



RESEARCH ARTICLE

**THE IMPACT OF ELECTRONIC CASH REGISTER MACHINE ON VAT
INCOME: THE CASE OF HAWASSA CITY**

Kassahun Bekele

School of Management and Accounting, college of Business and Economics,
Hawassa University, Hawassa, Ethiopia

ABSTRACT

Article History:

Received 22nd April 2016

Received in revised form 1st May
2016

Accepted 05.05.2016

Published on 011.05.2016

Keywords: Electronics cash register
Machine, Hawassa city and VAT
income.

Corresponding author:

kasahun.bekele9@gmail.com

The study-examined the impact of electronic cash register machine on awareness of tax payers to cash register machine, administration cost, compliance cost, the extent of tax evasion while using electronic cash register machine and audit follow up affects the VAT income in the city of Hawassa. Data were collected through questionnaire from fifty VAT registered organizations. The data collected from organizations were analyzed using percentage analysis method and regression method, to see the impact of explanatory variables on VAT income as well as the relationship between explanatory variables and VAT income. The study found that Audit follow up, tax evasion and administration cost has positive and significant impact on VAT income while, compliance cost and Awareness of tax payers to cash register machine have no significant impact on VAT income. This study serve as stepping stone for further study on similar topics and it may fill the literature gap.

1. Introduction

Value Added Tax (VAT) is a tax on the value added to goods and services by enterprises at each stage of the production and distribution processes. It arises whenever a “taxable person” makes a “supply of goods or services” in the course of his business. Thus, in some countries, it is called “goods and services tax” or GST. Value added tax (VAT) was invented by a French economist in 1954 by Maurice Laure, director of the French tax authority. Value added tax was invented because very high sales taxes

and tariffs encourage cheating and smuggling (Worku, 2008).

One of the mechanisms in which countries raise revenue to finance government spending on the goods and service that most of government uses as tool taxation. As compared to the developing countries, the developed countries have been able to generate substantial revenue through imposing of taxes. One of the reasons for this has been the efficient tax system operating in the developed countries unlike the developing economies which are

characterized by weak monetization and the low development of the formal sectors. In other words, these countries have employed tax systems that have one or a combination of the following desirable characteristics as economic efficiency, administrative simplicity, flexibility, political accountability and fairness. The tax system need to be economically efficient meaning the tax system should not have an impact on the allocation of resources. The tax system countries should be adopts easy and inexpensive to administer and that should be able to respond to changing economic circumstances. Taxpayers should also be able to determine what they are actually paying so that the political system can more accurately reflect the preferences of individuals (Abraham Tesfaye,2003).

It follows that optimality in a tax system requires absence of distortion in any economic activity (Hancock, 1995). It is expected that people's tax payments is in line with their income and they are required to pay a tax in proportion to their level of income. On the part of the tax collectors, collection of tax should be time conscious and convenient and the cost of collecting the taxes should not be high to discourage business. Alternatively, this means that the ideal tax system in developing countries should raise essential revenue without excessive government borrowing and should do so without discouraging economic activity and without deviating too much from tax system in other countries (Tanzi, 2001). Considering the significance of VAT administration, many studies have been conducted in some developing and transitional countries with respect to the main VAT administration tasks and its problem. These studies include (Abraham, 2003),(Herouy, 2004), (Kerver,2008), (Clement,2009) ,(Wollela A.,2008). These papers assessed the VAT administrators in developing and transitional

countries problems and prospects of implementing VAT in Ethiopia and others developing countries. This paper will assess the effect of cash register machine (technology) on VAT collection in Ethiopia revenue and Customs authority and it will forward some recommendation for this organization since it apply new system to collect VAT.

This paper was examined about the impact of electronic Cash register machine on VAT collection in Hawassa city.

1.1. Objective of the Study

The study has both the general and specific objectives have been achieved on this study.

1.1.1. General Objective

The main objective of the study is to assess the impact of Cash register machine on value added tax collection in Hawassa City.

1.1.2. Specific Objectives

This study also attempts to achieve the following specific objectives:

1. To see the impactof cash register machine on income from Value added tax
2. To measure the impact of cash register machine on tax evasion
3. To see the impact of cash register machine on compliance cost and
4. To see the effect of cash register machine on administration cost
5. To see the impact of cash register machine on audit follow up

1.2. Research hypotheses

After reviewing related empirical studies on how cash register machine, VAT evasion while using cashregister machine, Audit follow up, compliance cost and administration cost affect the VAT income. This study has developed four directional hypotheses as follows:

H1: Awareness of tax payers to cash register machine has significant impact on VAT

income

H2:Tax Evasion has significant impact on VAT income

H3:Administration cost has a significant impact on VAT income

H4: Compliancecost has a significant impact on VAT income

H5: Audit follow up has significant impact on VAT income

2. MATERIALS AND METHODS

2.1. Description of the study area

Hawassa is the capital city of S/N/N/P regional state. According to the 1999 population census, the resident of the city is about 350,000. The study area is Hawassa city administration. Hawassa city is chosen for the reasons that tax registered enterprises are densely populated.

2.2. Study subject

The main aim of this study is to look into the impact of electronic cash register machine on VAT income. The study was only focus on those business enterprises register for tax operating in the Hawassa city. Since September 2015 there are around 2,500 VAT registered organizations operating in the city of Hawassa.

2.3. Study design

Sampling is important because, in almost all cases, it is not practical to study all the members of a population (Vanderstoep, Johnston, 2009). In a population of several thousand a sample of a few hundred can be representative and (especially in self-completion surveys), researchers can 'over-sample' to compensate for non-response. In groups likely to be under-represented additional 'booster samples' can be taken (Williams, 2003). A common goal of survey research is to collect data representative of a population. The researcher used information gathered from the survey to generalize findings from a drawn sample back to a population, within the limits of random error (Wunsch, 1986). Within a quantitative survey design, determining sample size and dealing with nonresponse bias is essential. "One of the real advantages of quantitative methods is their ability to use smaller groups of people to make inferences about larger groups that would be prohibitively expensive to study" (Holton & Burnett, 1997, p. 71). The traditional method of increasing reliability of estimates is to increase sample size. But increasing the sample size has its own problems as reported by (Bakan, 1966).

The target population that is value added tax registered organization operating in the city of Hawassa. Currently, the value added tax registered organizations in Hawassa city as of July 07/2015 are 2500 as a total population. It is assumed that the sample should have 90% reliability and a sampling error of 10% or 0.1. The sample size is determined by using mathematical formula (Yamane, Taro, 1967) is as follows.

$$\text{Therefore, } n = \frac{N}{1+N(e)^2} = \frac{2500}{1+2500(0.1)^2} = 96$$

Where

n: is sample size

N: is total population

e: is sampling error

2.4. Study methodology

Primary data was used to assess the impact of electronics cash register machine on VAT income. To collect the data, the researcher distributed the questionnaire to manager because; they are assumed to have more knowledge on the impact of electronics cash register machine on VAT income. Therefore, the managers are the respondents to the questionnaire. For the purpose of this study, 96 VAT registered organization were selected. For those selected VAT registered organization, 96 questionnaires were distributed, that is 1 questionnaire for each of the 96 organizations. The respondents were given seven workdays so that they could provide their responses in an un hurry time, which minimizes response biasness. The analysis part of the study was depending on the answers taking them as representatives of VAT registered organization in Hawassa city.

2.5. Data management and analysis

Data collected from the survey were analysed using the Statistical Package for the Social Sciences (SPSS) version 15. The study use both descriptive and inferential statistics. Descriptive statistics used to identify whether there is a large variance in data. The study also used correlation analysis to see the degree

and direction of relationship among variables. Inferential statistics is used to test hypotheses.

2.6. Model Specification and Definition of Variables

Under this subsection, the researcher attempts to clearly show specific model and define variables. This study employed one regression model. The Model includes four independent variables (awareness of the tax payers to cash registration machine, VAT evasion while using cash register machine, administration cost of the government to collect VAT by using electronic tax register machine, compliance cost (a cost that is incurred by the VAT registered organizations to collect VAT and a tax returns and audit follow up taking place by the Hawassa city tax administration) and VAT income as dependent variable. To estimate the impact of independent variables on VAT income, the researcher runs the following regression model:

$$\text{VAT income} = \alpha_i + \beta_1 \text{AWE} + \beta_2 \text{EVA} + \beta_3 \text{ADM} + \beta_4 \text{COM} + \beta_5 \text{AUD} + \epsilon_i$$

Where: VAT income = VAT income while the government using ECR,

α = Alpha (constant);

β = Beta;

i = Firm index;

ϵ_i = residual

AWE = Awareness of tax payers to cash register machine

EVA = Tax evasion while using cash register machine

ADM = Administration cost

COM = Compliance cost

AUD = Audit follow up

3.RESULT AND DISCUSSION

This chapter provides results and discussion of the data, specifically descriptive statistics, correlation among variables, regression result and hypotheses test.

Initially the researcher distributed questionnaires to ninety six organizations however, the data used for analysis were obtained from fifty (50) VAT registered organization operating in Hawassa city. Forty six VAT registered organization did not return the questionnaire, therefore the response rate is $50/96 = 52$ percent and the non-response rate is 48 percent.

3.1. Business Profile & Background Information

The years that has been organizations in operation determines the experiences of the old VAT collection system and new VAT collection system in filling its tax returns irrelevant information which can able the business organizations to evaluate the existence VAT collection system by making comparison with the previous one. So, in order to get this essential information the respondents were asked to give the age of their businesses, and the age of their businesses on VAT collection without electronic register machine and with electronic cash register machine.

As we can see the above table 1 and figure 1, the respondents were asked to give the age of their businesses, and from the research data, it was found that most businesses have been in operation for more than five years before adopting cash register machine, that is 50% of the businesses have been in operation for over 5 years, This indicates that almost half of the respondents are well experienced which can able them measure the old tax system. 30 percent of the respondents state that they were operated for more than four years and 16 percent of the respondent state that that their business operated the

last three years before using cash register machine, while the remaining 4 percent started their business during this year.

3.2. Correlation Coefficients

The correlations obviously provide direction and strength of association among variables and it is a precondition to decide the likelihood of linearity among variables, although correlations do not highly support whether there is a causal effect between variables because variables that are not theoretically related and have no causal effect may reveal significant association.

The correlations support several predictions; however, the formal tests are based on a random effect level regression analysis. Accordingly, this study has one-regression models. The model is utilized to determine the correlation between VAT incomes (VAT) with five independent variables. Table 2 reports Pearson correlation coefficients for VAT income (VAT) with five independent variables.

Table 2 shows that awareness of tax payer (AWE) is positively related to VAT income, with a coefficient of $r = .28$ which is significant at ($p < .01$). It indicates that an increase in awareness of tax payer may increase VAT income of tax authority. Evasion (EVA) is positively associated with VAT income but statistically insignificant ($p > .1$). Administration cost (ADM) has positive correlation ship with VAT income, with a coefficient of $r = .28$ which is statistically significant at ($p < .1$). Compliance cost (COM) and VAT income has significant relationship ($r = .58$, $p < .01$). Audit follow up (AUD) has a positive relationship with VAT income, with a coefficient of $r = .61$ which is significant at ($p < .01$).

The association among independent variables incorporated the model is less than 0.50, therefore multicollinearity is not a serious problem in the model (Field, 2009).

Table 1: Time starting collection of VAT before cash register machine

Question	Response	Number	Percent
When did your organization Started to using cash register machine to collect VAT?	Before five year	25	50.0
	Four years ago	15	30.0
	Three years ago	8	16.0
	This year	2	4.0
	Total	50	100.0

Table 2: Pearson Correlation

		1	2	3	4	5	6
		VAT	AWE	EVA	ADM	COM	AUD
1	PRO	1					
2	AWE	.28	1				
3	EVA	.11	.19	1			
4	ADM	.28	.01	.16	1		
5	COM	.58	.25	.08	.23	1	
6	AUD	.61	.10	.03	-.26	.52	1

Note: **Bolds** indicate significance level at the 1% and **italics** indicate significant at the 5% (one - tailed is used because directional prediction is made)

3.3. Checking Ordinary Least Square (OLS) Assumption

There are several classical linear regression model (CLRM) assumptions, which are subject to test in data, especially, multicollinearity, normality, linearity and autocorrection. Accordingly, the

researcher tests these four assumptions whether they are met in the model.

Multicollinearity

This assumption is tested by variance inflation factor (VIF) as per this method, if the variance inflation factor on each variable is less than ten and $1 / VIF$ exceed 0.1, multicollinearity is not a serious

concern in the model. The present findings indicate that the tolerance values for the independent variables are quite respectable and the VIF values range from 1.147 to 2.047, which are well below the threshold of 10.

Table 3: the degree of multicollinearity in the model

Variables	Tolerance	VIF
AWE	.724	1.381
EVA	.872	1.147
ADM	.572	1.747
COM	.489	2.047
AUD	.523	1.912

Source: survey result

As shown in Table 3, the variance inflation factor for all variables is significantly less than the cut-off point or rule – of thumb that is ten (10). Therefore, the researcher concluded that multicollinearity is not a serious problem in the model (Field, 2009).

3.4. Regression Result

As can be seen in Table 4, the model has a high goodness of fit as evidenced by the R-square 68.4 percent. This shows that the model explains that 68.4 percent (R.sq) variance in VAT income (VAT). The model is significant at ($F = 6.665, p < 0.01$). VAT is the dependent variable in the model. As shown in the Table 4 awareness of tax payer (AWE), Tax evasion (EVA), Administration cost (ADM), compliance cost (COM) & audit follow up (AUD) are independent variables.

The result in table 4, demonstrates that awareness of tax payer (AWE) does not affect the VAT income of tax Authority. The study shows that tax evasion (EVA) influences the VAT income positively and significantly ($\beta = 0.349, t = 2.402, p < 0.05$). Administration cost (ADM) affect the VAT income positively and significantly ($\beta = 0.816, t = 2.359, p < 0.05$), compliance cost (COM) influence the VAT income positively and significantly ($\beta = .405, t = 3.428, p < 0.05$). Audit follow up (AUD) has positive significant impact on VAT income ($\beta = .408, t = 2.299, p < 0.05$).

3.5. Test of hypotheses

The study has developed twelve directional hypotheses. To test these hypotheses, the researcher restates them in null form. Accordingly, the researcher begins with the hypothesis related to awareness of tax payers as follow:

H0 (1): Awareness of tax payers to cash register machine has no significant impact on VAT income

As can be observed in table 4 the coefficient on awareness of tax payer (AWE) ($\beta = .048, t = .878, p > .1$) is statistically insignificant. This means that awareness of tax payer has no significant influence on VAT income. Therefore, the researcher accepted the null hypothesis.

H0 (2): Tax Evasion has no significant impact on VAT income.

Tax evasion while using cash register machine ($\beta = .349, t = 0.2402$) has a positive and significant influence on VAT income at ($p < .05$) in the expected direction. This implies that the more the tax is evaded, the less VAT income generated by tax authority. Thus, the null hypothesis is rejected.

H0 (3): Administration cost has no a significant impact on VAT income

A significant positive coefficient ($\beta = .816$, $t = 2.402$, $p < .05$) on administration cost shows the city tax authority incurs high amount of administration

Table 4: Results of Regression Analysis

Dependent Variable :VAT income					
Model	Unstandardized Coefficients		Standardized Coefficients	t-value	p-value
	B	Std. Error	Beta		
1					
Constant	.347	.404		.858	.397
AWE	.048	.056	.095	.870	.390
EVA	.349	.145	.238	2.402	.021**
ADM	.816	.346	.288	2.359	.024**
COM	.146	.100	.192	1.450	.156
AUD	.405	.118	.438	3.428	.002***
R. Square = 0.684					
F = 6.665					
P < 0.01					
N= 50					
Note: ***, **, * represent significant level at 1%, 5% and 10% respectively.					
VAT income = AWE + EVA + ADM + COM + AUD, significant at P < 0.01					

cost which affects the VAT income. Therefore, the researcher accepts the alternative hypothesis and rejects the null hypothesis.

H0 (4): Compliance cost has no a significant impact on VAT income

Table 4 shows compliance cost($\beta =.146$, $t = 1.450$) statistically insignificant influence on VAT income ($p > .1$). Compliance costs are private

sector costs, and again, simply stated, they comprise the costs to taxpayers and third parties “in meeting the requirements laid upon them in complying with a given structure and level of tax” (Sandford, Godwin and Hardwick, 1989, p. 10).This result not supports the alternative hypothesis. Therefore, the researcher fails to reject the null hypothesis.

H0 (5): Audit follow up has no significant impact on VAT income

As shown in table 4 audit follow up ($\beta = .405$, $t = 3.428$) positively and significantly influences VAT income at ($p < 0.01$). It implies that afrequency of audit inspection increases VAT income. Accordingly, the researcher accepted the alternative hypothesis that predicts positive and significant association between audit follow up and VAT income of tax authority. Therefore, the null hypothesis is rejected.

References

- Abraham Tesfaye,2003, Problems and Prospects of implementing VAT in , EthiopiaAddis Ababa, Ethiopia
- Aczel, D, A., 1999. Complete Business Statistics. 4th ed. Boston: McGraw-Hill Companies, Inc.
- Bakan, D. (1966). The test of significance in psychological research. Psychological Bulletin, 66(6), 423-437.
- BekureHerouy ,2004, The VAT Regime Under Ethiopian Law with Special Emphasis on Tax Exemption: Addis Ababa ,CRDA
- Chris Evans,2003, Counting the costs of taxation: an exploration of recent developmentsChris
- Brooks,2008, Introductory Econometrics for Finance, 2nd ed, Cambridge University Press, New York
- Exhibit Companion , March 29 to July 7, 1996, The Abacus: Precursor to the Cash Register.
- Federal Democratic Republic of Ethiopia, 2002, VAT Proclamation No 285/2002
- George. A, & Nancy, L., 2004. SPSS for Introductory Statistics: Use and Interpretation. 2nd ed. New Jersey: Lawrence Erlbaum Associates, Inc.
- G.S.Maddala,1992, Introduction to Econometrics, 2nd ed, Macmillan publishing Inc; New York
- Hosking.SG and Preez.MD, (2003) ‘Application for CV Study to Estimate Recreational Value for fresh Water’ Neilson Mandela Elisabeth University South Africa.
- J.Hair .J, Anderson .R, Tatham.R and Black WC 1998, Multi variant Data Analysis, 5th ed, 20th prints/Hall Inc., upper sadleriver,NJ
- John W. Creswell,2003,, Research Design Qualitative, Quantitative, and mixed methods approaches,2nd ed.
- Mark E. Schaffer and Gerard Turley ,2001, Effective versus statutory taxation: measuring effective tax administration in transition economies;
- Olaoye Clement,2009.A Review of VAT Administration in Nigeria, Nigeria, MedwellJournals
- Paler-Calmorin, L &Calmorin, M.A., 2006.Methods of Research and Thesis Writing.Manilla, philipins; Bookstore Inc.
- Tanzi, Vito and Howell Zee, Tax Policy For Developing Countries. IMF. www.imf.org
- WollelaAbehodieYesegat, 2008, Value Added Tax Administration in Ethiopia: