TRADERS' WILLINGNESS TO USE ELECTRONIC FISCAL DEVICES IN REVENUE COLLECTION:

AN EMPIRICAL STUDY IN MOROGORO MUNICIPALITY, TANZANIA

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By

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A Dissertation Submitted in Partial Fulfillment of the Requirements for Award of Masters of Science Degree in Economic Policy and Planning of Mzumbe University

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CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled, "***Traders' willingness to use Electronic Fiscal Devices in Revenue collection: An empirical study in Morogoro Municipality, Tanzania"***, in partial/fulfillment of the requirements for award of the Masters of Science degree in Economic Policy and Planning of Mzumbe University.

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Major Supervisor

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Internal Examiner

Accepted for the board of

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FACULTY OF SOCIAL SCIENCES OF MZUMBE UNIVERSITY

DECLARATION AND COPYRIGHT

I, Felix Noah Silver**,** declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

Signature _____

Date_____

ACKNOWLEDGEMENTS

There are many remarkable people who have helped me acquire research knowledge and skills, which have led to fruition of this work. However, I would like to only mention my supervisor, Dr. Romanus L. Dimoso for his phenomenal and unyielding support throughout the whole process of undertaking the current study. Ultimately, what he has imparted in me remains as an indelible mark in a bank of my knowledge and skills. Yet, all points of view, errors and mistakes solely rest with me.

DEDICATION

The work is dedicated to Mzumbe University, specifically the Department of Economics, whose members have helped me gain insights on scientific research.

LIST OF ABBREVIATIONS

CDF	Cumulative Density Function
ECRs	Electronic Cash Registers
EFDs	Electronic Fiscal Devices
EFJ	Electronic Fiscal Journal
EFP	Electronic Fiscal Printer
ESD	Electronic Signature Device
ETR	Electronic Tax Register
EU	European Union
GDP	Gross Domestic Product
GPS	Global Positioning System
ICT	Information and Communication Technology
IMF	International Monetary Fund
IT	Information Technology
SDGs	Sustainable Development Goals
TBS	Tanzania Bureau of Standards
TCCIA	Tanzania Chambers of Commerce, Industry and Agriculture
TDV	Tanzania Development Vision
TIN	Tax Identification Number
TRA	Tanzania Revenue Authority
TZS	Tanzanian shillings
UN	United Nations
URT	United Republic of Tanzania
VAT	Value Added Tax
WTU	Willingness to use

ABSTRACT

Electronic Fiscal Devices (EFDs) are widely being used by revenue collection authorities due to their potential to improve revenue collection. However, there is low usage of EFDs by traders, which impedes the possibility of realizing this potential. Thus, the current study was an attempt to investigate factors influencing traders' willingness to use EFDs in Morogoro Municipality, Tanzania. Specifically, the study aimed at identifying factors influencing traders' willingness to use EFDs, examining the influence of socio-demographic factors such as age, gender, education as well as technological system factors such as perceived ease of use and perceived usefulness on traders' willingness to use EFDs. Moreover, the study aimed at examining traders' awareness on the machines and the influence it has on traders' willingness to use them. To accomplish its purpose, the study employed a cross-sectional survey, which was undertaken to 149 systematic randomly selected traders with EFD machines in the study area. It used a structured questionnaire that entailed closed-ended questions. Binary choice probit model regression was applied in analyzing the data. Based on the analysis of the data, the study found a statistically significant relation between traders' willingness to use EFDs and socio-demographic factors such as age, gender, education as well as technological system factors such as perceived ease of use, and perceived usefulness. While gender, education, perceived ease of use, and perceived usefulness had statistically significant positive relation with traders' willingness to use EFDs, age had statistically significant negative relation with willingness to use EFDs. Therefore, traders' willingness to use EFDs is significantly influenced by age, gender, education, perceived ease of use and perceived usefulness in the study area. In a nutshell, if the government wants to improve traders' willingness to use EFDs, it should consider the influence of socio-demographic and technological system factors on willingness to use them.

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CHAPTER ONE

INTRODUCTION

1.0 An overview

This chapter presents background information, statement of the problem, research questions, general objective, specific objectives, scope, significance, rationale, and finally organization of the current study.

1.1 Background of the study

The use of Electronic Fiscal Devices (EFDs) in revenue collection is increasingly becoming very important not only in developed countries but also in developing ones. This is so because of the potential of these machines to improve revenue collection (Mandari *et al*., 2017). EFDs, which are described as a wide range of technological devices used by revenue administration authorities in monitoring business transactions were introduced in late 1970s. Since then, both developed and developing countries have adopted the use of EFDs in their revenue collection systems. For example, developed countries such as Italy and Greece adopted the use of EFDs in 1983 and 1988 respectively. And currently, EFDs are being used in revenue collection by many developed and middle-income countries including Brazil, Bulgaria, Chile, Mexico, Romania, South Korea, and Sweden (Casey & Castro, 2015).

In African context, countries like Ethiopia, Kenya, Malawi, Rwanda, South Africa, and Zimbabwe have adopted the use of EFDs in their revenue collection systems. However, the experience with using EFDs in revenue collection in developing countries is a very challenging one because in most cases, it has not given the anticipated results. The main issue has always been how traders respond to the system (Mandari *et al*., 2017). For example, Ethiopia introduced the use of EFDs in its revenue collection system in order to increase revenue. Nevertheless, Ethiopian government is yet to full realize the benefits of EFDs due to low awareness of traders on the devices (Ikasu, 2014). Kenya

introduced the use of EFDs to secure sales information, enhance compliance, and avert invoice fraud by traders and ultimately increase revenue collection. However, traders' willingness to use them is not yet satisfactory (Mboma, 2012). The introduction of EFDs in South Africa and Zimbabwe respectively was meant to help tax collectors get correct sales information from traders, reduce revenue collection costs, and expedite compliance by traders. However, traders have no enough education on the devices, and thus posing a potential difficulty for traders to willingly use them in their daily business transactions (Mmanda, 2010).

In Tanzanian context, EFDs usage was introduced in 2010. The introduction of EFDs in Tanzania involved two phases, namely, phase I and phase II respectively. Phase I was implemented in 2010, and covered VAT registered traders whose annual sales turnover was above TZS 100 million. And phase II was implemented in 2013, and covered non-VAT registered traders (TRA, 2013). Introduction of EFDs in Tanzania aimed at *inter alia* enabling TRA elicit sales information from traders, reduce revenue collection costs, and ultimately improve revenue collection and tax compliance (Mandari, *et al*., 2017). This was in line with Tanzania Finance Act 2010 and now Tanzania Finance Act 2016 (URT, 2016). It was also in line with Tanzania Development Vision (TDV) 2025, which emphasizes *inter alia* on the need to use technology to enhance efficiency. It is also now in line with United Nations Sustainable Development Goals (SDGs) 2030, which stress on the need of employing technology in solving different problems facing nations (UN, 2015).

The main challenge for EFDs usage in Tanzania has been to achieve and maintain traders' willingness to effectively use the machines. Thus, adoption of EFDs has not been smooth as it led to conflict between traders and the government. In view of that, the government forced traders to acquire the machines. As a result, traders have been reluctant to willingly use them in their daily business transactions (Kapera, 2017). For example, Kira (2016) found that majority of traders in Dodoma acquired and used EFDs due to fear of being caught by government authorities (62.7%) than benefits they get

from using them (29.3%) and their own willingness to use these machines (8%).

Therefore, despite the adoption of EFDs in revenue collection system in Tanzania, traders are not willing to use them in their daily business transactions (Ikasu, 2014 and Mandari *et al*., 2017). This potentially poses a difficulty in achieving the aims of introducing EFDs in revenue collection system by Tanzanian government.

While EFDs have the potential to improve revenue collection, it is the actual use of these machines by traders that can lead to the possibility to improve revenue collection. Hence, increased knowledge of the factors influencing traders' willingness to use EFDs in their daily business transactions is very important if the aim of introducing them in revenue collection system is to be realized. Better understanding of what influences traders' willingness to use EFDs in business transactions would offer us valuable insights on the reasons for traders to or not use EFDs and how to address them to increase use of EFDs by traders.

Therefore, the current study strived to investigate the factors that influence traders' willingness to use EFDs in their daily business transactions in Morogoro Municipality, Tanzania.

1.2 Problem statement

Electronic Fiscal Devices (EFDs) usage has the potential to improve revenue collection in Tanzania. For example, Tanzania Revenue Authority (TRA) realized an increase in revenue collection after the introduction of EFDs in its revenue administration system (Kapera, 2017). According to TRA (2013), Value Added Tax (VAT) collections increased from TZS 585,882.4 million for the financial year 2009/2010 before the introduction of EFDs to TZS 791,462.9 million in the financial year 2010/2011 after the introduction of EFDs. TRA also reported a 40% increase in its VAT collection in financial year 2011/2012 due to the implementation of EFDs usage (TRA, 2014). Chamshama (2015) found that EFDs assisted in VAT collections in Morogoro Municipality. Mohamed (2015) indicated that there was an increase in revenue

collection owing to the introduction of EFDs in revenue collection system of Kinondoni Municipality – Dar es Salaam. However, this increase was attributable to those traders who were willing to use EFDs in their daily business transactions (Walter, 2013).

Despite the potential of EFDs to improve revenue collection in Tanzania, it is the actual use of these machines that can help in realizing improvement in revenue collection. The actual use of EFDs depends on willingness of traders to employ the machines in their daily business transactions. However, some studies have indicated that traders' willingness to use them is low. For example, according to Walter (2013), 53% of traders with EFDs in Kinondoni Municipality - Dar es Salaam, were not willing to issue correct fiscal receipts as required by Finance Act 2010. Kira (2016) found that only 8% of traders who have EFDs in Dodoma were using them on their own volition. According to Karongo (2014), challenges facing successfully EFDs usage in Tanzania include reluctance of some traders to use the machines in issuing correct fiscal receipts and sometimes not issuing fiscal receipts at all for some sales. Furthermore, Temba (2015) indicated that 56% of traders in Ilala tax region were unwilling to use EFDs in their daily business transactions.

While there are many studies which have attempted to study EFDs in revenue collection, few of them have explicitly studied EFDs and traders' willingness to use them in their daily business transactions. A number of studies have generally focused on the impact of EFDs on revenue collection (Taye, 2011; Ali *et al*., 2013; Bakari, 2014; Chege *et al*., 2015; and Mohammed, 2015). Some other studies have focused on the impact of EFDs on Value Added Tax (VAT) collection in Tanzania (Weru, 2013; and Zaburi, A., 2014).

Therefore, the current study sought to fill the gap by investigating factors influencing willingness to explain what might be contributing to low usage of EFDs in revenue collection by traders. The study area was Morogro Municipality, Tanzania.

1.3 Research questions

The current study aimed at investigating factors influencing traders' willingness to use EFDs in their daily business transactions. The dependent variable was therefore traders' willingness to use EFDs (WTU_{EFDs}). The major question that guided the current study was: What are the factors that influence traders' willingness to use EFDs in revenue collection? To effectively answer this question, it was broken down into two specific questions.

i. What are the factors that influence traders' willingness to use EFDs in revenue collection?
ii. What is the influence of socio-demographic and technological system factors such as age, gender, education, perceived ease of use, and perceived usefulness on traders' willingness to use EFDs?
iii. What is the influence of trader's awareness on EFDs to willingness to use them?

1.4 Objectives

1.4.1 General objective

The general objective was to investigate factors influencing traders' willingness to use EFDs in revenue collection**.**

1.4.2 Specific objectives

The specific objectives were:

i. To identify the factors influencing traders' willingness to use EFDs in revenue collection
ii. To examine the influence of socio-demographic and technological system factors such as age, gender, education, perceived ease of use and perceived usefulness on traders' willingness to use EFDs
iii. To examine traders' awareness on EFDs and the influence it has on willingness to use them

1.5 Scope, Significance and rationale of the study

1.5.1 Scope of the study

The area under which the current study was conducted is Morogoro Municipality, Tanzania. The study investigated factors influencing traders' willingness to use EFDs in their daily business transactions. Only one region was selected based on the assumption that the behavioral patterns of traders are almost the same across the country. And revenue collection strategies using EFDs were the same in all regions in the United Republic of Tanzania.

1.5.2 Significance of the study

As a number of studies on EFDs had concentrated on impact and challenges of EFDs in revenue collection in Tanzania without specifically considering traders' willingness to use them, little or no information on the factors influencing traders' willingness to use EFDs in their daily business transactions was available. In view of that, a study to investigate factors influencing traders' willingness to use these machines in revenue collection particularly in Morogoro Municipality was very important. Therefore, the current study might be significant due to a number of reasons.

Firstly, the current study, through its findings was intended to reveal the factors that influence traders to willingly use EFDs without being coerced by law enforcement authorities. As a result, TRA might use this information to devise sustainable strategies for revenue collection in Tanzania.

Secondly, the results from the current study might also be used by government to develop tax policy that emphasizes on voluntary compliance by taxpayers that may ultimately lead to efficient and sustainable revenue collection in Tanzania.

Finally, in future, this study might act as a reference material for researchers who might be interested in undertaking further research in the field of revenue collection using EFDs or any other revenue collection technology.

Therefore, based on the reasons given above, the current study was worthy undertaking so as to investigate factors influencing traders' willingness to use EFDs in Morogoro Municipality, Tanzania.

1.5.3 Rationale of the study

The use of EFDs was likely to improve revenue collection in Tanzania. However, this depended on whether traders were willing to use them in their daily business transactions. The low EFDs usage by traders was likely to have negative impact on revenue collection endeavors. Thus, investigating factors that influenced traders to willingly use EFDs was very important. Therefore, the current study investigated factors contributing to low usage of EFDs by traders in Morogoro Municipality, Tanzania.

1.6 Organization of the study

This research report is presented in six chapters. Chapter one includes the background, problem statement, research questions, general objective, specific objectives, scope, significance, and rationale of the current study.

Chapter two presents a review of the literature, which includes theoretical and empirical perspectives. The chapter further entails summary and synthesis emanating from literature review. It also entails conceptual framework, research model, variable measurements and expected signs, and hypotheses.

Chapter three describes the methodology used. It entails the study area, study design, research approach, target population, sample size, sampling techniques, data collection methods, data analysis technique, econometric model, econometric model estimation technique, and, validity and reliability of data collection instruments.

