THE EFFECTS OF REVENUE SYSTEM MODERNIZATION ON REVENUE COLLECTION AT KENYA REVENUE AUTHORITY

A CASE STUDY OF ADOPTION OF THE SIMBA 2005 SYSTEM BY CUSTOMS AND BORDER CONTROL DEPARTMENT

BY

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DECLARATION

This research project is my original work and has not been submitted for a degree or diploma award in any university or learning institution.

Signature ……Date …….
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This Research project has been submitted for examination with my approval as Kenya School of Revenue Administration Supervisor.

Signed…….. Date ……
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DEDICATION

The research project is dedicated to my lovely family.

ACKNOWLEDGEMENT

First and foremost is my gratitude to God for granting me good health to undertake this study.

I salute my supervisor, Mrs. Latifa Said who guided me and corrected me through this research project. Without her support, this study would not have been a success.

I also acknowledge my wife and mentor Alice Njeri for her support and encouragement during the entire period of my studies and the research work.

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ABSTRACT

Technology has always been accompanied by change. Some of this change is fairly small and affects only one specific sector, while other change is major and affects everyone. When it comes to changes in technology, more often than not it's on a fairly large scale. Look at the computer, for example, we are still seeing major ripples from changes in that technology.

Today, it is difficult to find an enterprise that has not benefitted from technological revolution. This is because businesses in all sectors have embraced technology and integrated it in their operations in an effort to improve their effectiveness and efficiency. Governments are open systems like other organizations as they interact with their environments just like any other entity. There is an increasing need of governments to adopt new technological innovations in their operations in line with other organizations in the business landscape.

The objective of the study is to determine the relationship between system modernization and revenue collection at the Customs and Border Control Department with regard to the Simba 2005 System. This study will employ descriptive study design. The study will make use of secondary data collection method. The research will utilize Customs and Border Control Department's data for eight financial years; four before and four after adoption of Simba 2005 System in verifying the impact of adoption of the new system. The period selected is from July 2001to June 2009. The data will be analyzed using Statistical Package for Social Sciences (SPSS) and presented in figures and tables.

CHAPTER ONE

1.1Introduction and Background of the Study

This chapter provides an overview of the study and a summary of some of the key research outcomes. The chapter begins with the background of the study, problem statement, justification of study, research objectives and research questions, scope and limitations of study. The chapter also provides the foundation for the next chapter.

Tax is the most stable source of revenue for developing countries. A research on tax revenue done by Prof. Mick Moore and Dr. Odd-Helge Fjeldstad argues that weak tax policies in developing countries need to be addressed in order to promote better governance. Tax is central to building better relationships between citizens and the state, the researchers argued. Automation based approaches have become an important vehicle for achieving efficiency in tax administration, (UNCTAD, 2006).

The ratio of tax to GDP in poorer countries is only about half of what it is in the developed world. Though sub- Saharan Africa is not expected to match Scandinavian levels of taxation, many low-income countries could boost their tax take by improving their fiscal systems, and by doing so reinforce development. This is not a theory, as, for example, reforms in Rwanda have shown. The Rwandan Revenue Authority, with strong international support, carried out changes to strengthen internal organizational structures and training, as well as relationships with local government. The result was a sharp increase in domestic revenue from 9% of GDP in 1998 to nearly 15% in 2005 in what has been one of Africa's better performing economies.

Tax is more than just a source of revenue and growth. It also plays a key role in building up institutions, markets and democracy through making the state accountable to its taxpayers. Just as excessive tax burdens might hinder growth in wealthier countries, in developing economies a lack of tax structures is a major cause of weak, unresponsive governance. It also leads to an overreliance on aid. With tax, the public can hold governments to account for their decisions, and not feel tied to the will of aid donors. And because tax revenues are relatively predictable, governments can plan ahead with greater certainty.

There has been a concerted move to reduce the amount of face-to-face interaction that takes place between taxpayers and tax collectors. This is where corruption takes place. Tax assessments have been separated from physical revenue collection. Payment may take place at large open collection centers, and the whole process is automated. Many African Customs administrations have made substantial progress in recent years in becoming more effective and efficient in achieving their goals. There is much to do, but most are on the right path.

In the early years of the twenty-first century, aging technology, disorganization, and corruption undermined the effectiveness of Kenya's customs service as highlighted in a 2002 study by the World Customs Organization of port operations at Mombasa. Growing regional trade and domestic anti-corruption initiatives created pressure to improve customs operations. Neighboring countries had started to upgrade their ports and implement measures that would expand both regional and inter-continental trade. To control revenue loss and maintain a significant role in global trade, Kenya would have to

streamline customs processes and improve accountability. In 2002, newly elected president Mwai Kibaki put his political support behind an effort to improve government services, reduce corruption, and boost the country's financial position. The Kenya Revenue Authority, the agency responsible for customs, was at the center of the nationwide reform effort. Over the next several years, the authority's new commissioner, Michael Waweru, and a handful of lieutenants reshaped record keeping, upgraded automation, raised the level of staff training, and succeeded in paving the road to future reforms.

In 2002, a visitor to one of Kenya's port long rooms, the points of entry where all declarations and clearance transactions took place could quickly see the challenges the nation's customs clearing process faced: antiquated computer systems, long waits, and rampant corruption. The atmosphere was loud and chaotic as clearing agents jostled in long lines to get their required approvals and documentations.

The new government of voted in election of 2002 advocated a new approach to government, promising to fight corruption, enhance service delivery, and improve the country's fiscal position. One of the main objectives was increased efficiency in revenue collection. To boost efficiency in revenue collection, reforms had to correct two major shortcomings that were closely related: inefficiency and corruption. The common response to those problems, around the globe, was "customs facilitation." This type of reform usually included automation of paper-based systems, integration of customs collection with other government offices, improvements in port and border infrastructure, and improvements in the training of customs officers.

