

The Impact of Digital Tax Administration Enhancing Tax Growth in Developing Countries: Evidence from Rwanda Electronic Filing and Payment

Mugabe Roger

School of Economics, Wuhan University of Technology, Wuhan, P.R.China, 430070

Kigali Independent University ULK KG 14 Ave, Kigali, Rwanda, 2280

E-mail: mugabe.roger@ac.rw

Abstract: *A more and highest possible tax collection and tax compliance are key essential responsibilities of any tax administration. An effective tax system will facilitate domestic revenue mobilization and promote foreign investment. And this has been a challenging work in developed and developing countries but a severe concern to low-income countries and needs advancement in innovation to reduce fraud, tax evasion, and fight against corruption. Rwanda has set a series of reforms to go from manual tax administration until it has gone digital since 2012. Tax administration aims to deliver quality service to taxpayers that were, in turn, encouraging their voluntary tax compliance, payment and compliance, and tax payer's trust in tax administration. Digital systems also lead to safe and proper data storage benefits to RRA and taxpayers' audits. Tax liability calculus was easy; therefore, third parties play a vital role in real information under the tax compliance process. The purpose of this research was to find out the changes in the tax collection system. Data collected from RRA annual reports (2013-2019). Moreover, the analysis ratios used to evaluate the revenues collected throughout the six consecutive years categorized into two sections. Section one dealt with the process of data migration, while the second dealt with tax administration was fully digitalized, thus full system sensitization. With digital tax administration, we have found out that it has reduced high risk of tax avoidance, evasion in as far as digital tax administration the promotion of effective service delivery and lead to a successful role played by the tax administration, we have found out that the vital milestone was made to improve Rwandan tax system with the adoption of technology innovation to facilitate efficiency in tax compliance. However, tax education and awareness information and ICT infrastructures were Key issues in Rwanda. We concluded by indicating a significant increase in tax revenues collected in a row of three years after full sensitization of the system with a constant increment of 1.6% in 2017 and 1.5% on average yearly tax revenues collected.*

Keywords— Innovation; Tax administration; Electronic services; Developing countries

INTRODUCTION

Efficiency and effectiveness in tax collection and compliance have to remain undying a cornerstone of the country's development and equal or balanced prosperity sharing apparatus. For more than 100 years, countries were trying to brace tax administration whereby all means utilized to achieve, therefore, purpose. Nevertheless, for a few decades, with technological innovation in economy tax administration, it was questioned about their tax administration effectiveness if it does not go digital hand in hand with today's global digital economy.¹ Rwandan taxation system has gone through several series reforms in which this paper will try to eloquent on some key important time, furthermore as this research is concerned how the tax collection and tax compliance was effective when RRA gone through different steps as digitalized tax administration. For a period of more than 100 years, Rwanda's tax system in spite of this long period tax system in place revenues collected was not enough thus lacks contribution to a country's economic development.² Since 1885, the first tax system introduced the colonial regime; as we know, under colonization, all revenues from taxes benefits to colonizer country whereas colonized exposed for exploitation. In 1964 the tax system was introduced for the first time after the country's independence, thereby ineffective Government, uncountable moreover lack of autonomous tax administration has not contributed enough to country's economic growth neither self-reliance. In 1973 new tax reform system hit a struck back, thereby tribalism Government, lack of domestic resources mobilization whereby the country relied on foreign aids, loans, and grants to finance government activities. Tax collection and compliance lack of efficiency furthermore unaccountable Government lead to the 1994 Genocide against Tutsi, thus the destruction of the whole country's economy in 1994-1995. The Rwandan tax system has more reforms over two decades; key milestones include the creation of RRA in 1998 (USAID report 2018). After Genocide, the tax system was in MINECOFIN department after that, and 1873 tax law was repealed and replaced by the law 15/97 of 08/11/1997 the law was voted to introduce Rwanda revenue authority (RRA) whereby MINEFIN remains a line management ministry, and RRA was introduced with the following key principles: political inclusions, accountability, transparency, perceived fairness, effectiveness and political commitment to shared property (RRA report 1998). Since 2012 the Rwandan Government, through its tax administration Rwanda revenue authority (RRA) has started a series of reforms intending to have a digital tax administration; the purpose is to have an effective tax administration in the region and worldwide by sensitizing the system to taxpayers whereby consider tax liability as a contribution to national development in addition decrease in tax administration cost

