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## **Government Expenditure and Performance of Public Secondary Schools in Zanzibar**

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### **Abstract**

The Vector Autoregressive and Vector Error Correction Modelling were used to examine the impact of government expenditure on the performance of public ordinary (Form II and Form IV) and advanced (Form VI) secondary level respectively from the year 1990 to 2019. The results show that increase one value in government expenditure for education (GE) lead to increase the education performance (EDP) of Form II and Form IV by 2.46 and 5.11 values respectively. A satisfactory evidence to the Form VI model shows GE have positive effect with EDP in long and short run. A one value increase in GE promotes the EDP by 4.21 and 3.16 in long and short run correspondingly. The pupil teacher ratio is negative significant with EDP of Form II and Form IV while positive in Form VI. On other hand, the pupil classroom ratio shown to have negative significant effect with EDP in Form IV while it is insignificant for Form II and Form VI. Thus, the study concluded that the more government spending in education sector could promotes the performance of education in all secondary levels. Based on the findings, the study suggests that the allocation of fund should be focused on investing in education materials like books and computers; and employing more teachers in all secondary levels as it was seen to be more efficient in education performance.

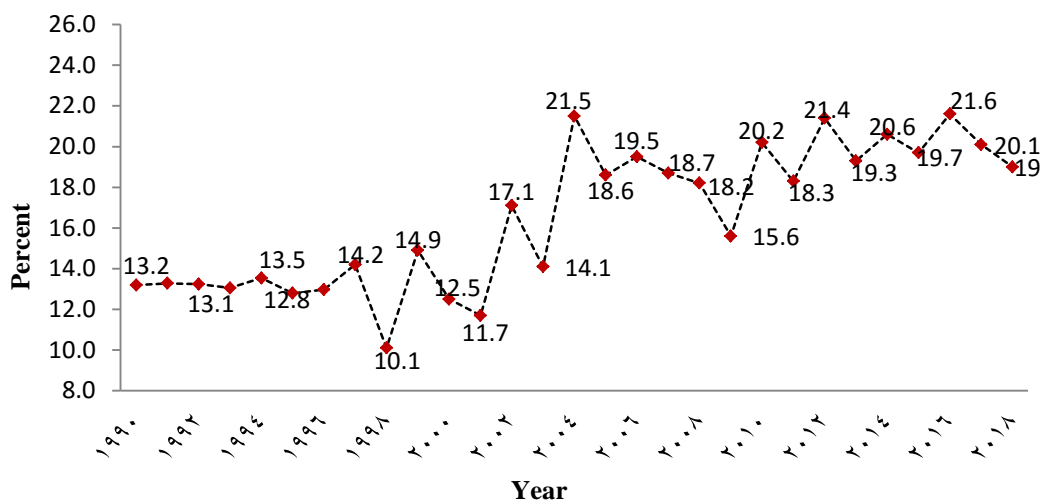
**Keywords:** Education Performance; Government Expenditure; VAR and VECM.

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## 1. Introduction

History shows the responsibility of all governments around the world is to provide services that are basic rights their citizens whereby individuals cannot effectively provide for themselves. From the perception of basic rights, education is among the important one which plays vital role in a country to be able to absorb technology and develop the capacity for the realization of development and sustainable economic growth. Zanzibar as the part of the world also recognized education as a basic human right immediately after the revolution of 1964 when the government announced to provide free education for all. According to [1], since the revolution of Zanzibar, the government allocates funds in every financial year for the purposes of increase and sustainability of the education sector. Figure 1 shows the proportion of government spending on education sector increased from 13.2% in 1989/90 to 19.0% in 2018/19.



**Figure 1:** Trend of Zanzibar Government Expenditure on Education Sector from 1990-2018

**Source:** Office of Chief Government Statistician Data, 2020

It is becoming difficult to ignore government expenditure when we discuss the development of education sector in any country. This is because government expenditure plays a vital role to boost up the development programs of countries including educational programs. The importance of government in providing educational facilities shown by [2,3,4,5] when they examined the effect of school resources to student achievements. They found that resources have positively related to student outcomes. Therefore, they suggested that the greater government expenditure on education sector will be able to increase the quantity and quality of education and then enhance the productive human capital who promote the economic growth. The relationship between government expenditure on education and education performance continues to attract the attention of many. However, many scholars support the positive relation but some claimed that education expenditures have negatively and significantly effect on educational access and performance. [6] has advocated that, there is no strong or consistent relationship between student performance and school resources, at least after variations in family inputs are taken into account. Furthermore, [7,8] found the negative relation between expenditure and student performance. He emphasized his results by paraphrased his conclusion in widely cited article as “Variations in

