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Tax evasion: Empirical evidence from sub-Saharan Africa

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Tax is the income which is paid to the government in order to fulfill the need of the public. However tax evasion is the act of not paying the tax by use of illegal ways. Allingham and Sandmo being the first researchers studying the tax evasion found a relationship of tax evasion with low penalty fees and a low detection. The tax evasion basically is affected by various factors but it also affects many economic factors. Sub Saharan Africa being a developing region is facing the phenomenon of tax evasion in a crucial way. This study measures the impact of the tax evasion on the Gross Domestic Product (GDP) per capita of Sub Saharan Africa. The relationship between the GDP per capita and tax evasion is tested using the generalized least squared whereby it is found that there is a positive impact of tax evasion on the GDP per capita however the p-value states that the tax evasion is insignificant and is not an important component for the determination of the GDP per capita. Moreover in the presence of tax evasion, this study shows that GDP per capita has also a negative relationship with the Foreign Direct Investment (FDI), positive relationship the Gross Domestic Fixed Capital Formation (GDFCF), a favorable connection with the export, a negative relationship with the import, a positive impact on the inflation and a negative relationship with the government expenditure. To fight against tax evasion for the economic benefit of Sub Saharan Africa, it is advised to review the tax system, to implement strict and severe penalties and very high fines for tax evaders. Moreover, the tax authorities of Sub Saharan Africa need to appoint more experts in auditing department to be able to detect the non-compliance tax payers easily and rapidly

Key words: Tax evasion, cross sectional regression, tax morale.

INTRODUCTION

Taxation is the revenue that government receives as a percentage of each individual's income. Besides being the major source of income to the government, taxation is another way to achieve the macroeconomic aims of a country. It is regarded as being an important element to promote economic growth and a sustainable

development in a country. According to Becker and Spicer (1980), with no taxation there will be no advanced and modern state and similarly without taxation there will be no tax evasion. However, due to the presence of the unobservable economy and shadow economy which brings along the tax evasion, the development of the economy can be threatened.

The tax evasion being an illegal way of avoiding tax, affects the economy as a whole and the behavior of the tax payers. As stated by Brezeanu et al. (2011) from a global perspective, tax evasion is stealing fully or partly by any means, to pay taxes and other amounts owed to the state budget, local budgets, state social insurance budget and special funds off-budget." Recent studies by Pantoja and Penaloza (2014) Alm and Torlger (2011) showed that tax evasion is an increasing phenomenon which has disseminated throughout the world. Allingham and Sandmo (1972) being the first researchers to analyze the factors driving taxpayers to evade the income tax, stated that to evade taxes, it depends on the probability of the penalty fees and the probability to be detected. Moreover, there are other researchers who link the tax evasion with macro-economic factors. This study will be concentrated more on the impact of the tax evasion on mostly macroeconomic variables of Sub Saharan Africa.

LITERATURE REVIEW

Theoretical review

Tax is the amount that is imposed on individual or corporation income or profit or on commodities that has been levied by the government in order to finance the government expenditure. According to James and Nobes (1997), a tax is a compulsory levy made by public authorities for which nothing is received in return." Taxes are normally classified as direct taxes and indirect taxes. Direct taxes are taxes that are directly on the income of individuals or the profit of companies or on the capital gain or on wealth. Indirect taxes are directly taxes imposed on goods and services that consumers pay. Examples of indirect taxes are value added tax, per unit tax, sales tax, goods and services tax.

Tax non-compliance is an act of not respecting the tax law and rules of a country by not paying the tax or by not declaring the true value of the actual income. This may include tax evaded in an illegally way and legally means, that is, it involves the tax avoidance and the tax evasion. Tax avoidance is performing an act of minimizing the tax liabilities within the law. Tax evasion is performing an illegal act of avoiding paying tax. Kesselman (1997) stated that pure tax evasion (PTE) involves non-reporting, understatement, or misreporting of taxable income, profits, or sales. Some PTE activity is related to extreme financial manipulation that goes beyond the

bounds of the legal tax avoidance. Other PTE occurs in conventional, legitimate businesses that underreport their receipts or overstate their expenses".

As stated by Organization for Economic Co-operation and Development (OECD) the Non Observed Economy (NOE) is an economy where there are some economic transactions which have not been declared and are not added to the GDP. Similar to the OECD report on NOE, Smith (1994) also defined the NOE as an economy where the production of goods and services arising from legal or illegal means are not incorporated in the estimation of the GDP.

In the 1980's the phenomenon of shadow economy had started and given rise to anxiety within countries.

The shadow economy is part of the underground economy which is not declared, not registered and which is being hidden from the national economy. The shadow economy can be said to be an illegal economy and Feige (1997) defined the illegal economy as an economy where there are income generated from the non-compliance of tax law of a country.

In addition to the shadow economy, evading taxes is illegal and unethical. In the shadow economy, people do not declare their income and thus are not paying taxes. Other common methods of evading tax are failing to report the tax return, by underreporting or omitting the real income, by returning a false tax return, by declaring a false deduction or overstating the amount of deductions and mostly by making false entries in the books and keeping two books purposely.

Causes of tax evasion

Low tax morale

Tax morale is defined as a principle and a duty of contributing to the society by paying taxes.