instead of considering tax forced obligation and thus high tax evasion and tax avoidance, taxpayers were anchored tax effectiveness and tax administration accountability that leads to a strong domestic revenues mobilization (DRM) and promotion of business in the country as a whole. With a digital tax administration, the is to collect tax revenues effectively and efficiently all possible domestic revenues from tax by enhancing equitable tax payment and domestic as well as FDI business promotion.³ With successful business promotion and equitable tax payment will encourage transparency and formal business in the economy which has been since a long time ago a challenging issue for low-income countries and is a case of Rwanda and the RRA was set to overcome that challenge, by the way, means digital tax administration and reduce the risk loopholes in domestic tax source mobilization, tax avoidance, and tax evasion with the introduction ICT infrastructures and digital services to taxpayers deject confrontation between tax administration staff and taxpayers and thus reduction of ways and means to corruption, may hinder the revenues and gains targeted by the tax administration.⁴ Despite the best efforts with high motivation in domestic innovation in addition to domestic resources mobilization developing countries market size and ICT infrastructures has remained drawbacks issues the same as for Rwanda, whereby digital tax administration will face challenges of tax revenues collection in rural areas which lacks ICT infrastructures and business development. However Rwandan Government in 2000 tried to modernize its tax administration with the United Kingdom's Department for International Development (DFID) provide a high level of technical and material support for two decades, thereof implementation of a new system called Standardized Integrated Government Tax Administration (SIGTAS) a business analysis software that supports data management for each taxpayer and facilitates tax returns processing, enforcement, and audit. SIGTAS implementation eventually paved the way for digital RRA frontline taxpayer's services thus e-filing and e-payment (USAID Report 2018). However this system was gradually mixed manual and automated lack of electronic payment consequently. In 2001 RRA has gone through new tax reforms replacement of inefficient sales tax of 15% with a more modern value-added tax at 18%, preparing for entering into membership of the East Africa Community (EAC) customs union in 2009 (Effective in 2010) with the rationale to hold fast to EAC tax regime whereby policymakers have to update the tax administration mandate to fit EAC objectives; furthermore, e-filing and e-payment system has to be introduced. This paper has the objective of finding out the effectiveness of tax increment; thereby, technological innovation in tax administration sensitization, tax collection management costs, and tax ratios to GDP were considered in this paper.

RELATED LITERATURE

In some decades, IT has played a most critical function in sloping data businesses, which extracts and processes information, thereby its goals and objectives achievement. Tax, revenue, and service are basically founded on financial data about individuals and businesses. In sort to serve the Government – indirectly the nation that elected the political agents, the Internal Revenue Service (IRS) is almost completely dependent on ICT since its activities are fundamentally based on processed data that yield information to collect taxes and revenues; however, generally, low-income countries have consistent issues related to ICT infrastructures.⁵ Efficient and effective revenue collection is a key driver for financing development and strengthening good governance. Information and communication technology (ICT) has a great potential to advance revenue collection by automating processes, better servicing taxpayers, and increasing compliance. On the other hand, implementing ICT solutions in tax administration in developed and developing countries alike is mixed. The study “information technology in tax administration in developing countries” explores the factors for efficiency and effectiveness of tax administration modernization programmers' and compares the most important integrated software solutions for tax administration.⁶

The e-filing and e-payment, which allows tracing tax revenues for any transaction's occurrence to taxpayers and even from the third party, has been found as the best way to mitigate the tax evasion whereby software has been introduced even if it is still needed other innovated features and engineering skills in order to prevent tax evasion entirely.⁷ Tax administration requires highly trained staff to match up with the sophistication of tax evasion with the use of advanced technology.

There are several definitions that can be found in different sources, which reflected that sometimes we speak about the same formula in a different way or vice versa; we speak about different items based on the same definition.

Key points were highlighted, such as:

Efficiency: Producing desired results with a minimum of effort, expense, or waste. (Webster's New World Dictionary 1995.)

Efficiency: State or quality of being efficient (Hornby (ed.): Oxford értelmezőkéziszótár. /Oxford dictionary/ Kultúra International, Budapest, 1989.) **Effectiveness:** Getting any given results with the smallest possible inputs or getting the maximum possible output from given resources. (A Dictionary of Economics. Second Edition Oxford University Press, 2002.)⁸

Efficiency: Technical efficiency: a measure of the ability of the manufacturer to produce the maximum output of acceptable quality with the minimum of inputs. Economic efficiency: a measure of the ability of an organization to produce and distribute its product at the lowest possible cost. (A Dictionary of Economics Third Edition Oxford University Press, 2002.).⁹In the line of this research, the efficiency ratio represents the contribution of Electronic filing and Electronic payment to the increase of tax collected in Rwanda.

What was the Electronic filing and e-payment purpose?

Besides skirmishing tax evasion and corruption, Electronic filing and payment help in overcoming various challenges whereby market balance, informal sector economy reduction and make equal business opportunities among entrepreneurs. Rwanda Revenue Authority (RRA) aware of the lacks in filing and tax payment whereby most businesses were struggling with tax liability hence underpayment of tax revenues to prove that fact auditors often spend countless hours investigating and going over massive paperwork's documentation consequently disruption in operations of both honest taxpayers and those who evade tax on purpose. Rwandan thanks to this affordable technology, electronic filing and electronic paid by the citizens and businesses will be instantly recorded, and the audit itself will become much simpler¹⁰.

The aspiration of Rwanda Revenue Authority (RRA) is to increase budget goes to the promotion of all citizens who will eventually have the benefit of recovered shared programs, and the revenues collected from citizens strong relations between taxpayers and accountable Government; therefore, this will be achieved by seriously hostility tax evasion through Electronic filing and payment.

For more than two decades, the e-commerce mutiny began in the 1990s, tax policy discussions in developed economies have enlisted "e-solutions" to streamline consumption tax Administration, in addition to solving technical issues. These well-considered discussions are now producing universal, multi-jurisdictional changes in Europe and United States consumption tax regimes and updated fixtures related to modern VAT.¹¹ The introduction of tax automation minimizes direct contact between tax collection officers and businessmen and women or their agents, therefore a useful tool for eliminating corruption. Furthermore, benefits achieved through customs automation include improved reporting, control of file transfers, automatic reconciliation of tax returns declarations, and compliance testing of bank files, and information available from the third party, thus promoting a paperless system in the economy. As the tax administration goes digital, some critical types of automated systems were introduced to handle the specific types of taxes, and some have a significant impact on the tax collection, thereby the number of taxpayers and to whom the tax is levied. Electronic billing machine EBM was introduced to cater for indirect taxes levied to all last consumers and being collected by sellers, so because of the process was too complicated and had so many chances of taxes evasion in this paper we have had a look on this particular type of tax collection process with technical information that abides thereof tax system.

Why was it so essential to use e-filing and e-payment?

It is about one of the most important measures for the legalization of the gray economy. Citizens will, thank these secure devices, know exactly how much they paid for goods or services, and the tax burden will be justified and turn wakefulness about tax liability. The introduction of this invoicing system will eventually lead to the modernization of Rwanda towards new consumer protection programs and the creation of fair competition among all taxpayers.

An official in the compliance department of RRA says that they are aware that many businesses are not paying their full taxes, and to prove that fact, auditors spend countless hours going over massive documentation which causes disruption in operations of both honest taxpayers and those who evade tax deliberately (Fraud).¹²

That thanks to this affordable technology, VAT paid by the citizens and businesses will be instantly recorded, and the audit itself will become much simpler, thereby reducing paper's work.

Rwanda Revenue Authority (RRA) adds that the electronic billing machine (EBMs) will also provide a market balance and make equal business opportunities for every entrepreneur in the sense that it promotes transparency in book-keeping and transaction records. This is because, when taxpayer A withholds taxes he's supposed to remit to RRA, he unfairly makes more profits than taxpayer B, who chooses to operate honestly. The information can be collected even from taxpayer B, considered as a third party hence the authenticity of the data.

How was EBM introduced in Rwanda?

On August 26, 2013, the Ministerial Order on Modalities of Use of Certified Electronic Billing Machine, No. 002/23/10TC of 31/07/2013, was published in the Official Gazette of Rwanda. This Order has set loose a technology revolution in VAT compliance that promises business efficiencies and revenue enhancements that are only imagined in more developed countries (RRA Report 2014). What makes Rwanda so interesting from a tax compliance perspective is that it is very clear that the Government has moved beyond focussing on the device and has instead begun thinking about security in terms of programming functionality and operation of the device. Therefore any device that passes certification review is acceptable to Rwanda Revenue Authority (RRA); the Rwandan system is one step away from the virtual system. In principle, it should not matter to the RRA the name, shape, or size of the SDC. The device is just the container for collecting the data RRA wants (RRA Report 2013).

Taxes to GDP ratio: The tax to GDP ratio is the indicator of how a country is collecting its taxes effectively; thereby, an increase in the gross domestic product will increase taxes revenues of the nation; conversely rise in GDP will lead to higher taxes revenues collection higher the GDP higher the tax collected.¹³ In 2000, Kenya and Burundi had had the highest tax ratio of the entire group of countries members of EAC, but Rwanda's tax ratio rose more dramatically than others over the period of 2017, second only to that of Kenya (USAID Report 2018).

Political institutionalization and digital tax administration

The accountable and transparent Government must portray prevention to corruption, increase transparency, better service delivery, improved interactions with business and industry, and promote the business to hire, expand, and innovate.¹⁴ When technological innovation is at the initial state may cause some issues of tax evasion, it may lead to a lack of trust in tax administration with the information required from them, and this has happened to RRA when prompted the evolution of electronic tax management system to promote efficiency in services. Structure in tax collection has significant importance in returns filing and payments of the business organization's tax obligations that fall due whereby the more the business is required vague types taxes evasion and avoidance will be high. Hence, tax fairness to tax filing and payment promote efficiency in tax compliance tax fairness is a crucial concern in the low-income countries economy.¹⁵ 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 (smart phone, 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.¹⁶ Failing to submit tax returns and delay in revenues tax collection has remained critical issues for both tax administration and taxpayers in the period before the e-filing and e-payment introduction. Nevertheless, the intensive education on the convenient system with the technological innovation of tax collection must be supported by taxpayer's high understanding due to that in some developing countries whereby the system can be adopted like e-filing and payment but taxpayers resist to change moreover taxpayers spent some years without enjoying the benefits of the system.¹⁷ The education and sensitization of the technology innovation in taxes plays a vital role, Malaysia electronic tax system was adopted in order 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.¹⁸ As per this paper is concerned was to find out the successful sensitization of the system after the introduction whereas most research conducted in this area of was just interested in the effect of introducing the electronic management system to tax collection, introduction of EBM to tax collection, impact of tax collection to economy resiliency of Rwanda.

RESEARCH METHODOLOGY

As the aim of this course paper was to assess the contribution of e-filing and e-payment efficiency to the tax collection in Rwanda in general and the impact of a digital tax administration sensitization; secondary data from RRA annual reports were collected for the periods before(2013/2014, 2014/2015&2015/2016) and after(2016/2017, 2017/2018&2018/2019) the introduction of Electronic filing and Electronic payment (E-filing and E-payment).In order to assess the impact of Electronic filing and payment (E-filing and E-payment),the method of calculating efficiency ratios between two periods of time was used to find out the difference under sensitization period of the system and when the system said operating effectively at the completion of system sensitization when the system has attained a full utilization the after all data migration from a manual system to automated system Electronic filing and payment (E-filing and E-payment).The research needs to find out if there is any positive change or negative in taxes collected due to the completed sensitization of Electronic filing and payment (E-filing and E-payment).Thus for getting tax growth efficiency ratios, we used the formula of output/output or GT collected before EFP/GT collected after completed sensitization of EFP.

Data and findings

By using the formula of GT collected before sensitized EFP/GT collected after a complete sensitization of EFP, the following table indicates the results obtained as growth efficiency ratios.

The period after sensitization of Electronic filing and payment (EFP)	Total tax collected in Billions Rwf after EFP(1)	Period before (EFP)	Total tax collected in Billions Rwf before EFP(2)	Ratios (1)/(2)
---	--	----------------------	---	----------------

2016/2017	763.4	2013/2014	473.9	1.6
2017/2018	859.1	2014/2015	574.5	1.5
2018/2019	986.7	2015/2016	641.2	1.5
Average annual increase				1.5

Source: Rwanda Revenue Authority, Annual Reports, 2013/2014, 2015/2016&2016/2017, 2018/2019

The findings and results have shown that after a complete sensitization of digital tax administration, rates have grown rapidly growing especially for the years 2017 understudy, with a clear growth efficiency ratio that grows up to 1.6. It implies that after electronic filing and payment said to fully sensitized by RRA has collected 1.6 times than what it collected before the sensitization completion. Nevertheless, the changes ratios generally have been growing on an average ratio of 1.5 for all years gradually under study.

Conclusion and Recommendations

All through technological innovation of tax administration deemed so importantly, however the technology was associated with technological shoplifting kinds such as tax evasion whereby some taxpayers provide electronic billing machine invoice with fewer amounts to real amount paid by customers. In addition to that, business people have companies. They register for VAT taxpayers, and then sell invoices to those who want to reduce Output VAT due, therefore the tax revenues understatement. This issue has a significant impact on Gross tax collection because VAT is the main contributor to Rwanda's resource growth. The following recommendations can be considered as useful to Rwanda Revenue Authority (RRA) and other concerned parts:

Review of returns in order to trace taxes fully to all transaction Rwanda Revenue Authority should update the components of the current Electronic filing and payment, where this system must be able to manage the inventory/stock of every taxpayer. This will prevent those taxable sales which are done out of the current electronic billing machine as the updated machine will show the quantity out, and the balance remained in the stock. Rwanda Revenue Authority should continue to educate last consumers to claim a full invoice as their rights whereby sensitize and educate taxpayers and a third party through meetings, workshops, tax clinics, dialogues, and tax friend clubs. Last consumers are significant partners in the tax collection process to understand the importance of taxes. This is a crucial concern related to VAT collection, known as the main contributor to Rwanda's revenue source of taxation.

Rwanda Revenue Authority has a responsibility of building and an automated risk rules scoring system in electronic filing and payment systems. Organize and conduct tax dialogues through media houses. Furthermore, explain the role of mobilizing the public towards compliance. Improve quality services to customers to enhance voluntary tax compliance; this will reduce considerably more attempt to tax evasion by electronic devices or technological innovation in place used by RRA.

REFERENCES

- Christians, A.; Diniz Magalhaes, T., A New Global Tax Deal for the Digital Age. *Available at SSRN* **2019**.
- .Li, J.; Bao, J.; Li, H. C., Value Creation: A Constant Principle in a Changing World of International Taxation. *Canadian Tax Journal/Revue fiscale canadienne* **2019**,67 (4), 1107-1134.
- Harelimana, J., The role of taxation on resilient economy and development of Rwanda. *J Fin Mark. 2018; 2 (1): 28-39. J Fin Mark 2018 Volume 2 Issue 1* **2018**,29.
- Williams Colin, C., Public policy innovations: the case of undeclared work. *Management Decision* **2013**,51 (6), 1161-1175.
- Umar, M. A.; Masud, A., Why information technology is constrained in tackling tax noncompliance in developing countries. *Accounting Research Journal* **2020**.
- Gnangnon, S. K., Internet and Tax Reform in Developing Countries. *Information Economics and Policy* **2020**, 100850.
- Kamana, D. Influence of electronic tax management system on effectiveness of tax collection in Rwanda: a case study of Rwanda revenue authority (RRA). University of Rwanda, 2016.
- Novak, P. J.; Arnold, W. A.; Henningsgaard, B.; Hozalski, R. M.; Kessler, K.; LaPara, T. L.; Parrella, A.; Rogacki, L.; Thompson, C.; Thorson, R., Innovation promoted by regulatory flexibility. ACS Publications: 2015.
- Nábrádi, A.; Pető, K.; Dékán Tamásné Orbán, I., Analysis of efficiency indicators. **2009**.
- Rwanda Revenue Authority annual report: Kigali, 2013.
- Ainsworth, R. T., Carousel fraud in the EU: a digital VAT solution. *May* **2006**,1, 06-23.
- Kumar, S.; Gupta, S., A Study on Income Tax Payers Perception towards Electronic Filing. *The Journal of Internet Banking and Commerce* **2017**, 1-14.
- Akitoby, B.; Baum, A.; Hackney, C.; Harrison, O.; Primus, K.; Salins, V., Tax revenue mobilization episodes in developing countries. *Policy Design and Practice* **2019**, 1-29.

14. Rajeswari, K.; Mary, S., E-filing of income tax returns: Awareness and satisfaction level of salaried employees. *International Journal of Current Research and Academic Review* **2014**,2 (9), 39-45.
15. Ruhoma, A. S. A. A. Examining the influence of tax fairness on tax compliance in Libya. Universiti Utara Malaysia, 2015.
16. Ndayisenga, E.; Shukla, J., THE INTERNATIONAL JOURNAL OF BUSINESS & MANAGEMENT.
17. Sichone, J.; Milano, R.; Kimea, A., The influence of facilitating conditions, perceived benefits, and perceived risk on intention to adopt e-filing in Tanzania. *Business management review* **2018**,20 (2), 50-59.
18. World Bank, W., Implementing electronic tax filing and payments in Malaysia. 2013.