Chapter four presents the findings for the present study; chapter five presents discussion of findings, whereas chapter six presents summary, conclusions and policy implications of the findings of the current study.

CHAPTER TWO

LITERATURE REVIEW

2.0 An overview

This chapter presents explanation of concepts applied in the present study; theoretical and empirical perspectives; conceptual framework, research model, as well as a summary and synthesis of the reviewed previous empirical studies.

2.1 Concepts applied in the current study

This subsection gives explanation of some concepts used in the present study. For example, the meaning of Electronic Fiscal Device (EFD), Fiscal Receipt, Tax and Revenue are given in subsections that follow.

2.1.1 Electronic Fiscal Device (EFD)

Generally, Electronic Fiscal Device (EFD) is explained as a variety of technological devices used by revenue administration authorities in monitoring daily business transactions. It is used to monitor business to consumer, and business-to-business transactions (Casey & Castro, 2013). According to Tanzania Finance Act 2016, Electronic Fiscal Device (EFD) means a machine designed for use in business for efficient management controls in areas of sales analysis and stock control system. It is designed to be used by VAT and non-VAT traders in Tanzania to enable TRA track sales records and information which were previously privy to traders, and thus be able to collect correct VAT from VAT registered traders and make accurate estimates of tax returns from non-VAT registered traders. EFD is used to print fiscal receipts when sales of goods or services are made.

For the purpose of the current study, EFD is taken to mean technological machine used by TRA to monitor daily business transactions, and collecting tax revenue from businesses and consumers of goods and services in Tanzania on one hand, and a

technological machine used by a trader to print fiscal receipt for an individual customer or business after supplying goods and services to the customer or business on the other.

2.1.2 Fiscal Receipt

According to Tanzania Finance Act 2016, fiscal receipt means a fiscal document printed by Electronic Fiscal Device (EFD) for the customer for the supply of goods or services supplied to him/her bearing the contents such as amount paid for the good or service. Value Added Tax (VAT) and non-VAT registered traders have to issue fiscal receipts, which bear the amount paid for the good or service purchased. To confirm the authenticity of a fiscal receipt, one has to look for TRA labels, Taxpayer's Identification number (TIN), the number of items purchased, the amount paid, and the date on which the purchase is made.

For the purpose of the current study, fiscal receipt is taken to mean a fiscal document printed by a trader using an EFD machine for the individual customer or business after supplying goods and services to the customer or business.

2.1.3 Types of EFD Devices

According to TRA (2010), there are three types of EFDs being used by traders in Tanzania. These EFDs are categorized based on the nature and scale of business a trader is operating. Brief description on each of the three types of EFDs used in Tanzania is given in subsections that follow.

2.1.3.1 Electronic Tax Register (ETR)

This type of EFD applies to businesses that issue cash receipts manually, or via their cash registers (ECR). For example, retail shops.

2.1.3.2 Electronic Fiscal Printer (EFP)

This type of EFD applies to businesses that issue cash sales or invoices via their point-of-sale (POS) system (or PCs). For example, fuel pumps.

2.1.3.3 Electronic Signature Device (ESD)

This type of EFD applies to businesses that issue invoices, fee notes, delivery notes, and other financial documents via an accounting software. For example, hardware shops, wholesale shops, and hotels.

2.1.4 Activation of EFD

According to TRA (2010), EFD has a Multi-Media Card that is capable of recording all transactions and other information that are printed by EFD. The first Electronic Fiscal Journal (EFJ) activates the start of fiscalization and begins recording of the sales data and produces fiscal receipt or fiscal invoices. The activated device sends a message to the TRA central database for registration to enable it to send the first “Z” report. The message contains at least device serial number, date and time of activation, license number of the supplier and user identification number. Whenever the EFJ is removed, the device is supposed to stop functioning until EFJ is reinserted. It is the duty and obligation of the user to replace full EFJ at any point in time. The EFJ assists the authority to easily search for fiscal data inside the journal than it would be the case with papers. EFJ forms part of the statutory documents maintained by the user.

2.1.5 Operation of EFD

According to TRA (2010), the operation of EFD requires traders to submit the sales information to TRA every day. Therefore, at the end of each day traders must submit a "Z-Report" by pressing a “Z” button on EFD device. The "Z" button should be pressed only once per day at the close of the day's business. This action summarizes all the day's transactions and computes the totals. The totals are automatically captured in both the taxpayer's EFD and the TRA's main server.

The advantage of the "Z-Report" system is evident during tax audits that are occasionally conducted by the TRA officials. With the "Z-Report" system, submission of multitude of documents by the taxpayer for verification purposes is rendered redundant. What the TRA officials do is to come with their memory chip that contains

information captured from their main server, insert it in the taxpayer's EFD, and compare their data to that of the taxpayer. This saves time, resources and unnecessary arguments that were quite common under the previous tax audit system.

2.1.6 Enforcement

According to Finance Act 2016, it is mandatory for a seller to issue a fiscal receipt for each sale; and it is also mandatory for a buyer to demand for a fiscal receipt for a purchase. The act imposes severe punitive measures to both sellers and buyers who violate this legal requirement. The offences have been categorized as failure to use EFD, fraudulent use of EFD, and tempering with EFD and/or related software. All these offences are punishable according to the law.

2.1.7 Tax

A tax is an amount levied on a given individual, institutions or group by the government (Mudida, 2004). It is a compulsory transfer of money from individual, groups or institutions to the government (Hardwick *et al.*, 1999). Tax is the compulsory and unrequited payment to the general government sector. For the purpose of the present study, tax means a compulsory and unrequited payment to the general government sector by traders.

2.1.8 Revenue

In the context of taxation, revenue is described as funds collected from traders and consumers of goods and services. For general government units, there are various sources of revenue among which is the tax revenue (Mudida, 2004). Tax revenue is composed of compulsory transfers of money to the general government sector. In the context of the present study, revenue is taken to mean all money transfers disbursed to the government by traders.

2.2 Theoretical perspectives

Willingness to use technology particularly EFDs in revenue collection can be explained by social, economic, psychological and technological theoretical perspectives. Therefore, the present study was guided by theoretical perspectives drawn from economic, psychological, and technological theories (Ajzen, 1980; Bakos & Kemerer, 1991; Davis, 2006; and Xiao *et al*., 2015). Thus, in view of the current study, the Principal – Agent Theory (Bakos & Kemerer, 1991), The Theory of Planned Behaviour (Ajzen, 1980), and Economic Utility Theory *with* Technology Acceptance Model (Davis, 2006; and Xiao *et al*., 2015) were important. These theories are discussed in subsequent subsections.

2.2.1 Principal – Agent Theory

According to Bakos and Kemerer (1991), the Principal – Agent Theory involves a contractual relationship between two parties namely, the principal and the agent so as to perform some service. It is based on two models of asymmetric information. The first model stipulates that, the agent's actions affect the principal, but the principal does not observe these actions directly. The principal observes outcomes that are correlated with the agent's actions but not the actions themselves. This is called the hidden action model. This model is also called moral hazard. The second model stipulates that the agent has private information, and it is called the hidden type model. This model is also called adverse selection model (Nicholson & Snyder, 2012).

This theory was initially being widely applied to analyze organizational behaviour and corporate government. But, it is now widely used in different disciplines, including economics and taxation. In economic literatures, the theory is used to illustrate criminal behaviours emanating from a rational choice made by the agent. It departs from the classical view of traditional economics, a paradigm, which only focuses on individuals' economic interests. In taxation, the theory acts as the valuable tool for detecting tax

evasion, and illustrates taxpayers' behaviour by emphasizing on tax morale (Donato, 2016).

A large body of prior empirical studies supports Principal - Agent Theory (for example, Arce, 2012; Biswas *et al*., 2012; Torome, 2013; and Donato, 2016). Arce (2012) applied Principal – Agent theory to study principals' preferences for agents with social preferences. The study explored a nested illustration of ethical, moral social identity, motivated opportunistic and reciprocal agent preferences to characterize screening contracts in principal-agent model under adverse selection. This leads to a ranking of the type social preferences that principals should seek in agents. Biswas *et al*. (2012) applied the Principal – Agent Theory to study the problem with respect to tax evasion by firms. The study focused on the role of legal rules relating to liability for tax evasion in determining the parties choices, since concealment costs varied according to whether the risk neutral principal or the risk averse agent are held responsible when tax evasion is detected.

The main finding of the study was that, there was a simple *ex post-test* that could be conducted to deduce whether employing the agent was socially beneficial. Donato (2016) used the Principal – Agent Theory to study corruption and tax evasion in United Kingdom. The findings of the study confirmed that taxpayers were influenced by a series of intrinsic motivation like trust, moral rules, and sentiments, which acted to modify their tax morale. This means that trust in government and the rule of law had a positive effect on tax morale. The study also found that citizens' willingness to pay tax was influenced by tax benefits. In this case, tax was paid in exchange for social services and efficient provision of public goods. The study further found that, tax compliance was influenced by the perceived behaviour of other taxpayers. This implied that, an individual taxpayer was influenced by the perception of the behaviour of others towards tax payment. If other taxpayers believed tax evasion was a normal act, tax morale decreased, and vice versa. Torome (2013) used the Principal – Agent Theory to study relationship between revenue mobilization and performance of local authorities in

Kenya. The study concluded that increased in central government fund transfer from the central government led to increase in efficiency service delivery. The study recommended that revenue collection in local government should be outsourced so as to reduce the increasing rate of tax defaulters and forming enforcement teams to check businesses that have failed to pay taxes and penalize them accordingly.

As applied to the present study with regard to traders' willingness to use EFDs, the Principal – Agent Theory held that TRA is the principal, while traders are the agents. Therefore, traders being agents are obliged to use EFDs in their daily business transactions as required by TRA (principal). In this case, traders possessed the private information that directed their actions with respect to the decision to use EFDs or not in revenue collection. This was according to hidden action and type models. Since EFD is the technology, the hidden type model could entail socio-demographic factors such as age, gender and education that could inform the hidden action i.e. the decision to willingly use the EFDs or not.

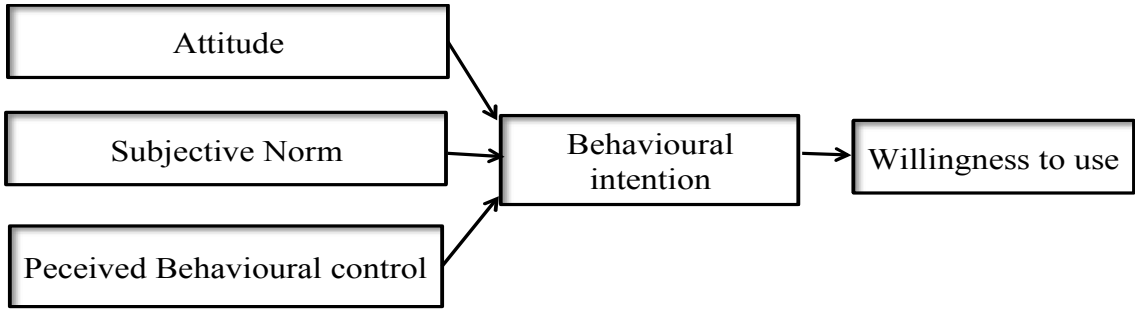
Therefore, under the present study, the Principal – Agent Theory predicted that traders' willingness to use EFDs was influenced by trader's socio-demographic factors such as age, gender, and education. In this case, traders' willingness to use EFDs in revenue collection was positively influenced by gender and education but negatively influenced by age of the trader. However, the Principal – Agent Theory did not give complete variables, and it was thus integrated with the Theory of Planned Behaviour, which identified one more other factor, which could have influence on traders' willingness to use EFDs. In what follows, the Theory of Planned Behaviour is described.

2.2.2 The Theory of Planned Behaviour

The Theory of Planned Behaviour was developed by Ajzen in 1980, and it has since then been successfully applied to study various behavioral realms. According to this theory, the intention to perform a particular behaviour was the direct cause of the behaviour in question, including the behaviour to willingly use technology in collecting revenue.

According to Ajzen (1991), intention was an indication of an individual's willingness to perform a particular behaviour. And behaviour was the manifest, visible reaction to a given condition with regard to intended objective. The behavioral intention was caused by attitude towards the behaviour, subjective norm, and perceived behaviour control. The attitude towards the behaviour referred to an individual's positive or negative evaluation of performing the behaviour. An individual's perception of social pressure from reference group members to enact the behaviour was captured by the subjective norm. Perceived behavioral control included the perceived ease or difficulty of performing the behaviour. The attitude towards behaviour referred to an individual's positive or negative assessment of performing the behaviour (Ajzen *et al*., 1996). Therefore, the three main concepts in the Theory of Planned Behaviour were attitude towards the behaviour, subjective norm, and perceived behavioral control (Figure 2.1).

Figure 2.1: The Theory of Planned Behaviour (TPB)



***Source**: Modified from Ajzen's model (1980)*

The theory of Planned Behaviour was confirmed in other studies (for example, Githinji *et al*., 2014; Chege *et al*., 2015; and Osman *et al*., 2017). Chege *et al.* (2015) applied the Theory of Planned Behaviour to study effects of EFDs on VAT collection in Tanzania. Variables used in this study were roll out, compliance checks, and enforcement in EFDs implementation. Githinji *et al.* (2014) applied the Theory of Planned Behaviour to study the effect of ICT on revenue collection by Kenyan counties, and much emphasis was given on attitude of taxpayers towards paying tax. From these two studies, roll out

checks and attitude variables were statistically significant, while the other variables were statistically insignificant. Osman *et al*. (2017) applied the Theory of Planned Behaviour to examine the determinant factors of consumer safety behaviour in the motor vehicle repair and service industry. The variables used were attitude towards accident risk, social norm, perceived behavioural control, and safety priorities. The results showed that all factors considered were significant.

As applied to the present study with respect to traders' willingness to use EFDs in revenue collection, this theory held that, willingness to use EFDs was likely to increase with awareness. This was because, traders who were aware of the presence of other traders who willingly used EFDs were more likely to use them as well because they regarded the act as a socially appropriate norm (subjective norm). Therefore, with regard to EFDs usage in revenue collection, willingness to use was expected to increase with an increasing social pressure towards using EFDs. Thus, under the present study, the Theory of Planned Behaviour predicted that traders' willingness to use EFDs was positively influenced by awareness.