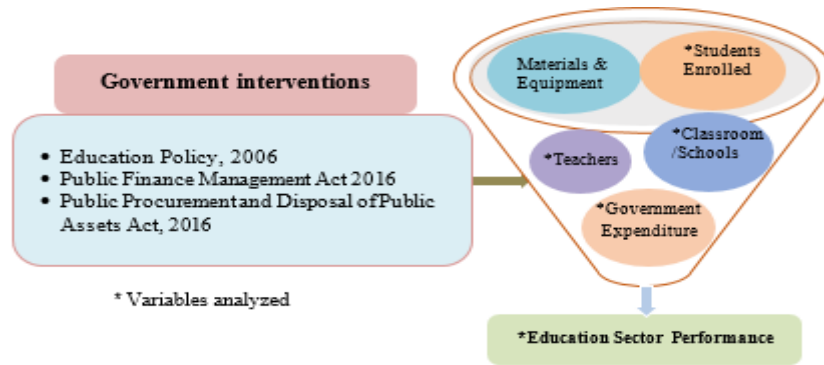
school expenditures are not systematically related to variations in student performance". Following the announcement of free education to all in 1964, the education sector is overseen by the Ministry of Education. Since then, much effort has been taken by Government in implementing that order as well as improving the entire education sector. These efforts are aligned with the requirement of World Declaration on Education for All of year 2000, SDG and Zanzibar Vision 2020 which requires the transition rate of secondary education to reach 100 percent at the end of the year 2020. The examination report of 2019, shows in 2019 the pass rate of Form II candidates is 75.8 percent, Form IV achieved 55.7 percent and Form VI reached 95.7 percent. This means that considerably approximately half of pupils have access to the final level of ordinary secondary (Form IV). [9] proposed the benchmark for a country to achieve SDG 4 (education goal) should allocate at least 4% to 5% of GDP to education, and/or 15% to 20% of public expenditure to education. For more than decade, Zanzibar Government allocated public expenditure to education for an average of 19.5% and GDP to education expenditure is around 4.3% that align with the benchmark proposed by UNESCO. Despite the above-mentioned achievements, still most pupils do not reach Form VI because of their performance in the selective Form II and Form IV examination, as well as other factors contributing to dropout in the primary and ordinary secondary levels. This resulted many pupils leave the system after completing Form II or IV [10]. Moreover, the transition rate in 2018 for Form II to Form III was 72.2% and Form IV to Form V was 16.4% indicates that only a small portion of student's complete higher secondary education in Zanzibar. Therefore, the target of Vision 2020 that the transition rate to the second cycle of secondary education should reach 100 percent by the last year of the Vision has not yet been adequately achieved. Therefore, this study aims to examine the impact of government expenditure on performance of public secondary schools in Zanzibar for the period of 1990-2019. Specifically, the study examined the performance of final examination results for Form II, IV and VI level. This study is organized in five main sections. Section 2 contains the details of theoretical and empirical literature while section 3 introduces methodological techniques used including data sources, variables and their measurement. The study findings will be presented in section 4 and the final section will cover present conclusion and recommendation with respects to findings.

## **2. Materials and Methods**

### **2.1. Materials**

The study significantly will increase the stock of knowledge on the role of government expenditure on education performance for developing countries. According to the Government Finance Statistics Manual of 2014, the term government expenditure refers to the government expense or outflow of resources to the various sectors of the economy and the net acquisition of nonfinancial assets. While [11,12], when they find the link between financing and performance of education describe the education performance as the educational achievement attained over a specific time in school, college and university. Reference [13] explain that there are different theories relating to public expenditure. According to [14], the human capital investment theory explain that money can be used to buy better educational quality which may affect the current educational performance and future demand on for education sector. They also in their study found that the household with low income their children have the possibility of getting negative impacts on their school performance. The findings of [15] confirm the Musgrave and Rostow's theory which state that usually any government makes decisions for the social wellbeing by considering the basic social services that are required to be provided by the public sectors