The Revenue Authority used a customs tracking system that the government had acquired in 1989 through an earlier reform attempt. The system, called the Bishopsgate Office Freight Forwarders Integrated Network, or BOFFIN, had been developed by a private company in the United Kingdom. In adopting the system, the Kenyan government had hoped to reap efficiency gains through single-entry documents and a modern customs valuation system.

BOFFIN became operational in 1996, seven years after the signing of the contract between Bishopsgate and the government. The system quickly proved disappointing in several ways. First, concerns about the system's reliability intensified as the system aged, and its outdated procedures facilitated corruption in port long rooms. Second, BOFFIN was only semi-automated-customs officers moved between automated and manual transactions-and 80% of customs transactions remained manual. The many manual transactions presented opportunities for those who administered the system at ports to take bribes or divert funds.

Third, BOFFIN was a proprietary system. The company that had developed the cargo-tracking program owned the software and source code. As a result, the Revenue Authority depended on Bishopsgate for upgrades and had to pay whatever the company demanded. Because the government had no direct control over operation and maintenance of the system, operating costs were needlessly high.

By the time Waweru took over as head of the Revenue Authority in 2003, BOFFIN was obsolescent, and the Kenyans were confronted by a dilemma: either they had to pay Bishopsgate to revamp its existing system, or they had to rework their customs

infrastructure from the ground up. An opening for reform came in 2004, when Kenya's contract for BOFFIN was set to expire. Bishopsgate wanted to implement a new software system as part of its effort to comply with international protocols calling for simplification and harmonization of customs procedures. However, the new software required added funding as well as changes to national customs policies. Given Kenya's financial concerns and the desire to overhaul its customs system rather than try to repair it, the government decided to break with Bishopsgate and create its own computerized customs system.

In May 2004, Mr. Michael Waweru, the Commissioner General of the Kenya Revenue Authority and a few colleagues made a visit to Makhtar Diop, the World Bank's Kenya country director, to seek advice on systems architecture alternatives. Senegal's customs department had undertaken similar reforms years earlier, and Diop was familiar with Senegal's experience from his tenure as Senegal's minister of finance. As Waweru sat in his office, Diop called a former colleague in Senegal to make the initial introduction between the Kenyan and Senegalese customs authorities. The Senegalese system, coined GAINDE, or "lion" in Wolof, Senegal's most widely spoken language, was developed to improve trade and transportation in the country in the 1990s. Senegalese ICT experts later introduced a more-advanced version of the architecture, called GAINDE 2000, which piqued the interest of Waweru and the then Commissioner of Customs Mr. Francis Thuranira.

Shortly after the visit to Diop, Waweru sent a team of customs and ICT staff to Senegal to meet with experts at the GAINDE 2000 offices. Upon their return, the Kenyan

reformers reevaluated their options. After several high-level meetings, Revenue Authority staff and representatives from the Ministry of Finance, who supplied funding from a special project line, decided that Senegal's ICT infrastructure should be the basis of Kenya's customs system because Senegal's had the most required functionalities.

Waweru and his reform team decided that the GAINDE system offered the best avenue to resolve Kenya's customs troubles. Taking a cue from its Senegalese counterparts, the Kenyan team named the new system SIMBA 2005-using the Swahili word for lion and the year it would become operational.

With a team in place, a system chosen, and a target date set for beginning operations, the project could move ahead. At a 2004 meeting of the various agencies involved in the reform process, Thuranira formally announced the Customs Reform and Modernization team and laid out the problem the team had to solve. "Over the past 10 years or so, rudimentary reforms have been undertaken, and therefore most of the administrative procedures have remained manual, paper based, supported by an almost obsolete ICT system," he told the group. "Transit procedures are based on physical controls, and verification is based on physical opening of containers. Suffice it to say that customs procedures have remained largely unsupportive of revenue collection, trade facilitation, and investment." Despite some reservations and uncertainty, SIMBA went live as scheduled on the night of June 30, 2005, and the Revenue Authority pulled the plug on BOFFIN.

1.2 Problem Statement

A research statement is the fundamental core of a research project, study, or review of literature. It focuses the study, determines the methodology, and guides all stages of inquiry, analysis, and reporting.

In today's competitive, fast-paced business landscape, getting the most out of available resources is not an option but rather a requirement. Organizations are taking a highly proactive approach to systems modernization and operations in an effort to increase efficiency and effectiveness in their operations. System modernization allows organizations to upgrade to new platforms of their systems in order to enjoy maximum benefits (Amin, 2000).

It is therefore against this background that the researcher seeks to examine the whole spectrum of tax reforms and modernization in the Customs and Border Control Department of Kenya Revenue Authority by analyzing the effects of adoption of Simba 2005 IT system in the administration of the Customs and Border Control Department.

1.3 Justification of Study

This study will be significant to several stakeholders: To scholars and academicians, this study will increase body of knowledge to the scholars of revenue system modernization and revenue collection in the Kenyan. It will also suggest areas for further research so that future scholars can pick up these areas and study further.

The study will also be important to the Government, especially the Ministry of Finance andKenya Revenue Authority in making policy decisions whose overall objectives is to influence the level of economic activity and manage public debt.

The general public will also be interested in confirming that the huge investment done by the government in modernization of its processes is a worthwhile investment by assessing its impact in the efficiency of goods clearance and effectiveness on revenue collection.

1.4 Objectives of the Research

The study seeks to assess the relationship between system modernization and revenue collection with regard to adoption of Simba 2005 system by the Customs Department of Kenya Revenue Authority.

1.5 Research Questions

We live in an information-rich society and enjoy technology that allows us to access this information quickly and efficiently. This widespread availability of information is a real boon when we are looking to answer quick questions such the starting time for a film, weather forecasts, or the lyrics to a favorite song. But, when we are conducting academic research, this availability of information can quickly lead to information overload.

Research questions are designed to guide you through a huge “storehouse” of information. They provide you a great place to get started with your research, and allow you to efficiently locate and retrieve the most relevant knowledge possible to support your thesis. A list of questions can help prevent you from getting off track as you sift through large quantities of information, and even help keep you organized as you begin writing.

My analysis seeks to answer the questions listed below;

1. What are the effects of adoption of Simba 2005 system to collection of revenue by the Customs Department of Kenya Revenue Authority?
2. What impact has did adoption of Simba 2005 system cause in the process of clearance of good by Customs Department?
3. What I think can be done to improve on the positive effects that modernization of Customs through implementation of Simba 2005 system in perspective of revenue collection.

1.6 Scope of Study

This study will focused on the evaluation of the effects of the adoption of the Simba 2005 system on tax revenue collection in Kenya. Specifically the study concentrated on the period from 2001 to 2009because period is long enough to capture both the pure and total responsiveness of tax revenues to system change.

1.7 Limitations of Study

All systems have their own unique vulnerabilities that, if acted on by a fraudster, could become a costly incident for an organization. Every organization needs to understand their vulnerabilities in order to successfully prevent fraud. New technology is often used by fraudsters to perpetrate fraud. In this research data was mainly collected from secondary sources in the custody of Kenya Revenue Authority, particularly its website and reports kept by the Customs Department with regard to the BOFFIN and the Simba

2005 systems. Very little information was gathered on the vulnerabilities of Simba 2005 system.

CHAPTER TWO

2.1 LITERATURE REVIEW

2.1.1 Introduction

In this chapter, the study will review literature by different scholars that focuses on the relationship between revenue system modernization and revenue collection. First, it will briefly review the theoretical models on which the study is built before reviewing the empirical studies relevant to the subject. The chapter then proceeds to present the chapter summary.

2.1.2 Customs Policy Reforms

The customs policy reforms aim at transforming and modernizing customs administration in accordance with internationally accepted conventional standards and best practices. This also involved embracing the redefined function of customs to lay greater emphasis on trade facilitation and protection of society. This was achieved through implementation of the following reform initiatives: a web based Simba 2005 System and its subsidiary systems, i.e. Cargo Management Information System (CAMIS) and Customs Oil Stocks Information System (COSIS), a 24-hour Document Procession Processing Centre (DPC) for processing documents to replace the long-room concept, Embracing Risk Management practices, Enhancing cargo clearance by implementation of an electronic document exchange platform (ORBUS) and expansion of the Authorized Economic Operator (AEO) program, enhancing uniformity in commodity valuation by implementation of a Valuation.

Database, Strengthening enforcement by adopting the EAC recommended forms including Single Administrative Document(C17B); enhancing Post Clearance Audit(PCA); automating Air Passenger Service Charge (APSC); implementation of One Stop Border Posts (OSBP); implementation of Electronic Cargo Tracking System (ECTS);and adoption of X Ray Cargo Scanners, Sniffer Dogs (K9 Unit) and Patrol Boats, and Capacity Building in various Customs operational areas(KRA 2012)Kenya's customs taxes underwent significant changes during the reform period in the direction of restricting exemptions on duty, encouraging exports, reforming the tariff structure and strengthening the administration of customs duties. Broadly, these reforms were aimed at encouraging a free market atmosphere and therefore increasing the level of foreign direct investment in Kenya. During the period 1987 to 1998, the top tariff rate was reduced systematically from 170% to 25% while the rate bands were reduced from 24 to 5. As a result of the changes, the simple average rate fell from 40% to 16% (KIPPRA, 2005)

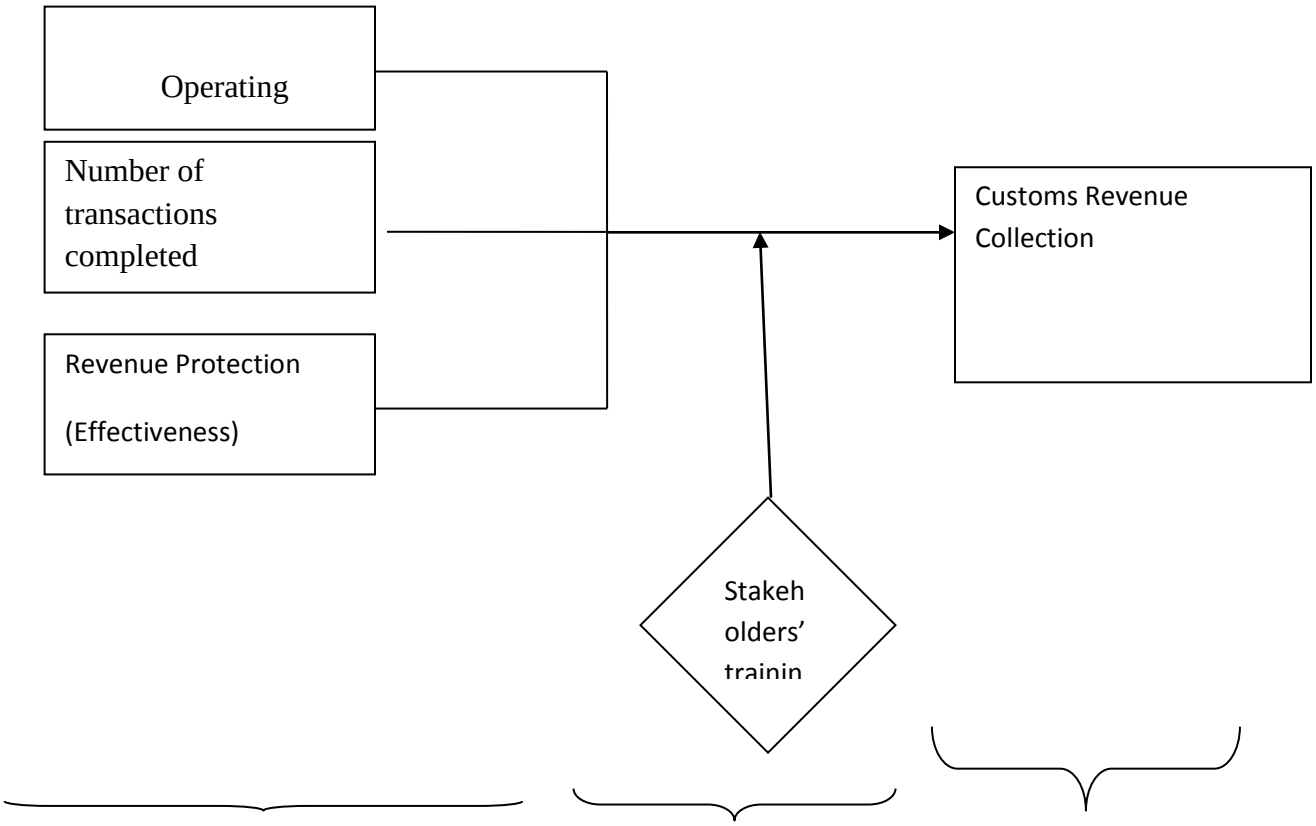
2.2 Conceptual Framework

Revenue performance is empirically measured in terms of turnover growth. The hypothesized relationship between effective revenue collection and turnover growth is straight forward. The implementation of new and effective customs system can lead to improved service options to taxpayers; facilitate participation by all sectors and simplification of the tax process which are positively associated with turnover growth. At the core of the taxpayer approach to increasing revenue collection is the proposition that a higher level of service helps to reduce both the financial and psychological level of compliance costs which in turn leads to an increased level or revenue collection. Hence,

no general relationship between IT usage and profitability can be hypothesized because profitability crucially depends on the respective competitive environment of each individual firm and its ability to limit imitation by rivals. KRA corporate performance has several dimension as outlined its corporate plan. The plan underscores the need to develop strategies that improve on revenue collection and continuous tax compliance.

Figure 2.1 presents the Conceptual Model which illustrates the foundation on which the entire project is based. It is a logically developed, described and, elaborated network of associations among the variables deemed relevant to the problem situation and identified through a literature survey.

Figure1: Conceptual Model



2.3 Theoretical Review

The purpose of this form is to examine the corpus of theory that has accumulated in regard to an issue, concept, theory, phenomena. The theoretical literature review helps to establish what theories already exist, the relationships between them, to what degree the existing theories have been investigated, and to develop new hypotheses to be tested. Often this form is used to help establish a lack of appropriate theories or reveal that current theories are inadequate for explaining new or emerging research problems. The unit of analysis can focus on a theoretical concept or a whole theory or framework.

2.3.1 Wagner's Law of Increasing State Activity

The Law of increasing State activity was introduced by Adolf Wagner a nineteen century German economist to explain the growth of the share of public expenditure in Gross National Product (GNP). He divided government expenditures into three categories namely; administration and defense, cultural and welfare, and provision of direct services by government in case of market failure. It is well known that rather than allow for monopoly to emerge, government usually creates Statutory Corporations such as NITEL, Post Office, and Water Boards etc., to cater for the welfare of the people. Wagner's Law states that as per-capita income increase, the relative size of the public sector will grow. According to Wagner as the economy becomes industrialized, population tends to concentrate in the urban areas. This in turn leads to externalities (market failure) and congestion which require government intervention and regulations. Legal authorities and the police emerge to address problems of law and order, peace and security. Banking services by the State arise to link surplus funds with those who have the investment opportunities. The increase of public expenditures on recreation, education, health, and welfare services is explained in terms of the high population in the urban centers. Wagner argued that as real income increases, public expenditure on education, recreation, health etc. would increase more than the increase in real income. This explains the increasing ratio of government expenditure to gross national product.

Wagner's theory of increasing State activity has many defects. First, it is not a well-articulated theory of public wants; rather it is an organic theory of the State where the State behaves as if it were an individual and takes decisions independent of members of

the society. Secondly, the predictive power of the theory is very much doubtful. It is not always true that as par capita income grows, the share of public expenditure in GNP increases. The share of public expenditure may actually decrease as the economy grows particularly when the private sector is strong and dynamic.

2.3.2 Peacock Wiseman Theory of Public Expenditure

Allan Peacock and Jack Wiseman theory(PWT), was based on the political theory of public expenditure determination which states that government likes to spend more money, citizens do not like to pay more taxes, and that government needs to pay some attention to the aspiration and wishes of their people PWT attempted to explain the circular trend or time pattern of change in government expenditure in response to development in the political economy while the taxable capacity of the electorate acts as a constraint. Their theory is known as the Displacement Hypothesis and is based on the experience of Great Britain. Displacement hypothesis states that government expenditure grows in step wise fashion. During periods of catastrophes or wars, government expenditure grew rapidly in Great Britain and remained constant during the war, famine, or disaster otherwise catastrophic period. They also argued that government expenditures are largely determined by government revenue or taxation, PWT maintains that as the economy and income grew, tax revenue would raise thereby enabling government expenditures to rise in line with GNP. The acceptance of the existence of tolerable level of taxation which acts as a constraint on government behavior is consistent with Clark's "Catastrophe School" of taxation.PWT make a destination in government expenditure growth between normal or peak time and war, crisis or social upheaval period.

According to PWT, during peak, public expenditures would tend to experience an upward trend, even though there may be some discrepancies between a desirable level of government expenditure and a desirable level of taxation. During war, famine or social upheaval this normal and steady growth in government expenditures, would be interrupted. This is as a result of the displacement hypothesis as unproductive government spending during social upheavals displaced productive government expenditure leading to rapid increase in public expenditure. Government imposes higher taxes which are regarded as acceptable during period of crisis. During this period, public expenditure is displaced upward (i.e. displacement effect). War-related expenditure displaces private and other government expenditures. However, after the wars or crisis, aggregate public expenditures does not fall back to its original level since a war is not fully paid for from taxation alone. Inspection effect may also occur as government attempts to increase expenditures to improve social conditions which have deteriorated during the period of the crisis. Government finances the high expenditure from the increase and tolerable level of taxation that does not return to its former level. There are two possible scenarios which may occur after the war or social upheaval. First, total private expenditures may return to its original growth path and second, government expenditures experienced during the war may continue in the postwar period along with an increase in civilian government expenditures until the desired growth is reached (Baghebo M. 2012)

2.4 Empirical Review

Gachanja (2012), in his research on the effect of tax reforms and economic factors on tax revenues in Kenya observed that Kenya introduced the tax modernization program in 1986 with the hope that this would, among other things, enhance revenue collection. The objective of this study was to establish the effect of tax reforms and economic factors on tax revenues in Kenya. A correlational study design was selected. Secondary data was collected for a ten-year period (2000-2009) from various sources included the Central Bank of Kenya website, the Kenya National Bureau of Statistics, Transparency International website and the World Bank website. Trend analysis was used to graphically present some of the trends in the data. With the aid of SPSS, a multivariate analysis was employed with the OLS regression being used. The dependent variable was tax revenues while the independent variables were tax reforms (measured as a dummy variable). The regression model was controlled for corruption (measured by the corruption perception index). The trend analyses revealed that the corruption index in Kenya had been improving since 2000 while tax revenues had been rising over the period. The OLS regression revealed that the independent variables accounted for 91.6% of the variance in tax revenues. Reforms were negatively and significantly correlated with tax revenues, which had a positive and significant influence on tax revenues, while corruption had a positive but insignificant impact on tax revenues. The study concludes that tax reforms haven negatively contributed to tax revenues in Kenya while economic conditions (GOP)have positively impacted on revenues. The effect of tax reforms is therefore counter intuitive. The study recommends that the Kenya Revenue Authority

relook into the issue of reforms and modernization programs to check on whether some of the reforms they have instituted lead to better revenue collections. The study also recommends that reforms and measures need to be carried out in all sectors of the economy to spur economic growth and therefore improving the tax revenues. Future studies should also perform the normality of distribution tests to determine which type of multi-variant analysis to be carried out. Other tests to check whether the conditions for parametric analysis as well as for OLS regression analysis are met can be performed. Okech and Mburu (2011), in their research‘ Analysis of responsiveness of tax revenue to changes in national income in Kenya19862009’, observed over the years, the Kenyan government had continued to experience budget deficit. This had been partly attributed to the inability of the tax system to generate sufficient revenue to finance public expenditure. Inadequacy of tax revenue to finance public expenditure had largely been attributed to lack of responsiveness of tax revenue to changes in national income.

2.5 Summary of Literature Review

This chapter reviewed literature by other scholars and researchers on the subject of revenue system modernization and revenue collection. Nkote and Luwugge (2010) reviewed the relationship between automation and customs tax administration using empirical evidence from Uganda. Çakmak, Benk and Budak (2011) reviewed the Acceptance of Tax Office Automation System (VEDOP) by employees using factorial validation of Turkish adapted Technology Acceptance Model (TAM). Fernando (2010)

CHAPTER THREE

3.1 RESEARCH METHODOLOGY

3.1.1 Introduction

This chapter explores the methodology that was used in this study clearly explaining the research design, the population of interest, data collection and data analysis. The methods section describes the rationale for the application of specific procedures or techniques used to identify, select, and analyze information applied to understanding the research problem, thereby, allowing the reader to critically evaluate a study's overall validity and reliability. The methodology section of a research paper answers two main questions: How was the data collected or generated? And, how was it analyzed? It explains sources of the data that was used, methods of data collection and the techniques that were used to analyze the collected data. It also explains the model used as well as clearly elaborate all the variables of interest.

3.1.2 Research Design

This study used descriptive study design. According to Cooper and Schindler (2003), a descriptive study attempts to describe or define a subject, often by creating a profile of a group of problems, people, or events. The choice of descriptive design is because the study seeks to explain system modernization and its impact to revenue collection at Kenya Revenue Authority using a case of Simba 2005 System, a state of affairs already existing in the field and no variable will be manipulated.

3.1.3 Data Collection

The main source of data was secondary data from the Kenya Revenue Authority records. Information and data was collected from the KRA official website and other reports maintained by Kenya Revenue Authority. The study collected data necessary for completion of the study. Monthly data was used for both periods of the study.

3.1.4 Data Analysis

Secondary data collected was coded and entered into Statistical Package for Social Sciences (SPSS, Version 19.0) for analysis. This particular package has chosen because it's user-friendliness. The study collected data on total revenue collected four (4) years before Simba System introduction and four (4) years after Simba System implementation.

Data was presented in figures and tables, summary statistics of the mean, and standard deviation. In addition, the correlation matrix of the independent variables was created. The result of the regression of the model was then developed and tables used to show there regression results for the Country's performance.

3.2 Model Specification

In order to establish whether there is any relationship between Simba system performance variables and Revenue collection, the following multiple regression model equation was used before and after the implementation of Simba System.

$Y=\beta 0+ \beta 1X1+ \beta 2X2+ \beta 3X3+ \beta 4X4+€$

Where Y= Revenue Collected by customs service departments in Kshs

X1= Number of transactions completed (Monthly)

X2 = Exchange rates (USD)

X3=Inflation (Consumer Price index)

X4= Operating Costs (Ksh)

€ = Error Term

This model was adapted from Nkote and Luwugge (2010) who reviewed the relationship between automation and customs tax administration using empirical evidence from

Uganda and established that automation impacted minimally on the effectiveness of revenue collection as the increase in effectiveness was prior to automation. However, they included in their model policy provisions and complexity of automation as intervening variables. The study compared the regression for the two periods under analysis (four years before the implementation of Simba System and four years after the implementation).

To test for the strength of the model and the effects of revenue system modernization on revenue collection at Kenya Revenue Authority, the researcher used chi-square test (X2). Chi-square is a statistical test commonly used to compare observed data with data that one would expect to obtain according to a specific hypothesis. Chi-square test tests the null hypothesis, which states that there is no significant difference between the expected and observed result. System modernization has no effect on revenue collection at KRA.

CHAPTER FOUR

4.0DATA ANALYSIS, RESULTS AND DISCUSSION

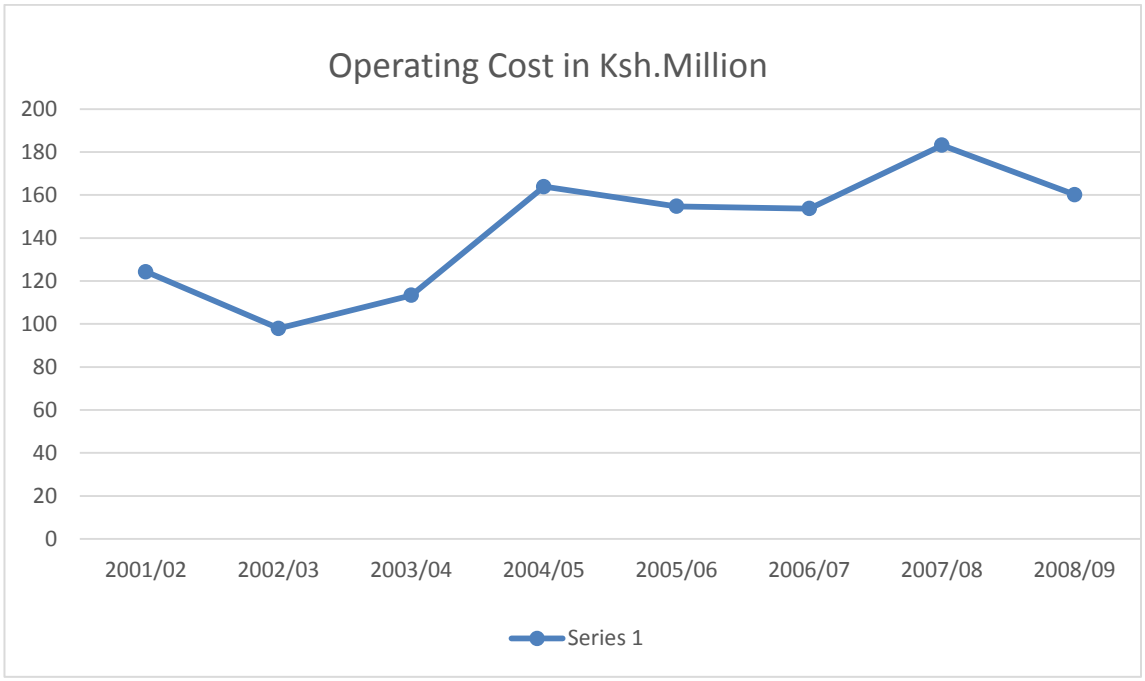
4.1 Introduction

This chapter presents analysis, findings and discussion of the study as set out in the research objective and research methodology. The aim is to establish the relationship between system modernization and revenue collection at the Kenya Revenue Authority in Kenya with regard to the Simba System. The data was gathered exclusively from the secondary source which from Kenya Revenue Authority records.

4.2 Data Presentation

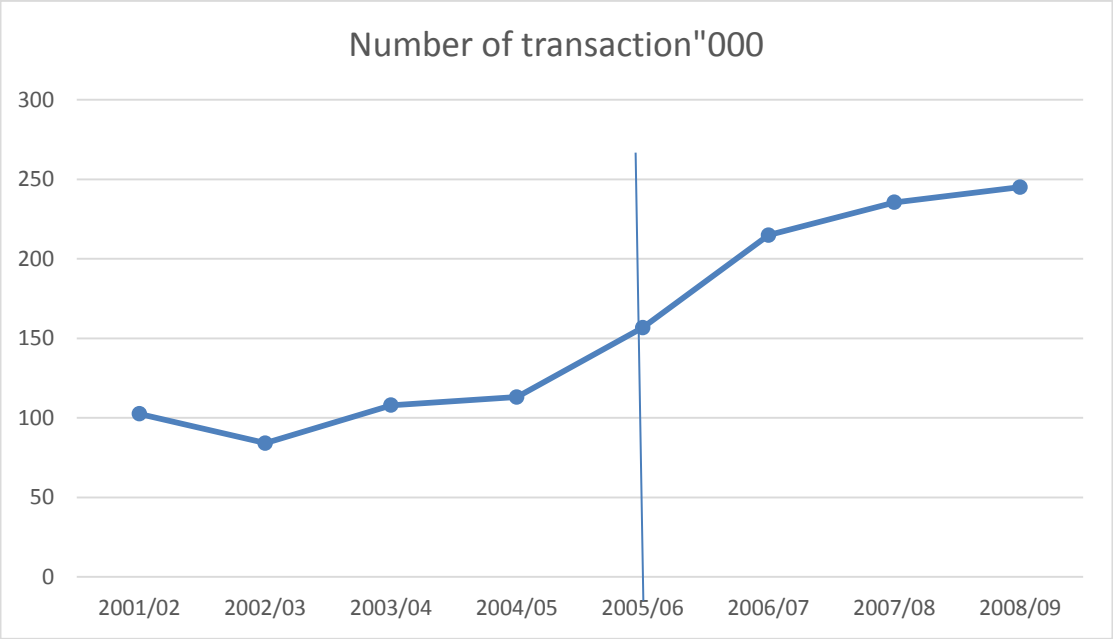
The four independent variables were analyzed and presented as shown in figures 4.1, 4.2, 4.3 and 4.4 below. From these findings, operation costs for the period preceding the implementation of Simba system was lower than that recorded after the implementation of Simba system. The increases could however be attributed to general increases in the cost of living as indicated in the inflation rates. The numbers of transactions were more in the period after implementation of Simba system compared to that before Simba system implementation. The number of transactions increased tremendously after the implementation of Simba System as shown in the figure below.

Figure 2: Operating Costs



Operating cost went down with the adoption of the new system as indicated in the graph above.

Figure 3: Number of Transactions Completed



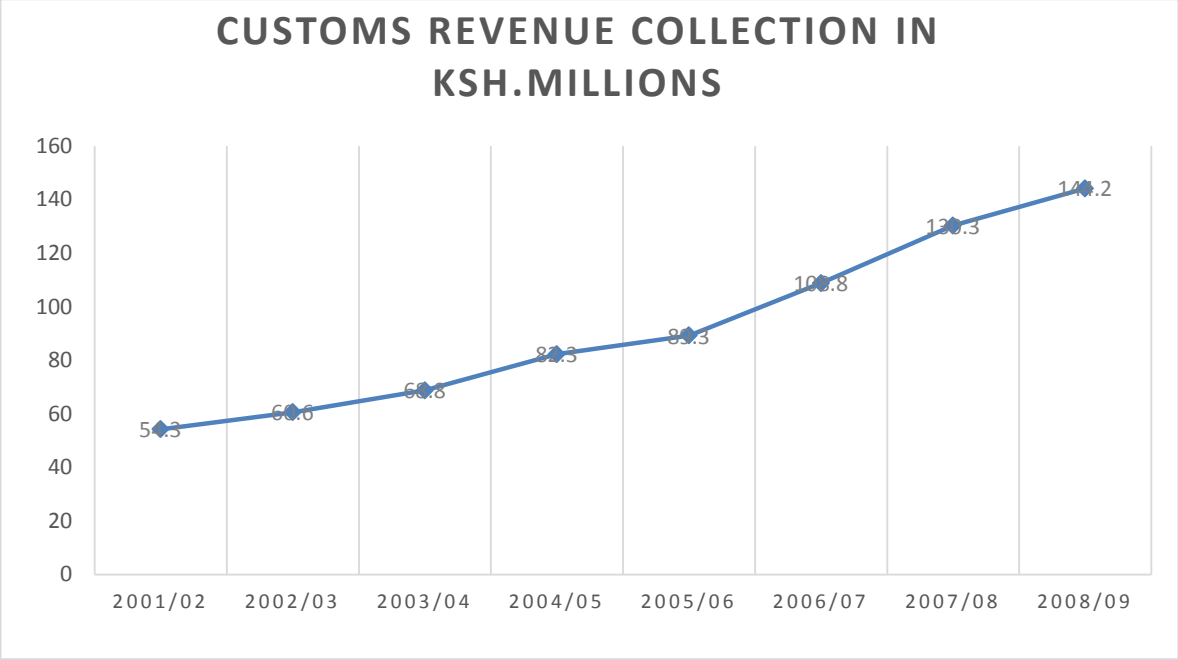
The number of transactions greatly improved as indicated in the graph above.

Figure 4: Training of Stakeholders

Initially stakeholder engagement sessions were frequent but reduced as all stakeholders adopted new system.

4.2.1 Revenue Collected

Figure 5: Revenue Collected



Source: (Kenya Revenue Authority, 2013)

The study sought to find out the trend in variation of revenue collected by KRA within the study period. The findings were as shown in the figure 4.4 below and appendix I.

From the findings, revenue collected increased at an increasing rate after the implementation of Simba system as compared to the increases recorded prior to the implementation of the system. As a result of system implementation, efficiency levels in the organization in revenue collection were high. This was largely because the implementation of Simba system allowed coordinated declaration of custom values in a centralized system regardless of the office location.

4.3 Regression Analysis

4.3.1 Regression before Introduction of Simba System

The researcher conducted multiple regression analysis in order to determine the whether there was any relationship between Simba system performance variables and Revenue collection. Two regression models were used to compare the relationships one before and the other after the introduction of the Simba System. The study findings for the regression analysis four years before the adoption of the Simba system were as illustrated in the table 4.1 below:

Table1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.949[a]	.901	.802	4.04917

a.Predictors:(Constant),0peratingcost,Exchangerates(USD),Inflation(ConsumerPriceindex),Numberoftransactionscompleted

Coefficient of determination explains the percentage of variation in the dependent variable that is explained by the independent variables. It explains the extent to which changes in the dependent variable can be explained by the change in the independent variables.

From the analysis, the independent variables (Inflation measured by Consumer Price index, Number of transactions completed, Exchange rates against USD and operational cost) in this study contributed to 90.1% of the variation in the revenue collected as explained by adjusted R^2 of 0.901.

Table 2: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	595.586	4	148.896	9.081	.028[a]
	Residual	65.583	4	16.396		
	Total	661.169	8			

a.Predictors:(Constant),Operatingcost,Exchangerates(USD),Inflation(ConsumerPriceindex),Numberoftransactionscompleted

b. Dependent Variable: Revenue Collected

From the ANOVAs results, the probability value of 0.028[a] was obtained implying that the regression model was significant in predicting the relationship between Revenue Collected and all the predictor variables as it was less than α=0.05.

Table 3: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.859	8.653		.793	.472
	Number of transactions completed	.001	.000	.623	2.052	.009
	Exchange rates (USD)	-.002	.002	-.028	-.126	.906
	Inflation (Consumer Price index)	-.114	.044	-.489	-2.615	.049
	Operating cost	-.024	.000	.522	1.945	.024
a. Dependent Variable: Revenue Collected						

The researcher conducted a regression analysis so as to determine the relationship between Revenue Collected and the independent variables before introduction of the Simba system. The regression equation was:

$$\mathbf{Y=6.859+\ 001X_1-0.002X_2-0.114X_3\ -0.024X_4+4.049}$$

From the regression model obtained above, holding all the other factors constant, the revenue collected will be Ksh. 6.859 billion. A unit change in the number of transactions completed holding the other factors constant will change the revenue collected by Ksh. 0.001 billion; A unit change in Exchange rates (USD) holding the other factors constant will change the revenue collected by Ksh. **-0.002** billion. A unit change in Inflation (Consumer Price index) holding the other factors constant will change the revenue collected by Ksh. -0.144 billion. This implied that Number of transactions completed had the highest influence on the revenue collected followed by Inflation (Consumer

Price index) and finally Exchange rates (USD). The obtained regression equation further implied that there was a direct relationship between the revenue collected and the number of transactions completed while there was an inverse relationship between the revenue collected and Inflation, Exchange rates (USD) and operating costs.

The analysis was undertaken at 5% significance level. The criteria for comparing whether the predictor variables were significant in the model was through comparing the obtained probability value and α=0.05. If the probability value was less than α, then the predictor variable was significant otherwise it wasn't. Number of transactions completed, inflation and operating costs were significant in the model as their respective probability values were 0.009, 0.049 and 0.024 which were less than 0.05. However, the other variable was insignificant in the model.

4.3.2 Regression after the Introduction of the Simba System

The study further conducted a regression model for the period after introduction of the Simba system to establish the relationship between Simba system performance variables and Revenue collection. The findings were presented below.

Table4: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.842[a]	.742	.691	5.394683
a.Predictors:(Constant),Operatingcost,Exchangerates(USD),Inflation(ConsumerPriceindex),Numberoftransactionscompleted				

From the analysis, the independent variables contributed to 74.2% of the variation in the revenue collected as explained by adjusted R^2 of 0.74.2

The study conducted an Analysis of Variance, in order to test the significance of the model. The findings were as shown below:

The researcher conducted a regression analysis so as to determine the relationship between Revenue Collected and the independent variables. The regression equation was:

$$\mathbf{Y=12.461+ 0.002X_1-0.0053X_2-0.058X_3-0.012\ X_4 +5.39}$$

From the regression model obtained above, holding all the other factors constant, the revenue collected will be Ksh. 12.461 billion. A unit change in the number of transactions completed holding the other factors constant will change the revenue collected by Ksh. 0.002 billion; A unit change in Exchange rates (USD) holding the other factors constant will change the revenue collected by Ksh. -0.0053; a unit change in Inflation (Consumer Price index) holding the other factors constant will change the revenue collected by Ksh. -0.058 billion while a unit change in operating cost holding

other factors constant will change the revenue collected by -0.012 billion. This implied that Number of transactions completed had the highest influence on the revenue collected followed by Inflation (Consumer Price index) then operating cost and finally Exchange rates (USD). The obtained regression equation further implied that there was a direct relationship between the revenue collected and the number of transactions completed while there was an inverse relationship between the revenue collected and Inflation

(Consumer Price index) Exchange rates (USD) and operating cost.

All the predictor variables in this study were significant in the model as their probability values were less than $\alpha=0.05$ as indicated by probability values of 0.000, 0.001 and 0.03 for number of transactions completed, Inflation (Consumer Price index) and 0perating costs respectively except exchange rates whose probability value was 0.092 .Comparing the two regression equations, the revenue collected was higher after the introduction of the Simba system while operating cost increased significantly. Also the impact of operational cost on the revenue collected reduced in the second model implying that the Simba system contributed toward reducing the operational cost.

An analysis of the level of confidence at 95% revealed that three variables were significant in measuring the effects of system modernization on revenue collection while one was not significant. From the findings, number of transaction completed registered a significance of 0.009, inflation registered 0.049 while operating costs registered 0.024 which are below the threshold of 0.05. Exchange rate was found to have insignificant relationship in explaining the relationship.

An analysis of post Simba system implementation revealed that again the three variables were significant in explaining the changes in the dependent variable (revenue collected). Number of transaction recorded significance of 0.000, Inflation 0.001 while operating costs 0.003. These significances also show that these three variables were relevant in explaining the relationship to revenue collected. Exchange rates recorded a significance

of 0.093 which is above the threshold of 0.05 at 95% level of confidence hence insignificant in explaining the changes in revenue collected at KRA.

4.4 Summary and Interpretation of Findings

The number of transactions completed by KRA after it implemented a new Customs system (Simba 2005 System) to replace Bishops Office Freight Forwarders Integrated Network (BOFFIN) system that was implemented in 1989 had increased. Comparing the average of these transactions for four years before and four years after the implementation, the study findings established that the transactions increased significantly after the implementation process. The number of transactions, as established by the study, has positive relationship with revenue collection process, this means that due to revenue systems modernization a high number of imported consignments were processed and passed through the centralized Document Processing Center (DPC).

The study findings established that there was a significant increase in the the revenue collected after the implementation of a new Customs system in July 2005. prior to the introduction of the new system the average collections of revenue were low after which they increased significantly afterwards.

The study findings established that the exchange rates of Kenyan shillings against the United States dollar have been unstable over the period of study. The findings established that the revenue collected was inversely associated with the exchange rates. The study findings observed that the operating costs by the Customs Department

increased significantly due the system trainings and sensitizations to KRA staff and clearing agents, others costs with upward trends was costs on compliance audits which resulted to increased revenue. On inflation rate the study found out that the inflation rates were high as indicated by the consumer price index. There was no change in the inflation rates after the introduction of the Simba system as the consumer price index remained high.

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