Alm and Torgler (2006) and Torgler and Schneider (2007) described tax morale together with the tax payers ethics. Similarly Frey (1997) defined tax morale as an intrinsic motivation for paying taxes. Moreover in many countries, the level of deterrence is low hence tending to have a higher rate of tax evasion as taxpayers are fearless of being caught. In the Alligham and Sandmo (1972) study, it was found that if the tax evader is caught, he will have to pay a fine higher than the amount of tax that he evades. Moreover, Spicer and Lundstedt (1996) put forward that a set of attitudes and norms are also having an impact on the behavior of a taxpayer. The more a taxpayer believes that others have low tax morale, the lower his/her moral costs will be to behave dishonestly (Frey and Torgler, 2007). According to Pantoja and Penaloza (2014), tax payers behave according to moral principles that are external to the game.

High compliance cost

Another factor that influences tax payers to evade tax is due to the high compliance cost. Additionally as reported by Haig and Ecker-R (1935), the latter found that most countries compliance cost of VAT are greater than other taxation and he also mentioned that the compliance costs for small and medium firms are higher than that of larger firms. Likewise survey made by the World Bank starting from 2006 to 2011 on developing countries on the VAT compliance cost and it was found that the compliance costs are "regressive". Therefore it will be more obvious that tax payers would not comply and not pay the taxes intentionally.

Age, sex and status

Torlger (2011) reached to a conclusion that factors which really caused the tax evasion were the age and the sex. Hence it was found that older people and women tend to be having the higher tax morale than younger ones, men, employed and self-employed people. Moreover Feinstein (1991) and Richardson (2006) also agreed on the age factor that influences tax payers from evading and their studies shows that younger taxpayers are more likely to evade taxes easily as they are not afraid of the punishment and the fines which would be followed by the fraudulent act. According to Feinstein (1991), it is more probable that married persons will not evade taxes than unmarried persons as married people would be more conscious about how they would be seen in the society.

Level of income

Studies such as Jackson and Milleron (1986) showed that lower income taxpayers and high income taxpayers tend to evade more rather than the middle taxpayers. However it can also be said that those having a high income will evade if the tax system is a progressive one.

High tax rate and no strict penalty

Slemrod (2007) stated that the higher the marginal tax rate the less individuals will comply to pay taxes. Sousa et al. (2008) measured the impact of import tariffs on tax evasion and found that a rise in the tariff gives a rise in the tax evasion. Alligham and Sandmon (1972) also stated that the motive behind the tax evasion would be upon the gain and loss the taxpayer would make if he would be caught. However Siqueira and Ramos (2006) stated that "...an increase of the marginal aliquot reduces tax evasion and in addition, that an increase of the probability of detection and of penalty fee also leads to a

reduction of tax evasion."

Complex tax system and misuse of taxes

Jackson and Milleron (1986) found that the increase of taxpayers of not complying with taxes is because of the complexity and the evolution of tax system over time. The various types of forms to fill for the payment of taxes also discourage taxpayers from filing and hence this leads to an increase in the tax non-compliance. Andreoni et al. (1998) explained that what also influences taxpayers from not complying is the embezzlement of taxes. Consequently taxpayers would be more willing to not pay the taxes as the taxes are not being used for the benefit and welfare of the society.

The impact of tax evasion

The tax evasion has an impact on the economic factors of an economy as well as on the society. Firstly it was found that tax evasion has a negative impact on the government expenditure and the economic growth. As added by Dalu et al. (2012) "a country facing an increasing amount of tax evasion and tax avoidance is likely to exhibit a low productive investment mix, this would mean low economic growth and the public run enterprises would be negatively affected."

Secondly, Fishburn (1981) and Nourzad (1986) found that the inflation has a positive relationship with the tax evasion as they came to a point that the real value of the income of individual would decline by the influence of the inflation. However, if the individual decided not to pay the tax then he would eventually save his money and his purchasing power for the coming times. Moreover, according to Tanzi (1977) and Olivera (1967), a country which is in a situation of hyperinflation, tax evasion would be very flagrant.

Thirdly, the impact that the tax evasion has on the investments is quite twisted. As Baumann and Friehe (2010) argued in their study, tax evasion has both positive and negative impact on the investment. In the same line, Kreutzer and Lee (1986) argued that the level of tax evaded will depend on the penalty and fine that would be paid if caught and therefore this would determine how much profit would be reported to be taxed.

Fourthly, the GDP per capita represents the income per head in a country. It is certain that while complying with the tax payment, the income will decrease as there is an outflow of income. Yet there are cases where individuals do not pay the taxes and hence their incomes do not decline. Therefore as the tax evasion increases, the GDP per capita increases as well. However Kafkalas (2014) stated as GDP per capita increases people tend to

evade less as their income is increasing on the other hand.

Fifthly, the tax evasion has a negative impact on the moral behavior of the society as complying or not complying therefore is upon the culture and the moral behavior of an individual. Oberholzer (2008) argued that there are taxpayers who are not willing to pay taxes as they do not get anything in return therefore they have an immoral behavior towards the government.

Empirical review

Kafkalas et al. (2014) had established a logarithmic model inspired from Jorgenson and Nishimizu (1978), where he had measured its dependent variable, the rate of tax evasion on, the independent variables: the quality of regulation framework and tax auditing mechanism, the real per capita GDP, the rate of tax and the tax revenue. Kafkalas et al. (2014) used a cross sectional data for two categories of countries, firstly 110 non OECD countries and secondly 35 OECD countries for one period of time, 2011. The coefficient for the real GDP per capita is -0.0192, it means that if the real GDP per capita increases by 1%, the tax evasion will decrease by 1.92%. Hence, there is a negative impact between the real GDP per capita and the tax evasion.

Additionally, Walker and Sennoga (2007) have analyzed the effect of tax evasion on the level of corruption, agriculture (a % of GDP), GDP per capita, mining, export ratio and the combination of 4 types of taxes which they call trend. The trend includes taxes on income, taxes on consumption, property taxes and the international trade taxes that is, the import taxes and the export taxes. The authors have also analyzed the effect of the tax evasion on the trend. They utilized a panel data for two sets of countries for a period of 1989/1990 to 2001/2002. The observation was for 126 OECD countries and 33 East African Countries (EAC). In their first stage least squared estimates for OECD countries, they found that when the GDP per capita increases by 1% the tax evasion would fall by 0.214% and for EAC if GDP per capita increases by 1% the tax evasion would decrease by 1.1751%.

Razieh et al. (2012) in their study of the estimation of tax evasion in Malaysia showed the relationship between the tax evasion and other economic variables such as tax burden, GDP per capita, the government regulation, inflation rate and trade openness. The authors used Artificial Neural Network method (ANN) to analyze the factors that influence the tax evasion. The data are collected for the period of 1963 to 2010 for Malaysia. The result from the study showed a negative relationship between the tax evasion and the GDP per capita. When the GDP per capita increases by 1%, the tax evasion decreases by 2.23%.

On the contrary Embaye (2007) found a positive relationship between the tax evasion and the GDP per capita unlike other authors. His argument is that in South Africa from year 2000 to 2002, the real GDP per capita has increased and the cause of this rise is the presence of tax evasion. He measured the income, population rate, wage rate, total tax share, total income and wealth tax share, individual income and wealth tax share, corporate income tax share, VAT tax share and production and import tax share for a period starting from 1990 to 2002. The result of the test showed that a percentage increase in the total tax payment decreases the GDP per capita by 0.606%, this implies that when there is no tax evasion the GDP per capita would decline. However if the total tax payment decreases by one percentage, the GDP per capita would increase by 0.606%. Adam and Ginsburgh (1985) also found a positive relationship between the income per capita and the tax evasion.

METHODOLOGY

The aim of this section is to describe the methods used to identify the impact of tax evasion on the Gross Domestic Product (GDP) of the Sub Saharan African countries, within which 10 countries have been selected.

Research design

This study will operate with a panel data analysis which is a combination of both cross sectional and time series data. Panel data which is also known as longitudinal or cross sectional time series is where a set of data are is measured for a two or more time periods. The impact of tax evasion is measured on the GDP per capita for 10 countries over 7 years starting from 2008 to 2014. Furthermore, the data will be collected from the available sources that is through secondary data. Data that World Bank, International Monetary Fund and Tax Justice Network have provided will be applied. The data on the tax burden, tax revenue lost as a result of shadow economy and the share of government spending to GDP, will be provided by the Tax Justice Network. The reports of the World Bank and the International Monetary Fund (IMF) will provide data on the FDI, GDFCF, export, import, inflation and the government spending on GDP as well. The targeted population for this study is only 10 countries out of the 50 countries of Sub Saharan African countries. The sampling of the population is based on the highest rate of tax evasion and they are ranked by the total tax evaded according to the Tax Justice Network. The countries are: South Africa, Ghana, Kenya, Tanzania, Cote d'Ivoire, Botswana, Zambia, Cameroon, Ethiopia and Senegal.

Model specification

Kafkalas et al. (2014) put forward a model to measure tax evasion by modifying the existing bilateral approach of the Jorgenson and Nishimizu (1978). The function is as follows:

$$\ln h_i = \ln \beta_0 + \beta_g \ln GE_i + \beta_r \ln RGDP_i + \beta_{rj} \ln \tau_i + \beta_{\mu j} \ln \mu_i + \varepsilon_i$$

(1)

Where the dependent variable is the tax evasion and the

independent variables are the index of the quality of regulatory framework, real GDP per capita, tax rate and the share of tax revenue that goes for monitoring. Moreover using Kafkalas et al. (2014) model in this study, the impact of tax evasion will be examined on the GDP per capita where the GDP per capita will be the dependent variable and the tax evasion will be the independent and the main variable. Other independent variables will be used as well. The function below will be used:

GDP= f (Tax Evasion, FDI, GDFCF, Export, Import, Inflation, Govt Expenditure)

$$\ln GDP_i = \ln \beta_0 + \beta_1 \ln TE_i + \beta_2 \ln FDI_i + \beta_3 \ln GDFCF_i + \beta_4 \ln X_i + \beta_5 \ln M_i + \beta_6 \ln I_i + \beta_7 \ln GOVT_i + \varepsilon_i$$

(2)

Where,
1. i= data at ith year
2. GDP_i = GDP per capita
3. TE_i = Tax Evasion
4. FDI_i = Foreign direct investment
5. $GDFCF_i$ = Gross domestic fixed capital formation
6. X_i = Export
7. M_i = Import
8. I_i = Inflation
9. $GOVT_i$ = Government expenditure
10. ε_i = Error term

Dependent variables

Gross domestic product per capita

The dependent variable is the gross domestic product per capita (GDP per capita), it is the indicator of a country's income per head. In a recent study, Ismail and Ahmed (2015) agreed with the other research such as Massell et al. (1972), Voivodas (1973), Michaely (1977), Tyler (1981), Salvatore (1983), Sachs and Warner (1995) and Hassan (2007), that an increase in the GDP per capita is caused by the liberalization of the international trade and by the growth in the FDI. The GDP per capita has a mean of 7.311792% with minimum mean of 5.786268% and a maximum mean of 8.997254%. The Standard deviation for the GDP per capita is 0.8414%.

