanda Revenue Authority still faces various challenges and risk associated with revenue collection that hinders its performance. The main ones are highlighted below:

3.3.1 Low tax compliance culture by some taxpayers

Although the tax compliance kept increasing over time, some taxpayers do not declare and pay their due taxes or intentionally lower the taxable base to evade taxes. In addition, some VAT registered taxpayers are still reluctant to use the Electronic Billing Machines despite it being one of the most effective tools to collect accurate tax liability information in real time.

3.5.2 Prosecution of tax evaders

Despite significant efforts made by the judiciary system in handling tax offence cases submitted to courts, there are areas that need further improvements:

- Public prosecutors are preoccupied with a heavy backlog of criminal cases and tax fraud cases are not given priority.
- Public prosecutors have limited expertise in tax matters, which leads to some complex tax fraud cases not being prosecuted successfully before the Courts of law.

3.5.3 Continued staff turnover due to RRA’s inability to attract and retain highly qualified and competent staff.

From July 2017 to June 2018, RRA recorded 25 employees who left voluntarily, composed of 16 resignations and 9 leave of absence cases. This is a decrease of 16.7% from 30 who left voluntarily in 2016/17. Of the 25 employees who left voluntarily, 4 were managers while 21 were technical staff. Although in general the number is not alarming, we lost a number of skilled and experienced staff and this adversely affected RRA performance

and service delivery.
We hope the staff retention and welfare scheme implemented from July 2018 as well as salary increase implemented from August 2018 will contribute to the reduction of staff turnover due to administrative inefficiency. RRA believes that it is not operating at its full potential and the restructuring process “NOM” is intended to address this issue. In fact, the delay to fully implement NOM has not only affected the RRA plans but also created uncertainty with in the institution. As result, this led to high staff turnover; fiscal year 2021/22 recorded the highest staff turnover of 2.3% compared to 0.96% for FY 2020/21 and 1.4% for FY 2019/20.

3.5.4 High Domestic tax arrears

Despite efforts employed to recover tax arrears such as automation of enforcement processes, tax arrears are still high and keep on increasing year on year. Tax arrears escalated by 41.7% in FY 2020/21, fiscal year 2019/20 had recorded 36.8% and FY 2021/22 recorded an increase of 8.2%. Also, there is Inaccurate interpretation of some tax laws caused revenue loss and unfavorable judicial outcomes on tax corruption cases.

- **Researcher point of view**

A multifaceted strategy that includes technical developments, capacity-building programs, legal reforms, and strategic organizational management is needed to address these issues. By addressing these challenges head-on, RRA can improve the efficacy and efficiency of its income collection, which will support Rwanda's long-term economic growth.

3.6 Key Risks in Revenue Collection for RRA

3.6.1 Registration risk

Any person who sets up a business or other activity that may be taxable is obliged to register with Rwanda Development Board (RDB) within a period of seven (7) days from the beginning of the business or activity or the establishment of the company. From the analysis, it was found out that Some Taxpayers are registered in some tax heads but not registered in other taxes which they are eligible, here are examples:

- ✓ High Significant potential operating businesses not registered as Taxpayers
- ✓ Taxpayers declaring CIT/PIT turnover eligible for VAT but not registered
- ✓ Taxpayers registering in VAT but not in CIT/PIT
- ✓ Taxpayers registering in CIT/PIT but not in PAYE Importers importing goods with CIF eligible for CIT/PIT registration but not registered Importers importing Vatable goods with CIF eligible for VAT registration but not registered.
- ✓ Taxpayers with trading license, purchases and/or importation but not registered in income tax

3.6.2 Filing risk

From RRA analysis, it was found out that the following are the most practices: Many small Taxpayers lack of understanding of tax obligations Late filing and missing returns. However, to avoid this, Taxpayers should regularly file their tax returns on time.
Payment Risk: From RRA analysis it was found out that the following are the most practices.

3.6.3 Payment risk

From RRA analysis it was found out that the following are the most practices. Nonpayment of taxes late payment of taxes. In order to avoid this, Taxpayers should: Make all payments on time make a follow up of their business transactions to record all payments.

3.6.4 Inaccurate and incomplete reporting risk

From RRA analysis, it was found out that the following are the most practices:

- ✓ High Under declaration of income
- ✓ Inflated expenses and continual losses
- ✓ Taxpayers implementing aggressive tax planning
- ✓ Purchases and expenses being redirected for personal use
- ✓ Wrong number of losses carried forward
- ✓ Interest declared on shareholder's loans exceeding 4 times the amount of equity

Therefore, Taxpayers are requested to comply with tax laws and regulations to address issues mentioned above by using EBM V.2 and those without EBM V.2 are requested to acquire them because RRA is extremely willing and prepared to assist taxpayers comply with tax laws and regulations.

3.7 RRA Risk Management Approaches in Revenue collection

RRA undertook proactive actions to identify and management risks that may affect its operations, the following key achievements were recorded towards risk management and integration of risk mitigations in RRA operations:

3.7.1 The evaluation of risk mitigation

Risk registers are maintained at departmental and corporate level. Risk mitigation strategies are therefore then in daily operations and monitored and evaluated quarterly by risk management committees. These committees produce quarterly reports alongside their meetings. For example, as end June 2022 there were 169 risks in all risk registers, 137 open and 32 closed risks. The final evaluation done by respective risk management committee meetings showed that implementation level of overall risk mitigation strategies was 82.5% as of end June 2022 against a target of 75%.

3.7.2 The tax compliance improvement plan

RRA Tax improvement plan Mainly focused on five main aspects i.e., general and sector specific compliance interventions, construction sector compliance interventions, Information and Communication sector compliance interventions, importers compliance interventions and clearing agents' compliance interventions.

In the year 2021/2022 the general compliance interventions were implemented at; 85% for general sector, 100% for construction sector, 97.5% for Information and Communication sector, 97.5% for importers and 80% for clearing agents. Additionally, the overall implementation status by the end fiscal year 2021/22 was 92.5% against a target of 85%. Again, a developed and deployed a centralized risks rules dashboard for piloting EBM division compliance operations.

The automated risk rules help to identify risky areas for further analysis; these risk rules are accessible via the web link. Also Review and automate VAT refund process to allow low risk taxpayers to receive their VAT refunds automatically subject to post refund payment checking is another risk Management activity done by RRA.

3.7.3 Strengthening Internal Control Systems.

RRA conducted internal audit to strengthen the internal control every had a plan to the audit. For example, during the 2021/22 fiscal year, 14 internal audit assignments were completed out of 17 that were planned (82.4% achievement). Three planned internal audit cases were deferred to 2022/23 fiscal year. The deferred audit assignments relate to; revenue accountability statement, enforcement procedures and debt management, human resources management, payroll and HR policies. RRA staffs Maintain high level integrity which is a key foundation for RRA operations, as such during 2021/22 fiscal year, 17 integrity investigations were completed compared 19 investigation cases handled during 2021/22 fiscal year. Additionally, RRA continued to implement an international standard for their quality management system (QMS). RRA implemented ISO 9001: 2015 standards on quality management systems since its inception in 2009, QMS audits are periodically conducted to ensure compliance with the standard. During 2021/22 fiscal year, 7 QMS audits were completed against a target of 8 cases. To strengthen internal control system Monitoring of implementation of audit recommendations was ensured by conducting monthly management review meeting and by end June 2022, implementation progress portrayed the following results:

1. Out of 160 internal audit recommendations that were issued in the last five fiscal years and were still open in 2021/22 fiscal year (In total, 79 audit recommendations were raised from the finalized internal audit assignments, of which 67 (84.8%) were rated at high risk, while 12 (15.2%) were rated at medium risk.
   All these recommendations were captured in the implementation plan for 2020/21 fiscal year.): 70 were fully implemented (44%); 43 partially implemented (27%); while 47 recommendations had not been implemented by the end of 2021/22 (29%). 84 (53%) internal audit recommendations that are at least 12 months old remained open as at 30th June 2022.
2. Implementation of Auditor General's recommendations was also reviewed on a regular basis. By end June 2022, out of 95 Auditor General's recommendations that were still open at the beginning of 2021/22 fiscal year: 49(52%) were fully implemented; 13 (14%) were partially implemented; and 33 (35%) not implemented by the end of the fiscal year. In total, open Auditor General's recommendations that are at least 12 months old were 40 as at 30th June 2021, representing 42%.
3. For QMS audit recommendation, 39 (55%) audit recommendations out of 71 audit recommendations were fully implemented by end June 2022, 12 recommendations equivalent to 17% were partially implemented, 20 (28%) recommendations not implemented while 32 recommendations representing 45% were still open by end June 2022.

3.7.4 Risk Differentiation Framework (RDF).

RRA adopted the Risk Differentiation Framework (RDF) tool made up of four different quadrants (groups) that contain taxpayers with common behaviours as per risk perspective. RDF tool helps to frame taxpayers' risk levels using different metrics[7].

Quadrant 1: Higher Risk Taxpayers
Quadrant 2: Key Taxpayers
Quadrant 3: Medium Risk Taxpayers
Quadrant 4: Low Risk Taxpayers

Figure 10-3: RRA Risk Differentiation Framework (RDF)

7 https://www.rra.gov.rw/fileadmin/user_upload/RRA_Tax_Compliance_Improvement_Plan__2023-2024_.pdf

The above RDF is based on the premise that RRA risk management approach to tax compliance should take account of our perception of both the:

i) Estimated likelihood of having a tax position that RRA disagree with, or taxpayer (through error or omission) have misreported tax obligations (as evidenced by behaviour, approach to business activities, governance, and compliance with tax laws),

ii) Consequences of that potential non-compliance (financial impact, relative influence, impact on community confidence)

For higher risk taxpayers, RRA assign appropriate resources to allow for continuous review. These activities may include comprehensive audit and other intensive risk analysis approaches. This will enable RRA to identify and understand risks as they arise and provide information about our possible concerns, allowing the taxpayer to make a more informed choice about their compliance approach.

For key taxpayer, RRA take a particularly close interest in your risk management and governance frameworks to mitigate tax compliance risks. It is believed that the key taxpayers to fully disclose potentially contestable matters to RRA as they arise. RRA assign the necessary resources to ensure a good working relationship and increase its understanding of your business.

For taxpayers identified as medium risk, RRA undertake targeted activities to deal with tax compliance concerns. These activities are more likely to be reviews and audits. RRA may contact Taxpayer to seek assurance that a particular transaction has been treated correctly.

Lower risk taxpayers, RRA monitor intelligence to confirm your lower risk categorization. This can involve activities such as requesting targeted information about specific issues identified, visiting taxpayers for information about business operations, and normal internal review processes.

- **Researcher's concern**

Overall, RRA has demonstrated a comprehensive approach to risk management in revenue collection. By maintaining risk registers, implementing targeted compliance interventions, strengthening internal control systems, and adopting tools like the RDF, RRA aims to mitigate risks effectively while enhancing tax compliance and revenue collection efforts. Ongoing monitoring and evaluation are crucial to addressing remaining audit recommendations and ensuring continuous improvement in risk management practices.

By incorporating both the estimated likelihood of non-compliance and its consequences, RRA's RDF enables a targeted and proactive approach to tax compliance management. Higher risk taxpayers receive heightened scrutiny and resource allocation to address potential risks promptly, while key taxpayers benefit from collaborative efforts to enhance transparency and understanding. Medium risk taxpayers undergo targeted compliance activities, ensuring compliance with tax laws, while lower risk taxpayers are subject to monitoring to maintain their risk categorization. This tailored approach optimizes resource allocation, fosters compliance, and strengthens the integrity of the tax system.

4 LEVERAGING ELECTRONIC TAX COLLECTION SYSTEMS IN RWANDA

Implementing an electronic tax collection system offers numerous benefits for tax authorities, taxpayers, and overall tax compliance. Below is a detailed analysis of the various aspects involved:

4.1 Issuance of Tax identification Number (TIN) and Registration

To formally create a link between the taxpayer and the revenue authority, a tax ID must first be issued, whether to a citizen, business, or other entity. It's significant that the tax ID is applied to all tax kinds and procedures. By replacing paper files with digital files, tax IDs increase security, decrease errors, enable automatic ID matching, and streamline the tax ID issuance process.
Taxpayers supply all required information to the revenue authorities upon registration in order to formally establish their tax status. Several digital identification techniques, such as the e-signature, e-password, and e-stamp for companies, may be used upon registration. With the use of these technologies, taxpayers may electronically comply with their tax duties and authenticate themselves online. E-signatures may be overly complicated in nations with inadequate digital infrastructure and skills, therefore online registration. In summary Issuance of Taxpayer Identification Number helps but not limited to the following:

Enhanced Efficiency: The issuing and registration of TINs are made easier by switching from paper-based to digital operations. Digital files enhance security, reduce errors, and facilitate automatic ID matching.
Enhanced Compliance: With digital identification techniques such as e-signatures and e-passwords, taxpayers can conveniently fulfill their tax obligations online, promoting compliance and authentication.

4.2 Invoicing

For taxes like the corporate income tax (CIT) and value-added tax (VAT), which are aimed at enterprises and independent contractors, invoices are essential. A business transaction involving the sale of goods and services results in an electronic file known as an e-invoice that contains tax information. This record was made using paper invoices before the advent of e-invoicing. The tax administrator receives the electronically produced invoice from the taxpayer in real time.
E-invoicing digitally notifies authorities of economic transactions. In this way, it can reduce the time for authorities and businesses to process invoices. It also enables businesses to classify types of invoices (e.g. using alphanumeric online codes). E-invoicing can reduce the likelihood of corruption by boosting transparency, eliminating cash transactions, and automating internal processes. In countries like Mexico, companies can issue their own e-invoices or use third party providers for such services. In fact, E-tax helps can help tax

collection through invoicing in but not limited to the following:

Efficiency in Transaction Reporting: E-invoicing replaces traditional paper invoices, enabling real-time transmission of tax information to tax authorities. This reduces processing time for both businesses and authorities, enhancing efficiency in tax reporting.
Openness and Anti-Corruption Initiatives: E-invoicing minimizes corruption opportunities and enhances overall integrity in company transactions by promoting transparency, reducing cash transactions, and automating internal operations.

4.3 Pre-filing and Filing

Pre-filing returns can have significant advantages, but it necessitates close coordination with other parties. Relevant information on taxpayers may be obtained via third-party agents (e.g., companies may furnish employee wage information). Tax forms can then be pre-populated with this data. Because pre-filing significantly cuts down on the amount of time required for people to complete their tax returns, it is especially popular and effective for personal income tax (PIT). Pre-population can happen automatically thanks to digitization. It can minimize the possibility of errors while cutting down on pre-population administrative time and expense.
Taxpayers confirm their pre-populated forms and supply the necessary information for tax compliance by filing tax returns. Taxpayers can submit the needed information online by using e-filing. Online portals can create digital accounts for taxpayers to check and fulfill their responsibilities their obligations. In summary e-tax can help tax in collection through Pre-filing and Filing in the following way:

Streamlined Tax Return Process: Pre-filing of tax returns, facilitated by obtaining relevant taxpayer information from third-party agents, significantly reduces the time required for individuals to complete their tax obligations, especially for personal income tax (PIT).
Error Reduction: Pre-populating tax forms with data obtained through digitization minimizes the likelihood of errors and reduces administrative time and costs associated with manual data entry.

4.4 Payment and Refund

Payments and refunds Digital payments allow taxpayers and revenue authorities to shorten processing times. Some countries have authorized credit card payments for tax collection (e.g. Mexico).
Efficiency in Transactions: Digital payments expedite processing times for both tax payments and refunds, enhancing efficiency in financial transactions between taxpayers and revenue authorities.
Corruption Mitigation: Digital payments, by eliminating cash transactions, can mitigate the risk of corruption and theft, promoting greater financial transparency and integrity in tax collection processes.

4.5 Accounting and Reporting System (SAGE X3)

RRA fixed certain difficulties and implemented the SAGE X3 accounting and reporting system. The system received the necessary technical help, and the following issues were

resolved:
Adjusting the dimensions of transactions; uploading manual payments and transfers; creating new reports upon user request; monitoring bank compliance, including MTN and MobiCash; resolving new user concerns; creating new journal types; creating LGT invoices and cover letters; carrying out period and year-end procedures; upgrading SAGE X3; installing the SAGE enterprise intelligence reporting tool; integrating BNR (which will remove manual payments from BNR); and lowering the suspense account's size. This helps in System Improvement by Implementation of SAGE X3 addresses identified issues and enhances technical support for tax accounting and reporting. Various areas, such as transaction correction, report development, and system integration, are addressed to ensure efficient tax management.

4.6 Review and Auditing

Tax authorities confirm the tax obligations of taxpayers by reviewing and auditing tax returns. Digitalization allows for an algorithmic selection of which tax returns to audit. Additionally, digitalized reviews may allow for automated alarms (reminders) to be sent to specific groups of taxpayers, including those identified as high-risk by data-driven selection mechanisms**.** However, by Automated Selection and Alerts, Digitalization enables algorithmic selection of tax returns for review and auditing, improving the efficiency and effectiveness of compliance monitoring. Automated alerts can be sent to high-risk taxpayers based on data-driven selection mechanisms, enhancing tax oversight.

Overall Analysis by researcher

The adoption of an electronic tax collection system offers a comprehensive solution to enhance tax compliance through improved efficiency, transparency, and integrity in tax processes. From TIN issuance to payment and auditing, digitalization streamlines procedures, reduces errors, and minimizes opportunities for non-compliance and corruption. Additionally, the integration of accounting and reporting systems like SAGE X3 further strengthens tax management capabilities, ensuring robust financial oversight and compliance monitoring.

Year	IT solution
2004	Introduced an Automated System for Customs Data (ASYCUDA). ASYCUDA is a computerized system which covers foreign trade procedures
2005	Introduced the Standard Integrated Government Tax Administration System (SIGTAS)
2011	Introduced e-filing and e-payment
2012	Issued the Electronic Single Window, a system that allows firms to provide import and export information online
2013	Created a mobile application for filing and payment with feature phones
2013	Mandated the use of EBM1 for formal businesses with revenues above a minimum threshold (RWF 20 million (approximately US$16,700) annually)
2014	E-Tax enhancement replaced previous e-filling and e-payment systems
2017	Launched EBM2 through a staggered implementation
2019	Launched e-suggestion, a web-based chat function to support taxpayers
2021	Launched the 'EBM for all' policy, mandating the use of EBMs for taxpayers of any size

Table 1-4: Digital reforms undertaken by the RRA, 2004–2021

5 DATA ANALYSIS AND INTERPRETATION

This chapter looks at material from the field survey via questionnaires as well as secondary data from various papers, journals, surveys, statistics, and books about the subject of research. The forms of questionnaire analysis provided in line with specific goals serve as representations of the analysis and interpretation. The profile includes basic information on the respondents, in addition to their gender, education, and experience.

5.1 Secondary data analysis

5.1.1 Analysis of tax revenue and nation budget

Table 2-5: Tax collections during 1998-2022

Fiscal ye	Target (Bn Rwf)	Total Revenue (Bn Rwf)	variance (Bn Rwf)	perfotmance achieved in percentage (Bn Rwf)	Tatal Nominal Budget(Bn Rwf)	% Contribution of total Revenue to Tatal Nominal Budget(Bn Rwf)
1998	62.8	68.4	5.6	108.9%	173.2	39.5%
1999	64.04	67.1	3.06	104.8%	174.1	38.5%
2000	65.4	68.4	3	104.6%	169.2	40.4%
2001	76.8	81.1	4.3	105.6%	184.4	44.0%
2002	93.9	95.7	1.8	101.9%	207.6	46.1%
2003	111.2	119.1	119.1	107.1%	252	47.3%
2004	126.3	139.7	13.4	110.6%	334.5	41.8%
2005	156.7	184.8	28.1	117.9%	374.2	49.4%
2006	176.5	204.7	28.2	116.0%	396.2	51.7%
2007	214.6	252.5	37.9	117.7%	528	47.8%
2008	257.8	351.8	94	136.5%	623.2	56.5%
Jan-June 2009	176.1	191.8	15.7	108.9%	392.1	48.9%
July 2009-June 2010	369.3	395.8	26.5	107.2%	899	44.0%
June 2010-July 2011	476.9	491.3	14.4	103.0%	948	51.8%
2011 - 2012	532.8	588.1	55.3	110.4%	1,194.20	49.2%
2012-2013	658.9	665.8	665.8	101.0%	1,550.30	42.9%
2013-2014	878.02	888.2	10.18	101.2%	1755.9	50.6%
2014-2015	878.03	859.2	-18.83	97.9%	1768.2	48.6%
2015-2016	949.2	1,086.50	137.3	114.5%	1,949.40	55.7%
2016-2017	1,094.30	1,102.80	8.5	100.8%	2,094.90	52.6%
2017-2018	1,215.20	1,252.30	37.1	103.1%	2,443.50	51.3%
2018-2019	1,392.10	1,422.90	30.8	102.2%	2,876.90	49.5%
2019-2020	1,589.00	1,516.30	-72.7	95.4%	3,245.70	46.7%
2020-2021	1,594.30	1,654.50	60.2	103.8%	3,806.90	43.5%
2021-2022	1,831.30	1,910.20	78.9	104.3%	4,764.80	40.1%

Source: Rwanda Revenue Authority Report 1998 – 2022

Based on the information provided above, it's evident that prior to the introduction of the electronic tax system in Rwanda, tax collection experienced fluctuations from 1998 to 2012, with amounts ranging from 67.1 to 665.8, respectively with average collection of 3300.3.

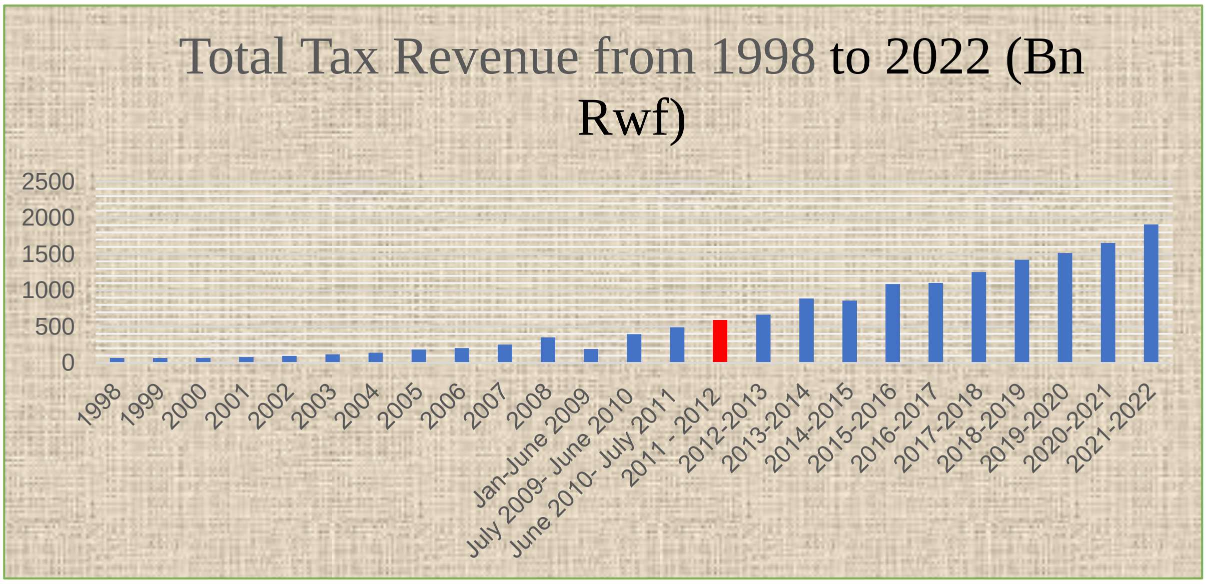
However, during this period, the RRRA consistently fell short of meeting its tax collection targets, particularly from 2003 to 2007, despite achieving relatively high variances. These differences suggested that tax revenue was below the level needed to achieve the country's financial objectives, leading to below-budget operations.

In response to the mentioned challenges, Rwanda Revenue Authority introduced e-taxation systems in 2012. This initiative aimed to enhance tax collection efficiency and meet budget targets. The introduction of various e-filing systems, such as Mobile Declaration, electronic billing machine, Electronic Single Window (ESW) for domestic taxpayers, and Authorized Economic Operator (AEO) for importers and exporters, facilitated electronic interaction with Rwanda revenue Authority, enabling taxpayers to fulfill their obligations conveniently and efficiently. And this was carried out in order to improve tax administration, enable taxpayers to deal with RRA electronically at any time and from any location, collect taxes more quickly, and increase tax compliance and efficiency. It provides clients with the opportunity to electronically file taxes such as VAT, PAYE, excise duty, and withholding taxes via the RRA website, negating the need to physically visit an RRA location, particularly in cases when tax education and compliance are ensured.

The implementation of the electronic tax system yielded significant change in tax collection by achieving 101% and 101.2% of the targeted amounts in 2012 and 2013, respectively. However, challenges persisted, as evidenced by a slight shortfall of 2.1% in 2014, attributed to factors such as limited perception and skills among taxpayers regarding the electronic tax system. Despite this challenge, there was a notable increase in tax collection in 2015, surpassing the target by 137.3% and contributing substantially to the national budget.

The following years saw steady growth in revenue from taxes, with the exception of 2019, when RRA fell 4.4% short of its goal. Nevertheless, the overall trend indicated a positive impact of the electronic tax management system on revenue generation.

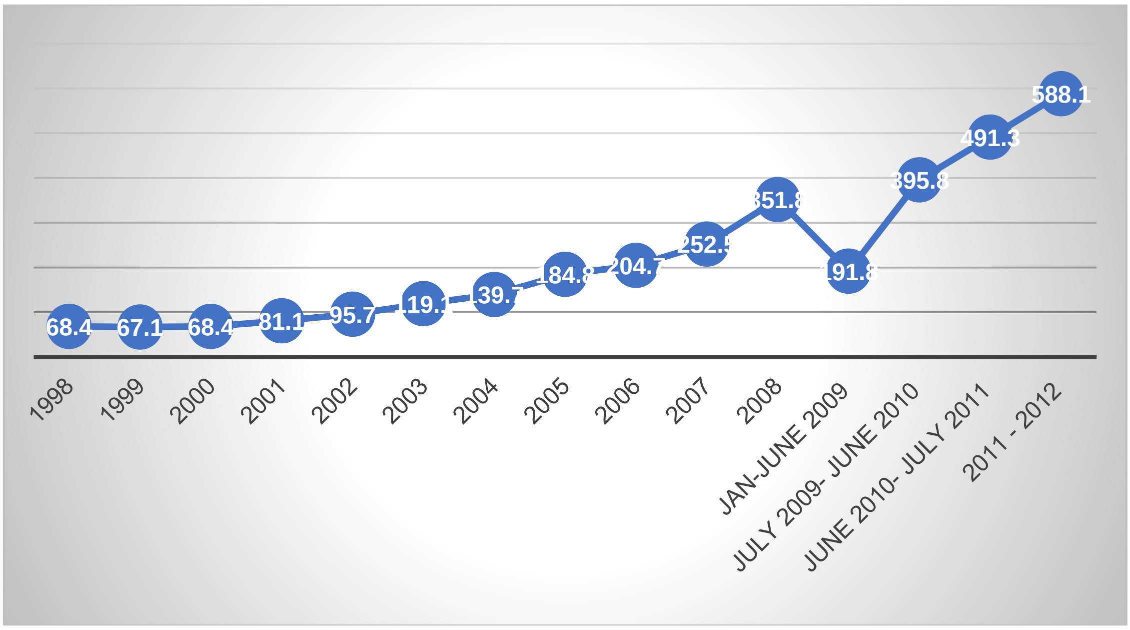
As a conclusion to this table above, the adoption of electronic tax systems in Rwanda has played a significant role in enhancing tax collection, improving efficiency, and contributing significantly to the national budget. Despite initial challenges, ongoing efforts to promote awareness and build taxpayer capacity have contributed to sustained progress in revenue generation.



Source: Researcher 2023

Figure 11-5: Total Tax Revenue from 1998 to 2022 (Bn Rwf)

As disused in the above table 2, this figure shows a significant change in tax collection after the introduction of electronic tax system in 2012 with average collections of 12358.7 from 2012 to 2022. this figure providing additional visual representations of tax collection trends, the impact of e-tax systems, and performance against targets from 1998 to 2022.

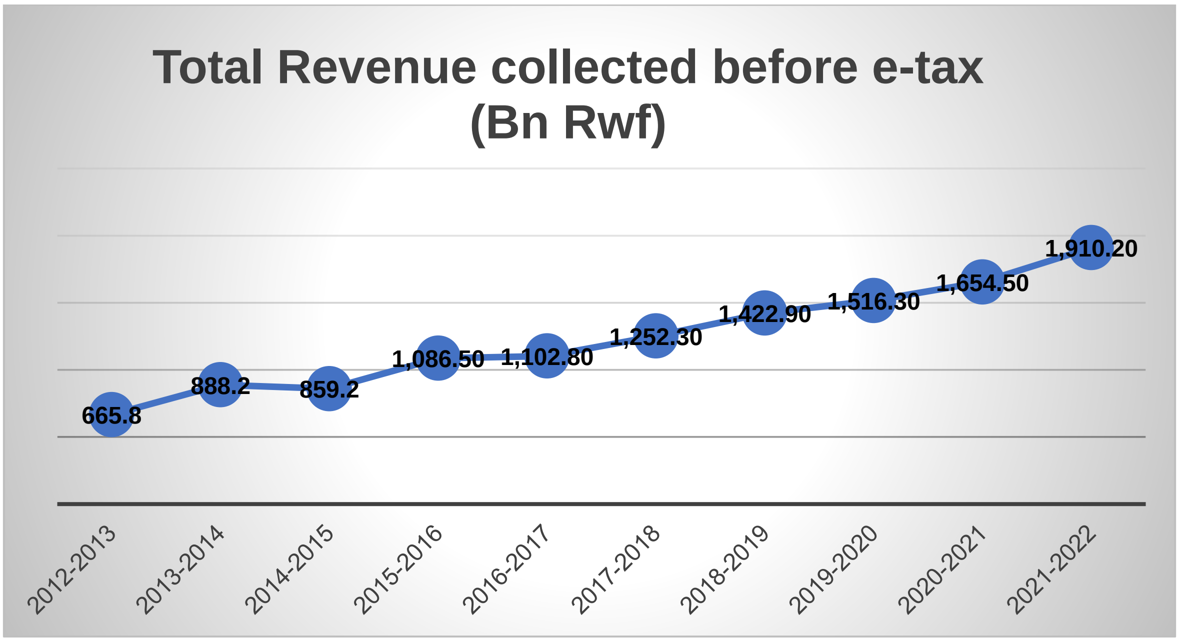


Source: Researcher 2023

Figure 12-5:Total Revenue collected before e-tax (Bn Rwf)

This figure represents data trends of collected tax before e-tax implementation by RRA. We can observe the trends and patterns in revenue generation over the years. Here ‘s an overview of the data:
From 1998 to 2008, revenue shows a generally increase in trends with occasional fluctuations. There’s a noticeable jump in revenue from 2007 to 2008 with a significant increase of 99.3 billion Rwandan francs.

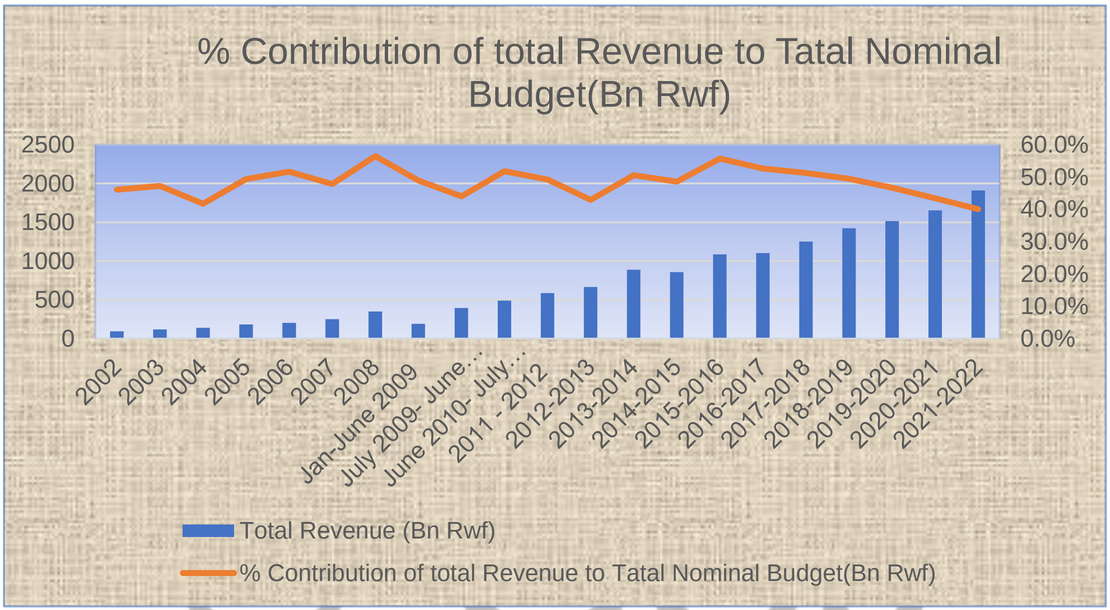
The first half of 2009(January to June) saw a decline in revenue compared to the previous years, followed by a substantial increase in revenue in the second half of 2009 to mid-2010(July 2009 to June 2010). There is also another notable increase in revenue from June 2010 to July 2011 compared to the previous period. The highest recorded revenue is in the fiscal year 2011-2012, reaching588.1 billion Rwandan francs. In fact, the data indicates consistent growth in revenue collection by RRA over the years even before e-tax system implementation, this suggest effective tax administration and increase in compliance, we can suggest also that the general economic growth of Rwanda during the selected period could have contributed to the increase in revenues with expending businesses and increasing income leading to high tax receipts.



Source: Researcher 2023

Figure 13-5:Total Revenue collected after e-tax (Bn Rwf)

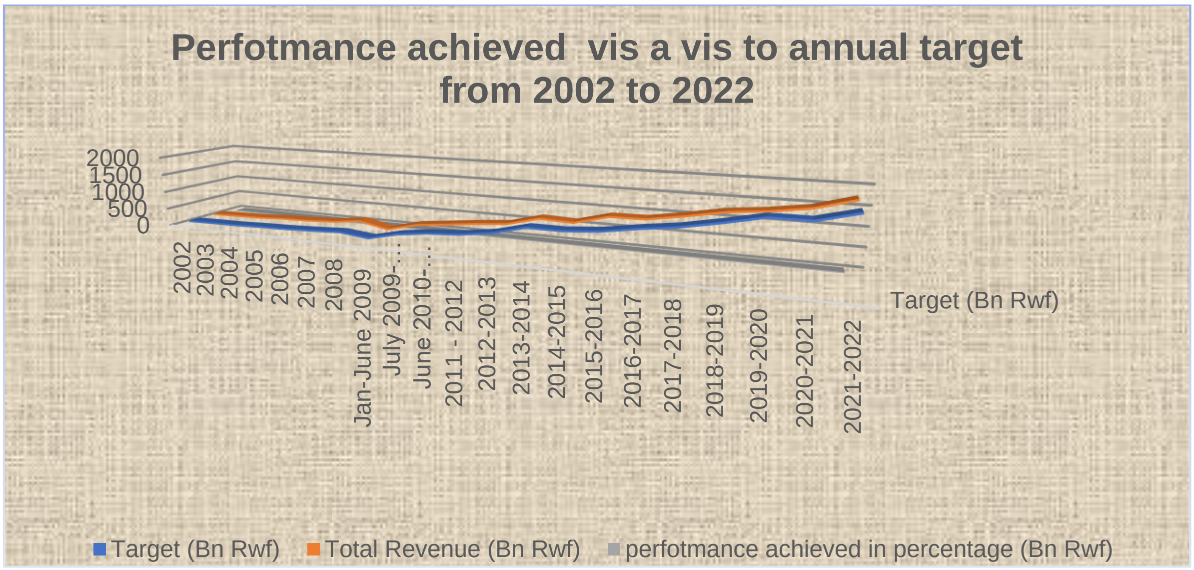
The data on revenue above of collected after e-tax implementation from 2012-2013 to year 2021-2022 exhibits a remarkable upward trend, reflecting the effectiveness of e-tax system in enhancing revenue generation, this consistent rise over the years, demonstrate the sustained positive impact of electronic tax administration. It is clear presented on the graph which indicate the magnitude of revenue varied annually, with some years experiencing more substantial increases than others nut overall, there was a notable cumulative compare to 14 year of tax collected before e-tax implementation as show in the figure 13 above. This suggest that e-tax implantation has been instrumental in fostering steady and significant revenue expansion for government. The consistent upward trajectory indicates successful modernization of tax administration through electronic tax system, likely leading to improve efficiency with timely files returns, reduce tax evasion, better service to tax payers, reduce tax payment risk, and enhanced compliance



Source: Researcher 2023

Figure 14-5 Figure showing % Contribution of total Revenue to Total Nominal Budget (Bn Rwf)

The above data presented in figure 15 indicate the contribution of tax revenue to national budget from 2022, both before and after the implementation of e-tax system. Before e-tax implementation (2002-2011), the contribution ranged from 41.8% to 56.5%. with an average contribution of approximately 48.5%. notably, there was a steady increase in the percentage contribution from 2002 to 2008, peaking at 56.5% in 2008. After the implementation of e-tax system (2012-2022), the contribution fluctuated between 40.2% and 55.7%, with an average of approximately 48.8%. while there was slight decrease in the average contribution compared to the pre-e-tax period, the revenue still played a significant role in funding national budget. Despite fluctuations, the tax revenue continued to make a substantial contribution to the budget, highlighting the importance of effective tax collection mechanisms in supporting government expenditures and fiscal sustainability.



Source: Researcher 2023

Figure 15-5 Performance achieved vis a vis to annual target from 2002 to 2022

The data above presents the relationship between target tax revenue and the actual revenue collected before and after the implementation of e-tax system from 2002-2022(20 years). Before e-tax implementation (2002-2011), the actual revenue collected generally exceeded the set targets with performance achieved ranging from =101.9% to 117% on average. Notable years of surpassing targets include 2008, where revenue collected reached 136.5% on target.

After the implementation of e-tax system (2012-2022), the relationship between target and actual revenue collected remained relatively consistent, with performance achieved varying between exceeding and falling short of targets. However, there was a slight decrease in performance in some years, particularly in 2019-2020, where revenue collected amounted to 95.4% of target. In fact, while there were fluctuations in performance both before and after electronic tax implementation, the data suggests a generally effective revenue collection process, with occasional deviations from the set targets.

5.1.2 Analysis of administrative measures that support RRA performance.

The analysis of this study shows that to increase tax compliance, facilitate taxpayers and increase Revenue collection here are administrative measures implemented by RRA other than use of technologies for revenue optimization:

1. **Extension of the deadlines:** filing and payment of taxes was intended to facilitate taxpayers and acceleration of VAT refund as a way of boosting businesses cash flow.
2. **Use of Data Science to improve tax compliance:** RRA uses data science in detection of fictitious invoices, stock analysis, monitoring VAT input claim, monitoring of invoices reported after declaration, monitoring of non-reporting EBMs, etc.
3. **Keeping an eye on non-payers and non-filers:** The Rwanda Revenue Authority monitors taxpayers who don't fulfill their filing and payment responsibilities in a proactive manner. This include following up with non-filers and late filers, conducting desk audits, and calling taxpayers with personalized message reminders. In order to promote ongoing compliance, thank-you notes are also issued to compliant taxpayers.
4. **Tax Education and Information:** RRA conducts extensive tax education programs targeting various segments of taxpayers, including newly registered taxpayers.

Workshops, tax dialogues, and audits are conducted to ensure taxpayers understand their obligations and the use of Electronic Billing Machines (EBMs).

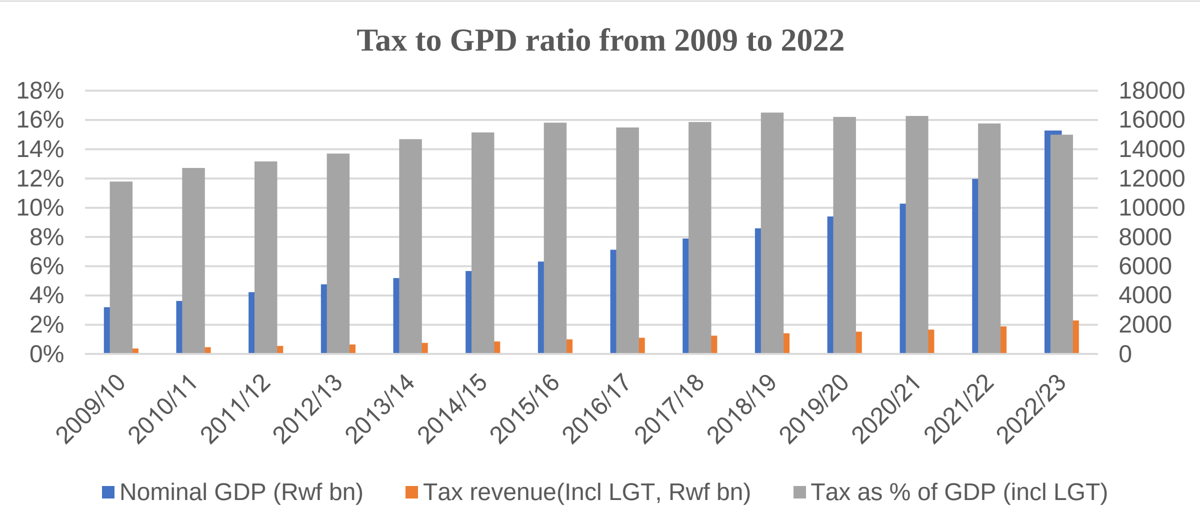
5. **Combatting Tax Evasion:** here tax investigation cases either comprehensive-related cases, immediate assessment cases, issue-related case and customs investigation cases are done by the Revenue Investigation and Enforcement Department (RI&ED). This department plays a crucial role in investigating tax evasion cases and conducting enforcement actions. Intelligence operations, risk-based operations, and impoundments of unaccustomed goods are carried out to combat fraud. Additionally, recovered tax amounts are obtained through legal processes such as establishing statements of offenses and conducting public auctions.
6. **Public Communication and Engagement:** Rwanda Revenue Authority utilizes various communication channels including TV, radio, print newspapers, and online media to disseminate relevant information to taxpayers as well as others stakeholders.

In summary, these administrative measures demonstrate Rwanda revenue Authority's commitment to fostering tax compliance, facilitating taxpayer engagement, and optimizing revenue collection through a combination of proactive monitoring, enforcement, education, and communication strategies not only relaying on e-tax.

5.1.3 Analysis of other key performance indicators in RRA

- **Tax to GDP ratio**

Tax to GDP ratio is calculated by dividing the tax revenue collected by a country by the Gross Domestic Product of that country and multiplied by 100. A higher level of a tax-to-GDP ratio commonly exhibition of bigger fiscal capacity but even may reveal a higher tax pressure on people or businesses. However, such a ratio could imply a smaller tax base or inefficiencies in tax collection. Tax-to-GDP ratio trend analysis across time returns insights into a nation 's level of economic development, policy effectiveness, and sustainability of public finances.



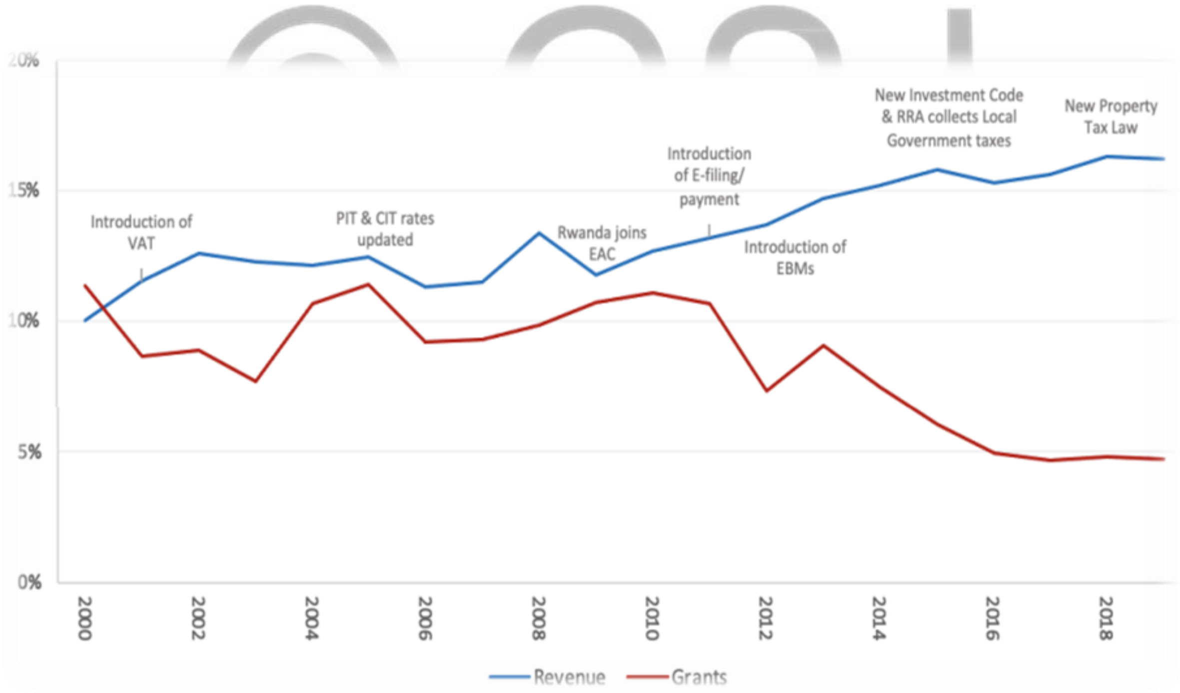
Source: Researcher 2023

Figure 16-5: Tax to GPD ratio from 2009 to 2022

The data provided above presents the nominal Gross Domestic Product (GDP) in Rwanda Francs (Rwf Bn). Tax revenue (including Local Government Transfers) in in Rwanda Francs (Rwf Bn), and the tax as percentages of GDP (including Local Government Transfers) for the fiscal years from 2009/10 t0 2022/23. Over this period, both nominal GDP and tax Revenue have shown consistent growth, with tax revenue increasing from 377 billion Rwf in 2009/10 to 2,291.190 billion Rwf in 2022/23. Similarly, nominal GDP has increased steadily from 3,399 billion Rwf in 2009/10 to 15,283 billion Rwf in 2022/23. The tax as percentage of GDP has fluctuated slightly, ranging from 12% to 17%. With an average approximately of 15%. In fact, this data indicates a stable relationship between tax revenue and the overall economic output, with a tax contributing around 15% of GDP over years, reflecting the tax system's consistency in capturing share of economic activity.

This graph presents a clear picture of a drastic increase of tax-to-GDP ratio starting from 2024 up to 2020, with the exceptions being the years of minor falls. There are some reductions in particular, happened in 2015 (from 15.8% to 15.5%), 2021 (from 16.3% to 15.8%), and 2022 (from 15.8% to 15.0%). Nevertheless, it should be emphasized that, immediately prior to the depicted decades, the peculiarity of the tax-to-GDP ratio is the fact that its upward trend was consistent.

From 2009 to 2014, this rate inclined smoothly and reached the scored 11.8%, 12.7%, 13.2%, 13.7%, 14.7%, and 15.2% at each consecutive point. The increasing trend, therefore, indicates a shift in the tax revenue as a percentage of the average GDP growth rate showing possible disruptions occasionally. Crunching this phenomenon would help to discover irregularities that are the symptoms of fluctuations of economic settings, government policies or tax enforcement mechanisms. The relative changes in nominal GDP and tax revenues determine changes in the tax-to-GDP ratio. The tax-to-GDP ratio will climb annually if tax receipts increase (or decrease) more than the GDP. On the other hand, if tax receipts increase less than GDP or decrease even more, the ratio of taxes to GDP will decrease[8]. Rwanda's Grants and tax revenues as percentage of GDP has presented here below[9]:



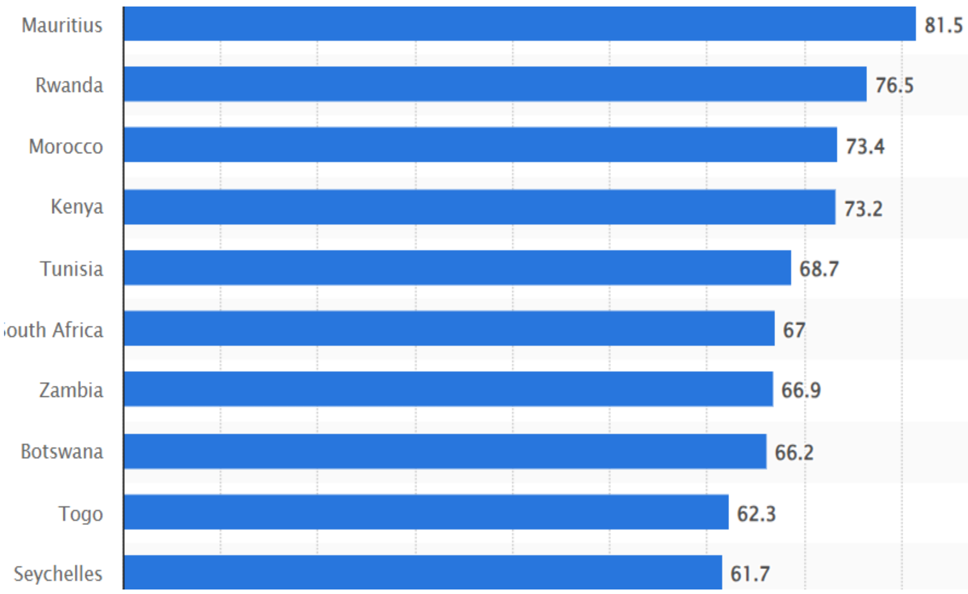
Source: MINECOFIN, MEDIUM TERM REVENUE STRATEGY 2021 - 2024

Figure 17-5: Rwanda's Grants and tax revenues as percentage of GDP

[8] Tax revenue trends 1965-2021 | Revenue Statistics 2022 : The Impact of COVID-19 on OECD Tax Revenues | OECD iLibrary.
[9] https://www.minecofin.gov.rw/index.php?eID=dumpFile&t=f&f=47839&token=8a225ec327ea93e24ca2ad06633abd4e3f5836e8

With the figure above, shows that Rwanda's tax reforms can be separated into three major stages: *restoration of the tax base*; *introduction of tax incentives to strengthen production for domestic and foreign investors*; and *enhancing efficiency in tax administration*.
In 1997, RRA was established to collect domestic revenue and better manage the scarce resources of the recovering Rwandan economy. RRA has continually strengthened its performance through parallel institutional and legal framework reforms. Initial reforms aimed to widen the tax base, with the introduction of VAT in 2001, reduction of CIT from 35 to 30 percent in 2005 and the standard corporate tax rate for companies now is 28% (reduced from 30% effective 14 September 2023). The accession to EAC in 2009.

Improved use of technology in RRA has reduced the cost of doing business, with the E-Tax portal introduced in 2011 and the Electronic Billing Machine (EBM) in 2012. Key improvements within tax administration in recent years include taxpayer outreach, increasing the number of registered taxpayers, providing better services, enhanced use of IT, and better risk management. Streamlining and modernizing RRA have contributed to an improved business-enabling environment. In 2020, Rwanda scored 76.5 points in the ease of doing business index. The country offers the best business environment in Africa, only after Mauritius if above Rwanda in other African countries as per Statista 2020 report below[10]:



Source: Statista 2020

Figure 18-5: Top 10 African countries offers the best business environment

Comparing east African countries, Burundi, Kenya, Tanzania, and Uganda had increases in their rankings in the 2020 Statista study, while Rwanda saw a decline, but it was still the best-ranked nation in the East African Community and one of only two African nations in the world's top 50.[11]. From this data we can conclude that easy doing business have an impact on economic growth, through tax paid by business owners, availability of job opportunity, improvement of production capacity and attracting many investors.

[10] https://www.statista.com/statistics/1227392/ease-or-doing-business-in-african-countries/

[11] Ease of Doing Business.
https://www.eac.int/investment-climate-and-incentives/ease-of-doing-business

➢ Tax to budget ratio

The tax to budget ratio is an indispensable indicator where the barometer stands for the proportion of government revenue at discretion to the amount of the general budget. It is a measure of the level of social autonomy and the reliance of a government on tax to fund its expenditure.

A high tax-to-budget ratio manifests itself in the use of taxes as a significant source of income for the budget; thus, a greater weight is placed on the tax payer's shoulders, while the economy can be seriously affected. On the other hand, a low ratio could else exemplify alternative income sources or a more confined government service provision.

Making a deeper dive into the tax-to-budget ratio adjustment over any time period gives an opportunity to observe changes in the country's tax policy, economic conditions, and setting government spending priorities which the fiscal decision makers, investors and commentators take into consideration when assessing the direction and health of the country's budget.

➢ On time filling ratio

The on-time filing ratio for taxes is one of the vital indicators which measures the efficacy in taxpayers complying with these deadlines and meeting their obligations on taxes. They determine this ratio by comparing the filed prompt returns with the remaining total returns. The effectiveness of tax system is high these days due to high performance of both tax compliance and administrative efficiency. It provides a positive evidence for the accomplishment of efficient tax enforcement measures, taxpayer education programs, and the easy tax filing. The authorities of government and tax departments also keep watch on this indicator closely as it allows to enumerate revenue forecasting, budgeting, and the wellness of the economy.

Besides, the factor of a filling ratio being on time always contributes to the trust in the tax system and government institutions' institutions on the part of society. Thus, work on taxpayer compliance and on simplifying them is paramount in order to keep the positive on-time filling ratio sustainable. As we see the levels of timely income tax filing in 2017 formed wide spectrum among the taxpayer categories undefined:

Table 3-5: On time returns filing ratios for income tax (CIT & PIT) for 2017 tax period[12]

YEAR	Taxpayer segment	Number of expected declarations	Number of on time declarations	On-time filing ratio
2017	LARGE	372	368	**99.0%**
	MEDIUM	1,009	976	**94.8%**
	SMALL	162,710	104,680	**62.9%**
2019	LARGE	252	240	**95.2%**
	MEDIUM	684	637	**93.1%**
	SMALL	190,136	116,347	**61.2%**

Source RRA Report 2018,2020

The data in this table indicates that small taxpayers have a lower on-time filing ratio compared to other taxpayer segments. This discrepancy may be attributed to a lack of technical skills, as suggested by primary data findings. Additionally, small taxpayers might

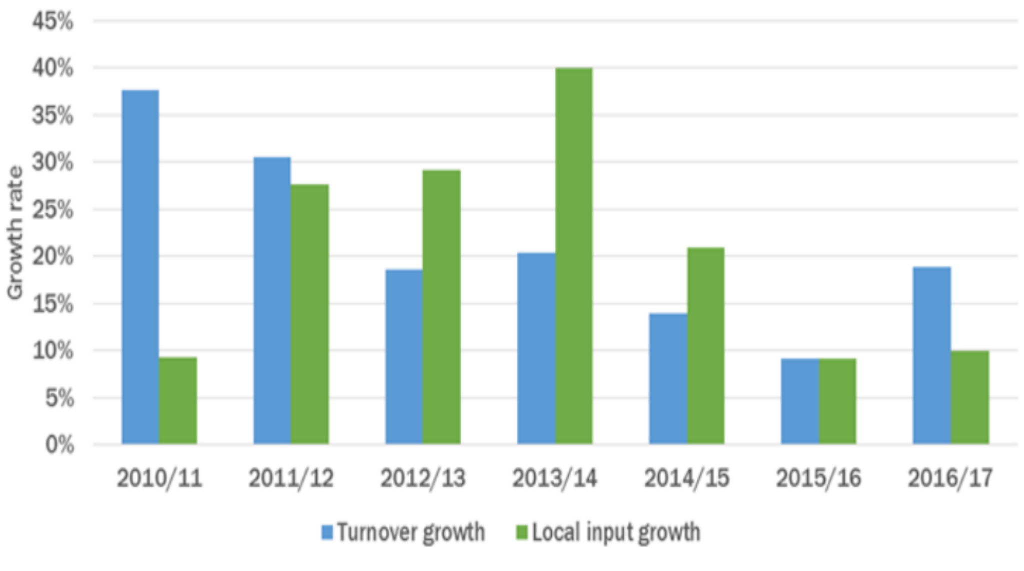
[12] https://www.rra.gov.rw/en/publications

face challenges in accessing sufficient capital to engage tax advisory professionals.

These insights underscore the importance of further research on tax compliance among small taxpayers, encouraging scholars to delve deeper into this issue. For instance, in the RRA report of 2021-2022 large taxpayers score a rate of 96.7% concerning income taxes (PIT & CIT), 90.5% for VAT revenue, and 91.4% for PAYE taxes. While in the 2019-2020, large taxpayers paid all the calculated taxes on time in 95.5% (CIT & PIT), 98.8% (VAT) and 99.2% (PAYE) of the claims registered in the tax portfolio.
The timely tax payment ratios, on the other hand, have been consistently very high for small and medium taxpayers – up to 72.1% for income tax, 98.9% for VAT, and 91.5% for PAYE. Generally, the mean on-time tax payment ratios recorded among various taxpayers were 79.0% for tax, 98.9% for VAT, and 96.8% for PAYE. These figures signify that there is still a problem with taxpayers that declare but do not pay their taxes mainly on income tax, not VAT, taxes. Yet further research is needed to discover the reason behind such an outcome through primary data.

- **Electronic billing machine (EBM)**

The proliferation of EBMs in the supervision of documented business transactions in assessing VAT compliance has a lot to commend it. Though they clarify some facts, it is recognized that Rules alone are not sufficient for biased reporting of the taxes, as there are still windows, which businesses take advantage of to avoid paying taxes, such as not issuing receipts or issuing fraudulent ones. For instance, Victor (2017) holds that EBMs could enhance VAT compliance in Rwanda and other African countries, but this possibility can only be realized where there is a concurrent use of measures such as data analytics and receipt checks. Undefined:
1. Benchmark audits: This stage involves in looking into the true sales data of businesses. An indicator for potential non-compliance can be set up by a law enforcement agency through knowing an expected sales pattern as a base point.
2. Data analytics: Through the data analysis, authorities can determine who the outliers are and those who are not following the accepted norms and standards. Something abnormal could be happening in sales patterns or fraudulent transaction behaviors, which can be sent for review.
3. Mystery shopper audits: Data analytics can help to point out problems of non-compliance other than ones noticed at random checks, thus allowing authorities to ask for mystery shopper audits to ensure the accuracy of the findings.
These audits may include use of secret service agents or the conduction of surveillance operations to finds out if businesses actually are not issuing EBM receipts, or they are engaged with fraud practices.
Adopting EBMs along with the above measures, authorities can evolve a system narrowing possible errors of tax payment by the entities. This method not only detects and punishes non-compliant businesses but also can be used as a deterrent so increasing overall VAT compliance thereby becoming vital in countries with the levels of VAT non-compliance becoming high.



Source RRA Report 2018[13]

Figure 19-5: Turnover growth vs. local input VAT claims growth.

The data mentioned hint at system controls for input claims of VAT, towards EBMs and other measures championed by Victor, showing an improvement in the number of domestic VAT declarations and revenue mobilization. Undefined:

1. **Positive Impact of System Controls:** The installation of accounting systems for VAT input claims has brought about a rise in the tax returns filed in the period between January and June 2017 as compared to the previous periods.
2. **Steady Growth in Local Input VAT:** In spite of having being implemented preventive measures, growth rate of local input VAT remains quite much steady with a little difference of about approximately 10% in 2016/17 and 9.2% in 2015/16. This scenario means that the measures do not harm the VAT input valid claims.

3. **Increased Turnover:** There has been a massive growth in turnover which reached the rate of 18.9% in the period January-June 2016 compared to the same period the previous year, 2015/16.
4. **Comparative Analysis**: Figure 15 illustrates that the growth rates of turnover and local input VAT have followed comparable paths, suggesting a correlation between the two. However, there has been a lack of comparable rise in the local input growth rate, indicating a reduction in local input VAT claims due to the validation measures.
5. **EBMs and Victor's Proposed Measures**: The information also highlights the effectiveness of EBMs and other proposed measures by Victor in ensuring accurate reporting of VAT liabilities. These measures serve as a powerful tool to combat VAT non-compliance, ultimately improving domestic revenue mobilization.

Overall, the combination of system controls for VAT input claims, EBMs, and other proposed measures has proven to be effective in enhancing VAT compliance and revenue collection in the country.

- **Use of electronic filing facilities**

This indicator is under study by researcher. It measures the extent to which declarations, for

13 https://www.rra.gov.rw/fileadmin/user_upload/rra_annual_activity_report_2018-19.pdf

all core taxes, are filed electronically. According to RRA report of year 2020 the following table shows in percentages on how taxpayers declared electronically[14]:

Table 4-5:shows the electronic filing status in four fiscal years.

Tax types	**2016/17**	**2017/18**	**2018/19**	**2019/20**
	In percentages of all declarations	**In percentages of all declarations**	**In percentages of all declarations**	**In percentages of all declarations**
EXERISE	89.5%	100.0%	97.8%	100.0%
CIT	83.6%	96.6%	99.8%	100.0%
PAYE	99.5%	99.9%	100.0%	100.0%
PIT	70.5%	83.3%	97.1%	100.0%
VAT	99.1	99.8%	99.9%	99.9%
LARGE TAXPAYERS (ALL CORE TAXES)	85.7%	100.0%	100.0%	100.0%

Source: RRA report 2020

Rwanda's move towards e-filing illustrates a successful transformation from a manual system to an electronic system in tax administration. The Rwanda Revenue Authority (RRA) made electronic filing mandatory and no longer accepting the manual option, this contributed to a remarkable compliance rate as shown by e-filing rates during the 2019/20 fiscal year that exceeded 99% in most tax matters.

The e-filing adoption has been very successful especially in the PAYE, Excise, CIT and PIT categories, where all taxpayers registered 100% as compliance rates. However, within a bigger taxpayer segment, which is marked by complex problems, the rate of e-filing has reached 100% for all the core taxes.

- **Use of electronic payment methods**

This data depicts the portion of overall tax payments made electronically during a specific period. It examines the proportion of essential tax revenue settled through electronic means, such as credit cards, debit cards, and online bank transfers, without direct bank employee or tax authority involvement. Utilizing the table sourced from the RRA report of 2020, it demonstrates the extent of electronic payment adoption for the fiscal year 2019-2020[15].

Table 5-5:Use of Electronic Payments for 2019/20 fiscal year

Taxpayers segments and tax types		**In percent of total value of payments received for each tax types**	**Percentage average**
Small & medium taxpayers	CIT	91.1%	
	PIT	85.6%	
	PAYE	90.6%	**92.6%**

[14]https://www.rra.gov.rw/fileadmin/user_upload/RRA_Annual_Activity_Report_2020-2021_Final_Version.pdf

[15]https://www.rra.gov.rw/fileadmin/user_upload/RRA_Annual_Activity_Report_2020-2021_Final_Version.pdf

	VAT	95.9%	
	EXCISE TAX	99.8%	
Large taxpayers	CIT	93.7%	**96.2%**
	PIT	97.5%	
	PAYE	92.1%	
	VAT	98.0%	
	EXCISE TAX	99.8%	

Source: RRA Report 2020

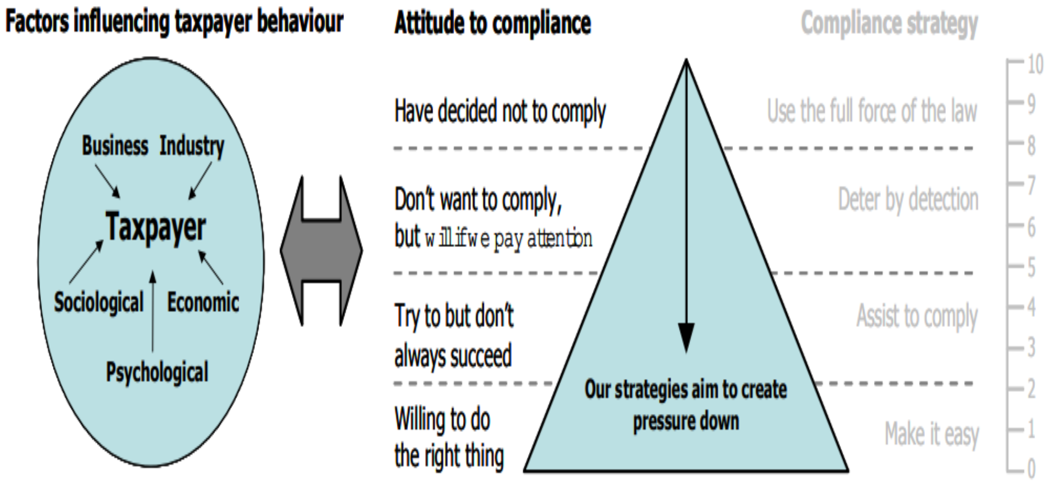
Based on the information provided, it seems that electronic payment rates for large taxpayers are lower than international good practice standards (100%) but have a higher rate in excise tax of 99.8% and VAT of 98.0% followed by PIT of 97.5%, while small and medium taxpayers generally have higher electronic payment rates specifically in excise tax (99.8%) and VAT (95.9%), followed by CIT (91.1%), PAYE (90.6%), and PIT (85.6%).
On average, small and medium taxpayers have an electronic payment rate of 92.6%.
This suggests that there may be room for improvement in electronic payment rates, especially among large taxpayers, to align with international standards and improve overall efficiency in tax collection.

5.1.4 Analysis of how taxpayers obtain information about the services provided by the RRA.

Generally, compliance means conforming to a specification, standard or law that has been clearly defined. It is the practice of obeying a rule and law in accordance with established guidelines, try to fit specific standards set and meet the requirements of prescribed regulations. Compliance in the context of tax administration refers to the extent to which taxpayers and traders, along with intermediaries like practitioners fulfil their tax obligations. Compliance with tax laws in Rwanda typically means registering when required, filing returns on time, reporting complete and accurate information to determine tax liability and paying all amounts owing when due. Non-compliance occurs when any of these obligations are not met for whatever reason.
Different studies categorize Taxpayer’s compliance in two perspective models (economic Deterrence model and fiscal and social psychology model). Economic Deterrence model is based on the concept that the risk of detection and punishment will improve compliance behavior. On the other hand, inductive models of social and fiscal psychology look into taxpayers' attitudes and beliefs to forecast their actual conduct. Tax obligations placed on a taxpayer varies from one tax type to another and from one jurisdiction to the next. However, the four major broad categories of taxpayer obligations remain the same for all taxpayers irrespective of jurisdiction, these are:

Registration: Any person subject to any type of tax administered by RRA has to be registered in RRA and obtain a fiscal number before engaging in any economic activity of taxation relevance.
Filling and declaration: Taxpayers have to file tax returns with RRA in accordance with the tax legislation. All importers and exporters have to declare their imports or exports in accordance with the East African Community Customs Management Act (EACCMA).
Complete and accurate reporting: Each taxpayer is obliged to keep evidence of economic activities (books, records, invoices, etc.) as required in the tax legislation and submit/present the data and or documentation required by RRA accurately and timely in accordance with the tax legislation.

Payments: Taxpayers have to pay taxes and duties at the specified time without RRA notice or request. Rwandan tax law states that a taxpayer may be deemed non-compliant if they neglect to fulfill any of the aforementioned requirements. The willingness and behaviour of a Taxpayer to meet tax obligations has a major impact on compliance levels. In order to achieve the optimal level of compliance, it is necessary to pay attention to Taxpayer's behaviour and the methods of influencing behaviour. This assists the tax administration in choosing the most efficient (low costs) and effective (best outcome) way to treat such behaviours. This is better explained in the OECD Compliance pyramid and behavior model shown below[16]:



Source: OECD, 2004

Figure 20-5: A spectrum of taxpayer attitudes to compliance

According to other scholars SMEs still have a challenge to use E-filling due to limited Knowledge, Insufficient IT infrastructures, and network problems. However, RRA should Increase investment in tax services for SMEs to accommodate their varying levels of infrastructure and IT literacy, with particular focus on gender inclusion. It is understandable that the RRA initially focused digitalization efforts on larger businesses that contribute more to total tax revenue and are more capable of quickly adapting to new systems.

However, to create a more inclusive tax system, it will be important for RRA to design services that meet the needs of all taxpayers. Rwanda has seen notable improvement in revenue collection from SMEs, but some such businesses many of which are run by women find it difficult to locate guidance on which taxes and forms are applicable to them. Whereas larger firms report high satisfaction in their interactions with RRA, smaller firms noted long delays in communication.

Many taxpayers interviewed said the best way to get a quick response from RRA was to go directly to its offices, a time and cost investment that many lower-income taxpayers are unable to make. These challenges illustrate the degree to which digitalization has been designed primarily for larger businesses. Investing in understanding the needs and pain-points of SMEs would greatly benefit taxpayers, RRA, and the government, including through greater formalization of businesses, compliance, and total revenue, the 3 tables summarize the Taxpayers awareness of RRA services, the source of Awareness of Customer

[16] https://www.oecd.org/tax/administration/33818656.pdf

Services and Awareness of Tax reforms and initiatives[17].

Table 6-5: Table Taxpayers awareness of RRA services

Services	Count	%
Registration or de-registration	**1,032**	**71.0%**
Business registration & acquisition of a Taxpayer Identification Number (TIN)	949	92.0%
Registration and acquisition of a Taxpayer Identification Number (TIN) for Local Government Taxes	650	63.0%
VAT registration and acquisition of a VAT Certificate	456	44.2%
Registration under quarterly payment of VAT & PAYE	443	42.9%
Provide access to E-tax system (Web registration)	342	33.1%
Business deregistration	292	28.3%
De-registration from Local Government Taxes	237	23.0%
Tax declaration and Customs Duties	**1,404**	**96.6%**
Personal and Corporate Income Tax	1,146	81.6%
Value Added Tax (VAT)	796	56.7%
Custom duties	698	49.7%
Withholding tax	586	41.7%
Consumption Tax	340	24.2%
Tax on Gaming activities	250	17.8%
Tax on Mineral	140	10.0%
Tax exemption on imported goods	115	8.2%
Local Government Taxes (Trading license, Property tax, Rental income tax)	76	5.4%
Public cleaning fee	60	4.3%
Other services	**332**	**22.8%**
Issuance of tax clearance certificate	189	56.9%
Tax arrears certificate (for public tender purpose)	188	56.6%
Issuance of a tax payment certificate	185	55.7%
Issuance of tax stamps	182	54.8%
VAT Refund request	123	37.0%
Installment or Payment facility	89	26.8%
EBM activation	87	26.2%
EBM De-activation/ suspension	81	24.4%
Request for a password for EBM	80	24.1%
General technical support for EBM	69	20.8%
Processing of customs import declaration	65	19.6%
Processing of customs export declaration	43	13.0%
Motor vehicles services	28	8.4%

Source: RRA Customer satisfaction survey, 2020

According to the data provided, awareness levels regarding business registration or deregistration stand at 71%. Within this service, the highest level of awareness is observed in business registration and obtaining a Taxpayer Identification Number (TIN), reaching 92%. However, awareness regarding deregistration from Local Government Taxes remains low at 23%.

Tax declaration and customs duty service show a high awareness rate of 96.6%, with taxpayers being particularly informed about personal and corporation taxes (81%) compared to other aspects such as tax exemption on imported goods, Local Government Taxes (Trading license, Property tax, Rental income tax), and Public cleaning fee (currently is no longer charged), which scored much lower at 8.2%, 5.4%, and 4.3% respectively. Awareness levels for other services vary across different taxpayer categories. For example, large taxpayers exhibit high awareness regarding declaration/filing and processing of tax clearance certificates, while registration/deregistration services are more recognized among large and medium taxpayers. This indicates that taxpayers tend to prioritize services relevant to their business domains, leading to varied levels of awareness across different RRA services. Therefore, it's not surprising that some taxpayers may not be familiar with many of the services offered by the RRA.

Table 7-5: Communication tools used to be aware of RRA Services

17 https://www.rra.gov.rw/fileadmin/user_upload/RRA_Final_Report_Customer_Satisfaction_Survey_2020.pdf

	Count	%
Radio	1,149	79.0%
TV	975	67.1%
RRA's website	530	36.5%
Employees of RRA	471	32.4%
Newspaper	196	13.5%
Social Media (Twitter, Facebook, Instagram, YouTube)	149	10.2%
Posters within RRA's buildings	122	8.4%
Exhibitions and promotions e.g. shows	102	7.0%
Events held by RRA e.g., launch events, Taxpayers Appreciation Day	76	5.2%
Other	29	2.0%

Source: RRA Customer satisfaction survey, 2020

The table indicates that customers discover information about RRA products and services through a range of channels. In accordance with this, the research aimed to determine how customers become aware of RRA's service charter. It was found that the majority of taxpayers, 79% and 67.1%, respectively, are informed about RRA services through Radio and TV. Conversely, the other communication tools exhibit lower percentages, ranging from 36.5% to 2%.

Table 8-5: Table Awareness of Tax reforms and initiatives

	Count	%
M-declaration (dialing *800#)	827	56.9%
Payment of taxes using mobile money	789	54.3%
E- payment (Money transfer from your bank account to RRA account)	625	43.0%
Electronic billing machine (EBM)	552	38.0%
E- filling	290	19.9%
Tax payment through Mobicash	269	18.5%
Electronic Single Window	133	9.1%
Motor vehicles ownership transfers	75	5.2%
Tax payment through infinity	69	4.7%
One Stop Boarder Post	46	3.2%
Single customs territory	41	2.8%
Blue Channel	30	2.1%
Other	21	1.4%

Source: RRA Customer satisfaction survey, 2020

In order to assess if taxpayers have noticed any changes in service delivery as a result of reforms, it was crucial to determine their awareness of ongoing or completed reforms implemented by RRA. The survey identified three main reforms across different customer segments. According to Table 10, approximately 56.9% of taxpayers reported awareness of reforms regarding tax declaration with M-declaration, 54.3% were aware of the option to pay taxes using mobile money, and 43.0% were informed about E-payment methods.

Table 9-5: Perception of taxpayers on the impact of RRA's reforms

Services	Strongly negative	Negative	No impact	Positive	Strongly positive	Positive impact
Tax payment through Mobile Money	6.1	2.0	16.4	45.4	30.2	**75.6**
M-declaration	7.1	2.4	17.1	44.6	28.9	**73.5**
E- filling	5.2	2.1	20.9	45.5	26.3	**71.8**
E- payment	9.6	3.9	18.6	44.2	23.7	**67.9**
Electronic billing machine (EBM)	10.0	3.1	23.7	40.9	22.4	**63.2**
Motor vehicles ownership transfers	18.8	9.4	25.6	33.2	13.0	**46.2**
Tax payment through infinity	25.5	12.4	26.5	25.1	10.4	**35.5**
Electronic Single Window	34.7	12.4	21.9	22.3	8.6	**30.9**
One Stop Boarder Post	35.8	12.0	22.4	20.8	8.9	**29.7**
Single customs territory	36.5	13.6	23.6	19.3	7.0	**26.3**
Blue Channel	37.0	13.5	23.2	19.5	6.7	**26.3**

Source: RRA Customer satisfaction survey, 2020

According to the survey conducted by RRA to assess the impact of reforms on taxpayers, respondents rated various aspects of the system on a scale of 1 to 5. The results indicate that the top benefits perceived by taxpayers were mobile telephone payments (75.6%) and M-declaration (73.5%), followed by E-Payment (67.9%) and E-filing (71.8%).
Regarding the processing of VAT and its impact on service delivery, customers highlighted faster service (63.2%) as a significant improvement.

5.2 Primary data analysis

This section involves the examination and interpretation of raw data collected directly from the original source such as surveys, experiment or observation. In this case the details of profile of respondent, organized data, summarized key findings through descriptive statistics and regression was used to explore the relationship between variable under study.
The main goal of this section is to address research questions or research objectives effectively.

5.2.1. Profile of the Respondents

This section covered all necessary demographic information the respondents such as Gender, age, education level, experience, category of taxpayer and their experience. The main aim was to gain an understanding on how various groups with sample may view or experience the subject matter differently to break dawn the data according to these variables.

This analysis offers important insights for comprehending the wider significance of the findings and possibly customizing interventions or suggestions in light of any potential biases or variances in responses across demographic categories. Furthermore, investigating these demographic variables enables researchers to evaluate the sample's representativeness and consider any potential restrictions or biases brought on by demographic skewing.

Table 10-5: Profile of the Respondents

Profile of respondents		Count	Column N %
Gender	Male	29	58.0%
	Female	21	42.0%
Total		**50**	**100%.0**

Age	21- 30 years	11	22.0%
	31- 40 years	19	38.0%
	41- 50 years	19	38.0%
	51years and above	1	2.0%
Total		**50**	100.0%
Education	Secondary	0	0.0%
	Undergraduates	30	60.0%
	Postgraduates	20	40%.0
	Others	0	0.0%
Total		**50**	**100.0%**
Experience	1- 2 years	8	8.0%
	3- 5 years	52	52.0%
	6- 9 years	32	32.0%
	10 years and above	8	8.0%
Total		**50**	**100.0%**
Category of Taxpayers	Small	126	84.0%
	Medium	19	12.7%
	Large	5	3.3%
Total		**150**	**100.0%**
Experience of taxpayers	Between 2-5 years	109	72.7%
	Between 5-10 years	33	22.0%
	Above 10 years	8	5.3%
Total		**150**	100.%

Source: Primary data, 2023

The distribution is based on the respondents' break down and more male (58%) than female (42%) are those who have responded. The respondents whose ages fell within the brackets of 31–40 and 41–50 years taken together formed 38% of the total respondents, with the 21–30 age group standing on 22%. Undergraduates led the way according to the educational background criterion, being 60%. additionally, 32% of the respondents has experience in range from 6 to 9 years while 52% had an experience from 3 to 5 years.

this primary data shows that 84% of small taxpayers, 12.7% of medium taxpayers and 3.3% of large taxpayers were reached with 126, 19 and 5 respondents respectively. Furthermore, all of the taxpayers have a work history between 2 and 5 years that make up 72.7%.

This is followed by the 5-10 years range which is 22% make up 33 respondents and only 5.3% of business experience is greater than 10 years make up 8 respondents. It suggests that all respondents were qualified enough to offer qualified information to researcher.

5.2.2. Inferential Statistics

In this work, a multiple regression analysis was conducted to reveal the relationship between the electronic tax system and tax collection of the Revenue Authority. The regression model included several variables: the perception on e-tax (X1), the technical skills of using the system (X2), and an error term. (ε). Undefined:

$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \varepsilon$

Where:

Y represents tax collection,

X1 is a variable that stands for the perception of an e-tax.

X2 measures users' skills of technical system usage.
ε stands for error term.
β signifies the coefficient of independent variables,
Constant term stands for α.
The Statistical Package for Social Sciences (SPSS) was used in the regression analysis and in calculating the results. The findings were presented through tables and the discussion thereafter. The aim of results was to find out the degree to which the electronic tax system assists in the tax collection.

Table 11-5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.698a	.487	.482	.176

a. Predictors: (Constant), Technical Skills, Perception
b. Dependent Variable: Tax collection

Source: Primary data, 2023

The multiple linear regression analysis aimed to assess the combined contribution of the electronic tax system on tax collection by considering three variables including two independent variables such as Technical Skills to use e-tax system, Perception on e-tax, and Tax collection as the dependent variable.
The multiple correlation coefficient (R) was found to be positive with a value of 0.698. This indicates a strong and positive correlation between the two independent variables (Technical Skills to use e-tax system and Perception on e-tax) combined and the dependent variable (Tax collection).
In other words, there is a substantial relationship between the predictors and the outcome variable when considered together. Furthermore, the coefficient of determination (R Square) was determined to be 0.487. This value suggests that approximately 48.7% of the variance observed in tax collection can be attributed to the combined influence of the two independent variables (Technical Skills to use e-tax system and Perception on e-tax). This indicates a moderate-to-high level of explanatory power of the model, suggesting that these variables collectively contribute significantly to explaining the variation in tax collection.

Table 12-5: ANOVA[a] analysis of variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.830	2	2.915	93.670	<.001[b]
	Residual	6.130	197	.031		
	Total	11.960	199			

Predictors: (Constant), Technical Skills, Perception
Dependent Variable: Tax collection

Source: Primary data, 2023

In ANOVA (Analysis of Variance), the "F" statistic is employed for comparing the null hypothesis, which is mostly kept zero, with the alternative hypothesis that explains that there is some significant relationship. In this case the significance value is 0.001 which is lower than the accepted significance level of 0.05. This implies that the model has a very strong statistical significance in in terms of relationship between Technical Skills in the using of e-tax systems and Perception of e-tax's impact on Tax collection. In addition, the computed value of “F” is 93.670 which is greater than the critical value of "F" for the 0.05 significance level. This result indicates that the overall model is very significant. It hints that the variables included in the regression model have some relevance to the outcome that is being predicted.

Finally, we have to take note that the significance level less than 0.05 implies a high degree of confidence on the relationship existing within the model. Hence, it shows that the covariates, like Technical Skills and Perception of e-tax, may have a considerable impact in Tax revenue. The significant "F" value, therefore, lends more support to the magnitude of this association. The model, altogether, holds very strong and sound in its ability as a predictor of the target variable. Thus, policy makers can rely on this model for the purpose of making many informed decisions on the effective e-tax implementation approaches with a significant influence on tax collection.

Table 13-5: Multiple regression analysis (coefficient)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.910	.221		8.638	<.001
	Perception	.314	.051	.456	6.134	<.001
	Technical Skills	.330	.084	.293	3.937	<.001
a. Dependent Variable: Tax collection						

Source: Primary data, 2023

The equation expressing the relationship between the variables is represented as follows, per the findings of the regression analysis:

$Y = 0.330X2 + \varepsilon + 0.314X1 + 1.910$

Within this formula:
The dependent variable, in this case tax collection, is denoted by Y.
X1 stands for E-tax Perception.
Technical Skills for using e-tax is represented by X2.
Error term is represented by ε.
α is the constant term representation. This equation can be understood as follows:
The intercept term (1.910) shows that the expected value of tax collection would be 1.910 units if all independent factors (technical skills and perception of e-tax) were maintained constant. The coefficient of X1 (0.314) indicates that, assuming all other variables are equal, there is an expected increase in tax collection of 0.314 units for every unit increase in perception of e-tax. Similarly, the coefficient of X2 (0.330) suggests that, while all other variables remain constant, there should be an estimated increase in tax collection of 0.330 units for every unit improvement in technical skills to use e-tax.
It is clear that tax collection is positively impacted by both technical proficiency with e-tax and perceptions about e-tax. This suggests that people or organizations who have a more favorable opinion of e-tax and who are more proficient with e-tax systems technically tend to make larger contributions to tax collection. Policymakers and tax authorities can use these data to help create interventions that improve tax collection by focusing on increasing taxpayers' and tax administrators' opinions of e-tax and technical skills.

Table 14-5:Correlation between electronic tax system and tax collection

			Tax collection	Electronic tax management system
Spearman's rho	Tax collection	Correlation Coefficient	1.000	.778**
		Sig. (2-tailed)	.	<.001
		N	200	200
	Electronic tax management system	Correlation Coefficient	.778**	1.000
		Sig. (2-tailed)	<.001	.
		N	200	200
**. Correlation is significant at the 0.01 level (2-tailed).				

Source: Primary data, 2023

The variation of Spearman Coefficient correlation is between -1 and 1. Spearman Coefficient correlation has significance when it is equal or greater than 0.05. in this case correlation coefficient is 0.778 which show that electronic tax system and tax collection a very strong correlation, which indicate that they have a substantial and favorable relationship.

When the Spearman correlation coefficient is equal to or greater than 0.05, it is usually considered significant. This threshold is exceeded in this instance by the correlation coefficient of 0.778, demonstrating the statistical significance of the observed association.

To elaborate more on the analysis, the discovery of a positive and extremely high correlation between the Electronic tax collection system and tax collection implies that there is a significant increase in tax collection as electronic tax collection systems are adopted and used more frequently.

This demonstrates how crucial and successful computerized tax collecting systems are in enhancing revenue collection procedures. In order to further increase the efficiency of tax collection, policymakers and tax authorities can utilize this information to prioritize and fund the creation and deployment of such systems. Furthermore, the statistically significant association confirms the validity of the findings and their practical implications for revenue management and tax administration by highlighting the dependability of the link found.

Table 15-5:Reliability Statistics

Cronbach's Alpha	N of Items
.853	34

Source: Primary data, 2023

With a value of 85.3%, the dependability of the 34 questions evaluated using the Cronbach's Alpha coefficient satisfies acceptable norms. This suggests that the data these questions provide is seen as trustworthy and dependable. A metric used to evaluate internal consistency reliability that gauges how closely linked a group of objects is to one another is called Cronbach's Alpha. When an assessment's Alpha coefficient is 85.3%, it indicates that the test's questions are reliably evaluating the same underlying construct or idea. This degree of reliability is usually regarded as good, meaning that the questionnaire is consistently yielding reliable responses and successfully gathering the desired information.

The validity of the information obtained by these questions may be trusted by researchers and practitioners, enabling more thorough analysis and well-informed decision-making based on the results.

Furthermore, attaining a high reliability level shows the validity and rigor of the measurement tool employed in the study, which strengthens the trustworthiness of the research findings. As a result, in order to make defensible judgments and relevant conclusions, stakeholders can depend on the data obtained from the questionnaire.

6 CONCLUSIONS, RECOMMENDATION AND TAKEAWAYS

6.1 Conclusion

The study project intended to examine the efficiency of electronic tax collection system used by Rwanda Revenue Authority, in tax collection performance. The research design was undertaken in order to acquire new and oriented knowledge to find a solution to the research problem which has been identified at the beginning of this research. The study used primary and secondary data collection methods by focusing on acquiring new knowledge and addressing the defined research topic through the use of a research design.

Two questionnaires were used to collect primary data: one was made specifically for RRA employees, while the other was made for taxpayers. By using this strategy, the researchers were able to collect both quantitative and qualitative data, which led to a thorough grasp of the topic. In order to properly understand the results, a thorough statistical analysis was made possible by the use of SPSS software for data analysis.

In addition to primary data collection, secondary data was reviewed through a documentation analysis. This involved reviewing different written sources such as books, reports, dissertations, and websites to collect additional insights into the topic. The findings of the study show that the electronic tax collection system have significance influence tax collection efficiency. This conclusion highlights the significant role and effectiveness of modern technological solutions in improving revenue collection processes within governmental body like the Rwanda Revenue Authority.

6.2 Recommendation

The recommendation is based on the study result which shows that the electronic tax system significantly impacts tax collection efficiency with both the perception of using the system and technical skills playing important roles. However, challenges persist for taxpayers, particularly small taxpayers, in adopting e-filing and e-payment due to limited knowledge, insufficient IT infrastructure, and network problems.

To address these challenges and improve tax collection performance, the Rwanda Revenue Authority (RRA) should increase investment in tax services for small and medium-sized enterprises (SMEs), accommodating varying levels of infrastructure and IT literacy, with a focus on gender inclusion. While the initial focus on larger businesses is understandable due to their contribution to total tax revenue, attention must be given to the needs of smaller taxpayers.

Several challenges hindering tax collection performance were identified, including taxpayers' advanced tax planning, inadequate training and communication between RRA and taxpayers, absence of a unified tax system, and insufficient resources for tax collectors. These challenges can be addressed by implementing an automated risk rules scoring system in electronic filing and payment systems, improving training and communication channels, and increasing resources for tax collectors, such as providing transport and expanding the number of tax collectors. Furthermore, organizing tax dialogues through media outlets can help educate the public about their role in tax collection and foster cooperation between taxpayers and tax authorities. By addressing these challenges and implementing targeted strategies, RRA can enhance revenue collection and promote compliance among taxpayers.

6.3 Key takeaways

In my observation I have realized that governance of a country starts with the needs of the people, and that their prosperity is the responsibility of the government. In order to succeed, the government must fulfill their obligations to the people, take the initiative, rally support from all sides, and make sure that policies are stable and consistent. The leadership must also be devoted, strong-willed, and determined. According to the study, Rwanda's government, acting through its tax administration authority, has put in place a number of measures to deal with the issues raised by the digital economy. These include making sure that companies operating in the digital space pay their fair share of taxes and encouraging innovation and entrepreneurship. the tactics for tax collecting and governance in Rwanda, with an emphasis on the government's involvement, partnerships with the business sector, and the value of flexibility in tax administration. Below is a summary of the main ideas:

Strong government support and leadership: The Office of the President, the Ministry of Finance and Economic Planning, and other key stakeholders have all strongly supported RRA. By requiring the adoption of new procedures and systems, RRA has been able to successfully leverage this support into increased compliance. While government cooperation and alignment are usually necessary for tax authorities to fully accomplish their digitalization goals, this centralized approach in Rwanda may not be applicable in other situations.

Private sector Collaboration: Together with the business sector, RRA and the Rwandan government have developed tax digitalization delivery models that are profitable. In order to create and run Irembo, a portal for accessing all government services, the government, acting through the Rwanda Development Board, signed a 25-year revenue-sharing agreement with Rwanda Online Platform Ltd (ROPL) in 2014.

Technology adaptation: The fact that RRA prioritizes software flexibility shows how important it is to keep up with technology developments and adjust to changes in the tax landscape. Because of this adaptability, tax authorities may continue to operate effectively and efficiently in the face of changing possibilities and obstacles.

Legal and regulatory framework: In order to regulate digital taxes, Rwanda has established a robust legal framework. Examples of this include legislation that establishes the scope of digital transactions that are taxable, outlines the compliance responsibilities of digital service providers, and ensures transparency and accountability in tax collection processes.

Compliance promotion and Enforcement: RRA have taken different major of compliance with digital taxation requirements which is crucial for the effectiveness of Rwanda's tax system. To help businesses and individuals understand their tax responsibilities in the digital sphere, the government has invested in taxpayer education and awareness programs, though there is still room for improvement.

Rwanda has also improved its enforcement methods, using digital platforms and data analytics to track transactions, identify possible tax evasion, and enforce compliance.

Support for digital Entrepreneurship: Rwanda remains committed to fostering an environment that promotes creativity in digital entrepreneurship and the use of digital taxes laws. The government offers tax breaks, funding accessibility, and capacity-building programs as ways to assist new and emerging digital enterprises.

Rwanda hopes to create jobs and diversify its economy by fostering the development of the digital economy and generating sustainable income streams.

In fact, the case of RRA highlights the significance of strong government support, collaboration with the private sector, and adaptability in achieving successful governance and revenue generation strategies. These guidelines can provide other nations looking to improve their governance structures and tax administration systems with insightful information. The experience Rwanda has had with digital taxation highlights how crucial it is to modify tax laws to reflect the changing needs of the digital economy. Rwanda aims to leverage the potential of digital technology to propel economic development and establish a more wealthy and inclusive society by means of a range of measures including legislative reforms, international collaboration, compliance initiatives, and encouragement for digital entrepreneurship. Rwanda is steadfast in its will to improve its digital taxation strategy in order to maintain sustainability, efficiency, and equity in revenue collection as the digital environment changes.

6.4 Areas of further studies

Studying the contribution of electronic tax systems (e-tax systems) in tax collection is an important area that can be explored from various perspectives. Here are some potential areas of further study:

Impact on Tax Compliance: Research can investigate how the implementation of e-tax systems influences tax compliance behavior among different segments of taxpayers. This could involve analyzing data on tax filing rates, timely payments, and the reduction of tax evasion.

Efficiency and Cost Savings: Evaluate the efficiency gains and cost savings associated with e-tax systems compared to traditional tax collection methods. This could include analyzing the reduction in administrative costs, processing times, and the overall effectiveness of resource utilization.

User adoption and experience: Analyze how taxpayers engage with electronic tax administrations. Examine elements including accessibility, convenience of use, and confidence in the security of the system that affect the uptake and acceptance of electronic tax filing and payment methods.

International Comparisons: International Comparisons: Examine how well e-tax systems are implemented and used in various nations and areas. List the best practices, the lessons that have been learnt from successful deployments, and the difficulties that have been faced in jurisdictions with different degrees of institutional and technological capabilities.

Long-Term Sustainability: Consider shifting taxpayer behaviors and the state of technology when assessing the long-term viability of e-tax systems. Think about methods for enhancing current procedures, adjusting to novel situations, and securing computerized tax administration systems for the future.

These areas offer a comprehensive framework for further research into the contribution of electronic tax systems to tax collection, addressing both practical implications and theoretical insights into the role of technology in modernizing tax administration.

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Appendices

Appendix 1

QUESTIONNAIRE

Dear Respondents,

I, **KANYABWIRA Jean Claude students** of the Masters of professional degree in Accounting at Shanghai National Accounting institute. We are carrying out our research on the *influence of the electronic billing machine on tax collection and tax compliance: A Case Study of Rwanda Revenue Authority.* This is one of the requirements to get this degree. Please kindly help the researcher in this study by answering the following questions in a way you feel appropriate. Your response will be only for academic purpose and will be treated confidential.

(***To be filled by RRA staffs***).

The questionnaire is divided two: Bio data of respondents and Likert scale questions (Specific objectives)

Please tick the response that you think is most appropriate to each question and indicates yourresponse in the space provided. tick whichever is applicable to you:

A. BIO DATA

1. Are you Male or Female?

1. Male [ ]

2. Female [ ]

2. How old are you? (Tick appropriately)1. 21- 30 years [ ]

2. 31- 40 years [ ]

3. 41- 50 years [ ]

4. 51years and above [ ]

3. Educational qualification:

1. Secondary [ ]

2. Undergraduate [ ]

3. Post graduate [ ]

4. Others specify [ ]

4. How long have you been working with Rwanda Revenue Authority (RRA)?

1. 1-2 years [ ]

2. 3-5 years [ ]

3. 6-9 years [ ]

4. 10 years and above [ ]

B. LIKERT SCALE QUESTIONS

SPECIFIC OBJECTIVE 1: ASSESSING PERCEPTION AND TECHNICAL SKILLS TOWARD USING ELECTRONIC TAX MANAGEMENT SYSTEM.

Definition of the Scale for the assessing internet payment system and its effect of internet payment/filing system on tax col- lection in Rwanda (1 = strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree,5= strongly agree)

Perception of using Electronic Tax Management System	**1**	**2**	**3**	**4**	**5**
1. Taxpayers filing and payment pay tax easily by using internet					
2. taxpayers has tax knowledge to use E-filing no need of help					
3. taxpayer has intention to evade tax					
4. E-tax system has made clients paytax in time and correct filing of returns					
5. taxpayers have behavior intention to provide invoice using electronic billing machine					
6. the way e-tax is designed is user-friendly					
7. taxpayers are satisfied by e-tax service					
Technical skill of using E-tax	**1**	**2**	**3**	**4**	**5**
1. taxpayers file and pay tax from anywhere by use of their mobile phone or internet					
2. Taxpayers has Knowledge to file and pay tax use of their mobile phone or through internet					
3. Taxpayers understand electronic Filing system functions very well and do not get problems when using it.					
4. electronic Filing system is fast and convenient compared to the old manual system.					

SPECIFIC OBJECTIVE 2: TO ASSESS IF ELECTRONIC TAX MANAGEMENT SYSTEM CAN HELP TAX AUTHORITIES FIND ERRORS IN THE PROCESS OF TAX PAYMENT, REDUCE TAX PAYMENT RISKS, IMPROVE THE EFFICIENCY OF TAX COLLECTION, IMPROVE TAX COMPLIANCE, AND BETTER SERVE TAXPAYERS.

Definition of the Scale for the electronic billing machine system and its effect on tax collection in Rwanda (1 = strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree)

Tax collection	1	2	3	4	5
1.E-tax has made efficient in tax collection in Rwanda					
2.E-tax system has made taxpayers File and pay tax in time					
3. E-tax system has improved efficient in tax collection and better serve taxpayers					
5.E-tax reduced tax payment risks and improved tax compliance					
5.Electronic tax collection help tax authorities find errors in the process of tax payment					
Internet filing and payments					
1.Taxpayers filing and payment pay tax easily by using internet					
2.taxpayers has tax knowledge to use E-filing and payment without physical appearance					
3.Internet payment/filing system has made taxpayers declare and pay tax from everywhere.					

Thank you

Dear Respondents,

I, **KANYABWIRA Jean Claude students** of the Masters of professional degree in Accounting at Shanghai National Accounting institute. We are carrying out our research on the *influence of the electronic tax management system on tax collection and tax compliance: A Case Study of Rwanda Revenue Authority.* This is one of the requirements to get this degree. Please kindly help the researcher in this study by answering the following questions in a way you feel appropriate. Your response will be only for academic purpose and will be treated confidential. (***To be filled by RRA taxpayers***).
Please tick the response that you think is most appropriate to each question and indicates yourresponse in the space provided. tick whichever is applicable to you.

SECTION A. BACKGROUND INFORMATION.

1. Tick your category
   a. small
   b. medium
   c. large
2. How long have you been in business?
   a. Between 2-5 years
   b. Between 5-10 years
   c. Above 10 years

Definition of the Scale for the assessing internet payment system and its effect of internet payment/filing system on tax col- lection in Rwanda (1 = strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree,5= strongly agree)

Perception of using Electronic Tax Management System	1	2	3	4	5

1. it is easy for you filing and pay tax easily by using internet					
2. you have tax knowledge to use E-filing no need of help					
3. E-tax system has made you paytax in time and correct filing of returns					
4.Though e-tax you get a better service					
Technical skill of using E-tax	**1**	**2**	**3**	**4**	**5**
1. you can file and pay tax from anywhere by use of their mobile phone or internet					
2. you have knowledge to file and pay tax use of their mobile phone or through internet					
3. you don't need to employ expert to declare and pay tax					
4. the way e-tax is designed is user-friendly					
Tax collection					
1.I pay my taxes willingly because I know the benefits					
2.I hate to pay taxes because tax rates are too high					
3.I pay my dues at the right time and in the right amount					
4.e-tax system has improved efficient in tax payment and better service					
Internet filing and payments					
1. I understand electronic tax management system functions very well and I do not get problems when using it.					
2.Electronic tax management system is fast and convenient compared to the old manual system.					
3.Does it take you little time to file and pay due on time using e-tax?					

1. Please state in your view the major weaknesses or challenges of electronic tax filing system.
………
…………………………………………………………………………
2. How can the above weaknesses or challenges (if any) be overcome?
………
………

Thank you

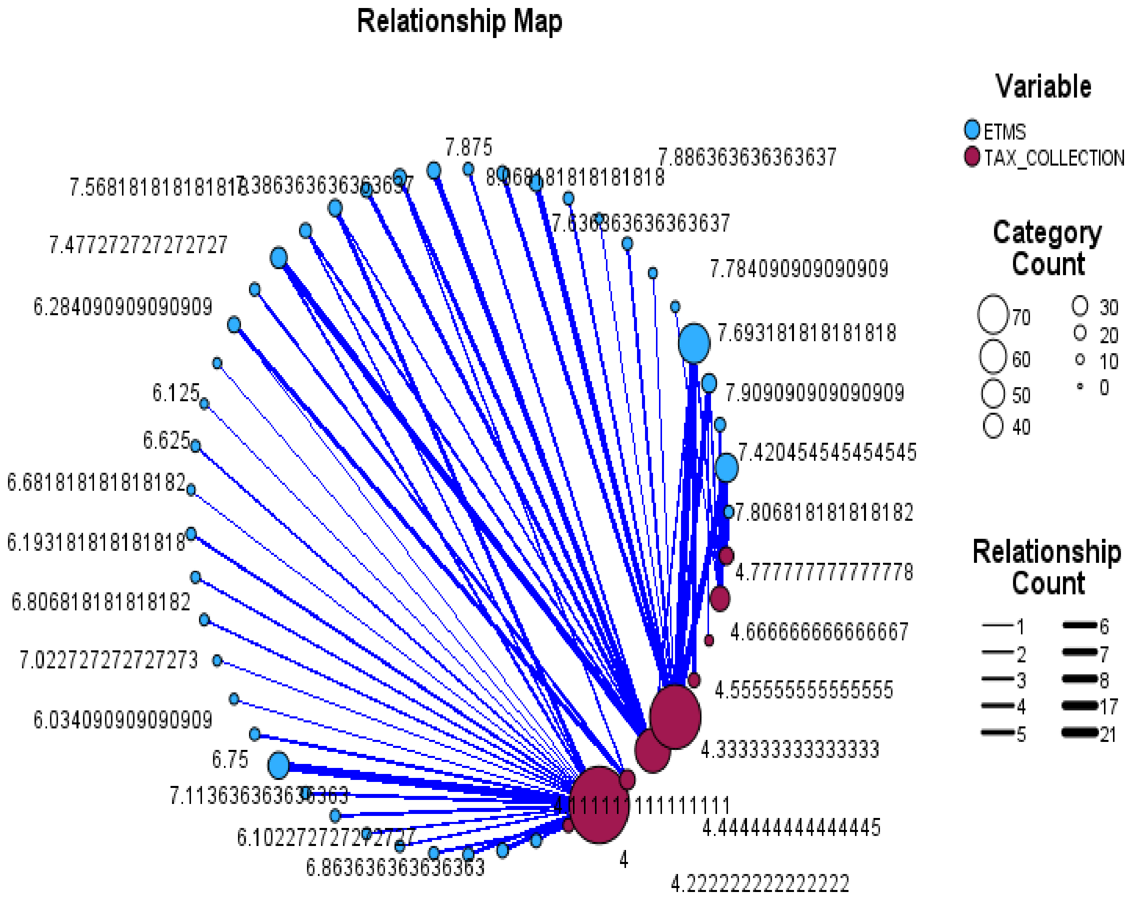
Appendix 2

Table 1: Descriptive statistics

Descriptive Statistics											
Questions	**N Statistic**	**Range Statistic**	**Minimum Statistic**	**Maximum Statistic**	**Mean**	**Mean Std. Error**	**Std. Deviation Statistic**	**Skewness Statistic**	**Skewness Std. Error**	**Kurtosis Statistic**	**Kurtosis Std. Error**
Gender	50	1	1	2	1.42	0.07051	0.4985694	0.3342898	0.336601	-1.968697	0.6619084
Age	50	3	1	4	2.2	0.11429	0.808122	-0.1450121	0.336601	-0.96874	0.6619084
Education	50	1	2	3	2.4	0.06999	0.4948717	0.4209846	0.336601	-1.900488	0.6619084
Experience	50	3	1	4	2.4	0.1069	0.7559289	0.3543417	0.336601	-0.061835	0.6619084
Cat. Of taxpayers	150	2	1	3	1.19333	0.03865	0.4734093	2.4713478	0.198038	5.492607	0.3935831
Experience of taxpayers	150	2	1	3	1.32667	0.04682	0.5734233	1.5785981	0.198038	1.510633	0.3935831
Taxpayers filing and payment pay tax easily by using internet	200	3	1	4	2.43	0.056	0.792	0.188	0.172	-0.365	0.342
taxpayers has tax knowledge to use E-filing no need of help	200	3	2	5	4.35	0.052	0.742	-0.89	0.172	0.147	0.342
Taxpayer has intention to evade tax	200	4	1	5	4.41	0.067	0.941	-1.89	0.172	3.415	0.342
E-tax system has made clients pay tax in time and correct filing of returns	200	3	2	5	4.35	0.051	0.72	-1.196	0.172	1.883	0.342
taxpayers have behavior intention to provide invoice using EBM	200	3	2	5	3.34	0.065	0.916	-0.014	0.172	-0.907	0.342
the way e-tax is designed is user-friendly	200	1	4	5	4.96	0.014	0.196	-4.73	0.172	20.582	0.342
taxpayers are satisfied by e-tax service	200	1	4	5	4.69	0.033	0.464	-0.828	0.172	-1.328	0.342
it is easy for you filing and pay tax easily by using internet	200	4	1	5	2.68	0.083	1.177	0.29	0.172	-0.799	0.342
you have tax knowledge to use E-filing no need of help	200	4	1	5	1.68	0.088	1.247	1.679	0.172	1.448	0.342
E-tax system has made you pay tax in time and correct filing of returns	200	3	2	5	3.39	0.073	1.026	-0.165	0.172	-1.24	0.342
Though e-tax you get a better service	200	3	2	5	2.61	0.069	0.977	1.484	0.172	0.92	0.342
taxpayers file and pay tax from anywhere by use of their mobile phone or internet	200	1	4	5	4.96	0.015	0.208	-4.423	0.172	17.74	0.342
Taxpayers has Knowledge to file and pay tax use of their mobile phone or through internet	200	2	3	5	4.32	0.051	0.715	-0.571	0.172	-0.877	0.342
Taxpayers understand electronic Filing system functions very well and do not get problems when using it.	200	2	3	5	4.35	0.046	0.648	-0.49	0.172	-0.681	0.342
electronic Filing system is fast and convenient compared to the old manual system.	200	1	4	5	4.51	0.035	0.501	-0.02	0.172	-2.02	0.342
you can file and pay tax from anywhere by use of their mobile phone or internet	200	2	2	4	3.85	0.037	0.528	-3.252	0.172	8.659	0.342
you have knowledge to file and pay tax use of their mobile phone or through internet	200	2	1	3	1.99	0.027	0.382	-0.052	0.172	4.025	0.342
you don’t need to employ expert to declare and pay tax	200	3	1	4	1.93	0.043	0.602	0.584	0.172	1.906	0.342
The way e-tax is designed is user-friendly	200	1	4	5	4.07	0.019	0.264	3.252	0.172	8.659	0.342
E-tax has made efficient in tax collection in Rwanda	200	1	4	5	4.39	0.035	0.49	0.433	0.172	-1.831	0.342
E-tax system has made taxpayers File and pay tax in time	200	1	4	5	4.35	0.034	0.477	0.657	0.172	-1.584	0.342
E-tax system has improved efficient in tax collection and better serve taxpayers	200	2	3	5	4.4	0.038	0.53	0	0.172	-1.141	0.342
E-tax reduced tax payment risks and improved tax compliance	200	1	4	5	4.35	0.034	0.478	0.634	0.172	-1.615	0.342
Electronic tax collection help tax authorities find errors in the process of tax payment	200	1	4	5	4.59	0.035	0.492	-0.39	0.172	-1.867	0.342
I pay my taxes willingly because I know the benefits	200	1	4	5	4.3	0.033	0.462	0.853	0.172	-1.285	0.342
I hate to pay taxes because tax rates are too high	200	1	4	5	4.05	0.015	0.218	4.161	0.172	15.466	0.342
I pay my dues at the right time and in the right amount	200	1	4	5	4.05	0.015	0.218	4.161	0.172	15.466	0.342
e-tax system has improved efficient in tax payment and better service	200	3	2	5	3.82	0.084	1.189	-0.606	0.172	-1.171	0.342
Valid N (listwise)	**200**										

Appendix 3

Figure 2: Relationship maps of variables


Relationship Map
Variable
ETMS
TAX_COLLECTION
Category Count
70
60
50
40
30
20
10
0
Relationship Count
1
2
3
4
5
6
7
8
17
21
7.875
7.886363636363637
7.568181818181818
7.386363636363637
8.068181818181818
7.636363636363637
7.477272727272727
7.784090909090909
6.284090909090909
7.693181818181818
7.909090909090909
6.125
6.625
7.420454545454545
6.681818181818182
7.806818181818182
6.193181818181818
4.777777777777778
6.806818181818182
4.666666666666667
7.022727272727273
4.555555555555555
6.034090909090909
4.333333333333333
6.75
7.113636363636363
4.111111111111111
6.102272727272727
4.444444444444445
6.863636363636363
4
4.222222222222222