Therefore, under the present study, the Principal – Agent Theory and the Theory of Planned Behaviour predicted that traders' willingness to use EFDs was positively influenced by trader's socio-demographic factors such as gender and education (identified by Principal – Agent Theory), and awareness (identified by the Theory of Planned Behaviour), but negatively influenced by age (identified by Principal – Agent Theory). However, these variables were not considered as the only important variables in predicting traders' willingness to use EFDs in revenue collection. Therefore, it was highly deemed important to add some more other variables from Economic Utility Theory *with* Technology Acceptance Model in order to have a better prediction. Thus, the description on Economic Utility Theory in combination with Technology Acceptance Model to identify more variables was given in sub-section that follows.

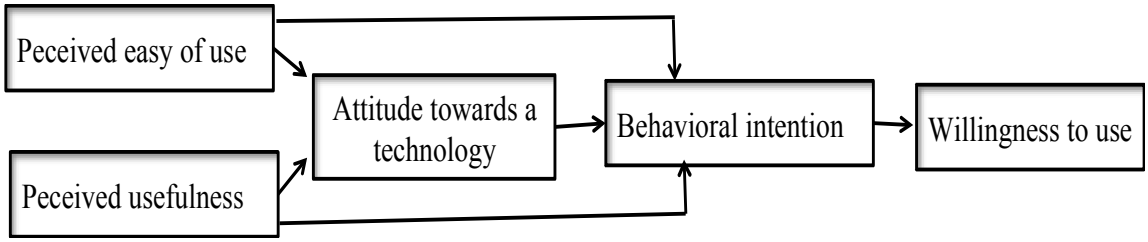
2.2.3 Economic Utility Theory with Technology Acceptance Model

The Economic Utility Theory was based on functional value that emanated from the perceived utility of a product or service to fulfill a task or achieve a goal. It assumed economic rationalism, and related to attributes of a product or service such as performance, price, quality, and reliability (Xiao *et al.,* 2015).

The theory was widely used to analyze consumers' perception of the functional value of a particular product including technology. For the case of technology, consumers opted to use it based on its functional value. Such functional value was based on technological attributes or characteristics such as perceived usefulness and perceived ease of use. If users perceived a technology to be useful and easy to use, they were likely to use it than if they perceived it to be less useful and difficult to use.

With respect to technology, the economic utility theory was supported by a Technology Acceptance Model, which indicated that willingness to use a technological system is determined by two categories of perceptions, namely, perceived ease of use and perceived usefulness of the system. Perceived ease of use was defined as the extent to which a person believed that using the system would be free of difficulty, while perceived usefulness was defined as the extent to which a person believed that using the system would enhance his/her daily business performance (Davis, 2006). Therefore, both, economic utility theory and technological acceptance model were used in studying the reaction of an individual facing an opportunity to use or reject a new technological system. Using or rejecting new technological system depended on the perceived ease of use (PEoU) and perceived usefulness (PU) (Figure 2.2).

Figure 2.2: Technology Acceptance Model (TAM)



***Source**: Modified from Davis' model (1979)*

There is a large body of empirical studies testing Economic Utility Theory and Technology Acceptance Model with generally supportive findings (for example, Chang, 2010; Cheung & Vogel, 2012; Githinji *et al*., 2014; Paper & Fayad, 2015; Xiao *et al*., 2015; and Yoon, 2016). Chang (2010) used the Technology Acceptance Model to examine factors influencing consumers' willingness to use a restaurant recommendation agent. Chang used perceived ease of use, and perceived usefulness as variables for the study. Cheung and Vogel (2012) applied Technology Acceptance Model to explain factors that influence the acceptance of Google Applications for collaborative learning. Variables used were *inter alia* perceived ease of use, and perceived usefulness. Githinji *et al*. (2014) also used the Technology Acceptance Model to study effect of ICT in revenue collection in Kenyan counties. The variables used were perceived ease of use and perceived usefulness. In both studies, these variables had positive influence on the dependent variable.

Paper & Fayad (2015) applied the Technology Acceptance Model to study consumers' behaviour towards electronic commerce. The study used perceived ease of use, and perceived usefulness variables among others. The variables were found to be significant. Xiao *et al*. (2015) used the Economic Utility Theory to study use of payment technology in a perspective based on theory of consumption value in Denmark. The findings showed that functional value such as perceived usefulness and perceived ease of use of a technology were very important for it to be used by consumers.

Yoon (2016) applied Technology Acceptance Model to predict user acceptance of Mobile Library Applications in Academic Libraries in South Korea. The study used perceived ease of use, and perceived usefulness as some of the variables. In this case, the study predicted that user acceptance of Mobile Library Applications in Academic Libraries would increase with perceived ease of use and perceived usefulness. The results for this study showed the prediction of Technology Acceptance Model was found to be correct. Thus, perceived ease of use and perceived usefulness were found to have significant influence on user attitude and intention to use mobile library applications.

As applied to the present study, with respect to traders' willingness to use EFDs in revenue collection, the Economic Utility Theory *with* Technology Acceptance Model predicted that, traders' willingness to use EFDs in revenue collection was positively influenced by technological system factors such as perceived ease of use and perceived usefulness. Thus, under the present study, willingness to use EFDs was positively influenced by technological system factors such perceived ease of use and perceived usefulness.

Table 2.1 shows the summary of theoretical perspectives for the present study. If one studies Table 2.1 critically, it becomes very evident that, the identified variables could be categorized into two constructs, namely, socio-demographic and technological system factors respectively. In this case, socio-demographic factors include age, gender, education, and awareness; while technological system factors entail perceived ease of use and perceived usefulness.

Table 2.1: Summary of theoretical perspectives

Theoretical perspective	Selected variables
Principal – Agent Theory	*Age* *Gender* *Education*
The Theory of Planned Behaviour	*Awareness*
Economic Utility Theory *with* Technology Acceptance Model	*Perceived ease of use (PEoU)* *Perceived usefulness (PU)*

***Source**: Author's own construction (2017)*

2.3 Empirical perspectives

Thus far, through theoretical perspectives, the present study had identified important variables that influence traders' willingness to use EFDs in revenue collection. However, it was deemed very important to also review previous empirical studies whose main objective was to study EFDs usage and revenue collection in Tanzania and beyond. The reason was to find out the knowledge gap that could be addressed by the present study.

In view of that fact, the reviewed empirical studies are presented in sub-sections that follow.

2.3.1 Factors affecting traders' willingness to use EFDs

Vlassenroot & Brookhuis (2014) analyzed factors influencing people's willingness to use new technology. The study findings indicated that socio-demographic factors such as age, gender, and education are among important factors that influence people to accept and use a new technology. They also indicated that device related characteristics such as ease of use and usefulness were important factors in people's willingness to accept the technological system. They also identified awareness as among the factors that influence people to willingly accept and use a technology. In this respect, they indicated that willingness to use a new technology is positively related to awareness of the user on the technology.

Mandari *et al*. (2017) investigated factors that motivate traders to accept EFDs for tax collection in Tanzania. The study applied purposive sampling technique to collect data from 253 respondents. The structural modeling equation (SEM) indicated that awareness was the key factor for the taxpayers to accept and use EFDs in the business transactions.

Kapera (2017) assessed the effectiveness of EFDs in tax collection in Arusha City Council, Tanzania. The study applied descriptive and exploratory research design. The findings indicated that *inter alia* taxpayers lacked education on the use of EFDs.

Temba (2015) conducted a study on user acceptance of EFDs as a new tool for tax collection in Ilala tax region. The study applied descriptive research design and simple random sampling technique in data collection. Findings showed that traders had partial elementary skills on the usefulness of EFDs. Furthermore, the study found that 56% of respondents seemed to be unwilling to use EFDs in their daily business transactions.

2.3.2 Influence of socio-demographic and technological factors on willingness to use

Kira (2016) investigated taxpayers' perceptions on the adoption of Electronic Fiscal Devices (EFDs) in revenue collection in Tanzania specifically in Dodoma region. He used 75 respondents. The results indicated that only 8% of respondents acquired and used EFDs on their own willingness. Majority of the respondents (62.7) acquired and used EFDs because of fear of being caught by government authorities. However, no comprehensive conclusion was given on the specific factors that led to low taxpayers' willingness to acquire and use EFDs.

Nyasha *et al*. (2015) conducted a study to assess attitudes of employees towards the use of fiscalized electronic devices in calculating Value Added Tax (VAT) in motor industry of Zimbabwe. The study used 50 employees randomly drawn from a population of 500 motor industry employees. The method of data analysis was mainly descriptive. The results showed that the use of fiscalized electronic devices is more effective and efficient than manual methods. The study further found that the majority of young employees had positive attitudes and feel secured in the use of fiscalized electronic devices than older ones. This means that there is a negative correlation between age and the use of fiscalized electronic devices in the motor industry. This study shows that age has impact on the use of EFDs. In this case, young people are more likely to willingly use EFDs relative to their older counterparts.

Walter (2013) assessed the effectiveness of administration of EFDs in revenue collection performance in Tanzania specifically in Kinondoni tax region. He used 30 EFD users as respondents. One of his objectives was to investigate EFDs users' willingness to use the devices. The results show that 53% of these respondents were not willing to issue correct fiscal receipts as required by law. However, no comprehensive account of the factors that led to unwillingness of EFD users. He therefore recommended for further research specifically on the factors influencing EFD users' willingness to use the machines, and the present study was designed in that endeavour.

Lin *et al.* (2014) conducted a study to investigate factors influencing people's willingness to accept and adopt information technology acceptance in logistics industry from supply chain perspective in Taiwan. Results from this study showed that perceived ease of use, and perceived usefulness directly affect willingness to accept and use technology, but indirectly affect willingness to adopt technology. This means that, people willingly accept and adopt technology if it is useful and easy to use. With respect to EFDs, it is expected that traders willingly acquire and use them based on their perceived ease of use, and perceived usefulness.

2.3.3 Awareness on EFDs and traders' willingness to use them

Mandari *et al*. (2017) investigated factors that motivate business community to accept the use of EFDs for tax collection in Tanzania. The study applied purposive technique to collect data from 253 respondents. The findings indicated that awareness was the key factor for the taxpayers to accept EFDs.

Maguire (2014) assessed the role of awareness in the adoption and use of new technology. The study results indicated that user awareness on the new technology is of utmost importance. In this respect, if the user knows how to use it, what it can do, and the benefits of using it, then, people are more likely to accept and use the technology.

2.4 Summary and synthesis of the literature review

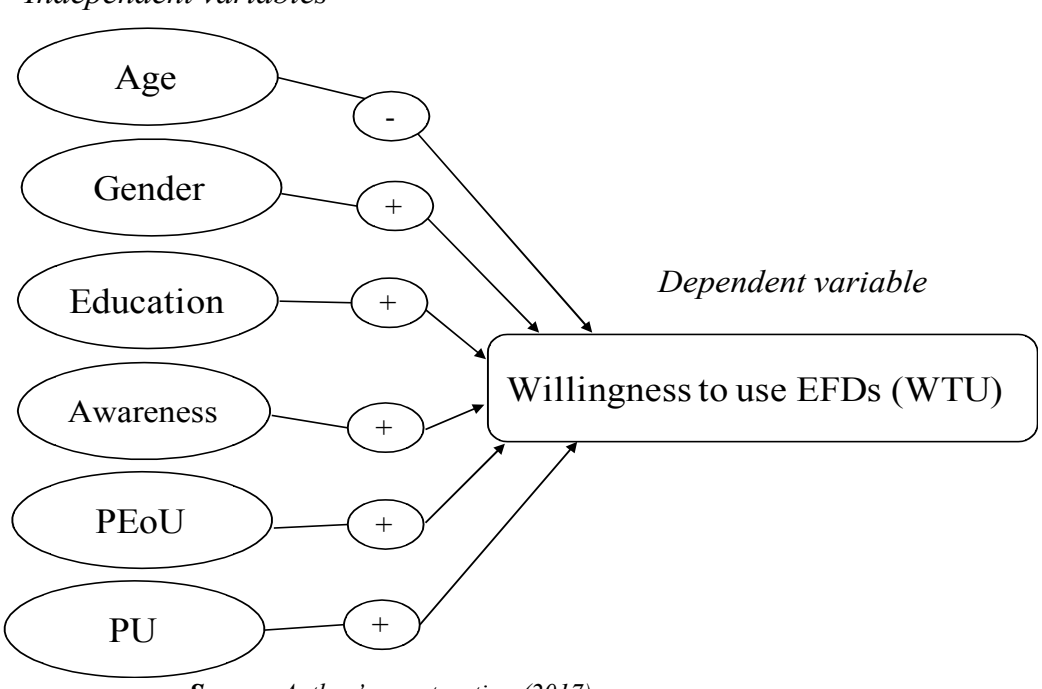
From the literature review it was found that, much of the current empirical studies related to Electronic Fiscal Devices (EFDs) and revenue collection focus on traders' acceptance of these machines and the impact they have on revenue collection. Moreover, these empirical studies have left out much of the variables that might be leading to low usage of EFDs by traders. Thus, the missing part of this body of knowledge is the plethora of variables and their influence on traders' willingness to use EFDs in revenue collection. In view of that, many studies have tended to explore few variables with their influence on traders' acceptance of EFDs as a tool for tax collection. In effect, they have not analyzed the joint influence of variables such as age, gender, education, perceived

ease of use, and perceived usefulness on traders' willingness to use EFDs. Thus, to fill the gap, the presentation of the comprehensive analysis of the factors influencing traders' willingness to use EFDs in revenue collection was necessary.

2.5 Conceptual framework

The conceptual framework for the present study was based on the Principal-Agent Theory, the Theory of Planned Behaviour and Economic Utility Theory *with* Technology Acceptance Model. The dependent and independent variables were carefully selected based on these theories and reviewed previous empirical studies, and put together in the conceptual framework, which identified 6 variables as shown in figure 2.1. Each variable is described in the sub-section 2.6 that follows.

Figure 2.3: Conceptual framework



***Source**: Author's construction (2017)*

Note: PEoU = Perceived ease of use, PU = Perceived usefulness

\+ = Positive influence, - = Negative influence

2.6 Description of the conceptual framework

The conceptual framework presented in figure 2.1 entailed dependent and independent variables. The dependent variable was the willingness to use EFDs (WTU), while independent variables were categorized into three groups, namely trader's socio-demographic factors such as age, gender, and education; technological system factors such as perceived ease of use, and perceived usefulness; and awareness of traders on EFDs and their benefits in business. The brief description of dependent variable and each independent variable is given in subsequent subsections.

2.6.1 Willingness to use EFDs

The main objective of the present study was to investigate factors influencing traders' willingness to use EFDs in revenue collection. Therefore, the dependent variable was willingness to use EFDs (WTU_{EFDs}). This variable was measured in terms of whether or not an individual trader willingly used EFDs in his/her daily business transactions. Reviewed empirical studies had indicated that traders' willingness to use new technology depended on socio-demographic factors, and perceived system factors of the technology, as well as awareness of traders on the technology and its benefits in business. Trader's socio-demographic factors included, age; gender; and education level variables; while, perceived technological system factors included perceived ease of use and perceived usefulness variables. In subsequent sub-sections, the description of how independent variables were defined, measured and how they were expected to influence dependent variable is given.

2.6.2 Trader's socio-demographic factors

The first group of independent variables such as age, gender, and education emanated from trader's socio-demographic factors construct. In this case each variable was described in terms of how it was measured and its expected influence on the dependent variable.

Age was considered to be a dummy variable in which one was years less than 56 (<56 years of age), and zero otherwise (1 = young (<56 years), 0 = otherwise). It was conceptualized as an important factor in traders' willingness to use EFDs, with young traders (<56 years) considered more likely to use EFDs than their older counterparts. Nyasha *et al.* (2011) advocated that older adults are less likely to use the fiscalized devices than their younger counterparts. Therefore, older traders were considered less likely to willingly use EFDs in revenue collection. Hence, age was expected to negatively influence traders' willingness to use EFDs in revenue collection in the study area.

Gender was conceptualized as a dummy variable in which one is male and zero female (1 = male, 0 = female). Based on reviewed literature, it was expected that males were more likely to willingly use EFDs than their female counterparts. This is because males are in most cases more likely to willingly adopt and use technology regardless of their familiarity levels, while females' willingness to adopt and use technology is more likely to increase with increasing familiarity levels. Bill (2003) states that males tend to display positive attitudes towards the use of fiscalized devices, regardless of the level of familiarity, while females' attitudes become more positive as the levels of familiarity increases. Therefore, gender was expected to either positively or negatively influence traders' willingness to use EFDs in revenue collection in the study area.

Education was conceptualized as a dummy variable in which one was education level from secondary to university, and zero otherwise (1 = secondary to university, 0 = otherwise). Higher education level (secondary to university) was considered to go well with willingness to use EFDs than lower education level. This is because higher education level was expected to result in lower information costs and thus traders with higher education level would be in a better position to deal with any problem or difficulty that could arise with the use of EFDs. Therefore, education was expected to positively influence traders' willingness to use EFDs in the study area.

2.6.3 Technological system factors

The second group of independent variables emanated from technological system factors, EFDs in this case. This group entailed two independent variables, namely, EFDs' perceived usefulness and perceived ease of use.

Perceived ease of use was conceptualized as one of the independent variables that influenced traders' willingness to use EFDs in revenue collection. The data regarding perceived ease of use variable were to be obtained using a one to three point Likert scale on the questionnaires. Later on, due to low degrees of freedom and convergence problems, variable could be transformed into a dummy variable with one being agreement of the statement implying a three response, and zero otherwise, implying neutral or disagreement with the statement, for one or two response (Li, 2013; Gosavi, 2015; and Harpe, 2015). In this case, when EFDs were perceived to be ease to use by respondents, they were more likely to be used in business transactions and vice versa. Therefore, it was expected that those respondents who agreed that EFDs are easy to use were more likely to use EFDs than those who were neutral or in disagreement with the statement. Hence, perceived ease of use variable was expected to positively influence traders' willingness to use EFDs in revenue collection in the study area.

Perceived usefulness was conceptualized as one of the independent variables that influenced traders' willingness to use EFDs in revenue collection. The data regarding perceived usefulness variable were to be obtained using a one to three point Likert scale on the questionnaire. Later on, due to low degrees of freedom and convergence problems, variable could be transformed into a dummy variable with one being agreement of the statement implying a three response, and zero otherwise, implying neutral or disagreement with the statement, for one or two response (Li, 2013; Gosavi, 2015; and Harpe, 2015). In this case, when EFDs were perceived to be useful by respondents, they were more likely to be used in business transactions and vice versa. Therefore, it was expected that those respondents who agreed that EFDs are useful were more likely to use EFDs in revenue collection than those who were neutral or in

disagreement with the statement. Hence, perceived usefulness was expected to positively influence traders' willingness to use EFDs in revenue collection in the study area.

2.6.4 Awareness on the use of EFDs and their benefits in business

The third group of independent variables entailed awareness of traders on the use of EFDs and their benefits in business. In this case, awareness was conceptualized as a dummy variable measured in terms of whether or not a trader had knowledge on how to use EFDs and knew the benefits of the same in business (1 if a trader was aware, and 0 if a trader was not aware). In this case, it was expected that if a trader was aware on how to use EFDs and knew the benefits of the same in business, then, he/she could be more likely to willingly use EFDs in daily business transactions than if the trader was not aware. Therefore, awareness was expected to positively influence traders' willingness to EFDs in revenue collection in the study area.

CHAPTER THREE

RESEARCH METHODOLOGY

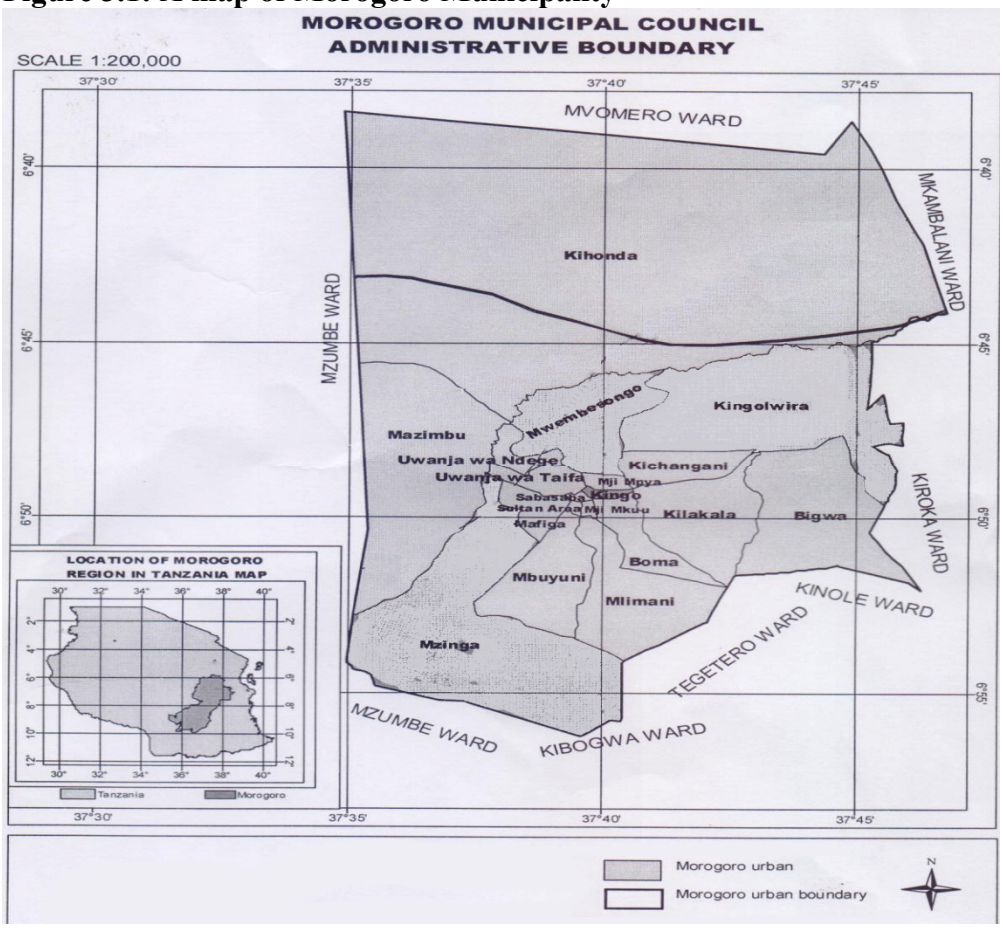
3.0 An overview

This chapter presents description of the study area, study design, research approach, target population, sample size and sampling procedure for the present study. It also entails data collection methods, data analysis, empirical econometric model, and estimation technique. It finally presents validity and reliability of data collection instrument used for the present study.

3.1 Description of the study area

The present study was conducted in Morogoro Municipality located in Morogoro Region, Tanzania. Morogoro Municipality is almost 195 kilometres from Dar es Salaam and is located on the slopes of Uluguru Mountains whose peak is about 2,630 meters (8,629 feet) above the sea level. It is found between latitude 4.49 South of Equator and longitude 37.0 East of Greenwich. It covers an area of 531 square kilometres (URT, 2012). Figure 3.1 shows the map of Morogoro Municipality.

Figure 3.1: A map of Morogoro Municipality



***Source**: Morogoro Municipal Council (2017)*

3.2 Justification for selection of the study area

Morogoro Municipality is increasingly becoming a very important business center not only due to the presence of a highway road linking it to the East, West, South and Northern parts of the country, but also due to its proximity to the biggest business city of Dar es Salaam. It is also increasingly becoming a very important business center because it is surrounded by a number of universities including, Sokoine University of Agriculture, Muslim University, Jordan University and Mzumbe University, whose students are very important customers to most of the businesses in the municipality.

Thus, the area was selected based on the fact that it is a very growing business center with many businesses that made it possible for the collection of data on traders' willingness to use EFDs in their daily business transactions. Therefore, the present study was exclusively conducted in Morogoro Municipality. It involved traders of goods and services in Morogoro Municipality.

3.3 Study design

According to Kumar (2014), a research design is a plan, structure and strategy of investigation so conceived as to obtain answers to research questions or problems. It is an arrangement of situations for collection and analysis of data in a style that aims to combine relevance to the research purpose with economy in procedure. Under the present study, research design was taken to mean a plan of the whole process used to collect and analyze data from respondents.

The present study applied Cross-sectional Research Design. Cross-sectional design, also known as one-shot or status design is the design best suited to studies aimed at finding out the prevalence of a phenomenon, situation, problem, attitude or issue, by taking a cross-section of the population (Kumar, 2014). It involves deciding what a researcher wants to find out about, identifying the study population, selecting a sample and contacting respondents to find out the required information. It is useful in obtaining an overall picture as it stands at the time of the study. It is designed to study some phenomenon by taking a cross-section of population at one time (Creswell, 2014).

Thus, the present study employed a cross-sectional research design, which gave a clear picture of the factors influencing traders' willingness to use EFDs in revenue collection in the present study area. This design was convenient because it focused on finding out relationships existing between variables at the time of study. Furthermore, the design was relatively inexpensive to conduct and consumed less time, as individual traders were accessible in the study area.

3.4 Research approach

According to Creswell (2014), quantitative research approach is an approach used for testing objective theories by examining the relationship between dependent and independent variables. These variables in turn can be measured; typically, on instruments so that, numbered data can be analyzed using statistical procedures. Creswell (2014) further notes that, quantitative approach is used in conducting researches that involve social problems, which call for specific approaches. Such problems include those involving the identification of factors that influence an outcome; the utility of an intervention; and understanding the best predictors of outcomes.

Under the present study, a research approach was taken to mean a style used to quantitatively test specific objectives to verify whether the identified explanatory variables were significant or not based on the given dependent variable. Since the present study intended to investigate factors influencing traders' willingness to use EFDs in revenue collection, then, quantitative approach was the best approach to use. Thus, the present study employed quantitative research approach.

3.5 Target population, sample size and sampling procedure

3.5.1 Target population

According to Creswell (2014), a target population is defined as the full set of cases from which a sample is taken. Under the present study, the target population was taken to mean all VAT and non-VAT registered traders in Morogoro Municipality who have EFD machines. Thus, the target population for the present study was all VAT and non-VAT registered traders in Morogoro Municipality who have EFDs. It was comprised of 387 VAT and 900 non-VAT registered traders in Morogoro Municipality, making a total of 1287 target population. This population was suitable because these traders have been using EFDs for at least three years now.

3.5.2 Sample size

The sample size for the present study was determined using the formula $n = \frac{N}{N * d^2 + 1}$,

Where

n = Sample size (number of respondents), N = Total number of target population (EFD users), d = Margin of error (0.077)

Hence, $n = \frac{1287}{1287 * (0.077)^2 + 1} = 149.12$ which, approximately equals to 149 respondents.

3.5.3 Sampling procedure

The sampling frame was 1287 VAT and non-VAT registered traders in Morogoro Municipality. Systematic random sampling was used because there were identified traders who were using EFDs. According to Gray (2014), in systematic random sampling every K^{th} element of a sampling frame is chosen for the sample. K is called the sampling interval, with the first element being chosen randomly.

Under the present study, K^{th} element represented every 9^{th} business. Thus, since the intention was to select a sample of 149 from a list of 1287 businesses, every 9^{th} business was chosen.

3.6 Data collection methods

Both primary and secondary data were collected. Primary and Secondary Data, their sources, and methods of collection are briefly discussed in what follows.

3.6.1 Primary data

Primary data are those data collected for the first time and thus happen to be original in nature (Kothari, 2008). The primary data were collected using the structured questionnaires that constituted closed–ended questions. Primary data were collected from both VAT and non-VAT registered traders in Morogoro Municipality. In this case, questionnaires were availed to respondents who were then requested to complete (self-

administered questionnaires). Thus, the present study involved distribution of questionnaires to respondents, and the filled questionnaires were collected after three days.

3.6.2 Secondary data

Secondary data are data which have been collected by someone else and which have already been passed through the statistical process (Kothari, 2008). In the present study, these data were collected from various sources including books, publications and Internet.

Therefore, the study involved collection of secondary data by reviewing various government reports, reading books and surfing the Internet concerning the use of EFDs in revenue collection. Secondary data were used to inform the present study on what is known and not known in the field of EFDs and revenue collection. In view of this, secondary information was synthesized to identify the gap that the present study sought to fill.