Independent variables

Tax evasion

Tax evasion is an independent variable in this study. GDP per capita is dependent on the level of taxation. It is assumed that if the tax evasion is high the GDP per capita is also high as while not paying taxes the income would not decrease. Hence it is expected to have a positive sign for the tax evasion. Moreover the tax evasion has a total observation of 69 and a mean of 2.044749% with a minimum mean 1.589235% and a maximum mean of 2.318124%. The range between the minimum mean and the maximum mean of the tax evasion is not too large as compared to the scale of the GDP per capita. The standard deviation for the tax evasion is 0.1431%

Foreign direct investment

The FDI is a driver of globalization. The OECD defines FDI as a

way towards the development of the economic integration, and therefore it influences a country's growth and its GDP. FDI is expected to have a positive sign. L.Alfaro (2003) found a positive impact of FDI on the growth of the GDP per capita for manufacturing sector however he found a negative relationship between FDI and the GDP per capita for primary sector. Additionally, the mean for the FDI is 0.7392814% with a minimum mean of -2.411724% and a maximum mean of 2.253084% which is observed on for the total 7years for the 10 countries. The standard deviation is 0.9873% for FDI.

Gross domestic fixed capital formation

Additionally, the GDFCF is an approach to calculate the GDP. It refers to the acquisition of non-current asset and the improvement of infrastructure, in all it is the net increase of the non-current asset. Ismail and Ahmed (2015) found a positive effect of the GDFCF on the GDP per capita. As it is believed that if the GDFCF increases so will be the GDP per capita. The range of the mean for the GDFCF is between 2.1917 and 3.6374%, with a mean of 3.1320%. The standard deviation for the GDFCF is 0.3216%.

Export

Export is the selling of goods and services to other countries and hence there will be a foreign currency inflow in the local country. Export is expected to be positively related to the growth of the GDP per capita, as an increase of export leads to an increase in the inflow of foreign currency in the economy thus increasing the income of the economy. Moreover, the mean for export is 3.3232% with a minimum mean of 2.4546% and a maximum mean of 3.9941%. The standard deviation of the export is 0.3910473%

Import

Import is the buying of goods and services from other countries, and thus there will be an outflow of money towards the countries which are being traded. The relationship between import and the GDP per capita growth is believed to be negative. When import increases it can be concluded that there will be an inflow of goods and services in the economy but on the other hand there will be an outflow of the local currency and it will decrease the national income and the income per head. The import has a minimum mean of 3.0459% and a maximum mean of 4.0661% with a mean of 3.5962. It has a standard deviation of 0.2322077%.

Inflation

Inflation is defined as the general increase in the prices level. High inflation may erode the value of money. Inflation may cause unemployment and it may decelerate GDP growth. Anderton (2010) claimed that inflation raises the cost of production which in turn raises uncertainty of investing. Therefore if there is low investment, unemployment rate will increase, there will be an impact on the balance of payment and thus having a negative impact on the economic growth. Hence inflation is expected to have a negative sign. The mean for inflation is 1.7697% with a minimum mean of -2.5711% and a maximum mean of 3.5128%. It has a standard deviation of 1.048% for a total observation of 68.

Government expenditure

Generally, money is raised through the tax system so as to finance

Table 1. Data summary.

Variable	Obs	Mean	Std. Dev.	Min	Max
lngdp	70	7.311792	0.8414922	5.786268	8.997254
lntax	69	2.044749	0.143063	1.589235	2.318124
lnfdi	70	0.7392814	0.9873237	-2.411724	2.253084
lngdfcf	61	3.132015	0.3216026	2.191779	3.637421
lnexport	67	3.323285	0.3910473	2.454587	3.994178
lnimport	67	3.596209	0.2322077	3.045886	4.066107
lninflation	68	1.769655	1.048313	-2.571151	3.512781
lngovt	61	4.423587	0.0989096	4.138977	4.584998

the government expenditure to provide the public goods for the citizen. If taxes have not been paid, less money will be collected and therefore it affects the government spending as well as the economic growth. It is expected to have a negative sign for government expenditure. Moreover the mean for the government expenditure is 4.4234% with a minimum mean of 4.1390% and a maximum mean of 4.5850%. It has a standard deviation of 0.09890% for 61 observations. Ten countries have been used for seven years for the determination of the mean and standard deviation. The model has been logged so as to standardize the data as they are measured in different scales. The observation for log GDP per capita is 70, that is, 10 countries x 7years. The mean is the average value of each variable over the number of observations. Moreover the standard deviation is an important tool to measure the spread, it is the square root of the variance. As it can be analysed that the panel data is not balanced, that is the observation number is not the same for each variable due to unavailability of information, OLS will work for unbalanced panel (Table 1).

RESULTS AND DISCUSSION

In this study, the Hausman (1978) test was conducted to choose between the random effect modeling and the fixed effect modeling. Table 2 shows the Hausman test. And hence given that the p-value is 0.0044 which is less than 0.05, H0 is rejected and H1 is accepted. Consequently, at 5% significant level, it can be concluded that it will not be safe to use the random effects as fixed effect model is best suited for this study. Moreover, the purpose of the multiple regressions is to study the impact or relationship of the dependent variable with the independent variables, that is, the impact of GDP per capita on tax evasion, FDI, GDFCF, export, import, inflation and government spending. If there are two independent variables which are correlated to each other, then there will be a problem of multicollinearity. The GDP per capita is the only variable to be dependent on the independent variables. In this study there is no multicollinearity between the independent variables as the correlation coefficients are neither approach -1 no 1 (Table 3). Therefore, there is no problem in the study so far, there will be no need to remove any independent

variables. However when removing an independent variable, it causes a huge change in the values and the sign of other independent variables.

Nevertheless, in this research there was the problem of heteroscedasticity and of serial correlation. Heteroscedasticity is a situation where the error term for all the relationship of the dependent variable and the independent variables are not the same. A modified Wald test for groupwise heteroskedasticity is conducted. Thus, H0 is rejected as the p value is 0 which is lesser than 0.1, hence accepting H1 and concluding that there is significant evidence at 10% significance level that there is problem of Heteroscedasticity in the dataset. Serial Correlation also known as autocorrelation is present when the regression errors are correlated across observations. When there is a serial correlation, the correlation and the covariance between the error terms of different time period do not equal to zero. A Wooldridge test for autocorrelation is conducted. The Wooldridge test has been put forward by Wooldridge (2002) where he has established an easy way to test for serial correlation in panel data. Therefore at 10% level of significance, it can be deduced that the p-value 0.044 is less than 0.1 thus H0 is rejected and H1 is accepted. Hence it is concluded that there is serial correlation.

In this model, as there is both heteroscedasticity and serial correlation problem, the best way to correct the issues is by making use of the generalized least squares (GLS). The GLS is a better and efficient way to take into account the extra information. The GLS is also considered to be more efficient compared to Ordinary Least squares and weighted least squares. Table 4 shows the regression using GLS.

There are various researches measuring the influence of tax evasion on GDP per capita and the impact of an increase or decrease in the income per head on tax evasion. In this study tax evasion being an independent variable has a coefficient 0.403 which means that a 1% increase in the TE will lead to 0.403% increase in the growth of GDP per capita. A rise in the GDP per capita is indicated by the positive sign of the coefficient of the TE.

Table 2. Hausman test.

Variable	(1) Fixed effect	(2) Random effect
Intax	0.925* (0.064)	0.792 (0.153)
Infdi	-0.035 (0.293)	-0.020 (0.612)
Ingdfcf	-0.121 (0.708)	-0.167 (0.648)
Inexport	-0.796** (0.027)	-0.522 (0.200)
Inimport	0.813* (0.084)	0.720 (0.178)
Ininflation	-0.035 (0.129)	-0.038 (0.158)
Ingovt	-2.646*** (0.006)	-2.317** (0.028)
Constant	17.369*** (0.000)	15.650*** (0.003)
Observations	58	58
R-squared	0.370	
Number of id	10	10
R2	0.0192	0.0927
F-Stat	3.446	
Prob>F	0.00544	
Chi2	-	15.73
Prob>Chi2	-	0.0277

pval in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Model	Chi-square statistics	P-value	Decision
Growth	20.61	0.0044	Fixed effect model

In this respect at 10% significance level, it can be deduced that the p-value for the TE is 0.545 which implies which is greater than 0.1, thus this implies that TE is not significant and is not an important determinant of the growth of the GDP per capita in this study of SSA. Franzoni (1998) who mentioned Allingham and Sandom (1972), Srinivasan (1973) and Yitzhaki (1974) found a positive relationship with the level of income that is the income per head increases the tax evasion rises as well. However Kafkalas et al. (2014) found a negative relationship between the tax evasion and the GDP per head. The GDP per capita has an adverse impact on tax evasion and thus encouraging individuals to evade tax.

The coefficient for the FDI is -0.010. In this case having a negative sign indicates that a 1% increase in FDI will lead to 0.01% fall in the GDP per capita for this sample. To add to it, the p-value which is 0.849 which is larger than 0.1 at 10% significance level, will lead to an insignificance decision for this variable, that is, the FDI is not an important variable to determine the growth of the GDP per capita in this sample of SSA. Moreover, Umeora (2013) and Saquib et al. (2013) also found a negative

Table 3. Multicollinearity table (multicollinearity matrix).

Variable	Intax	Infdi	Ingdfcf	Inexport	Inimport	Ininflation	Ingovt
Intax	1	-	-	-	-	-	-
Infdi	0.46	1	-	-	-	-	-
Ingdfcf	0.7	0.32	1	-	-	-	-
Inexport	0.31	0.19	-0.34	1	-	-	-
Inimport	0.61	0.17	0.15	0.64	1	-	-
Ininflation	0.13	0.19	0.23	-0.15	-0.09	1	-
Ingovt	-0.45	-0.18	-0.21	-0.52	-0.15	-0.07	1

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

Model	Chi-square statistics	P-value	Decision
Growth	291.15	0.000	Reject Ho

Wooldridge test for autocorrelation in panel data

Model	F-statistic	P-value	Decision
Growth	15.434	0.044	Reject Ho

Table 4. Generalised least squared.

Variable	(1) GLS: LnGDP
Intax	0.403 (0.545)
Infdi	-0.010 (0.849)
Ingdfcf	0.822* (0.063)
Inexport	1.273** (0.033)
Inimport	-1.023* (0.061)
Ininflation	0.009 (0.821)
Ingovt	-0.426 (0.762)
Constant	5.323 (0.452)
Observations	57
Chi2: Wald	35.46
Prob>Chi2	0.000

pval in parentheses
*** p<0.01, ** p<0.05, * p<0.1

relationship between the GDI and the FDI. Muhammad et al. (2010) found a positive relation between FDI and income per capita.

At 10% significance level, the p-value for the GDFCF is 0.063, it is less than 0.1 therefore it indicates that GDFCF is significant and important for this study. Additionally the coefficient for the GDFCF is 0.822. Hence an increase of 1% in the GDFCF will lead to an increase by 0.822% in the GPD per capita. S.Ismail and S.Ahmed (2015) obtained a significant relationship between GDP and GDFCF.

The coefficient of the export is 1.273. This illustrates that a rise of 1% in the export will lead to a rise as well by 1.273% in the growth of GDP per capita. Furthermore as the p-value of the export is 0.033 at 5% level of significance, it is denoted that 0.033 is smaller than 0.05 therefore this study shows that export is crucial and essential for the determination of the growth of the GDP per capita. Guillemineau et al. (2007) and Ekholm and Södersten (2002) found a positive relationship between export and the GDP per capita.

The coefficient of import is -1.023; therefore a 1% increase in the import will cause a decrease by 1.023% in the growth of the GDP per capita in this study. The negative sign is the root of the decrease of the growth of the GDP per capita. Moreover the p-value of the import is 0.061. At 10% significance level, the p value of the import is less than 0.1. Hence it means than the variable import is an important and significant element in the study to determine the growth of the GDP per capita. Guillemineau et al. (2007) obtained a negative relationship between the GDP per capita and the imports.

The coefficient of inflation in this GLS regression is 0.009. Considering the positive sign of the coefficient, it can be concluded that a 1% growth in the inflation will

positively influence the growth of the GDP per capita by not a huge percentage but it will increase the GDP per capita by 0.009%. Furthermore at 10% significance level, the p-value of the inflation is 0.821 which is greater than 0.1, thus inflation will be regarded to be insignificant and not key determinant of this study. Khan and Ssnhadji (2001) stated that there is a positive relationship between the inflation and the GDP growth only when the inflation rate is low which are the case for developed countries and the opposite for developing countries. According to Li and Zou (2002) study they found a negative relationship between inflation and income/GDP per capita.

The government expenditure's coefficient is -0.426. A negative sign means a decrease by 0.426 of the growth of the GDP per capita as the government expenditure would increase by 1%. The p-value of government expenditure is 0.762, at 10% significance level; it is larger than 0.1 which implies that in this sample of SSA, government expenditure is not an essential determination for the growth of the GDP per capita. In the research of Thornton (1998), it was stated that there is the possibility of both positive and a negative relationship between the GDP per capita and the government expenditure. Herrera (2007) stated that there is a positive link between the public expenditure and the GDP.

On that note it is said that when FDI is increasing, GDP is decreasing, thus it will obviously have an impact on the tax revenue and the behavior of investors to comply or no with the tax law. The multinational companies are mostly attracted with countries with weak tax system whereby they pay less tax and some MNEs found it easier to evade taxes and hide the profits they are earning in the developing countries. Likewise any change in the GDP is because of the variation in the GDFCF. Therefore it can be assumed that if the GDP is increasing, people may tend to evade taxes if the tax system is a progressive one. Therefore an increase in the real income per capita can easily influence the tax payer for not complying with the tax payment and on the other hand be encouraged to pay the tax as the level of income has increased. It can also be deduced that an increase in import will decrease the income level which in turn may be an influential factor for tax evaders and other tax payers.

Fishburn (1981) had set out that an increase in the inflation might cause a rise in the tax evasion. Herrera (2007) stated that there is a positive link between the public expenditure and the GDP as it also depends if whether the country is a developing one or a developed one. As according to him, in the developed economy taxation is not the only means to use for the public expenditure but there are other factors. However in developing countries, as being poor by nature, taxation is of the major source of government revenue. Thus the burden of the contribution of income to the government will be put on the faithful and loyal taxpayers and hence having a negative relationship between the government expenditure and the GDP per capita. That is the government spending is directly connected with tax revenue, an increase in the tax revenue means a decrease in the income per capita and thus an increase in the public spending. In the case of Sub Saharan African countries, all the countries are developing countries hence it can be said that this is the reason for the negative relationship between the two variables. Moreover tax evasion is more probable.

CONCLUSION

Tax evasion is a severe problem in the Sub Saharan Africa region. As measured using the generalized least squared method for a period of seven years, it was found that the tax evasion has a positive relationship with the GDP per capita in the Sub Saharan Africa. Thus it can be concluded that the impact of the tax evasion on the GDP per capita growth of Sub Saharan Africa is favorable. One reason for an increase in the GDP per capita may be because of an increase in the tax evasion in line with Allingham and Sandom (1972), Srinivasan (1973) and Yitzhaki (1974). Moreover, the study does not only show the tax evasion affecting the income per head but it also demonstrate that the tax evasion will indirectly influence the public spending in such a way that when tax payment is decreased the government spending will decrease. Thornton (1998) stated the possibility of both positive relationship in developed economies and a negative relationship in developing economies between the GDP per capita and the government expenditure. As taxation is the only revenue for the government in Sub Saharan African developing countries, if not complying with taxes the income per head would increase and consequently decreases the government spending on public goods. Additionally if inflation increases, the price level increases thus the income would not be enough to spend if the taxpayer would comply and GDP per capita increase. Another reason for tax evasion to occur is when inflation increases. As a globe, the tax evasion is harmful for the economy and its development.

RECOMMENDATION

The recommendation to fight against the tax evasion for the economic benefit of Sub Saharan Africa, it will be advised to review the tax system, to implement strict and severe penalties and very high fines for tax evaders. Moreover, the tax authorities of Sub Saharan Africa need to appoint more experts in auditing department to be able to detect the non-compliant tax payers easily and rapidly. The taxpayers need to be given an incentive and a motive to pay for the taxes like in Mauritius where there is a scheme called "Lucky Draw Scheme". The scheme is

focused on the submission of VAT invoices to the Mauritius Revenue Authority and by participating in this activity an individual can win prizes. Thus creating an incentive may help to decrease the level of tax evasion.

Moreover, the tax evasion can be controlled by private agency along with the government as well. Hood (1986) has mentioned the privatization of the tax enforcement as the private firms would do the work effectively and with skilled workers.

LIMITATIONS

The presence of the tax evasion in the Sub Saharan African countries has several limitations:

1. The tax evasion reduces the tax revenue collected by the tax authority for the government hence the government spending will dwindle.
2. Therefore there will be no prospective of rapid and steady economic growth and development in this developing area. The economies will not have enough resources to be up to date in technology and other economic benefits. It can also give rise to the rate of unemployment.
3. Additionally, the hidden money would cause a disruption in the circulation of money as money would be disappearing from the economy.
4. Due to the chaos in the money flow and the lack of money in the circulation, the government of the economy would be obliged to take loan from external banks and the World Bank, which lead to an increase in debt of the economies.
5. Seeing people evading taxes, some taxpayers are influenced and will tend to not comply with the tax payment.
6. Those faithful and loyal taxpayers would be victims to pay for higher taxes if the tax rates have been increased because of the tax evasion.

Conflict of interests

The authors have not declared any conflict of interests.

REFERENCES

Adam MC, Ginsburgh V (1985). The effects of irregular markets on macroeconomic policy: some estimates for Belgium. Euro. Econ. Rev. 29(1):15-33.

Andreoni J, Erard B, Feinstein J (1998). Tax compliance. J. Econ. Lit. 36(2):818-860.

Alfaro L (2003). Foreign direct investment and growth: Does the sector matter. Harv. Bus. Sch. pp. 1-31.

Allingham M, Sandmo A (1972). Income tax evasion: a theoretical analysis. J. Public. Econ. 1(3-4):323-338.

Alm J, Torgler B (2006). Culture differences and tax morale in the United States and in Europe. J. Econ. Psychol. 27(2):224-246.

Alm J, Torgler B (2011). Do ethics matter? Tax compliance and morality. J. Bus. Ethics 101(4):635-651.

Baumann F, Friehe T (2010). Tax evasion, investment, and firm activity. FinanzArchiv: Public. Financ. Anal. 66(1):1-14.

Brezeanu P, Celea S, Stanciu AP (2011). Forms of tax evasion in Romania. Analytical perspective. Of The University Of Petroşani~ Economics~, P 33.

Crane SE, Nourzad F (1986). Inflation and tax evasion: An empirical analysis. Rev. Econ. Stat. pp. 217-223.

Dalu T, Maposa VG, Pabwaungana S, Dalu T (2012). The impact of tax evasion and avoidance on the economy: a case of Harare, Zimbabwe. Afr. J. Econ. Sustain. Dev. 1(3):284-296.

De Sousa PR (2008). Tax Treaty Override. Schilcher, Michael/Weninger, Patrick, Fundamental Issues and Practical Problems in Tax Treaty Interpretation, Linde Verlag, Wien, pp. 241-266.

Ekholm K, Södersten B (2002). Growth and trade vs. trade and growth. Small Bus. Econ. 19(2):147-162.

Embaye AB (2007). Essays on Tax Evasion and Government Spending in Developing Countries.

Feige EL (1997a). Underground activity and institutional change: Productive, protective and predatory behavior in transition economies. Transforming Post-communist Political Econ. 21:34.

Feige EL (1997b). Revised estimates of the underground economy: Implications of US currency held abroad (13805). University Library of Munich, Germany.

Feinstein JS (1991). An econometric analysis of income tax evasion and its detection. RAND J. Econ.14-35.

Fishburn G (1981). Tax evasion and inflation. Aust. Econ. Pap. 20(37):325-332.

Franzoni LA (1998). Independent auditors as fiscal gatekeepers. Int. Rev. Law. Econ. 18(4):365-384.

Friedman E, Johnson S, Kaufmann D, Zoido-Lobaton P (2000). Dodging the grabbing hand: the determinants of unofficial activity in 69 countries. J. Public Econ. 76(3):459-493.

Guillemineau C, Khoman E, Liadze I (2007). Euro Area: investment, immigration and income per capita. Natl. Institute Econ. Rev. 200:21-30.

Haig RM, Ecker-R LL (1935). Direct Taxation in Hungary. Polit. Sci. Q. pp. 70-106.

Hassan A (2007). 'Exports and Economic Growth in Saudi Arabia: A VAR Model Analysis', J. Appl. Sci. 7(23):3649-3658.

Hausman JA (1978). Specification tests in econometrics. Econmetrica: J. Econ. Soc. pp. 1251-1271.

Herrera S (2007). Public expenditure and growth World Bank Publications. Vol. 4372.

Hood C (1986). Privatizing UK tax law enforcement?. Public Administration, 64(3):319-333.

Ismail S, Ahmed S (2015). Economic Growth and Macro Variables in India: An Empirical Study. Ismail, Saba and Ahmed, Shahid, Economic Growth and Macro Variables in India: An Empirical Study, J. Econ. Dev. 17(3):42-59.

James S, Nobes C, Channon G (1978). The economics of taxation. P. Allan.

Jackson BR, Milliron VC (1986). Tax compliance research: Findings, problems, and prospects. J. Account. Lit. 5(1):125-165.

Jorgenson DW, Nishimizu M (1978). US and Japanese economic growth, 1952-1974: an international comparison. Econ. J. 88(352):707-726.

Kafkalas S, Kalaitzidakis P, Tzouvelekas V (2014). Tax evasion and public expenditures on tax revenue services in an endogenous growth model. Eur. Econ. Rev. 70:438-453.

Kesselman JR (1997). General payroll taxes: Economics, politics, and design (No. 101). Canadian Tax Foundation= Association canadienne d'études fiscales.

Khan MS, Ssnhadji AS (2001). Threshold effects in the relationship between inflation and growth. IMF Staff papers. pp. 1-21.

Kreutzer D, Lee DR (1986). On Taxation & Understated Monopoly Profits. Natl. Tax. J. 39(2):241-243.

Li H, Zou HF (2002). Inflation, growth, and income distribution: A cross-country study. Ann. Econ. Finance 3(1):85-101.

Massell BF, Pearson SR, Fitch JB (1972). Foreign exchange and economic development: an empirical study of selected Latin American countries. Rev. Econ. Stat. pp. 208-212.

Michaely M (1977). Exports and growth: an empirical investigation. J. Dev. Econ. 4(1):49-53.

Oberholzer R (2008). Attitudes of South African taxpayers towards taxation: A pilot study. Account. Bus. Public Interest 7(1):46-52.

Pantoja GS, Penaloza RS (2014). Tax evasion under behavioral structures. Economia 15(1):30-40.

Richardson G (2006). Determinants of tax evasion: a cross-country investigation. J. Int. Account. Audit. Tax. 15(2):150-169

Sachs JD, Warner A (1995). Economic Reform and the Process of Global Integration, Brookings Papers on Economic Activity 1: 1-118.

Salvatore D (1983). A Simultaneous Equations Model of Trade and Development with Dynamic Policy Simulations Kyklos, 36(1):66-90.

Saqib D, Masnoon M, Rafique N (2013). Impact of foreign direct investment on economic growth of Pakistan. Adv. Manage. Appl. Econ. 3(1):35-45.

Slemrod J (2007). Cheating ourselves: The economics of tax evasion. J. Econ. Perspect. 21(1):25-48.

Smith P (1994). Assessing the Size of the Underground Economy: The Canadian Statistical Perspectives, mStatistics Canada.

Becker MW, Spicer LA (1980). Fiscal inequity and tax evasion: An experimental approach. Nat. Tax J. pp. 171-175.

Spicer MW, Lundstedt SB (1976). Understanding Tax Evasion. Public Finance 31:295-230

Srinivasan TN (1973). Tax evasion: A model. J. Public. Econ. 2(4):339-346.

Tanzi V (1977). Inflation, Lags in Collection, and the Real Value of Tax Revenue (L'inflation, les retards de recouvrement et la valeur réelle des recettes fiscales) (Inflación, desfases en la recaudación y valor real de los ingresos tributarios). Staff Papers-International Monetary Fund, pp.154-167.

Thornton J (1998).The growth of public expenditure in latin America: A Test Of'wagner's Law'. Cuadernos de Economía, pp. 255-263.

Torgler B, Schaltegger CA (2006). Tax morale: a survey with a special focus on Switzerland. Swiss J. Econ. Stat. (SJES), 142(III):395-425.

Torgler B, Schneider F (2007). Shadow economy, tax morale, governance and institutional quality: a panel analysis.

Torgler B, Schneider F (2009). The impact of tax morale and institutional quality on the shadow economy. J. Econ. Psychol. 30(2):228-245.

Torgler B (2011). Tax morale and compliance: review of evidence and case studies for Europe. World Bank Policy Research Working Paper Series.

Tyler WG (1981). Growth and Export Expansion in Developing Countries: Some Empirical Evidence, J. Dev. Econ. 9(1):121-130

Umeora CE (2013). Effects of Foreign Direct Investment (FDI) on Economic Growth in Nigeria. *Available at SSRN 2285329.*

Walker MB, Sennoga EB (2007). Does Tax Evasion influence the composition of tax instruments? Examining the effect of tax evasion on tax structure.

Yitzhaki S (1974). Income tax evasion: A theoretical analysis. J. Public. Econ. 3(2):201-202.

WEBSITES:
1. INVESTOPEDIA, www.**investopedia**.com/
2. INTERNATIONAL MONETARY FUND, http://www.imf.org/en/data
3. OECD: www.**oecd**.org/
4. TAX JUSTIE NETWORK, www.**taxjustice**.net/
5. WORLD BANK, http://data.worldbank.org/
6. WIKIPEDIA, https://www.**wikipedia**.org/

BOOK:
ANDERTON, A., 2010.Economics. Fifth Edition