such as security, health, education and sanitation. Professor Samuelson in 1954 developed the pure theory of public expenditure and categorized expenditure into private and collective consumption goods. Whereby the categorization was used to replicate the category of government spending. He also explained that, public expenditure will grow parallel with the labour growth and resulted the government expenditure on education to increase. Additionally, in 1917 the German economist called Adolph Wagner formulated Wagner's law which show the direct link between economic development and public expenditure. The law states that for growing economies, the share of all major government expenditure increases due to the pressure of social progress. Wagner also argued that increasingly larger expenditures on education and public health are needed with higher per capita national products. The OLS regression and Error Correction Model used by [16], when he evaluates the impact of government expenditure on education attainment in South Africa from 1998-2015. The results confirm that theory of human capital due to positive relationship found between Gross enrolment ratio and government expenditure. Reference [17] also applied the same method as used by [18] and found the same results when they examined government education spending and education outcome in Nigeria from 1970 to 2013. Additionally, the positive relation also showed by [19] when they using non-parametric approach to measure relative efficiency of Saudi Arabia public spending over the period 1988 to 2013. Though, when they incorporating environmental variables to explain the inefficiency scores by applying DEA-Bootstrap analysis the results show that government spending was mainly inefficient in education sector. The negative impact was also found by [20], when they investigate the impact of government spending on education and healthcare development outcomes for the period of 1995 to 2011 in Sri Lanka at provincial level. Panel data have been used in their investigation and found that government spending does not have effect on student failure rate but student teacher ratio has effect. Reference [21] when writing the paper concerning the efficiency in reaching the MDGs used panel data from 75 countries for the period 1990 to 1998. The Stochastic Frontier Analysis (SFA) used to estimate health and education efficiency. The study utilized primary enrolment rate as the output variable and real GDP per capita, adult illiteracy, and education expenditure per capita as input variables. The findings suggest that neither education expenditure nor regional differences have a statistically significant impact on net primary enrolment. Moreover, the VECM used by [22] in investigating the impact of government expenditure on total school enrolment in Nigeria from the period of 1980 to 2010. The study finds no evidence that government expenditure is significantly associated with education outcomes in Nigeria. In considering the government expenditure trend and decision-making process in Zanzibar, the above literatures provide insight into the impact of government expenditure on wellbeing of societies. However, all the above-mentioned theories have relevance in Zanzibar context but this study will consider human capital development theory because it relates directly with the expenditure on social services including education and health which are core to human capital development. In the presence of conducive environment for education sector the government expenditure will enhance the productive human capital who promote the economic growth. Therefore, Figure 2 presents a simple diagrammatically conceptual ideas behind this study. independent variables that present.



**Figure 2:** Dependent and the Independent Variables

*Source: Constructed by Author, 2020*

**2.2. Model Specification**

The study adopted the models of [5;3,20], and assumed a linear relationship between variable. Three models will be used to achieve the specific objectives. Therefore, the regression models will be:

**For Objective One:**  $EDP_{II}_t = \beta_0 + \beta_1 GE_t + \beta_2 PTR_t + \beta_3 PCR_t + \varepsilon_t$  (1)

**For Objective Two:**  $EDP_{IV}_t = \beta_0 + \beta_1 GE_t + \beta_2 PTR_t + \beta_3 PCR_t + \varepsilon_t$  (2)

**For Objective Three:**  $EDP_{VI}_t = \beta_0 + \beta_1 GE_t + \beta_2 PTR_t + \beta_3 PCR_t + \varepsilon_t$  (3)

Whereby, the parameters to be estimated are  $\beta_1, \beta_2, \beta_3$  while  $\beta_0$  and  $\varepsilon$  are constant and stochastic error term respectively.  $t = 1, 2, \dots$  is the time period from 1990 to 2019. EDP\_II, EDP\_IV and Form IV are education performance for Form II, IV and VI respectively. The term GE represent government expenditure on education sector, PCR is the pupil’s classroom ratio and PTR is pupil’s teacher ratio.

**2.3. Variables Description and their Measures**

**Table 1:** Measurement of Variables

Variable	Measurement	Source	Expected sign
EDP_II	Final Exam Form II Pass Rate	Zanzibar Statistical Abstracts- OCGS	Positive
EDP_IV	Final Exam Form IV Pass Rate		Positive
EDP_VI	Final Exam Form VI Pass Rate		Positive
GE	MoEVT Expenditure to GDP	MoEVT Budget Speeches	Positive
PTR	Pupil’s Classroom Ratio	Statistical Abstracts- MoEVT	Negative
PCR	Pupil’s Classroom Ratio		Negative

*Source: Constructed by authors (2020)*

The main source of data that used in this study is secondary data from MoEVT and OCGS. This is because these are the authorized institution for providing official data in relation to variables required for this study. Therefore, the expected signs, source and measurement of all variables used are shown in Table 1.

**2.4. Empirical Methodology**

**2.4.1. Correlation Analysis**

Correlation analysis is also used to test whether the regression analysis is robust. The correlation of coefficient (r) is computed to determine the degree of linear association between variables. The value of r lies between -1 and 1. When the value of r is negative indicates the correlation between the two variables is negative, this means when one variable increases, the other variable will decrease and the opposite is also true. However, when the value of r is zero means the two variables are not correlated.

**2.4.2. Unit root Test**

The unit root test has to be taken into account for verifying whether the data are suitable for analysis [23]. Failure to do that, the study can be obtain the spurious results from unrelated data when non-stationary series are used in regression analysis [24]. Hence, to avoid this problem, the study used ADF test and PP test to check the unit root problem for each series. The null hypothesis is  $H_0: \varphi_1 = 0$  (there is a unit root problem) tested against the alternative hypothesis that  $H_A: \varphi_1 < 0$  (no unit root problem). The  $H_0$  is rejected when the p-value of test is less than the critical value and concluded the data are stationary. The test is conducted for the coefficient of the lagged dependent variables from the following equations:

$$\text{No constant, no trend: } \Delta Y_t = \varphi_1 Y_{t-1} + \varepsilon_t \tag{4}$$

$$\text{Constant, no trend: } \Delta Y_t = \beta_0 + \varphi_1 Y_{t-1} + \varepsilon_t \tag{5}$$

$$\text{Constant and trend: } \Delta Y_t = \beta_0 + \varphi_1 Y_{t-1} + \beta_t + \varepsilon_t \tag{6}$$

Whereby,  $\Delta Y_t$  represent the dependent variables,  $Y_{t-1}$  lagged dependent variables,  $\beta_0$  and  $\varepsilon$  are constant and stochastic error term respectively.  $\varphi_1$  is the coefficient of the lagged dependent variables,  $\beta_t$  coefficient on time trend series and t is the time period from 1990 to 2019.

**2.4.3. Co-integration Test**

The idea of co-integration is for investigating the existence of long run relationship in the stochastic trends in the examined variable. Therefore, this study applied the Johansen test of co-integration in  $EDP_t$  model with multivariable. The following model is tested to ascertain whether the variables are co-integrated or not.

$$EDP_t = \theta + \sum_{i=1}^{T-1} w_i EDP_{t-i} + \pi EDP_{T-t} + \varepsilon_t \tag{7}$$

Whereby,  $\theta$  is a constant,  $w$  is a coefficient matrix and  $\pi$  is the number of independent co-integrating vectors, if

( $\pi = 0$ ) means no co-integration between series of variables used. Following the study of [25], if one series co-integrates this means that error in the regression model is stationary although the dependent and independents variables are nonstationary it is concluded the existence of long run relationship.

**2.4.4. Vector Autoregressive Mechanism**

If the variables used do not realize the long run relationship, the model would be estimated by using Vector Autoregressive mechanism (VAR) which estimate the short run impact by using the OLS method. The estimated model is as follow:

$$Y_t = \varphi_0 + \sum_{i=1}^p w_i Y_{t-1} + \alpha X_t + \varepsilon_t \tag{8}$$

Whereby,  $Y_t$  represent the vector of non-stationary Integrated order one variables,  $Y_{t-1}$  lagged dependent variables,  $\varphi_0$  and  $\varepsilon$  are constant and stochastic error term respectively.  $p$  is the number of lags,  $w$  and  $\alpha$  are coefficient matrices,  $X_t$  is the vector of deterministic variables and  $t$  is the time period from 1990 to 2019.

**2.4.5. Vector Error Correction Mechanism**

If the long run relationship will be realized, the model can be estimated by using vector error correction mechanism which allow for the separation out of long run and short run impacts as well as the error correction term (ECT) which show the speed of adjustment of the variables used to return to the equilibrium position. Then, the empirical VECM can be demonstrated as follows:

$$\Delta EDP_t = \eta_1 \sum_{i=1}^{k-1} w_{1,i} \Delta EDP_{t-i} + \sum_{i=1}^{k-1} \varphi_{1,i} \Delta GE_{t-i} + \sum_{i=1}^{k-1} \delta_{1,i} \Delta PCR_{t-i} + \sum_{i=1}^{k-1} \gamma_{1,i} \Delta PTR_{t-i} + \mu_1 ECT_{t-i} + \varepsilon_t \tag{9}$$

$$\Delta GE_t = \eta_2 \sum_{i=1}^{k-1} w_{2,i} \Delta EDP_{t-i} + \sum_{i=1}^{k-1} \varphi_{2,i} \Delta GE_{t-i} + \sum_{i=1}^{k-1} \delta_{2,i} \Delta PCR_{t-i} + \sum_{i=1}^{k-1} \gamma_{2,i} \Delta PTR_{t-i} + \mu_2 ECT_{t-i} + \varepsilon_t \tag{10}$$

$$\Delta PCR_t = \eta_3 \sum_{i=1}^{k-1} w_{3,i} \Delta EDP_{t-i} + \sum_{i=1}^{k-1} \varphi_{3,i} \Delta GE_{t-i} + \sum_{i=1}^{k-1} \delta_{3,i} \Delta PCR_{t-i} + \sum_{i=1}^{k-1} \gamma_{3,i} \Delta PTR_{t-i} + \mu_3 ECT_{t-i} + \varepsilon_t \tag{11}$$

$$\Delta PTR_t = \eta_4 \sum_{i=1}^{k-1} w_{4,i} \Delta EDP_{t-i} + \sum_{i=1}^{k-1} \varphi_{4,i} \Delta GE_{t-i} + \sum_{i=1}^{k-1} \delta_{4,i} \Delta PCR_{t-i} + \sum_{i=1}^{k-1} \gamma_{4,i} \Delta PTR_{t-i} + \mu_4 ECT_{t-i} + \varepsilon_t \tag{12}$$

In the above models, the value of  $\eta$ ,  $w$ ,  $\varphi$ ,  $\delta$  and  $\gamma$  represent the coefficient values,  $\mu ECT_{t-i}$  shows the causality

between variables and  $\varepsilon_t$  explain the speed of adjustment from dis-equilibrium to equilibrium in the long run.

### 3. Data Analysis and Discussion of Findings

#### 3.1. Descriptive Statistics

The results in Table 2 confirmed the variables used have the features of normal distribution curve. The results indicate a small coefficient of variation of the series, compared to the mean, the deviation between the maximum and minimum found to be reasonable and standard deviation of each individual series is found to be low. The ratio of mean over median is approximately to 1 and the p-value of null hypothesis for Jarque-Bera test is greater than 0.05 which confirms that the series are normally distributed. Moreover, the numeric of kurtosis and skewness for each variable is found to be close to 3 and 0 respectively which indicates the normality of distribution.

#### 3.2. Pairwise Correlation Results

**Table 2:** Descriptive Statistics

<b>Variables</b>	<b>EDP_II</b>	<b>EDP_IV</b>	<b>EDP_VI</b>	<b>GE</b>	<b>PCR</b>	<b>PTR</b>
<b>Mean</b>	48.1	73.7	89.8	3.3	78.1	30.1
<b>Median</b>	45.4	72.6	92.6	3.4	83.5	30.6
<b>Maximum</b>	76.3	94.4	99.4	5.1	90.4	33.0
<b>Minimum</b>	31.2	52.1	74.0	2.0	54.0	25.0
<b>Std. Dev.</b>	15.0	10.5	7.6	1.0	11.7	1.9
<b>Skewness</b>	0.5	0.1	-0.4	0.3	-0.7	-0.9
<b>Kurtosis</b>	2.9	2.5	2.8	2.9	2.1	2.4
<b>Jarque-Bera</b>	2.8	0.8	2.8	1.8	3.6	3.9
<b>Probability</b>	0.2	0.8	0.2	0.4	0.2	0.1
<b>Sum</b>	1443.3	2211.1	2694.7	100.0	2343.4	902.1
<b>Sum Sq. Dev.</b>	6505.4	3221.8	1687.9	27.0	3971.9	106.5
<b>Observations</b>	30	30	30	30	30	30

Since the presence of multi-collinearity in the models will lead the biased estimation, hence, this study applied pairwise correlation analysis to check multi-collinearity of the variables used in the models. The existence of a positive linear association between total government expenditure and performance of Form II and the strong negative relationship between government expenditure and education performance of Form IV and Form VI are shown in Table 3. Generally, the fears of multi-collinearity did not observe since there is no correlation coefficients which are above 0.7. More importantly for time series data before estimating the result is to select the appropriate lag length in order to ensure the models are stable. According to [12] indicated that, selecting too many lags than the true one tends the spurious results. The optimum lag length one has been selected from Akaike Information Criteria at 5% level of confidence.



**Table 3:** Pairwise Correlation Matrix for Key Variables

Variables	EDP_II	EDP_IV	EDP_VI	GE	PCR	PTR
<b>EDP_II</b>	1.00					
<b>EDP_IV</b>		1.00				
<b>EDP_VI</b>			1.00			
<b>GE</b>	0.67	-0.62	-0.65	1.00		
<b>PCR</b>	-0.60	0.59	-0.56	-0.64	1.00	
<b>PTR</b>	-0.53	0.52	0.60	-0.61	0.53	1.00

**3.3. Unit Root Results**

Table 4 present unit root results from the ADF and PP tests both at the intercept and the intercept with trend regression forms for the level and the first difference. Both tests were done by comparing the t- statistics calculated and Mackinnon critical values at the 1% level of significance. The test statistics in both test show that all of variables are evidencing to the existence of stationarity at the first difference.

**3.4. Co-integration Results**

**Table 4:** Unit Root Results

Variables	Augmented Dickey-Fuller Test				Philip Peron Test			
	Level		1 <sup>st</sup> Difference		Level		1 <sup>st</sup> Difference	
	Intercept	Intercept & trend	Intercept	Intercept & trend	Intercept	Intercept & trend	Intercept	Intercept & trend
<b>EDP_II</b>	1.421	-1.983	-5.454*	-6.158*	1.420	-1.983	-5.452*	-6.158*
<b>EDP_IV</b>	-0.904	-0.987	-8.704*	-9.305*	-1.955	-1.826	-8.544*	-10.487*
<b>EDP_VI</b>	-2.210	-2.224	-5.367*	-5.263*	-2.268	-2.291	-5.427*	-5.337*
<b>GE</b>	-1.164	-3.183	-7.973*	-7.860*	-1.522	-2.952	-7.859*	-7.609*
<b>PCR</b>	-1.262	-3.366	-7.061*	-4.812*	-0.982	-3.129	-10.866*	-11.367*
<b>PTR</b>	-1.958	-2.328	-5.074*	-4.958*	-1.951	-2.359	-5.533*	-5.206*

Note: At 1% levels of significance, the Mackinnon critical values for the intercept and intercept and trend are -3.679 and -4,310 at level; and -3.689 and -4.324 at first difference. \* Indicates significance at the 1% level.

The Johansen and Juselius maximum likelihood method have used to check the co-integration between the variables used. Table 5 shows that for the side of public Form II and Form IV secondary schools at intercept and intercept with trend, both Max- Eigen and Trace statistic test indicate no co-integration at the 0.05 level of significance, since there is no one series is co-integrated. For that result, it is concluding that there is no long run relationship among the variables used for the case of Form II and Form IV level. In the case of Form VI level, both tests indicated the existence of one co-integrated vector(r) among the variables. The co-integrating equation

show GE and PTR has positive impact in long run while PCR has negative impact, on average, ceteris paribus. All coefficients are statistically significant at the 1% level. Hence, the null hypothesis of no co-integrated is rejected and it is concluded that the long run equilibrium relationship exists among the variables for the case of Form VI level.

**Table 5:** Co-integration Results

<b>Intercept</b>									
<b>Hypothesis</b>	<b>EDP_II</b>			<b>EDP_IV</b>			<b>EDP_VI</b>		
	<b>Eigen value</b>	<b>Trace statistic</b>	<b>Max-Eigen statistic</b>	<b>Eigen value</b>	<b>Trace statistic</b>	<b>Max-Eigen statistic</b>	<b>Eigen value</b>	<b>Trace statistic</b>	<b>Max-Eigen statistic</b>
<b>r = 0</b>	0.611	37.881	21.694	0.520	37.489	16.860	0.66	51.359*	47.856*
<b>r ≤ 1</b>	0.387	16.187	11.240	0.461	20.629	14.196	8	*	*
<b>r ≤ 2</b>	0.182	4.947	4.618	0.222	6.433	5.762	0.42		
<b>r ≤ 3</b>	0.014	0.329	0.329	0.029	0.671	0.671	3	20.501	29.797
							0.13		
							5	5.129	15.495
							0.03		
							7	1.068	3.841
<b>Intercept &amp; Trend</b>									
<b>r = 0</b>	0.623	53.464	22.445	0.620	52.429	22.256	0.69	65.101*	63.876*
<b>r ≤ 1</b>	0.537	31.020	17.707	0.488	30.173	15.402	5	*	*
<b>r ≤ 2</b>	0.340	13.313	9.551	0.331	14.771	9.241	0.52		
<b>r ≤ 3</b>	0.151	3.762	3.762	0.214	5.530	5.530	9	31.810	42.915
							0.23		
							3	10.727	25.872
							0.11		
							1	3.306	12.518

Note: \*\* denote rejection of the null hypothesis (series are non-co-integrated) at 5% level of significant

**Co-integrating Equation**

$$EDP_{VI_t} = - 3.5GE_t + 0.40PCR_t - 5.90PTR_t \tag{13}$$

Std. Error (-2.221) (0.178) (-0.763)

Log likelihood = -182.81

### 3.5. Autocorrelation Results

The autocorrelation test was performed to test the goodness of the models. The Ljung-Box Q statistic used since it allows more than one lag. The result show that p-value of Q-statistic in various lags for both models (EDP\_II and EDP\_IV) are greater than 0.05, hence, the study failed to reject the null hypothesis that is there is no serial correlation in the models. Therefore, from these results, the models concluded are correct and free from the autocorrelation problem hence can be used to estimating the results.

### 3.6. Vector Autoregressive Estimate

As indicated above that models are good and no existence of long-run relationship, the results being estimated by using Vector autoregressive model. Knowing that, the VAR model does not contain the exogenous variables. This means that the dependent variable used in the model is a function of its lagged values and the lagged values of the other variables in the model. The R-square adjusted shown in Table 6 and 7 indicate the models are fitted to explain the variation of education performance in Form II and Form IV in Zanzibar by 96.7 and 69.4 percent respectively.

**Table 6:** EDP\_II Regression Model

Variables	Coefficient	Std. Error	t-statistics	P-value
EDP_II <sub>t</sub>	1.00			
$\beta_0$	8.56	16.01	0.53	0.00
EDP_II <sub>t-1</sub>	0.78	0.11	6.85	0.00
GE <sub>t-1</sub>	2.46	1.21	2.03	0.03
PCR <sub>t-1</sub>	0.21	0.11	-1.84	0.06
PTR <sub>t-1</sub>	-0.71	0.36	1.97	0.03
R- square adjusted		0.967		

The empirical results show the EDP\_II and EDP\_IV have positive significant effect on GE. From these results, the null hypotheses, that government education expenditure has enhanced the performance of public Form II and Form IV results are accepted at 5 percent level. These results are similar with the results found by [26] who examine the relationship between PTR and expenditure per pupil and educational attainment in South Africa. They found that expenditure per pupil have strong and higher effects specifically on attainment of lower education levels for Africans in South Africa.

Other scholars who came up with the similar results were [27] who found that public expenditure in Malta appears relatively efficient at the primary and secondary levels when they estimated the efficiency scores of three output indicators each for expenditure on education and health for EU Member States. The results from the study conducted by [28] on 50 countries with developing and transitional economies, also found public spending on primary and secondary education has a positive greater impact on education attainment. The above regression results imply that the measure of education performance for Form II and Form IV levels are

associated with a higher government expenditure in Zanzibar. More specifically, an increase of one value on government spending for education is associated with the increase of passing rate by 2.46 for Form II level and 5.11 for Form IV level, thus indicating that government expenditure appears to have favorable effect on student’s performance for both levels. The positive coefficient of GE is possibly the Government allocated fund in high productive activities or programs that were more effective enough to achieve the intended goal of promoting higher performance in education sector in Zanzibar. The negative sign on coefficients of PTR in both models warning the policy and decision makers that when increasing one value of PTR could lead the quality of education to suffer. The result implies the performance of Form II and Form IV to be at risk of reducing by 0.71 and 2.07 values respectively. As expected, the PCR has negative coefficient and statistically significant for EDP\_IV model, meaning when PCR increased tend to decrease the performance of Form IV level. Unfortunately, the findings of the study show that PCR is statistically insignificant to the Form II performance in Zanzibar. The same results found by [29] who conducted the study on the impact of crowded classroom on academic performance of public secondary schools’ students in Surulere Local Government at Lagos State, Nigeria, they found that overcrowding of classroom negatively affected academic performance of students. This is being the main reason that influence poor performance of students in public schools.

**Table 7: EDP\_IV Regression Model**

<b>Variables</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-statistics</b>	<b>P-value</b>
<b>EDP_IV<sub>t</sub></b>	1.00			
<b>β<sub>0</sub></b>	-78.99	-36.27	-2.18	0.01
<b>EDP_IV<sub>t-1</sub></b>	0.50	-0.16	3.17	0.00
<b>GE<sub>t-1</sub></b>	5.11	-2.52	2.03	0.02
<b>PCR<sub>t-1</sub></b>	-0.47	-0.17	2.69	0.00
<b>PTR<sub>t-1</sub></b>	-2.07	-0.95	2.18	0.05
R- square adjusted		0.694		

**3.7. Vector Error Correction Estimates**

Since the series were co-integrated the VECM used to estimate the results for long and short-term effect of government expenditure to the performance of public Form VI level in Zanzibar. In short run, the result in Table 8 indicates the value of GE is associated with the increase of 3.16 value on Form VI performance when everything else is kept constant. This result implies that in Zanzibar, the GE has positive significant effect on Form VI performance. The result is similar as found by [30] who examine the efficiency of public expenditure on education for New Member State. The PTR coefficient value is associated with the 0.83 value decrease of Form VI performance in short run. However, the coefficient of PCR appears to be negative and insignificant as in the EDP\_II model. The coefficient of ECT measures the speed at which the dependent variable return to equilibrium after change in independent variables. Table 8 indicates the coefficient of ECT for GE is 0.41. It implies that if everything else is kept constant, the model identified the sizable speed of adjustment by 41% of disequilibrium correction yearly for GE reaching long run equilibrium steady state position. Therefore, this accordingly implies that our model is correct and also it proves the presence of long-term relationship between

the variable used in this study.

