



**ELECTRONIC TAX SYSTEM AND TAX COLLECTION EFFICIENCY: A CASE OF RWANDA REVENUE
AUTHORITY- NYAGATARE DISTRICT**

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ABSTRACT

The general objective of this study was to assess the influence of electronic tax system on tax collection efficiency in Rwanda. Specific objectives are to assess the influence of electronic tax trainings on tax collection efficiency in Nyagatare District, analyze the influence of tax online services on tax collection efficiency in Nyagatare District and determine the influence of electronic tax regulations framework on tax collection efficiency in Nyagatare District. The researcher employed quantitative method in this study using descriptive case study research design. The population of this study was 124 including staff of Rwanda Revenue Authority (RRA), Domestic Taxes Department (DTD) Nyagatare Branch, Rwanda Revenue Authority Sector officers, Rwanda National Police unit, Youth Volunteers, Private Sector Federation (PSF) representatives, Youth Volunteers in charge of enforcement and follow up of EBM usage and Ngali Holdings Staff in charge of taxes in Nyagatare District. The Solvin formula, which gives simpler sample sizes, was used to calculate the sample size. A sample size of 94 is calculated when this calculation method is used. Participants were selected using a stratified sampling technique. The method included taking a representative sample from each stratum of a population that had been divided into subgroups according to one or more criteria. The researchers employed surveys and documentary analysis to compile their results. The researcher employed the statistical approach calculated by Statistical Product and Services Solutions to examine the collected data. In this case, the R square value of 0.615 indicates that approximately 61.5% of the variation in tax collection efficiency can be explained by the three predictor variables: Electronic tax regulations framework, Electronic tax trainings, and online services. The number of predictors is included in the adjusted R square value of 0.602, which accounts for this. It is recommended that the Rwanda Revenue Authority in Nyagatare District should prioritize and continue to invest in electronic tax trainings, particularly in improving worker development and electronic usage skills, as well as decreasing defects, waste, and customer complaints.

Key words: electronic tax system , trainings, online services, regulations framework and tax collection efficiency

INTRODUCTION

The first dynasty of the Old Kingdom, which happened between 3000 and 2800 B.C., was where tax collection as known it today began. Corvée and tithe taxes were the first and most common methods of taxation. Poor farmers provided the state with corvée, which is a form of involuntary labor (taxes in ancient Egyptian). It is documented in historical sources that every two years, the pharaoh would go around the realm to collect tithes from the citizens. Among the other documents are papyrus and limestone flakes bearing grain invoices (Kiyosov, 2020).

In the 1760s, colonies were upset about how the British taxed them, which led to the American Revolution. This is seen as the start of the modern era of taxes in the United States. The newly formed country raked in money from levies on imported goods ("tariffs"), distilled spirits, and even glass windows for a while. The voters in each state and town had to pay a poll tax, and homes and businesses had to pay property taxes. Both the state and federal governments levy excise taxes. After 1900, both the federal and state governments began levying inheritance taxes, and by the 1930s, states (but not the federal government) had begun levying sales taxes. The United States government implemented a temporary income tax during the Civil War and the 1890s, and a permanent one began in 1913. There is no Value Added Tax (VAT), sales tax, export tax, or tax on interstate commerce or donations to churches and other religious organizations (Ahrorov, 2020).

Early tax laws in Rwanda were most likely introduced there by colonial powers. The law passed in August 1912 developed a graduated tax rate and a tax on real estate, both of which were enacted as a result of this tax law. On June 1, 1925, the Belgian Congo issued an order creating a profit tax, and on November 15, 1925, an ordinance was passed to accept and implement this tax. This law has been updated over time to reflect the realities of the shifting economy. Among other similar legal instruments, Law No. 06/2001 of the 20th of January 2001 on the code of value added tax has replaced Law No. 29/91 of the 28th of June 1991 on sales tax or turnover tax (Minani & Mulyungi, 2017).

Objectives of the Study

The overall goal of this study was to examine the influence of electronic tax system on tax collection efficiency in Rwanda.

Specific objective of the study

- i. To assess the influence of electronic tax trainings on tax collection efficiency in Nyagatare District.
- ii. To analyze the influence of online services on tax collection efficiency in Nyagatare District.
- iii. To determine the influence of electronic tax regulations framework on tax collection efficiency in Nyagatare District.

Research hypotheses

On the basis of the goals of the research, the following null hypotheses were developed:

Ho1: Electronic tax trainings do not have statistical significant influence on tax collection efficiency in Nyagatare District.

Ho2: There is no statistical significant influence of online services on tax collection efficiency in Nyagatare District.

Ho3: There is no statistical significant influence of electronic tax regulations framework on tax collection efficiency in Nyagatare District.

LITERATURE REVIEW

This study refers and uses the theories like Ability to pay theory and Technology Acceptance Theory.

