

Does Government Fiscal Policy in Ghana Asymmetrically Affect Growth?

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ABSTRACT

Using ARDL and NARDL approaches, this study examines whether government fiscal policy symmetrically or asymmetrically impact economic growth in Ghana from the period 1988 to 2018. The study outcome reveals that fiscal policy variables used exhibited long-run cointegration with economic growth for both ARDL and NARDL models. Government tax revenue, expenditure and labour showed a strong positive and significant impact on economic growth whilst capital had a significant but inverse effect on economic growth in the long-run for ARDL. NARDL model shows that positive shocks of government tax revenue exerted much impact on growth rate compared to its negative shocks in both long and short run. Estimations from the long-run suggested that positive shocks of government expenditure increase growth rate whereas the negative shocks decrease growth. The Granger test, from the NARDL model, showed a Uni-directional causation moving from $LNEXP_NEG \rightarrow LNGDP$, $LNTR_NEG \rightarrow LNGDP$, $LNTR_POS \rightarrow LNGDP$ while a bi-directional causality is recorded for $LNEXP_POS \rightarrow LNGDP$ and $LNLAB \rightarrow LNGDP$. In the ARDL model bi-directional causality is recorded from $LNEXP \rightarrow LNGDP$, $LNTR \rightarrow LNGDP$ and $LNLAB \rightarrow LNGDP$. The research then concludes with a strong asymmetric relationship between fiscal policy and economic growth. Recommendations raised are that government should avoid raising taxes but should look for policies that will help widen its tax revenue base and in financing projects government should avoid unproductive projects that do not yield economic growth.

Keywords: Economic Growth, Fiscal Policy, Asymmetric, ARDL, Ghana.

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I. INTRODUCTION

In most economic policies, economic growth often takes centre stage and is important to be connected

with economic development, as without growth there can be no development. Nevertheless, growth does not inherently mean development. Growth simply refers only to production, while development refers

to all economic changes, including social, political and institutional changes that follow changes in output (Quashigah et al. 2016). Robert Lucas argues that growth and development are two distinct fields of research 'with the theory of growth described as the dimension of economic growth that one has an understanding of, and development as those that one does not. According to Chugunov, et al., 2021 and Easterly and Rebelo, 1993 fiscal policy is the use of public expenditure, taxes, and borrowing to influence the pattern of economic activity, as well as the level and growth of aggregate demand, production, and employment.

The effects of government fiscal policy on economic growth, especially in emerging economies, are a source of great debate. Fiscal policy's main goal is to hasten socio - economic growth by pursuing a policy pose that ensures a balance between taxing, spending, and borrowing that is compatible with long-term growth. However, in developing nations, the amount to which fiscal policy encourages economic growth continues to be a source of theoretical and empirical disagreement. In growth models that involve public services, the optimum tax policy is dependent on the type of public services. Fiscal policy refers to the government's deliberate spending of money and imposition of taxes with the goal of influencing economic indicators in a favorable direction which involves Long-term economic growth, greater job creation, and low inflation (Engen et al., 1992; Easterly and Rebelo, 1993; Gray et al. 2007; Pasichnyi, 2020). As a result, fiscal policy attempts to maintain economic stability while increasing public spending. The government's budget, which manages the public sector plan by defining the country's economic life, is mostly responsible for the execution of fiscal policy. The employment of a public budget as a tool in the administration of a nation's economy is, in reality, its most significant feature (Omitogun and Ayinla, 2007; Gray et al. 2007). Due to the role played by government fiscal policy in economic growth in the

development process of Ghana's economy, it is crucial to understand the determinants and aspects of economic growth and to decide whether Ghana's growth rate is keeping up with other developing countries.

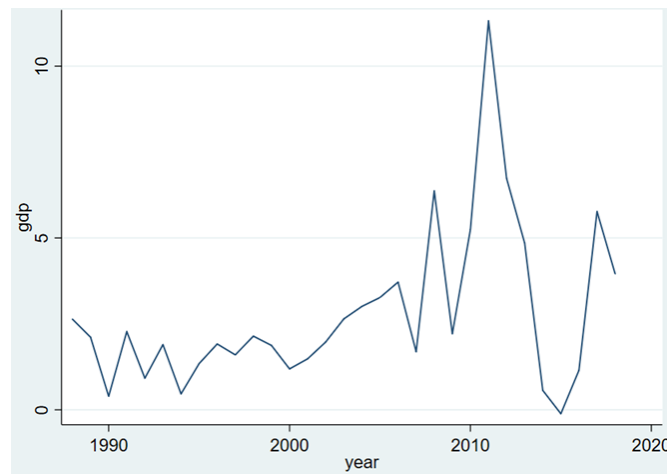


Fig.1: Growth rate Performance of Ghana.

Fig.1 presents the growth rate the country has experienced over thirty years and can be seen that there has not been a drift of continuous upward trend but the growth rate keeps fluctuating within 0 to 6%. The highest growth rate the country recorded was 11.32% which happened in 2011. These fluctuations in growth rate are a result of political instability, inadequacy of human capital, and as well the drop in cocoa price which was the foundation of the economic stability of the country in the 1960s (Baafi Antwi, 2010). Frequent change in government or political leaders has been a principal contributing factor that had impeded growth and development in Ghana. Economists view political instability to be a primary malady that impedes economic success. As a result of political instability, policymakers' views are likely to be shortened, resulting in sub-optimal structural adjustment. This might lead to constant policy revisions, resulting in greater volatility and a negative impact on macroeconomic performance (Alesina et al., 1996; Asteriou and Price, 2001; Jong-A-Pin, 2009; Aisen and Veiga, 2013). Nonetheless, this led to a lot of policy formulation by the

government of Ghana to improve the economic growth rate of the country.

The purpose of policy formulation and implementation by the government of Ghana is to speed up economic activities, growth and social development within the country. Two key views on the role of government fiscal policy in fostering economic growth and development have been expressed. Keynesian and endogenous theories have often thought that it is important to use fiscal policy to stimulate growth rate. On the contrary, the classical, along with the neoclassical theories, perceive governments as fundamentally bureaucratic and less productive, and as a result, they appear to impede growth rather than promoting it (Ocran, 2009). As far as economic conditions are concerned, countries in Africa and other developing countries have passed through many historic transformations. Most of them have undergone an economic transition from skewed and regulated markets to free-market economies. Policymakers from these countries have had a sustained interest in the role fiscal policy plays in economic growth and development in responding to the challenges associated with the transition (Twumasi, 2012).

In Ghana, fiscal policy is demand-based where the government of Ghana use it in attaining macroeconomic goals like the balance of payment, economic growth, price stability and reduction in unemployment. In other words, expenditure on research and development, education, health, sanitation, water, agriculture, transport, etc. by the government of Ghana will increase the potential of human capital, leading to an increase in the provision of aggregate resources. In this case, the economy will see its national output rising, unemployment dropping, and prices falling (Baafi Antwi, 2010).

The study is significant because its findings will aid in answering concerns such as: (i) Do government tax revenue and expenditure anticipate changes in

Ghana's growth rate? (ii) Will positive and negative shocks of tax revenue and expenditure influence economic growth? (iii) Will the Keynesian theory be validated in Ghana? The findings will aid authorities in establishing, harmonizing, and executing policies that are consistent with the Ghana's structural objectives considering the shocks from fiscal policy tools. Moreover, this study is important because it adds to the current knowledge on the linkage between government fiscal policy and economic growth and will serve as a resource for future scholars interested in conducting study in this area. Finally, the diverse results reported in literature revealed that there is a widespread disagreement based on divergent opinions on the benefits and drawbacks of fiscal policy instruments as an influencing component on economic growth. Hence, the study bridges the gap in determining if fiscal policy variables asymmetrically affect Ghana's economic growth. The study is categorized into five parts: the background of the study for the first part, followed by (2) literature reviews capturing theoretical backings, (3) data source and methodology, (4) findings, (5) discussions and (6) conclusion of the study.

II. LITERATURE REVIEW

2.1 Theoretical Backing

The effect of fiscal policy on economic growth has been widely studied, and the various economic schools of thought have been the subject of enormous discussions. Keynesian theories indicate that in managing a country's economic development, an active function of government policies can be successful. This was in contrast to the neoclassical and classical economic analysis of fiscal policies of the government. