

# Value Added Tax Compliance in Amhara National Regional State: (The Case of Bahir Dar City using Multiple Logistic Regression Analysis)

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## Abstract

This study Assessed Value Added Tax compliance among VAT registered taxpayers in Amhara National Regional State, taking the case of the city of Bahir Dar. The study used a sample of 176 VAT registered taxpayers and thus uses ETRs machines in the study area. Simple random sampling technique was used to draw the samples from the total target population. Primary data were collected from respondents. The collected data were analyzed with the help of SPSS version 21. The Multiple Logistic Regression analysis was employed to predict the likely impact of using ETRs machines on VAT compliance in the target population. The results from the Multiple Logistic Regression analysis showed that the use of ETRs machines among VAT registered taxpayers is correlated with high levels of tax compliance attitude in the target population. The logistic regression analysis further confirms that the independent variables of the study have their own role in explaining the level of VAT compliance among the target population. As such, the tax morale of the taxpayers, the fines and penalties of the tax laws, and the probability of audit have positive and significant impact on understanding VAT compliance level among the VAT registered taxpayers in the study area.

**Keywords:** Value Added Tax, VAT compliance, Logistic Regression, Bahir Dar

## 1.0 Introduction

Governments around the world are expected to fulfill different responsibilities to their people. These include providing some basic infrastructures, stabilizing the economy, and maintaining law and order. As such, governments need resources to finance and thereby properly discharge these big responsibilities. Here, one of the main tools used by governments in financing the above-mentioned functions is taxation (Fuest & Riedel, 2009). Nevertheless, the capacity to mobilize revenues from taxes does not follow an even distribution among countries in the world. Developing countries have, in general, lower capacity to raise revenue from taxation due to many factors. For instance, large informal sectors (GIZ, 2010), and the widespread tax avoidance and evasion (IMF, 2011; Fuest & Riedel, 2009) undermine the domestic tax bases in these countries. These problems are the most severe in African countries especially in Sub-Saharan regions (ibid.). As a result, these countries face big challenge of meeting the developmental needs of their citizens and thereby come out of the deep poverty existing in these countries.

To redress this challenge, different international institutions have been forwarding different reforms in these countries on the areas of tax design and administration. The World Bank (WB) and International Monetary Fund (IMF) advocate VAT as the solution in these developing countries (Ruiz, 2006). In its essence, a value added tax is exactly what the name itself suggests; it is a tax levied on *the value added* to a production chain (emphasis added, Bird & Gendron, 2007, p.10 as cited in Anderson, 2012). The IMF structural adjustment programs led African countries especially Sub-Saharan countries including Ethiopia to implement VAT in their tax system. As a result, 30 of the 42 economies in SSA including Ethiopia had implemented VAT in the beginning of 2003 (Ibid.).

In Ethiopia, VAT has also become the workhorse of the revenue system. For instance, in 2007/08, VAT revenue as a share of total revenue reached 41.4 percent (Abdella & Clifford, 2010). Thus, one could learn that VAT is also playing a great role in increasing the revenue from taxation in Ethiopia.

However, like other taxes, VAT is vulnerable to tax evasion, tax fraud and poor enforcement (ibid.). For instance, Sri Lanka once reportedly lost about 10 percent of its net VAT receipts from a single fraudulent episode (Keen & Smith, 2007). Jenkins and Kou (2000) recommend that if governments of developing countries want to rely on VAT over time, they must move aggressively to broaden the base and enhance compliance as part of necessary reforms (emphasis added, Jenkins & Kou, 2000 as cited in Wanjiku, 2011, p.1). This suggests that governments of these countries should take different types of measures to improve the compliance level of VAT and thereby fully reap the benefits of more revenue from it.

As a result, many countries including Ethiopia had taken different measures to curb the problems of non-compliance of VAT. One of the methods of enhancing high compliance is to demand all VAT registered taxpayers

to use ETRs (electronic tax register) machines to produce receipts.

In Ethiopia, the mandatory use of these machines by taxpayers came into force by the Council of Ministers in Jan 26, 2007 through an amendment in the Value Added Tax Act 139/2007 (ERCA website). After this act, the first use of Electronics Tax Register machine began in Addis Ababa, in February 2008 and its use has expanded much since then. Thus, this research seeks to lend empirical support on the issue of ETRs machines' impact in regional cities, taking Bahir Dar as a case and thereby contribute its own share to the research literature on ETRs machines. The rest of this article is structured as follows. The first section is about the introduction of the study. Section two deals with literature review. Section three discusses on the Specification and Estimation of the Model. Empirical results are discussed on in section four. Finally, section five concludes and suggests recommendations on policy and future area of study of this article.

## 2.0 Literature review

### 2.1 Theoretical literature

Tax is a *compulsory levy*, imposed by government or other tax raising body. As a result, it is supposed that nobody likes to pay them (emphasis added, *ibid.*). As such, tax authorities usually employ different measures to enforce them to pay their tax liability (Torgler & Schneider, 2009). Nevertheless, tax authorities usually find it difficult to persuade taxpayers to comply with tax requirements even though “tax laws are not always precise” (James & Alley, 2004 as cited in Palil & Mustapha, 2011, p.557). Thus, it can be understood that the issue of taxpayers' compliance with the taxes laws could be big a concern for tax authorities in a country.

There is considerable literature discussing on the underlying reasons for deciding not to comply or to comply with the tax laws by taxpayers (Alm, et al., 1998).

The first basic theoretical model which literatures discuss widely ,and also used as the foundation for constructing other models is the one which was developed by Becker (1968) ,and first applied to tax compliance by Allingham and Sandmo (1972) and Srinivasan (1973) (as cited in Alm & Torgler, 2012; Alm, et al.,1998 ). This model goes by the name economics-of-crime. The logic here is that tax payers as rational individuals always want to maximize their individual utility. As such, when they decide to comply or not to comply, they use cost-benefit analysis of committing the crime. Hence, this basic model suggests that increasing enforcement by the tax authorities would help curb the problem of tax non-compliance (*ibid.*).

Though this model was the pioneer and thus the foundation for explaining the underlying reasons for tax compliance decision among taxpayers, it is found inadequate in fully explaining the actual (observed) compliance attitude among taxpayers. Many empirical literatures on tax compliance indicate that taxpayer's compliance decisions are affected by many factors (Alm & Torgler, 2012; Alm, 1998). These include the tax morale among taxpayers (Schaffner & Torgler, 2007/11), tax knowledge (Djawadi & Fahr, 2013), penalties (Doran, 2009). Therefore ,it could be observed that tax compliance decision among tax payers is not only affected by the 'odds and payoffs' of tax compliance among tax payers as predicted by the economics-of -crime model rather many factors are found significant in explaining non-compliance (Torgler, et al.,2007). This suggests that tax policy designers should consider these wide factors, which affect taxpayers' compliance decision when they are designing any strategy to improve tax compliance.

### 2.2 Empirical works on ETRs machines

Here, empirical literatures on ETRs on VAT show that there are some empirical studies conducted in few African countries including Ethiopia (Chenge, 2010; Naibei & Siringi, 2011). In general, these studies confirm that the frequent use of the machine by traders contribute significantly to the VAT revenue collection effort in their countries through their effect on better compliance of taxpayers. Similarly, another study on the impact of ETR on VAT was done in Kenya. This study objective was to understand the impact of ETR on VAT compliance. Chenge (2010) conducted a study on the impact of ETR on VAT compliance among classified hotels found in the capital, Nairobi. He found out that the introduction of these machines result in the VAT compliance level through increasing the level of declared VAT liability among the studied classified hotels (Chenge, 2010).

Moreover, Wanjiku (2011) did a study on the impact of ETRs on the duration of VAT audit in Kenya. This study findings indicate that the use of ETRs contribute significantly in reducing the VAT audit time in the studied population in Kenya (Wanjiku, 2011).

The research findings suggest that the use of ETRs machines among VAT registered taxpayers in the study areas does indeed contribute in a positive and significant way to improving the compliance attitude and efficient tax administration in the study area.

### 3.0 Specification and Estimation of the model

Here, the study employs a Multiple Logistic Regression Model just to test the research hypotheses formulated for the study.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \dots \dots \dots \text{equation 1}$$

Here, the log transformation of equation 1 can be written in the form of the log of the odds called the logit.

$$\ln(\text{odds ratio}) = \text{Logit}(Z) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \dots \dots \dots \text{equation 2}$$

Where, **Z** in this case is the natural log of the odds ratio  $y_i=1$  versus  $y_i=0$ , i.e. the log odds of VAT compliance among VAT registered tax payers in the city occurring relative to not its occurring.

- X1** – tax morale
- X2** - due use of ETR
- X3** - tax fines and penalties
- X4** – Audit Probability (Frequency of inspection)
- ε** - Error term

### 3.1 Sources of data

This study used both primary and secondary data. However, the study used primary data predominantly. As such, the primary data for the study was from VAT registered traders from the city of Bahir Dar, using Likert type items, each with a 5-point scale questionnaire. The secondary data was from previous studies on VAT conducted by other researchers, from the ERCA reports, and different relevant websites.

### 4.0 Empirical result

The regression outputs of the SPSS Version.21 have been discussed on in the following ways.

**Table 1: Omnibus tests of model coefficients**

		Chi square	df	Sig.
Step 1	Step	75.381	4	.000
	Block	75.381	4	.000
	Model	75.381	4	.000

Source: Researcher's computation using SPSS (2015)

As can be seen from Table 1, we could see that the model chi square has 4 degrees of freedom, a value of 75.381 and a probability of  $p < 0.001$ . This result shows that the model has a poor fit with the model containing only the constant and this result is statistically significant as shown in the above table. Hence, we can confidently conclude that our model with the explanatory variables is a useful model.

**Table 2: Model summaries**

Step	-2Loglikelihood	Cox & Snell R square	Nagelkerke R Square
1	94.089a	.403	.587

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001

Source: Researcher's computation using SPSS (2015)

As seen from Table 2, the Nagelkerke R Square is 0.587, that is, roughly 58.7 percent of the variation in the dependent variable, that is, VAT compliance, could be explained by the variation in the independent variables chosen for our model (use of ETRs machines, fines and penalties, probability of audit, and tax morale of the VAT registered tax payers).

**Table 3: Variables in the equation table**

		B	S.E	Wald	df	Sig.	Exp(B)
	ETRs	1.226	.825	2.208	1	.039	3.407
	FIN_PEN	.906	.814	1.239	1	.026	2.474
	PROB_AUD	.999	.810	1.521	1	.048	2.755
Step	TAMR	.920	.924	.991	1	.028	2.509
1a	Constant	-9.254	3.105	8.886	1	.003	9.572

a. Variable(s) entered on step 1: ETRs, FIN\_PEN, PROB\_AUD, and TAM

Source: Researcher's computation using SPSS (2015)

As seen from Table 3, all of our chosen independent variables have their own contribution in our logistic model. The Wald statistics for each of the chosen independent variables indicate that all of them do contribute to the model significantly. Here, from Table 4.12, one could see that the 'B' coefficient for ETRs is 1.226, showing a positive contribution. That is to say, when a VAT registered taxpayers' increases the use of ETRs machines in his or her sales transaction, the log odds of showing a complaint attitude towards VAT payment would increase, holding

other explanatory variables constant. The result is statistically significant as the p-value for ETRs is 0.039, which is less than 0.05 as shown from the Logistic regression output.

Hence, our research findings are in congruent with previous study findings. Previous researches done on the ETRs machines suggest that the frequent use of the machine by traders have positive and significant impact on VAT revenue collection effort (Chenge, 2010; Naibei & Siringi, 2011).

### 5.0. Conclusions and Recommendations

The issue of taxpayers' compliance with the taxes laws is a big a concern for tax authorities in a country. In Ethiopia, ETRs machines use has become mandatory, following the reforms made on VAT administration. This study aims at understanding the VAT compliance among VAT registered taxpayers empirically, in Amhara National Regional State, taking the case of the city of Bahir Dar.

The results from the Multiple Logistic Regression analysis provide robust results for the impact of using ETRs machines on VAT compliance in the target population. Thus, this empirical study provides additional evidence that using ETRs machines among VAT registered taxpayers does contribute to the improvement of VAT compliance among taxpayers in the target population.

Moreover, the study findings confirm that the chosen explanatory variables for the study; the tax morale of the taxpayers, the probability of audit, tax fines and penalties all have their own role in explaining the VAT compliance attitude observed in the studied population.

Based on the above findings, this paper suggests the following recommendation. First, the Ethiopian Revenue and Customs Authority (ERCA) should strengthen the use of ETRs machines among taxpayers in the region and the country. Second, there should be different awareness programs to improve the tax morale of the taxpayers by ERCA. Third, there should be system should make the level of surveillance and monitoring adequate and strong by ERCA. Finally, future research should be done, taking the study population on other regional states in Ethiopia.

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