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THE EFFECTS OF THE USE OF ELECTRONIC FISCAL DEVICES ON TAX COLLECTION IN IRINGA MUNICIPALITY

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Abstract

This study is an attempt to determine the effects of the use of electronic fiscal devices on tax collection in Iringa Municipality. Specifically, it intends to determine tax compliance rates before from 2001 to 2010 and after the introduction of electronic fiscal devices from 2011 to 2020. The study included a sample of 20 years of observations of tax compliance rates and revenue collection rates from 2001 to 2020 in Iringa Municipality. The data was analyzed using descriptive statistics. From the results, tax collection rate before the introduction of electronic fiscal devices was growing on a little move compare after the introduction of electronic fiscal devices whereby tax collection grows at higher rates. On the other hand, revenue collection before the introduction of electronic fiscal devices was growing at lower rate due to lack of proper methods of revenue collection and tax avoidance among taxpayers. But after the introduction of electronic fiscal devices, revenue collection increases from 59.8 in 2010 to 76.08 in 2020 as there is a proper method of revenue collection (EFD machine) which is accurate and efficiency on revenue collection. The study concludes that the use of EFDs machines increases tax compliance and revenue collection. It was recommended that continuously more training, seminar and workshop are needed on the use of new technology (EFDs) to all EFDs user to increase awareness of new EFDs users and build competence to old users in order to further increase revenue collection. Furthermore, to encourage or enhance the use of EFDs, the cost of procuring them should not be too high.

Keywords: Electronic Fiscal Device (EFD), Tax, Tax Collection, Tax Compliance, Tax Compliance Rate.

1.Introduction

Government revenue is very important for the development of any country, since the revenue collected by the government is used for provision of different social services. For example, government revenue is used for construction of public schools, roads, hospitals, bridges, buying medicines in hospitals, paying salaries for public workers, and ensuring security in the country. Thus, revenue is crucial in ensuring the smooth execution of government activities (Ndunda et al., 2018). Corruption and poor methods employed in collection of government revenue, both in developed and developing countries, result in many governments' failure to generate enough income to improve social services in their respective countries. Therefore, the invention of Electronic Fiscal Devices (EFDs) was inevitable to ensure accurate reporting of tax collection by Revenue Authorities (RAs). The system of electronic fiscal device targets to help salesmen to

identify the correct sales details, reduction of cost in tax collection process as well as helping traders to comply with regulations of tax. In Tanzania, for instance, there have been setbacks associated with tax collection, such as lowering the profit being obtained from business, tax evasion, traders claiming refund in tax collection due to overpayments (URT, 2017).

EFDs were first introduced in Italy in the year 1980 and later in other countries of Europe and Asia, such as Russia, Poland, Bulgaria, Serbia, Albania and Georgia. In Africa, the compulsory use of EFDs was accelerated in the 2000s. Revenue Authorities of countries like Kenya, Ethiopia, Tanzania, Rwanda, Malawi, Uganda, Zimbabwe, Mauritius and Zambia joined the electronic gadgets league (Kerever, 2019). Electronic Fiscal Device is described as a wide variety of computerized devices that revenue administration can use to help monitoring of business transactions (Martin, et al 2017), These EFD machines are of four kinds; the first is Electronic Cash Register (ECR) which is a point of sale terminal that records information from barcode scanners, weighing scales, and credit and debit card machines. The second is Electronic Tax Register (ETR), which is an electronic cash register that calculates the tax value for every transaction made and stores this information in a permanent memory that can only be accessed by the tax agency. The third is Electronic Fiscalised Printers (EFPs) and Electronic Signature Devices (ESDs) (Martin, et al 2017). In Tanzania Mainland the term EFD refers to the devices used by TRA to monitor business and transactions that create a fiscal obligation for the Value-Added Tax (VAT). The compulsory use of EFDs has accelerated in recent years in African counties, following a comparative full implementation activity from 1994 to 2010. These devices are relatively costly, although they claim to offer the ability to provide a relatively secure mechanism for tax administration to monitor and detect non-compliance (Patricio, 2019).The Government of Tanzania, through the Tanzania Revenue Authority (TRA), introduced the requirement and use of Electronic Devices (EFDs) from 1st July 2010. The major objectives of establishing the devices were to provide TRA with correct sales information from businesses, to reduce tax collection costs and encourage taxpayer compliance. The requirements were directed towards all VAT registered traders, of which, the purpose was to ensure proper output tax record among the VAT registered traders, thus, an increase in Government revenue. Ten years before the introduction of Electronic Devices (EFDs) on 1st July 2010 in Tanzania, the state of tax collection under TRA was facing several challenges, for instance, thousands of traders were undervaluing their sales in order to evade tax which led to poor collection of tax (Rathus & Nevid, (2016); Agatha (2018); and Edwin (2019)). Following the tax collection improvement in 2010, it was decided to extend the requirement to use Electronic Fiscal Devices to all traders. Early July 2010 EFDs were introduced as strategies of improving VAT collection through assisting traders in keeping appropriate business records, eradicating non-issuance of receipts, eradicating under-invoicing of sales transactions, improving filing processes of VAT returns (Kerever, 2019). It is claimed that the initial EFD deployment was undermined in Tanzania by compliance challenges and lack of effective follow-up and enforcement (Kerever, 2019).

The EFDs were introduced to VAT registered traders under the "The Value Added Tax (Electronic Fiscal Device) Regulation, in 2010" - Subsidiary Legislation, Government Notice No. 192 published in May 28, 2010, and enshrined in the Finance Act 2010 with the main aim of enhancing VAT compliance in Tanzania. TRA’s new EFD system became effective on July 1, 2010 Finance Act, (URT, 2017). The system aims at allowing the taxman to get correct sales information from business people, reduce tax collection costs and help business people to comply with the VAT regulations, among others (Karongo, 2018). EFDs were introduced to help TRA establish the amount of VAT payable without necessarily requiring the traders to provide records for crosschecking. There was concern that thousands of traders were undervaluing their sales in order to evade tax (Rathus & Nevid, 2016). EFDs were designed in such a way that they

record each transaction made by tax payers to calculate the amount which was supposed to be collected for the government as VAT. As mentioned on page 2, there are four identified types of EFDs, namely, Electronic Cash Registers (ECRs), Electronic Tax Registers (ETRs), Electronic Fiscalised Printers (EFPs) and Electronic Signature Devices (ESDs). EFD replaced the former ECRs devices which were used by tax payers to record sales and issue receipts; they also store information such as sales, stocks and can issue reports, for example, daily sales report (Rathus & Nevid, 2016). This electronic device is used in combination with the accounting system to validate documents.

In the year 2011 the Commissioner General of TRA reported that in 2001, taxes, like income tax, only contributed 30% of revenue collected directly by the Tanzania Revenue Authority but tax collected through EFDs contributed 70% of all revenue collected by the Tanzania Revenue Authority. However, a study by Agatha (2018); Edwin (2019) and Siraji (2019) revealed that the technology manages to attain only 70% out of 100% due to some challenges facing the implementation of EFDs such as high cost of the device, lack of education, persistent power outage and lack of sufficient technical experts though tax collection were increased compared to the time before the introduction of EFDs in Tanzania. The World Bank in 2016 announced that, in developing countries, more than 80% of its revenue comes from tax collections. The level of usage of EFDs in Tanzania also is still low regardless of countless efforts being taken by Tanzania Revenue Authority (URT, 2017). However no specific study has been done in Tanzania to show the extent of problem of the use of electronic fiscal devices on tax collection. A report on factors influencing usage of EFDs in low income households indicated that education level, capital and attitude have more influence on the use of EFDs (Gillwald, 2020). However, factors influencing the use of EFDs could somehow be the same in different countries but the magnitude of the problem (coefficient) could be different. Studies revealed that introduction of EFDs was purposely proposed in order to increase the collections of tax. Perhaps these studies were done outside and inside Tanzania. In addition, there was no concrete evidence of such studies for Iringa Municipality. Therefore this study aimed at determining the effects of the use of electronic fiscal devices on tax collection in Iringa Municipality. among staff in local government authorities in Tanzania, a case of Ilala Municipal Council.

2. Literature Reviews

2.1Theoretical Framework

Diffusion of Innovation (DOI) Theory

This theory first was introduced by Rogers in 1962 as one of social science theories and attempts to cover a number of critical requirements that aid technology adoption in a developing country setting. The theory tries to postulate how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. Furthermore, he point out that, there are four elements which influence the spread of a new idea; the innovation itself, communication channels (skills and education), time, and a social system. However, the theory emphasis that the above process relies heavily on human capital and adopters are grouped into several stages like innovators, early adopters, early majority, late majority, and laggards. Finally, the theory illustrates that in moving from one stage to another in technological adoption there are a lot of challenges which act as hindrances like cost of technology, skill and education on how to use. This theory is relevant for this study because it explains the adoption of technology, whereby in this study the theory was applicable in explaining the effects of the use of electronic fiscal devices on tax collection. The theory was also used by Omari (2019) in his study on the effectiveness of Electronic Fiscal Devices (EFDs) in tax collection in Tanzania.

2.2 Empirical Review

Tax Compliance Rate before the Introduction of Electronic Fiscal Devices

Bakar (2017) conducted a study on "The Tax Collection Level Before and After Introducing Electronic Fiscal Devices Machines in Niger". Descriptive study was done to determine tax collection level before introducing electronic fiscal devices machines. Cross-sectional data was collected whereby a total of 98 observations were included and data were analyzed using descriptive statistics and regression analysis. The study revealed that revenue authorities before introducing electronic fiscal devices machines face several challenges in collecting tax as most of taxpayers evade complying their tax payments by lowering their profits. But after introduction of EFDs, it was revealed that Electronic Fiscal Devices have a significant impact on VAT collection and Value Added Tax returns submission. In addition Electronic Fiscal Devices have a negative effect on the rate of tax evasion. Hence it was concluded that Electronic Fiscal Devices are useful in the Performance of the Value Added Tax collection process. The study recommended that the Government should continue investing in Electronic Fiscal devices for Value Added Tax collection process.

Tax Compliance Rate after the Introduction of Electronic Fiscal Devices

Omari (2019) conducted a study on "The Effectiveness of Electronic Fiscal Devices (EFDs) on Tax Compliance in Tanzania". The study employed a cross-sectional research design and 50 taxpayers were sampled and descriptive statistics were used in data analysis. The study revealed that before introducing EFDs in Tanzania, revenue obtained from VAT registered taxpayers was growing lower by 5% resulted by high level of tax noncompliance. In other words, the study revealed that there was an increase of 30% on tax compliance following the introduction of EFDs. One of the reasons for an increase in revenue collection was availability of technology adoption. The major challenge facing full implementations of EFDs were the high cost of purchasing the devices.

Revenue Collection before the Introduction of Electronic Fiscal Devices

Siraji (2019) did a study on "Challenges Faced by Taxpayers in Using Electronic Fiscal Devices in Ethiopia". The study employed a cross-sectional design whereby 120 taxpayers were involved in the study and data were analyzed using descriptive statistics. The study found inherent challenges such as lack of education, high cost of the device, lack of sufficient technical experts, persistent power outage, and time loss on device operation. The device is to some extent effective in tax collection. Tax evaders were openly increased due to the mentioned challenges and this still raises some reservations to taxpayers on the effectiveness of Electronic Fiscal Devices (EFDs) machines.

3.0 Research Methodology

This study was conducted in Iringa Municipal Council. Iringa Municipal Council was chosen to know extent of the use of electronic fiscal devices on tax collection. Factors affecting the use of EFDs somehow could be the same in different countries, however the extant of the problem (coefficient) could be different. Besides, there was no concrete evidence of such studies for Iringa Municipality. Therefore this study intended to fill this gap by determining effects of the use of electronic fiscal devices on tax collection in Iringa Municipality

This study employed quantitative approach. This method was used in this research as its objectives is to firm up and modify knowledge first gained in a fundamentally quantitative way which is consistent with the research objectives (Bryman, 2017). Cross section research design

was used in this study since data was collected at one point in time. This study used a case study design to explore insights into the effects of the use of electronic fiscal devices on tax collection. The study involved time-series data to track change over time. According to Bogdan and Biklen (2016), population is defined as the entire group under study as specified by the objectives of the research project. It is composed of two groups which are target population and accessible population. The study covered 20 years data where 10 years are before introduction of EFDs and 10 years after introduction EFDs on tax collection from 2001 to 2020. This study used secondary data. According to Kothari (2014) secondary data are those which have already been collected by someone else and which have already been passed through the statistical process. The researcher used already printed document to obtain secondary data from TRA in Iringa Municipality that is, tax collection reports 10 years before and 10 years after introduction EFDs. Data were analyzed using descriptive and the difference between the actual taxpayers and targeted taxpayers was calculated.

4.0 Results and Discussions

4.1 Results

4.1.1 Tax Compliance Rates Before the Introduction of Electronic Fiscal Devices

Table4.1.2: Tax Compliance Rate Before EFDs from 2001 to 2010

Period Covered	Years (2001 to 2010)	Expected Tax Compliance Rate (%)	Actual Tax Compliance Rate (%)	Short Fall of Tax Compliance Rate (%)	Percentage of Short fall
Before EFDs	2001	71.21	41.07	-30.14	57.67
	2002	78.45	44.25	-34.20	56.41
	2003	89.36	56.19	-33.17	62.88
	2004	88.16	57.09	-31.07	64.76
	2005	90.91	56.97	-33.94	62.67
	2006	94.04	57.59	-36.45	61.24
	2007	87.48	59.28	-28.20	67.76
	2008	88.39	63.71	-24.68	72.08
	2009	99.06	63.49	-35.57	64.09
	2010	83.74	50.90	-32.84	60.78

Source: TRA (2022)

Table 4.1.2 shows that the highest tax compliance rate (63.71%) before the introduction of electronic fiscal devices was in 2008 while the lowest tax compliance rate (41.07%) was in 2001. This implies that tax collection rate before the introduction of electronic fiscal devices was growing on a slightly move as the average of short fall was 63.03% of tax compliance rate before the introduction of electronic fiscal devices in 10 years. The results show that there is an increase on number of taxpayers each year but the rate of compliance was still low, this might due to forge of receipts and lack of proper book keeping from taxpayers as well as poor assessments form tax officers from revenue authority. Therefore, before the introduction of EFDs, tax collection faced several challenges such as lack of compliance on their tax payments by lowering

their profits, forging of receipts and lack of proper book keeping by taxpayers as well as poor assessments by tax officers from the revenue authority.

4.1.4 Tax Compliance Rates after the Introduction of Electronic Fiscal Devices

Table4.1.5: Tax Compliance Rate after EFDs from 2011 to 2020

Period Covered	Years (2011 to 2020)	Expected Tax Compliance Rate (%)	Actual Tax Compliance Rate (%)	Short Fall of Tax Compliance Rate (%)	Percentage of Short fall
After EFDs	2011	68.88	73.02	4.14	106.01
	2012	83.83	75.68	-8.15	90.28
	2013	65.18	75.59	10.41	115.97
	2014	70.50	74.65	4.15	105.89
	2015	89.32	80.87	-8.45	90.54
	2016	91.32	82.70	-8.62	90.56
	2017	92.04	83.57	-8.47	90.80
	2018	82.41	85.82	3.41	104.14
	2019	88.02	91.28	3.26	103.70
	2020	90.54	94.01	3.47	103.83

Source: TRA (2022)

Table 4.1.5 shows that the highest rate of tax compliance after the introduction of electronic fiscal devices was 94.01% in 2020 compare to the lowest rate of tax compliance of 73.02% in 2011. The average of percent increase was 100.17%. This shows that after the introduction of electronic fiscal devices, tax compliance in Iringa Municipality increased compared to the period before the introduction of electronic fiscal devices. This implies that the introduction of electronic fiscal devices influences tax compliance rates to increase in Iringa Municipality due to trustworthy of the EFD system and its accuracy on recording information and issues receipts after each transaction done by EFD machine by taxpayers. In other words, the study revealed that there was an increase of 30% on tax compliance following the introduction of EFDs.

4.1.7 Revenue Collection before the Introduction of Electronic Fiscal Devices

Table4.1.8: Revenue Collection before EFDs from 2001 to 2010

Period Covered	Years (2001 to 2010)	Expected Revenue Collection (%)	Actual Revenue Collected (%)	Short Fall of Revenue Collection (%)	Percentage of Short fall
	2001	75.08	44.63	-30.45	59.44
	2002	75.93	43.79	-32.14	57.67
	2003	89.20	52.42	-36.78	58.77
	2004	87.82	53.21	-34.61	60.59

Before EFDs	2005	84.66	53.19	-31.47	62.83
	2006	86.10	55.97	-30.13	65.01
	2007	88.18	58.95	-29.23	66.85
	2008	91.00	57.85	-33.15	63.57
	2009	90.75	58.74	-32.01	64.73
	2010	93.98	59.80	-34.18	63.63

Source: TRA (2022)

show that before the introduction of electronic fiscal devices, revenue collection was poor as the highest rate was 59.8% in 2010 while the lowest was 43.79 in 2002. This implies that revenue collection before the introduction of electronic fiscal devices was growing on a slightly move as the average of short fall was 62.31% of revenue collection before the introduction of electronic fiscal devices in 10 years. This means that revenue collection before the introduction of electronic fiscal devices was at lower rate due to lack of proper methods of revenue collection and tax avoidance among taxpayers. This situation increases the rate of tax evaders hence lowering the growth rate of revenue collection within the municipality. Therefore, before the introduction of electronic fiscal devices, revenue collection faced the major challenge of poor methods of revenue collection which increases the rate of tax evaders hence lowering the growth rate of revenue collection within the municipality.

4.1.10 Revenue Collection After the Introduction of Electronic Fiscal Devices

Table4.1.11: Revenue Collection After EFDs from 2011 to 2020

Period Covered	Years (2001 to 2010)	Expected Revenue Collection (%)	Actual Revenue Collected (%)	Short Fall of Revenue Collection (%)	Percentage of Short fall
After EFDs	2011	55.45	59.87	4.42	107.97
	2012	94.62	62.38	-32.24	65.93
	2013	53.42	63.87	10.45	119.56
	2014	54.22	61.36	7.14	113.17
	2015	92.83	60.66	-32.17	65.35
	2016	99.50	67.04	-32.46	67.38
	2017	95.06	62.85	-32.21	66.12
	2018	63.97	72.09	8.12	112.69
	2019	65.00	74.47	9.47	114.57
	2020	66.78	76.08	9.30	113.93

Source: TRA (2022)

Table 4.1.12 shows that revenue collections increased after the introduction of electronic fiscal devices as the highest rate was 76.08% in 2020 while the lowest rate was 59.87% in 2011. The average of percent increase was 94.67%. This means that the introduction of electronic fiscal devices increased the rate of revenue collection from taxpayers within the Municipality as there is a proper method of revenue collection (EFD machine) which is accurate and efficiency on

revenue collection. This reduces the rate of forging receipts among taxpayers in the Municipality. Therefore, the introduction of electronic fiscal devices increases the rate of revenue collection from taxpayers within the municipality while reducing the rate of forging receipts hence increasing tax accuracy and tax compliance among taxpayers. Collection of taxes with the use of EFD machines increases the rates of revenue collected. If EFDs are well used in tax collection, revenue collection will be higher. Lack of using EFDs machine in revenue collection encourages evasion of taxpayers to comply effectively hence decreasing revenue collection.

4.3 Discussion

This chapter conducted the data analysis and interpretation with reference to the literature review. The aim of this study was to determine effects of the use of electronic fiscal devices on tax collection in Iringa Municipality. The main finding of this study revealed that introduction of electronic fiscal devices increases the rate of revenue collection from taxpayers within the municipality. If taxpayers comply their due taxes using EFDs machines, tax collection will be effectively increased. The higher rates of EFDs users encourage taxpayers to comply their taxes willingly, therefore, increases tax collection.

5.0 Conclusion and Implications

This study is an attempt to determine effects of the use of electronic fiscal devices on revenue collection in Iringa Municipality. Based on the results from data analysis and discussion of findings, the study finds that EFDs have significant effect on revenue collection process. The results revealed that EFDs have significant effect on revenue collection, as it was observed in ten years after EFD introduction. Revenue collections have increased gradually than 10 years before the introductions of them. Furthermore, EFDs have significant effect on tax compliance rate. They have enhanced the tax compliance rates from taxpayers, as it was noted that the rates of tax compliance from taxpayers after the introduction of EFDs was gradually increasing when comparing to the rates of tax compliance from taxpayers before the introduction of EFDs. This is an indication that most taxpayers in Iringa Municipality have complied with the EFDs requirements in Tanzania. EFDs have been introduced to get the country out of the problems that plague tax systems of developing countries as it was found that EFDs have enhanced revenue collections. In addition, the use of electronic fiscal devices influences the increase on tax compliance rates and increase in revenue collection among taxpayers hence makes tax collection effective in Iringa municipality. Before the introduction of electronic fiscal devices taxes were collected at lower among with respect to low compliance rates, but after the introduction of electronic fiscal devices on revenue collection, compliance rates and revenue collections increases at higher rates. Therefore, the use of electronic fiscal devices is effective on increasing tax compliance rates and revenue collection in Iringa municipality.

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