3.7 Data analysis, empirical econometric model and estimation technique

3.7.1 Data analysis

The present study aimed at investigating factors influencing traders' willingness to use EFDs in revenue collection in Morogoro Municipality, Tanzania. Since the dependent variable (willingness to use) was qualitative in nature with a yes or no response, the study analyzed data using binary choice probit model (Pedace, 2013). Thus, binary choice probit model was adopted because willingness to use (WTU) dependent variable assumes two values, 1 if the trader uses EFDs, and 0 if a trader does not use EFDs. And the model was selected due to its asymptotic characteristic of constraining the predicted probabilities within 0 and 1 interval, and its ability to resolve heteroscedasticity problem (Greene, 2012; and Verbeek, 2012).

3.7.2 Empirical econometric model specification

Since the dependent variable was qualitative in nature with binary response values of 1 if the trader uses EFDs, and 0 if the trader does not use EFDs, then, a binary choice probit model was applied in the analysis. The probit model can generally be presented by the general equation as,

$$F(Z) = \int_{-\infty}^{Z} (2\pi)^{1/2} e^{-Z^2/2} dZ$$

Where,

Z = Standard Normal Variable (a normal variable with zero mean and unit variance),

e = The base of the natural log (the value 2.71828…)

In the probit model therefore, willingness to use (WTU) EFDs was taken as 1, while unwillingness to use was taken as 0. The probability (P_r) of willingness to use over unwillingness is expressed as: $P_r = E(Y|X_i) = P_r(Y = 1|X_i)$.

Thus, to examine factors influencing traders' willingness to use EFDs in revenue collection, a probit model was specified as follows

$$WTU^* = X_i'\beta + u \text{----------} (1)$$

Where,

WTU* is a latent variable, where

$$\begin{cases} \text{WTU} = 1 \text{ if a trader is willing to use EFD} \\ \text{WTU} = 0 \text{ otherwise} \end{cases}$$

X_i' = Vector random variable

u = Disturbance term

Now, from equation (1),

$$\Pr(WTU = 1) = \Pr(X_i'\beta + u > 0) \text{----------} (2)$$

Rearranging the terms

$$\Pr(WTU=1) = \Pr(u > -(X_i'\beta))$$
$$= 1 - \Pr(u < -(X_i'\beta))$$
$$= 1 - F(-(X_i'\beta)) \text{----------} (3)$$

Where,

F is the Cumulative Normal Distribution Function of u assuming that

$$\Pr(WTU=1)$$
$$= 1 - \Phi(X_i'\beta) \text{----------} (4)$$

Where,

Φ is the Cumulative Normal Distribution Function.

Therefore, the probabilities for each response category are given by

$$\Pr(WTU_i=0) = \Phi[u_1 - \alpha X] - \Phi[u_0 - \alpha X] \text{----------} (5)$$

Where

$\alpha = \frac{\beta}{\partial}$ and $\frac{D}{\partial} = 1,0$

It should be noted that only ratios $\alpha = \frac{\beta}{\partial}$ and $\frac{D}{\partial}$ were estimated

Coefficients (βs) in equation (1) and their respective standard errors, which are asymptotically efficient, were estimated using Maximum Likelihood technique. Thus, the likelihood function is given by

$$\ln \hat{L}\left(\hat{\beta}_0, \hat{\beta}\right) = \sum_{i=1}^{n}\left[Y_i \ln\left(F\left(Z_i\right)\right) + \left(1-Y_i\right)\ln\left(1-F\left(Z_i\right)\right)\right] \text{----------} (6),$$

After substitution we have,

$$\ln \hat{L}\left(\hat{\beta}_0, \hat{\beta}\right) = \sum_{i=1}^{n}\left[Y_i \ln\left(F\left(\hat{\beta}_0 + \hat{\beta}X_i\right)\right) + \left(1-Y_i\right)\ln\left(1-F\left(\hat{\beta}_0 + \hat{\beta}X_i\right)\right)\right] \text{----} (7)$$

Specifically, for the present study, the model is expressed as

Willingness to use = f(Age, Gender, Education, Awareness, PEoU, PU), and the estimated empirical econometric model can be presented as

$$WTU = \beta_0 + \beta_1 Age_i + \beta_2 Gen_i + \beta_3 Edu_i + \beta_4 Awa_i + \beta_5 PEoU_i + \beta_6 PU + u$$

Where:

WTU = Willingness to use EFDs

Age = Age of a trader

Gen = Gender of trader

Edu = Education level of a trader

Awa = Awareness of trader

PEoU = Perceived ease of use of EFDs by a trader

PU = Perceived usefulness of EFDs by a trader

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, and\ \beta_6$ = Coefficients of parameters

μ = Error term

And after substitution specifically for the current study, we have equation

$$= \int_{-\infty}^{(\beta_0+\beta_1 Age_i+\beta_2 Gen_i+\beta_3 Edu_i+\beta_4 Awa_i+\beta_5 PEoU_i+\beta_6 PU)} (2\pi)^{1/2} e^{\frac{(\beta_0+\beta_1 Age_i+\beta_2 Gen_i+\beta_3 Edu_i+\beta_4 Awa_i+\beta_5 PEoU_i+\beta_6 PU)}{2}} d\left(\beta_0+\beta_1 Age_i+\beta_2 Gen_i+\beta_3 Edu_i+\beta_4 Awa_i+\beta_5 PEoU_i+\beta_6 PU\right)$$

Since β terms could not be estimated using OLS, the technique used was Maximum Likelihood (ML). The objective of maximum likelihood (ML) estimation was to choose values for the estimated parameters (βs) that would maximize the probability of observing the Y values in the sample with the given X values. This probability was presented in the likelihood function as shown in equations (6) and (7), which was used to calculate the joint probability of observing all the values of the dependent variable, based on the fact that each observation was drawn randomly and independently from the population. According to Pedace (2013), if the values of the dependent variable are random and independent, then one can find the joint probability of observing all the values simultaneously by multiplying the individual density functions.

Therefore, for the purpose of the present study, we have the equation as shown below

$$\ln \hat{L}\left(\hat{\beta}_0, \hat{\beta}_1, \hat{\beta}_2, \hat{\beta}_3, \hat{\beta}_4, \hat{\beta}_5, \hat{\beta}_6, \hat{\beta}_7\right)$$

$$= \sum_{i=1}^{n}\left[WTU \ln \beta_0+\beta_1 Age_i+\beta_2 Gen_i+\beta_3 Edu_i+\beta_4 Awa_i+\beta_5 PEoU_i+\beta_6 PU) \ln\left(1-F\left(\beta_0+\beta_1 Age_i+\beta_2 Gen_i+\beta_3 Edu_i+\beta_4 Awa_i+\beta_5 PEoU_i+\beta_6 PU\right)\right)\right]$$

The current study used STATA computer software version 13 for Mac to obtain the estimated βs.

3.7.3 Interpretation of probit coefficients

When estimating a probit function, the present study kept in mind that the model is nonlinear and the coefficients could not be interpreted as partial-slope coefficients. The coefficients produced by estimating a probit model provide the change in the Z (standard normal) value for a unit change in the independent variables. Because the probit is derived from the standard normal distribution (a nonlinear function), the study used **marginal effects** to interpret the results. The marginal effects were calculated using the STATA software version 13 for Mac.

3.7.4 Dependent variable

The present study aimed at investigating the factors influencing traders' willingness to use EFDs in their daily business transactions. Therefore, the dependent variable was willingness to use (WTU).

3.7.5 Independent variables, their measurements and expected effect

Based on theoretical and empirical literature review age, gender, education, awareness, perceived ease of use and perceived usefulness were the independent variables for the present study. The variables with their expected influence on traders' willingness to use EFDs in revenue collection are shown in Table 3.1.

Table 3.1: Variables definitions and expected signs for willingness to use EFDs

Variable	Description	Hypothesized sign
Willingness to use (*WTU*)	1 = willing to use EFDs, 0 = Otherwise	n/a
Age	Age taken as a dummy variable with 1 = young (<56 years), 0 = otherwise	-
Gender *(Gen)*	A dummy variable =1 if a trader is male, 0 if is female	+/-
Education (*Edu)*	Education level taken as a dummy variable with 1= Secondary to university, 0 = Otherwise	+
Awareness (*Awa*)	A dummy variable = 1 if a trader is aware, 0 = Otherwise	+
Perceived usefulness (PU)	3 point Likert scale (1=Disagree, 2=Neutral, 3=Agree) then converted to a dummy variable = 1 if a trader perceives EFD to be useful, 0 Otherwise	+
Perceived ease of use (*PEoU*)	3 point Likert scale (1=Disagree, 2=Neutral, 3=Agree) and then converted to a dummy variable = 1 if a trader perceives EFD to be easy to use, 0 Otherwise	+

3.8 Validity and reliability

3.8.1 Validity

Validity refers to the ability of a scale or tool to measure what is supposed to measure (Kumar, 2014). Validity of research instruments is one of the most important aspects that should be clearly addressed in research. This is because, if the data collection instruments are invalid, then, the data collected using invalid instruments will lead to wrong data, and ultimately result into wrong findings and conclusions (Pallant, 2016). In the present study, validity was addressed based on three aspects.

(i) External validity

This is associated with the generalizability of study findings from the survey research to the entire population (Pallant, 2016). Since the present study was not a statistical in itself, but its main aim being to sample widely, external validity was achieved through analytical generalizations by comparing the study evidence with previous empirical study conducted in this field of study.

(ii) Internal validity

This is taken as the extent to which the differences found from the dependent variable is directly related to the independent variables (Pallant, 2016). Under the present study, internal validity was achieved through specification of the unit of analysis and constructing conceptual framework that indicated the relationship between a number of variables as they relate to the present study (see figure 2.3). In this case, the unit of analysis was individual trader with EFDs.

(iii) Construct validity

This refers to the degree to which the study instruments are able to capture the construct of the interest, in this case, factors influencing traders' willingness to use electronic fiscal devices (Pallant, 2016). To achieve this aspect, the present study gathered evidence on the traders' willingness to use EFDs through self-administered questionnaires on one hand. On the other hand, the operational action on the concept was based on the factors identified in the course of literature review.

3.8.2 Reliability

According to Saunders *et al* (2009), reliability refers to the extent to which the data collection techniques or analysis procedures will yield consistent findings. The reliability has to do with the quality of measurement. It is the consistence or repeatability of a measure. According to Pallant (2016), internal reliability is tested by using Cronbach's Alpha Coefficient, in which, if its value is above 0.7 but less than 1, then, the instruments used in collecting data are reliable. Therefore, Cronbach's Alpha Coefficient was used to determine internal reliability. The degree of internal reliability was obtained by using IBM SPSS Statistics computer statistical software version 24 for Mac.

In testing the scale reliability, the present study applied Cronbach's Alpha Coefficient whose value was found to be higher than 0.7 but less than 1 for three scales tested (Table 3.2 and see appendix 3). Table 3.2 shows that all the two scales tested (perceived ease of use, and perceived usefulness) had Cronbach's Alpha Coefficient higher than 0.7 but less than 1. According to Pallant (2016), Cronbach's Alpha Coefficient value above 0.7 but less than 1 indicates internal reliability of the scales. With the value higher than 0.7 means that the scales for the present study were very reliable.

Deleting any question from the scales could not significantly increase the Cronbach's Alpha Coefficient for perceived ease of use and perceived usefulness. Based on this fact, the present study assumed that these scales were internally consistent.

Table 3.2: Cronbach's Alpha coefficients

Scale name	Number of items	Cronbach's Alpha Coefficient
Perceived ease of use (PEoU)	5	0.827
Perceived usefulness (PU)	5	0.834

***Source**: Survey Data (2017*

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.0 An overview

The chapter presents findings of the present study, which was conducted to investigate factors influencing traders' willingness to use EFDs in revenue collection in Morogoro Municipality. It covers descriptive findings as well as empirical analysis results of the primary data collected from traders in the study area. The chapter first presents descriptive statistics followed by probit regression results.

4.1 Socio-demographic characteristics of the respondents

The present study involved 149 traders who have EFD machines, among whom 102 (68.5%) were males and 47 (31.5%) were females. Data further show that age of the traders ranged from 18 to 65 years with the majority of them 90 (60.4%) having ages between 36 and 55 years, followed by 50 (33.6%) of those with age between 18 and 35 years, and the smallest group of them 9 (6%) had age between 56 and 65 years. With respect to education level, majority of the traders 132 (88.6%) had secondary school education, 13 (8.7%) had primary, and only 4 (2.7%) had university education respectively. With regard to awareness on other traders willingly using EFDs in their daily business transactions the data show that 63 (42.3%) of the traders were aware, and about 86 (57.7%) were not aware of other traders willingly using EFDs in their daily business transactions (see Table 4.1).

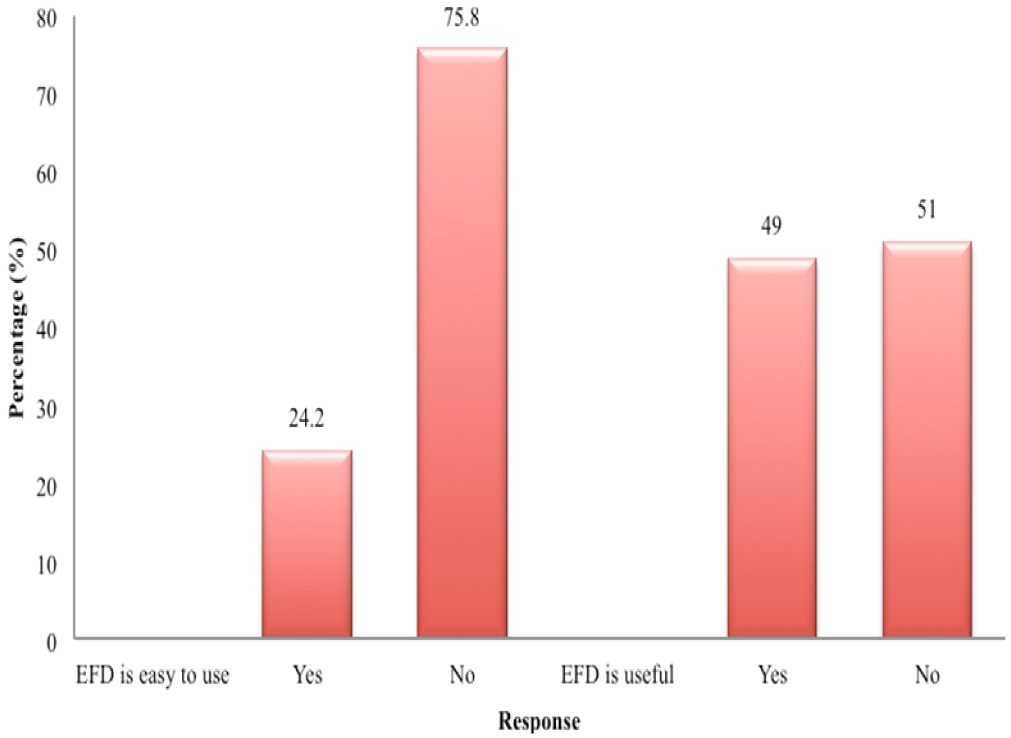
Furthermore, the data show that, majority of the traders 113 (75.8%) perceived EFDs to be difficult to use, while only 36 (24.2%) agreed that EFDs were easy to use. With respect to perceived usefulness of the EFD machines, data show that 73 (49%) of the traders agreed that EFDs were useful to their businesses, while 76 (51%) were skeptical of EFDs usefulness to their businesses (see figure 4.1).