**Table 8:** EDP\_VI Short Run Regression Model

Variables	Coefficient	Std. Error	t-statistics	P-value
<b>EDP_VI<sub>t</sub></b>	1.00			
<b>β<sub>0</sub></b>	0.03			0.04
<b>ECT<sub>t-1</sub></b>	-0.41	-0.20	2.02	0.01
<b>EDP_VI<sub>t-1</sub></b>	0.14	-0.26	0.54	0.01
<b>GE<sub>t-1</sub></b>	3.16	-1.47	2.15	0.03
<b>PCR<sub>t-1</sub></b>	0.06	-0.24	0.26	0.06
<b>PTR<sub>t-1</sub></b>	-0.83	-0.29	-2.83	0.00

The findings from EDP\_VI Co-integrating and Long run regression model reveals the GE and PTR revealed to be statistically significant as in the short run model. In the long run period, the GE shown to have significant positive effect on education performance of Form VI in Zanzibar while the negative impact appeared again on PTR (see Table 9). Nevertheless, the PCR has negative and statistical insignificant coefficient.

**Table 9:** EDP\_VI Co-integrating and Long run Regression Model

Variables	Coefficient	Std. Error	t-statistics	P-value
<b>EDP_VI<sub>t-1</sub></b>	1.00			
<b>GE<sub>t-1</sub></b>	4.21	-2.03	2.07	0.00
<b>PCR<sub>t-1</sub></b>	0.26	0.16	-6.50	0.51
<b>PTR<sub>t-1</sub></b>	-4.85	0.75	1.62	0.03

The findings also confirm the result found by [31] indicate that government expenditure is allocating on the basis of the priorities of education sector development outcomes of countries. They also said that the government expenditure on health has a strong connection with education standard, if people are healthier, they will spend more time in school as well as do better, hence improving education outcome. However, [32] found government expenditure on education in Mozambique was quite low with a weak effect. It is well known that government expenditure is one of the drivers of country's development. So indeed, the relevance of government spending to education sector and economic development is unarguable. The study findings show that a crucial factor in promoting good performance on education in Zanzibar is government expenditure. In general, according to [17] government education spending in developing countries is believed to be of huge importance because of the high level of illiteracy that drive the poverty to exists in these countries. As known that poverty limits the opportunity of individuals in achieving the good education thus why the Zanzibar government announced the free education to all through which many individuals can be educated. This situation resulted a large proportion of the Zanzibaris depend on the free service of public education system. The study has thus shown that this effort by the government of providing access to education to a large proportion of the population

is indeed not out of place, as higher spending is associated with higher education outcomes. Building new classrooms for all levels and recruits more teachers especially for Form IV levels are among the channels through which the observed positive effect of government spending on education performance materializes in reality. When government builds new classrooms, which warrants that more teachers be employed, the natural outcome is reducing the crowd of students due to some students move to the new schools that are closer to them. Also, the interaction between students and teachers will improved. Generally, student performances are expected to rise too, since lower student to teacher ratio is believed to be associated with better student performance.

#### **4. Conclusion and Recommendations**

The finding of this study supports the view that government educational expenditure has direct positive effect on education performance. The results are robust and strongly significant at the 5 percent level. The study revealed at all secondary level the government spending has positive and significant effect while in long run only Form VI level has positive effect. With regards to PTR, also shown to have a significant negative effect on education performance. It implies that, when PTR increased the education sector of Zanzibar will be destabilize. The study also did not recognize the effect increasing or decreasing the PCR, however, its correlation with government spending seems to be strongly negative which support the view of other study. This negative correlation implies that when spend more will influence the PCR to be reduced which is a favorable condition to the education performance. Although, the study used data for a few years, due to reliable data sources did not have much data from previous years but the study concluded that government expenditure on education is more important for the better performance of Zanzibar education. Considering the nature of impact government spending has on education performance in Zanzibar there is need to revisit how public spending on education is been allocated. The government should seek partners to mobilize the resources, since the government resources alone may not sufficient to improve the quality and system of education for Zanzibar. Improving the public expenditure management system is very important in strengthening the link between government spending and education outcomes as well reducing corruption. Further studies may be done on examine how much individuals spending affect the education performance in Zanzibar and which sectors is more effective in promoting Zanzibar education sector.

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