Ability to pay theory

Adam Smith himself advocated for, and showed support for, the concept that those who are able to pay more should pay a greater proportion of their income. The Ability to Pay Hypothesis, first proposed in 1959 by English economist Arthur Cecil Pigou, is widely regarded as a seminal work in the field of modern fiscal policy. One's financial means the ability-to-pay principle of taxation states that tax rates should be set such that they are fair for all taxpayers. Thus, the concept dictates that those having a larger capacity to pay taxes, as determined by wealth and income, should pay a bigger share of those taxes (Miller, 2014).

People should be expected to pay different amounts of tax depending on their respective taxable capacities; for example, person A should be expected to pay more than person B. The most widely held and widely recognized notion of fairness or justice in taxation is that individuals should pay taxes to the government in proportion to their means. The idea of taxing people according to their ability to pay seems fair and rational (Stiglitz, 2014).

For this study, everyone should make the same sacrifice in taxation is a fundamental tenet of the philosophy that guided this study. The ability-to-pay method is a good way to figure out tax burdens because it takes into account both an individual's financial situation and the value of the benefits they get from society.

Technology Acceptance Theory

The concept of technological acceptance was first proposed by Davis, Bagozzi, and Warshaw in 1989. The main purpose of the model is to explain in depth how many variables affect the widespread adoption of computer applications. According to Alaa and Mamoun (2017), the behavior of the people who are meant to utilize a computer information system is the primary factor in how often such a system is actually used. This is because users' perceptions regarding the system are affected by their conduct. How easy people find it to utilize the new technology has an impact on their opinion of it and how they plan to use it.

For this study, in order to gauge the rate of adoption of cutting-edge technology in VAT collection via electronic billing systems, the Technology Acceptance Model relies on surveys of taxpayers' opinions. The collection of value-added tax (VAT) via electronic billing systems is on the rise. Taxpayers' opinions on this innovative industry, however, are mostly unknown. The Technology Acceptance Theory was conceived after extensive research into this very topic.

RESEARCH METHODOLOGY

Descriptive survey methodologies are excellent for examining variable's correlations or linkages, and the collected data may be utilized to give a causal explanation for events. Descriptive studies are often the most successful ways for acquiring evidence that demonstrates correlations and describes the phenomenon as it now exists. An explanatory research design utilized to explain the link between variables. Because of what the study is about, the researcher used a quantitative method.

Target population

The population of this study was 124 including staff of RRA, domestic taxes department (DTD) Nyagatare branch, RRA local taxes officers, revenue protection unit staff, private sector federation (PSF) representatives, youth volunteers and Ngali Holdings Staff in charge of taxes in Nyagatare District.

Sample size

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

Sample size (n), population size (N), and margin of error (e) are all inputs into the formula. By using the calculation above, the researcher arrives at a sample size of 94.

$$n = \frac{124}{1 + 124(0.05)^2} = \frac{124}{1 + 124(0.0025)} = \frac{124}{1 + 0.31} = \frac{124}{1.31} = 94$$

Researcher employed a method called stratified sampling to choose study participants. Stratified sampling was a useful sampling technique for research because it increased the representativeness and accuracy of the sample, and enable researcher to draw more accurate conclusions about the population of interest.

Data collection instruments

Documentation technique

In order to do documentary analysis, the researcher employed a selection of documents; after determining which texts are useful to the project at hand and why, Researcher organized them into categories on handwritten drafts before finally entering them into a computer for compilation. This is important because it looks at the literature and consider people from all over the world their opinions in order to make comparison framework for analysis and evaluation.

Questionnaire technique

The questionnaire had space for the respondent to answer agree or disagree questions. A number of predetermined answers are presented to the respondent in a closed-ended inquiry. The collector can only choose from a predetermined set of replies.

Data analysis procedure

Researcher collected information from wide range of sources, examine it and draw conclusions based on analysis. A statistical approach calculated by Statistical Product and Services Solutions (SPSS) used by the researcher to assess the collected data.

In this approach, the research used descriptive ad correlation analysis. Descriptive analysis made use of frequency, proportion and percentage figures calculated for each variable. To explore and quantify the statistical link between two variables, a coefficient of determination was developed. The intensity and closeness of the link between variables calculated sing correlation analysis.

FINDINGS AND DISCUSSIONS

Inferential statistics as division of statistics dealt with making inferences or conclusions about a sample of data. Techniques used in inferential statistics include correlation analysis, hypothesis testing, confidence intervals, and regression analysis.

Table 1: Correlation matrix

		Electronic tax trainings	Online services	Electronic tax regulations framework	Tax Collection efficiency
Electronic tax trainings	Pearson Correlation	1	.671**	.624**	.688**
	Sig. (2-tailed)		.000	.000	.000
	N		89	89	89
Online services	Pearson Correlation		1	.724**	.713**
	Sig. (2-tailed)			.000	.000
	N			89	89
Electronic tax regulations framework	Pearson Correlation			1	.677**
	Sig. (2-tailed)				.000
	N				89
Tax Collection efficiency	Pearson Correlation				1
	Sig. (2-tailed)				
	N				

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

Source: Field data (2023)

Table 1 shows the correlations between Electronic tax trainings, online services, Electronic tax regulations framework, and Tax Collection efficiency. The degree and direction of a link between two variables may be determined by calculating their correlation coefficient.

The correlation coefficient between Electronic tax trainings and Tax Collection efficiency is 0.688. This demonstrates that there is a substantial association between Electronic tax trainings and Tax Collection efficiency of Rwanda Revenue Authority in Nyagatare District., since the positive correlation is statistically significant at the 0.01 level.

The effectiveness of Tax Collection has a 0.713 association with the prevalence of online services. This suggests there is a high degree of association between the two factors. There is a 0.01 level of significance for the association. This evidences the close connection between Rwanda Revenue Authority's Online services and Tax Collection efficiency in Nyagatare District.

The correlation coefficient between Electronic tax regulations framework and Tax Collection efficiency is 0.677. This suggests that there is a strong relationship between Electronic tax regulations framework and Tax Collection efficiency of Rwanda Revenue Authority in Nyagatare District. The findings are supported by the research study conducted by Harelimana, Patrick, Sanyu and Rutungwa (2020) established a positive association ($r=0.586$) between the obligatory adoption of EBMs and VAT compliance metrics. Through EBMs, we can increase VAT compliance. It is suggested that RRA come up with a plan for putting EBMs into larger tax compliance frameworks to make it easier for taxpayers to follow the rules on their own.

The findings conclude that there is a strong positive correlation between the implementation of electronic tax-related measures (such as Electronic tax trainings, Online services, and Electronic tax regulations framework) and Tax Collection efficiency of Rwanda Revenue Authority in Nyagatare District.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.784 ^a	.615	.602	9.06974

a. Predictors: (Constant), Electronic tax regulations framework, Electronic tax trainings, Online services

Source: Field data (2023)

The Model Summary as per Table 2 above provides information on the overall goodness of fit of the regression model. In this case, the R square value of .615 indicates that approximately 61.5% of the variation in tax collection efficiency can be explained by the three predictor variables: Electronic tax regulations framework, Electronic tax trainings, and Online services. The adjusted R square of .602 takes into account the number of predictors in the model and adjusts the R square value accordingly. The standard error of the estimate of 9.06974 represents the average distance that the actual tax collection efficiency values deviate from the predicted values based on the model. Overall, the results suggest that the regression model is a good fit for the data and that the predictor variables have a significant impact on tax collection efficiency of Rwanda Revenue Authority in Nyagatare District. The findings supported by Iqbal *et al.* (2014) highlighted the favorable effect that training had on the performance of workers within the setting of the Telecommunication Sector in Pakistan. Insightful statistical analysis reveals training's beneficial effects and correlation with increased productivity on the part of staff. R square= 0.716 which mean that 71% of the variance in performance can be attributed to training. Therefore, training is crucial to raising employees' levels of knowledge, skill, and confidence in the workplace.

Table 3: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11182.607	3	3727.536	45.314	.000 ^b
	Residual	6992.112	85	82.260		
	Total	18174.719	88			

a. Dependent Variable: Tax Collection efficiency

b. Predictors: (Constant), Electronic tax regulations framework, Electronic tax trainings, Online services

Source: Field data (2023)

The ANOVA Table 3 shows the results of the analysis of variance for the regression model. The null hypothesis is that there is no significant relationship between the independent variables (electronic tax trainings, online services, and electronic tax regulations framework) and the dependent variable (tax collection efficiency), while the alternative hypothesis is that there is a significant relationship. In this case, the F-value is 45.314, which is significant at the 0.05 level. This indicates that the independent variables are jointly significant in explaining the variance in the dependent variable. Fatos (2020) assessed the effects of e-business on widened scope and improved were assessed. The study reject the null hypothesis and conclude that there is a significant link since p value is less than 0.01 when compared to all other variables. The research confirmed that e-business had a favorable effect on expanding businesses' operations and boosting their profitability in Kosovo.

The ANOVA results indicate that the regression model is significant and that the independent variables (electronic tax trainings, online services, and electronic tax regulations framework) are jointly significant in explaining the variance in the dependent variable (Tax Collection efficiency of Rwanda Revenue Authority in Nyagatare District).

Conclusion

The study found that there is a strong positive correlation between the implementation of electronic tax-related measures (Electronic tax trainings, Online services, and Electronic tax regulations framework) and tax collection efficiency of Rwanda Revenue Authority in Nyagatare District. The regression model showed that the variation in tax collection efficiency can be explained by the three predictor variables. Joint significance between the independent and dependent variables was established by the study. The findings suggest that the implementation of electronic tax-related measures has a significant impact on improving tax collection efficiency.

Recommendations

It is recommended that the Rwanda Revenue Authority in Nyagatare District should prioritize and continue to invest in electronic tax trainings, particularly in improving worker development and electronic usage skills, as well as decreasing defects, waste, and customer complaints.

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