Table 4.1: Respondents' socio-demographic characteristics (N=149)

Variable	Trader's characteristics		
	Description	**Frequency**	**Percentage**
Age	18-35 years	50	33.6
	36 – 55 years	90	60.4
	56-65 years	9	6.0
Gender	Male	102	68.5
	Female	47	31.5
Education level	Primary education	13	08.7
	Secondary education	132	88.6
	University education	4	2.7
Trader's awareness	Aware	63	42.3
	Not aware	86	57.7

***Source**: Survey Data (2017)*

Figure 4.1: Traders' response on whether EFD is easy to use and useful



***Source**: Survey data (2017)*

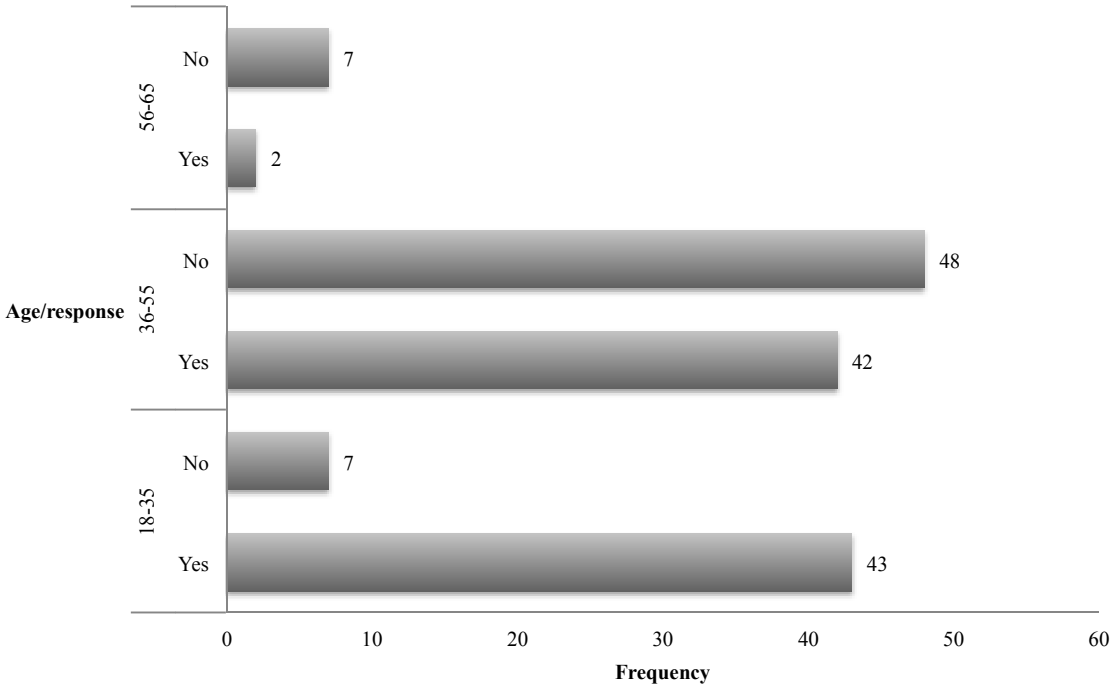
4.2 Descriptive findings

This sub-section sought to elicit the traders' responses on whether they were willingly using EFDs in their daily business transactions based on the socio-demographic factors like age, gender, education, and awareness, as well as on EFDs' perceived ease of use, and perceived usefulness variables. The dataset used under the present study contained 149 traders.

4.2.1 Traders' willingness to use EFDs based on age

Figure 4.2 show that, traders who are young are more likely to willingly use EFDs in their daily business transactions. Figure 4.2 shows that, of 50 traders with age between 18 and 35 years 43 traders were willingly using EFDs. And of 90 traders with age between 36 and 55 years, 42 traders were willingly using EFDs, while of 9 traders with age between 56 and 65 years, only 2 traders were willingly using EFDs.

Figure 4.2: Traders' willingness to use EFDs based on age



***Source**: Survey data (2017)*

4.2.2 Traders' willingness to use EFDs based on gender

Table 4.2 shows that, 81 of 102 male respondents were willingly using EFDs in their daily business transactions, while 22 of 47 female respondents were willingly using EFDs in their daily business transactions.

Table 4.2: Traders' willingness to use EFDs based on gender (N=149)

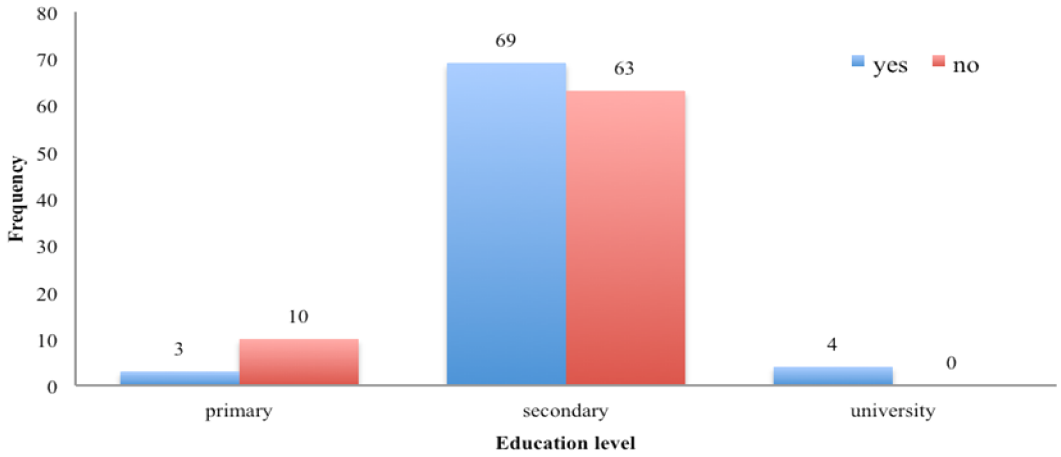
Gender	Willingness to use EFDs based on gender	
	Response	**Frequency**
Male (n=102)	Yes	81
	No	21
Female (n=47)	Yes	22
	No	25

***Source**: Survey Data (2017)*

4.2.3 Traders' willingness to use EFDs based on education

Figure 4.3 show that 3 traders of 13 traders with primary education level were willingly using EFDs, 69 traders of 132 traders with secondary education level were willingly using EFDs, while all 4 traders with university education level were willingly using EFDs. The results imply that, traders' willingness to use EFDs increases with education level of the trader. These results are consistent with previous empirical studies, which have suggested that willingness to use technology increases with increasing education level.

Figure 4.3: Traders' willingness to use EFDs based on education



***Source**: Survey data (2017)*

4.2.4 Traders' willingness to use EFDs based on awareness

Table 4.3 shows that 14 of 63 traders who were aware of the other traders willingly using EFDs in their daily business transactions were also willingly using EFDs, compared to 73 of 86 traders who were not aware on the EFDs and their benefits in business were willingly using EFDs. This implies that, traders' willingness to use EFDs in revenue collection is not influenced by traders' awareness on the devices.

Table 4.3: Traders' willingness to use EFDs based on awareness (N=149)

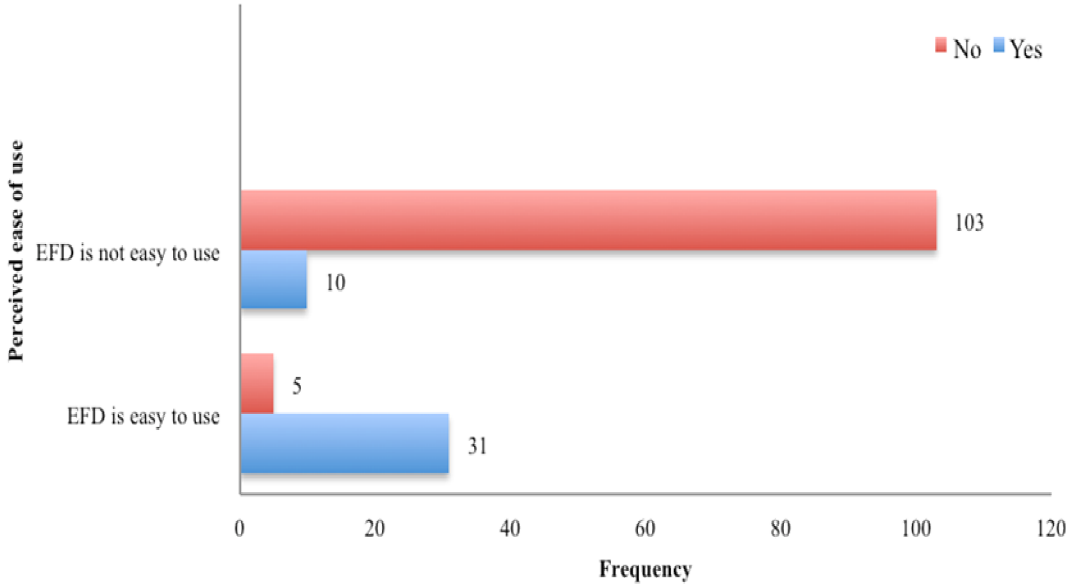
Aware or Not aware	Willingness to use EFDs based on awareness	
	Response	Frequency
Aware (n=63)	Yes	14
	No	49
Not aware (n=86)	Yes	73
	No	13

***Source**: Survey Data (2017)*

4.2.5 Traders' willingness to use EFDs based on perceived ease of use

Figure 4.4 show that 31 of 36 traders who perceived EFDs to be easy to use were willingly using EFDs in their daily business transactions compared to only 10 of 103 traders who perceived EFDs not easy to use. These results imply that, willingness to use EFDs increases if traders perceive them to be easy to use.

Figure 4.4: Traders' willingness to use EFDs based on perceived ease of use

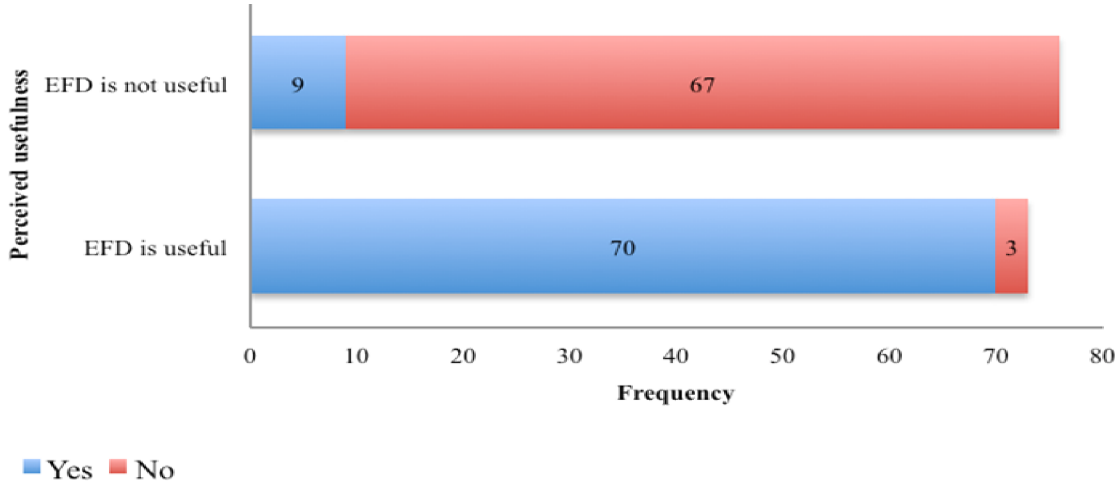


***Source**: Survey data (2017)*

4.2.6 Traders' willingness to use EFDs based on perceived usefulness

Figure 4.5 shows that 70 of 73 traders who perceived EFDs to be useful were willingly using them in their daily business transactions compared to only 9 of 67 traders who perceived EFDs as not useful. This implies that, willingness to use EFDs increases with increasing traders' positive perceptions on usefulness of EFDs.

Figure 4.5: Traders' willingness to use EFDs based on perceived usefulness



***Source**: Survey data (2017)*

4.4 Probit regression analysis results

4.4.1 The model

In the present study, the binary choice probit model was applied to estimate parameters of the factors influencing traders' willingness to use EFDs in revenue collection in Morogoro Municipality, Tanzania. The Pseudo R-squared value showed that about 53% of the variation of the factors influencing traders' willingness to use EFDs in revenue collection is explained by independent variables. And the significant LR chi-square of 58.78 indicates that the independent variables in the present study jointly influence traders' willingness to use EFDs in revenue collection. Therefore, traders' willingness to use EFDs in revenue collection is significantly influenced by age, gender, education, perceived ease of use, and perceived usefulness (see Table 4.5).

4.4.2 Model specification test

According to Gujarati (2011), the model for an econometric analysis should be correctly specified in order to give correct and appropriate prediction. Thus, the model for the present study was tested using the *linktest* to check if it was correctly specified. It was

tested under the assumption of the following null hypothesis: H_o: The model is correctly specified. The *linktest* results indicated that the hatsquare (*hatsq*) had a p-value of 0.865, which is greater than 10% level of significance. Therefore, the study failed to reject the null hypothesis, and concluded that the model was correctly specified, and the probit model applied was appropriate (see Table 4.4).

Table 4.4: Linktest for model specification fitness

WTU_{EFDs}*	Coef.	Std. Err	z	P>|z|	[95% Conf.	Interval]
_hat	0.9646754	0.3024424	3.19	0.001	0.3718991	1.557452
_hatsq	0.0282563	0.1664818	0.17	0.865	-0.2980421	0.3545547
_cons	-0.012457	0.296091	-0.04	0.966	-0.5927847	0.5678707

WTU_{EFDs}* denotes willingness to use EFDs
***Source**: Study results (2017)*

4.4.3 The study explanatory variables and probit regression results

4.4.3.1 Age

Probit regression analysis results in Table 4.5 show that, age of a trader is negative and statistically significant at 1% level of significance. This means that, it is negatively related to trader's willingness to use EFDs in revenue collection. Since the results indicate that the marginal effect for this variable is approximately 0.129 with negative sign, it means that as age of a trader increases by a year will lead to a decrease in probability of trader's willingness to use EFDs by 0.129.

4.4.3.2 Gender

With respect to gender (male), the results of the probit regression analysis show that gender is statistically significant at 1% level of signficance and has positive relationship with willingness to use EFDs and has the marginal effect 0.134. This suggests that males are more likely to willingly use EFD in revenue collection than females by 0.13 under *ceteris paribus*.

4.4.3.3 Education

On education level, the probit regression results show that education is statistically significant at 1% level of significance, and is positively related to traders' willingness to use EFDs and has the marginal effect of approximately 0.11. This indicates that an increase in education level of a trader is likely to result in an increase in trader's willingness to use EFDs by 0.11.

4.4.3.4 Awareness

Regarding traders' awareness, the probit regression analysis results show that awareness is is negatively related to traders' willingness to use EFDs in revenue collection and has the marginal effect of 0.014 with a negative sign. This means that increase in awareness of a trader on EFDs and their benefits in business will most likely result in a decrease in the probability of trader's willingness to use EFDs. However, this variable was not statistically significant.

4.4.3.5 Perceived ease of use

With respect to perceived ease of use, probit regression analysis show that perceived ease of use (PEoU) is statistically significant at 5% level of significance and is positively related to willingness to use EFDs and has a marginal effect of 0.065. This suggests that, traders' willingness to use EFDs increases by about 0.07 if a trader perceives EFDs to be easy to use than if s/he perceives them to be difficult to use.

4.4.3.6 Perceived usefulness

With regard to perceived usefulness, the probit regression results show that perceived usefulness of EFDs is statistically significant at 1% level of significance and is positively related to willingness to use EFDs and has a marginal effect of 0.097. This implies that, willingness to use EFDs is more likely to increase by about 0.1 if a trader perceives EFDs to be useful to daily business transactions than if s/he perceives them to be not useful.

Table 4.5: Marginal effects after probit

Independent variables	Marginal effect (dy/dx)	Std. error	p>[z]
Age	-0.128929***	0.0513025	0.012
Gender (male)	0.1340541***	0.0502866	0.008
Education	0.1074707***	0.0362122	0.003
Awareness	-0.0144175	0.0396871	0.716
Perceived ease of use (PEoU)	0.0653937**	0.0331204	0.048
Perceived usefulness (PU)	0.0967193***	0.0396935	0.015
Number of observations		149	
LR chi2(6)		58.78	
Prob>chi2		0.0000	
Log Pseudo likelihood		-22.038775	
Pseudo R^2		0.5253	

Note: Dependent variable (WTU) = 1 (willing to use), 0 (otherwise), *p<0.1 **p<0.05 ***p<0.01
***Source**: Probit Regression Estimation from Survey Data (2017)*

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 An overview

The current study investigated factors influencing traders' willingness to use EFDs in revenue collection in Morogoro Municipality, Tanzania. By using primary data obtained from a survey of 149 traders who have EFD machines in Morogoro Municipality, the study strived to identify factors influencing traders' willingness to use EFDs in revenue collection, which was under the first specific objective. The study further analyzed the relationship between traders' willingness to use EFDs in revenue collection and different independent variables, such as trader's socio-demographic factors like age, gender, education level and technological system factors such as perceived ease of use and perceived usefulness, which were under the second specific objectives, and awareness of traders on EFDs and their benefits which was under the third and the last specific objective. The results of probit regression analysis discovered a statistically significant relationship between traders' willingness to use EFDs and all of the independent variables considered in the analysis except awareness.

Therefore, this chapter discusses the implications of the major findings emanating from the data analysis of the present study. The major aim is to confirm or refute the applicability and relevance of the applied theories by comparing them with the findings of previous empirical studies.

5.1 Factors influencing traders' willingness to use EFDs

Based on the descriptive findings, factors influencing traders' willingness to use EFDs in revenue collection include socio-demographic factors such as age, gender, and education; while technological system factors include perceived ease of use and perceived usefulness. These findings are consistent with Vlassenroot & Brookhuis (2014) who found that factors influencing people's willingness to use new technology include socio-demographic factors such as age, gender, and education. They also

indicated that device related characteristics such as ease of use and usefulness were important factors in people's willingness to accept the technological system. The results are also in line with the findings by Kapera (2017) who indicated *inter alia* taxpayers' willingness to accept and use EFDs depend on education, in this case fiscal education. Furthermore, the results are consistent with Temba (2015) whose findings showed that traders had partial elementary skills on the usefulness of EFDs. Therefore, based on these findings, it is evident that age, gender, education, perceived ease of use, and perceived usefulness have significant influence on traders' willingness to use EFDs in the study area.

5.2 Socio-demographic and technological factors and willingness to use EFDs

5.2.1 Age

In the current study, results indicated that age was negatively related to willingness to use EFD in revenue collection and indicated that a one-year increase in age of a trader is likely to result in a decrease in the probability of willingness to use EFDs in revenue collection. The results are in line with the expectation of the present study, which had previously indicated that increase in age of a trader would lead to a decrease in the probability of willingness to use EFDs in revenue collection. The implication of this finding is that, young traders are less likely to willingly use EFDs in their daily business transactions. The reason might be that; young people are inclined to using ICT based technology with graphic user interface than the EFDs than their elder counterparts. Thus, this leads to their reluctance to willingly use EFDs in revenue collection. The result is inconsistent with some other previous empirical studies (Bill, 2003; Ellguth and Kohaut, 2014; and Nyasha *et al*., 2015). Bill (2003) found that young people tend to have positive attitude towards using technology than older people. Thus, willingness to use technology is high when people are young than when they are older. Ellguth and Kohaut (2014) argue that, willingness to use technology is more likely to increase if people are young than if they are older. Martey *et al.* (2013) also found that young people are more innovative and are thus more willing to adopt and use technology relative to older

people. Nyasha *et al*. (2015) found that young employees were more likely to willingly use fiscalized electronic devices than older ones in motor industry of Zimbabwe.

5.2.2 Gender

Gender was found to have a statistically significant and positive influence on traders' willingness to use EFDs. The findings show that male respondents were more likely to willingly use EFDs than females. With regard to willingness to use EFDs in revenue collection, the reason might be that men tend to show positive attitude towards technology regardless of their level of familiarity of the same. The findings meet the expectation of the present study, which has suggested that willingness to use EFDs is more likely to increase if a trader is male because males tend to have positive attitude towards technology relative to females. The results are consistent with the findings of some other previous empirical studies (Nyasha *et al.*, 2011). Nyasha *et al.* (2011) found that males tend to display positive attitudes towards the use of fiscalized devices regardless of the level of familiarity, while females' attitude becomes more positive as the level of familiarity increases. This means that, males are more likely to willingly use technology regardless of the level of familiarity relative to women. Conversely, the results are inconsistent with some other previous empirical studies including Fjeldstad *et al*. (2016) who found that female entrepreneurs were more likely to comply with the tax system than males in Ethiopia. This is because women entrepreneurs are more risk averse and more honest than men.

5.2.3 Education

Education was found to have a positive and statistically significant relationship with traders' willingness to use EFDs. In this case, the present study attempted to investigate the influence of general education on traders' willingness to use EFDs in revenue collection. The results show that higher level of education was associated with a more willingness to use EFDs in revenue collection. This implies that, the probability of willingness to use EFDs in revenue collection is higher for traders with higher education than those with lower level of education. The reason for this result might be that,

education increases ones' ability to access and process information for different purposes. Thus, with respect to EFDs, traders with higher education are able to solve problems that might be associated with EFDs more easily than traders with lower education level. The results meet the expectation of this study, which has suggested a positive relationship between education and willingness to use EFDs. Furthermore, these results are consistent with findings of some other previous empirical studies, which have studied the impact of education and willingness to use technology (Tambo, 2011; and Ali *et al*., 2013) As argued by Ali *et al*. (2013), education helps the taxpayers to understand and choose to comply or not with the tax laws and requirements. Tambo (2011) found that education enhances access to information and processing for easy technology adoption. Thus, educated people are more likely to willingly use technology than uneducated ones.

5.2.4 Perceived ease of use

The results indicate that perceived ease of use was found to have a statistically significant and positive influence on traders' willingness to use EFDs. This implies that how that, perceived ease of use influences traders' willingness to use EFDs in revenue collection. This means that, if traders perceive the EFDs to be easy to use and devoid of enormous costs in terms of time and money, then, traders' willingness to use them increases. The results meet the expectation of the present study, which was has suggested a positive influence on willingness to use. These results are consistent with the findings of some other previous empirical studies (Zargham *et al*., 2015; and Sarrab *et al*., 2016). Sarrab *et al*. (2016) found that perceived factors such as perceived ease use of a particular technology have influence on willingness to use that particular technology. This implies that, if people perceive that a particular technology is easy to use, then, their willingness to use it increases than if they perceive it to be difficult to use. Zargham *et al*. (2015) found that perceived ease of use played a significant role in the students' willingness to use the cell phone in environmental learning. This means

that, if a technology is perceived to be easy to use, the prospective users are more likely to use it than if they perceive it to be difficult to use.

5.2.5 Perceived usefulness

Perceived usefulness was found to have a statistically significant and positive influence on traders' willingness to use EFDs. The results show that, traders' willingness to use EFDs in revenue collection is influenced by perceived usefulness. This implies that, if traders perceive EFDs to be useful to them in the sense that, using EFDs enhances their business performance, then, willingness to use them increases. The results meet the expected sign of this variable in the present study, which was anticipated to be positive. These results are consistent with the findings of some other previous empirical studies (Rahman *et al*., 2015; and Sarrab *et al*., 2016). Sarrab *et al*. (2016) found that perceived factors such as perceived usefulness have influence on willingness to use a technology. This implies that, if people perceive that a particular technology is useful to them, then, their willingness to use it increases than if they perceive it to be not useful. Rahman *et al*. (2015) found that perceived usefulness was the most significant factor affecting consumers' willingness to use tagging technology in tracing halal status. This means that, if a technology is perceived to be useful, the prospective users are more likely to use it than if they perceive it to be not useful to them.

5.3 Awareness on EFDs and their benefits in business and willingness to use EFDs

The results indicated that awareness was negatively related to traders' willingness to use EFDs in revenue collection. This implies that increase in awareness of a trader on EFDs and their benefits in business will most likely result in a decrease in the probability of trader's willingness to use EFDs. These results are contrary to the expectations of the present study, which had previously indicated that awareness has positive relationship with willingness to use EFDs. However, this variable was not statistically significant. The results are also inconsistent with some other previous empirical studies (McCann & Nunez, 2004). McCann and Nunez (2004) argue that the willingness of the people to use technology is influenced by awareness of the people about the technology and its

benefits. Furthermore, the results are inconsistent with Mandari *et al*. (2017) who had found that awareness on the EFDs and their benefits in business is the key factor for traders to accept and use the devices. Thus, with respect to EFDs usage in revenue collection, traders are not influenced by the awareness on EFDs and their benefits in business. The reason might be that; traders do not see the immediate benefits of these machines for their businesses. However, awareness was also found to statistically insignificant.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

6.0 An overview

This chapter presents summary, conclusions and policy implications for the study conducted to investigate factors influencing traders' willingness to use EFDs in revenue collection in Morogoro Municipality, Tanzania. Thus, the summary, conclusion, and policy implications are presented in subsections that follow.

6.1 Summary of the study

Summary of the current study is based on three specific objectives that guided this study.

Objective number one was to identify factors influencing traders' willingness to use EFDs in revenue collection. The current study found that, a number of factors influence traders' willingness in revenue collection. Such factors include age, gender, education, perceived ease of use, perceived usefulness, and awareness of traders on EFDs and their benefits to the business.

Objective number two was meant to examine the influence of socio-demographic factors such as age, gender, education, as well as technological system factors such as perceived ease of use, and perceived usefulness on willingness to use EFDs in revenue collection by traders in Morogoro Municipality. The results indicated that age, gender, education, perceived ease of use, and perceived usefulness have influence on traders' willingness to use EFDs in revenue collection. While gender, education, perceived ease of use, and perceived usefulness have positive relation with willingness to use EFDs, age is negatively related to willingness to use EFDs in the study area.

Objective number three was to examine traders' awareness on EFDs and their benefits to their business. And ultimately examine its influence on traders' willingness to use them.

The results indicated that, traders in Morogoro Municipality were not influenced to use EFDs by awareness.

6.2 Conclusion

The results of the current study give a highlight on the factors influencing traders' willingness to use EFDs in revenue collection. In this case, this study draws attention to the important influence of socio-demographic and technological factors such as age, gender, education, perceived ease of use, and perceived usefulness on the willingness to use EFDs in revenue collection. Based on the results, traders' willingness to use EFDs in revenue collection in Morogoro Municipality is significantly influenced by socio-demographic factors such as age, gender, education and technological system factors such as perceived ease of use and perceived usefulness.

6.3 Policy implications

To increase the usage of EFDs in revenue collection, it is necessary to consider factors that influence traders' willingness to use these machines in their daily business transactions. In view of that, based on the findings of the present study, some policy implications can be suggested.

Firstly, considering that findings indicated a positive relation between age, gender and willingness to use EFDs, then, revenue collection authority can actively involve traders when designing and deploying revenue collection technology. Thus, collaboratively, traders and the authority can identify a technological system that may be acceptable to all stakeholders. This will help to lure traders of different age groups and both sexes to willingly use the technology because they will feel a sense of ownership for the machines.

Secondly, empirical results from the current study have indicated that education plays a very important role in traders' willingness to use EFDs in their daily business transactions. Therefore, revenue collection authorities should increase efforts in

education particularly fiscal education for traders. This can be done by offering trainings to traders on how to use the machines and their usefulness in their businesses.

In a nutshell, considering the fact that, Tanzania aspires to become an industrial and middle-income economy by 2025, designing strategies that will ensure sufficient and sustainable domestic revenue is very important than never before. Based on the results of the current study, it is only possible for the government to formulate the most appropriate policies and practices pertaining to EFDs usage in revenue collection by not only considering the influence of age, gender and education on traders' willingness to use EFDs but also traders' perceptions on whether EFDs are easy to use and useful to their businesses.

6.4 Limitations of the study

Although the results and conclusion of the current study are not affected, it is still very crucial to provide a highlight on a number of limitations.

Firstly, respondents for the present study were exclusively traders from Morogoro Municipality. Thus, the analysis was only based on traders' responses and did not consider buyers' perceptions on EFD usage. This might result in respondents' biasness and subjectivity. Therefore, these two issues may reduce the extent to which the results can be generalized to all regions in Tanzania.

Secondly, the current study was able to only capture the prevailing situation on traders' willingness to use EFDs in revenue collection at the time of undertaking the survey. Therefore, it did not consider changes that may occur with change in time.

Lastly, some traders, albeit very few were skeptical of the current study. Therefore, a lot of time was spent persuading them to participate. However, it should be noted that, this group of traders was very small. Thus, the present study assumes that the group did not affect the overall results and conclusion in any way.

6.5 Areas for further research

The current study was conducted in Morogoro Municipality to systematically investigate factors influencing traders' willingness to use EFDs in revenue collection. It is concluded in this study that, socio-demographic factors such as age, gender, education; and technological system factors such as perceived ease of use, and perceived usefulness have significant influence on traders' willingness to use EFDs in revenue collection. However, the present study was only undertaken in Morogoro Municipality. Thus, future research works could be undertaken in other regions of Tanzania, particularly in rural areas, which have not been a focus in the current study.

Similarly, further research may also be conducted by involving buyers of goods and services as respondents to get insights of their views on EFDs and fiscal receipts in the current Tanzania tax administration system.

Furthermore, there is a need to use longitudinal or panel approach in this line of study to see if one will get similar results as those of the present study.

In a nutshell, to reduce the limitations, future research works should attempt to replicate this line of study using a sample randomly drawn from different regions of the country.

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APPENDICES

Appendix 1: Respondents' informed consent form

Part I: Brief information on the researcher and the intended study

1. The researcher

The researcher's name is **Felix N. Silver**, a student from Mzumbe University, pursuing Masters of Science in Economic Policy and Planning, intake of 2015/2016. The present study is being undertaken as a Partial Fulfillment of the Requirements for Award of Masters Degree of Science in Economic Policy and Planning of Mzumbe University.

2. Purpose of the study

The present study aims at investigating factors influencing traders' willingness to use EFDs in revenue collection in Morogoro Municipality. It will strive to bring insights on the factors influencing traders' willingness to use EFDs to improve revenue collection in Tanzania, particularly in Morogoro Municipality. The study will therefore be useful for various stakeholders such as traders, buyers, and policy makers in an effort to improve revenue collection in Tanzania for ultimate sustainable and inclusive development.

3. What will be done?

The present study will involve structured questionnaires, which will be distributed to traders in Morogoro Municipality who have EFDs. The questionnaires will entail close ended questions on willingness to use EFDs. Participants will be requested to respond to all the questions. The questionnaires will take a maximum of 2 days to complete depending on trader's time. The researcher will physically contact each trader to distribute and collect the completed questionnaires.

4. Participation

Firstly, it should be noted that participation in the present study is completely voluntary. The participant is not indebted to participate in this study if s/he does not feel to. Participation should be out of participant's will. The participant has the right to withdraw from the study at any point if s/he feels like s/he is no longer comfortable with the process or the questionnaires.

5. Confidentiality

The information collected will be completely confidential and will only be used for academic purposes. Participant's names will not appear on the questionnaires. Only the researcher of this study will have access to participant's full name in case he needs to trace back some information. Personal information will not be disseminated under any circumstances.

6. Risk involved

There are completely no any risks involved for participating in this research

Part II: Agreement

WHEREAS, I _____have read and understood the information given above about the intended study,

AND WHEREAS, I am completely aware of the purpose of the study and what is expected from me as a respondent,

AND WHEREAS, I understand that I can willingly participate in this study without being forced or coerced, and that information I give will be treated with confidentiality,

AND WHEREAS, I am also aware that I can withdraw any time when I feel uncomfortable,

NOW THEREFORE, I agree and declare to full participate in this study.

_____

Signature and date

Appendix 2: Questionnaires for traders in Morogoro Municipality, Tanzania

QUESTIONNAIRE ON TRADERS' WILLINGNESS TO USE EFDs IN REVENUE COLLECTION IN MOROGORO MUNICIPALITY

1.0 Introduction

Dear esteemed respondent,

This questionnaire is designed to collect data for the study entitled, ***Traders' willingness to use EFDs in revenue collection: An empirical study in Morogoro Municipality***, ***Tanzania***. The present study is being undertaken as a partial fulfillment for the requirements of the Masters of Science Degree in Economic Policy and Planning of Mzumbe University. The collected data will be exclusively used for academic purposes, and confidentiality will be highly maintained. In view of that, I humbly request for your honest and genuine responses.

2.0 General instructions

Please, put a tick (☐) or enter a number in the check boxes provided for the answer corresponding to your situation in the list of responses provided in the table for question A1 to A13, circle the number of your choice for question PEoU.1 to PEoU5, and PU1 to PU5 respectively.

Questionnaire number: _____

Date: _____/_____/2017

Part A: Trader's socio-demographic factors and willingness to use EFDs

Instructions: *Put a tick (☐) or enter a number in the check boxes provided for the answer corresponding to your situation in the list of responses provided in the table for question A1 to A13*

Question #	Check the appropriate option
A1. What is your age?	1. ☐ 18-35 years 2. ☐ 36-55 years 3. ☐ 56-65 years
A2. What is your gender?	1. ☐ Male 2. ☐ Female
A3. What is your education level?	1. ☐ Primary education 2. ☐ Secondary education 3. ☐ Tertiary education
A4. Do you have an EFD machine?	1. ☐ Yes 2. ☐ No
A5. If Yes in A.4, do you willingly use it?	1. ☐ Yes 2. ☐ No

Question #	Check the appropriate option
A6. If Yes in A.5, is it easy to use?	1. ☐ Yes 2. ☐ No
A7. If No in A.6, why?	1. ☐ Complicated to use 2. ☐ Time consuming
A8. Is EFD useful to your business?	1. ☐ Yes 2. ☐ No
A9. If Yes in A.8, can you recommend it to other traders?	1. ☐ Yes 2. ☐ No
A10. Are you aware of other traders willingly using EFD?	1. ☐ Yes 2. ☐ No
A11. If Yes in A.10, do you learn anything from them about the use of EFD?	1. ☐ Yes 2. ☐ No
A12. Are you generally willing to use EFD?	1. ☐ Yes 2. ☐ No
A13. If No in A.12, why?	1. ☐ Due to EFD's problems 2. ☐ I don't like EFD

Part B: Technological system factors and willingness to use EFDs

Instructions: *Circle the number corresponding to your situation*

Perceived ease of use (PEoU) of Electronic Fiscal Devices (EFDs)	Disagree	Neutral	Agree
PEoU1. EFD is very easy to use	1	2	3
PEoU2. Learning to use EFD is very easy	1	2	3
PEoU3. No serious problems using EFD	1	2	3
PEoU4. It is very easy to print fiscal receipt using EFD	1	2	3
PEoU5. Generally, I am willing to use EFD because is very easy to use	1	2	3

Perceived usefulness (PU) of Electronic Fiscal Devices (EFDs)	Disagree	Neutral	Agree
PU1. EFD improves my business transactions information	1	2	3
PU2. EFD gives me greater control of business information	1	2	3
PU3. EFD helps to accomplish business transactions more quickly	1	2	3
PU4. EFD increases my business efficiency	1	2	3
PU5. Generally, I am willing to use EFD due to its usefulness in my business	1	2	3

Thank y

Appendix 3: Reliability test SPSS output

Scale: Perceived ease of use (PEoU)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.821	.827	5

Scale: Perceived usefulness (PU)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.832	.834	5

Appendix 4: SPSS outputs on trader's demographic characteristics

Age of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-35 years	50	33.6	33.6	33.6
	36-55 years	90	60.4	60.4	94.0
	56-65 years	9	6.0	6.0	100.0
	Total	149	100.0	100.0	

Gender of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	102	68.5	68.5	68.5
	Female	47	31.5	31.5	100.0
	Total	149	100.0	100.0	

Education of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary	13	8.7	8.7	8.7
	Secondary	132	88.6	88.6	97.3
	College/University	4	2.7	2.7	100.0
	Total	149	100.0	100.0	

Awareness of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	63	42.3	42.3	42.3
	No	86	57.7	57.7	100.0
	Total	149	100.0	100.0	

Appendix 5: SPSS outputs on trader's willingness to use EFDs based on demographic and technological system factors

age of the respondent * if the respondent is willingly using an EFD machine Crosstabulation

Count

		if the respondent is willingly using an EFD machine		
		Yes	No	Total
age of the respondent	18-35 years	43	7	50
	36-55 years	42	48	90
	56-65 years	2	7	9
Total		87	62	149

gender of the respondent * if the respondent is willingly using an EFD machine Crosstabulation

Count

		if the respondent is willingly using an EFD machine		
		Yes	No	Total
gender of the respondent	male	81	21	102
	female	22	25	47
Total		103	46	149

education level of the respondent * if the respondent is willingly using an EFD machine Crosstabulation

Count

		if the respondent is willingly using an EFD machine		
		Yes	No	Total
education level of the respondent	primary	3	10	13
	secondary	69	63	132
	college/university	4	0	4
Total		76	73	149

awareness of the respondent * if the respondent is willingly using an EFD machine Crosstabulation

Count

		if the respondent is willingly using an EFD machine		
		Yes	No	Total
awareness of the respondent	Yes	14	73	87
	No	49	13	62
Total		63	86	149

if the respondent feels that an EFD machine is easy to use * if the respondent is willingly using an EFD machine Crosstabulation

Count

		if the respondent is willingly using an EFD machine		
		Yes	No	Total
if the respondent feels that an EFD machine is easy to use	Yes	31	10	41
	No	5	103	108
Total		36	113	149

if the respondent feels that an EFD machine is useful * if the respondent is willingly using an EFD machine Crosstabulation

Count

		if the respondent is willingly using an EFD machine		
		Yes	No	Total
if the respondent feels that an EFD machine is useful	Yes	70	9	79
	No	3	67	70
Total		73	76	149

Appendix 6: STATA probit regression output

```
. probit WTU Age Gender Education Awareness PEoU PU

Iteration 0:   log likelihood = -46.429102
Iteration 1:   log likelihood = -25.722249
Iteration 2:   log likelihood = -22.379986
Iteration 3:   log likelihood = -22.043914
Iteration 4:   log likelihood = -22.038781
Iteration 5:   log likelihood = -22.038775
Iteration 6:   log likelihood = -22.038775

Probit regression                                 Number of obs   =        149
                                                  LR chi2(6)      =      58.78
                                                  Prob > chi2     =     0.0000
Log likelihood = -22.038775                       Pseudo R2       =     0.5253

------------------------------------------------------------------------------
         WTU |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         Age |  -1.609893   .6861202    -2.35   0.019    -2.954664    -.265122
      Gender |   1.673889    .687613     2.43   0.015     .3261919    3.021585
   Education |    1.34195   .5029357     2.67   0.008     .3562143    2.327686
   Awareness |  -.1800262   .4960158    -0.36   0.717    -1.152199     .792147
        PEoU |   .8165494   .4320185     1.89   0.059     1.66329     2.030191
          PU |   1.207702   .5385085     2.24   0.025     2.163159    2.252244
       _cons |   1.635422   .7210601     2.27   0.023     .2221698    3.048674
------------------------------------------------------------------------------



. linktest

Iteration 0:   log likelihood = -46.429102
Iteration 1:   log likelihood = -23.582355
Iteration 2:   log likelihood =  -22.33163
Iteration 3:   log likelihood = -22.065407
Iteration 4:   log likelihood = -22.024705
Iteration 5:   log likelihood = -22.024364
Iteration 6:   log likelihood = -22.024364


Probit regression                                 Number of obs   =        149
                                                  LR chi2(2)      =      58.81
                                                  Prob > chi2     =     0.0000
Log likelihood = -22.024364                       Pseudo R2       =     0.5256

-------- ------------------------------------------------------------------------------
         WTU  |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        _hat |   .9646754   .3024424     3.19   0.001     .3718991    1.557452
      _hatsq |   .0282563   .1664818     0.17   0.865    -.2980421    .3545547
       _cons |   -.012457    .296091    -0.04   0.966    -.5927847    .5678707
------------------------------------------------------------------------------
```

```
 margins, dydx(Age Gender Education Awareness PEoU PU)


Average marginal effects                        Number of obs   =        149
Model VCE    : OIM


Expression   : Pr(WTU), predict()
dy/dx w.r.t. : Age Gender Education Awareness PEoU PU

------------------------------------------------------------------------------
             |            Delta-method
   variable |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         Age |   -.128929   .0513025    -2.51   0.012    -.2294801   -.0283779
      Gender |   .1340541   .0502866     2.67   0.008     .0354941    .2326141
   Education |   .1074707   .0362122     2.97   0.003      .036496    .1784453
   Awareness |  -.0144175   .0396871    -0.36   0.716    -.0922028    .0633678
        PEoU |   .0653937   .0331204     1.97   0.048     .1303085    .2784789
          PU |   .0967193   .0396935     2.44   0.015     .1745171    .2189215
------------------------------------------------------------------------------
```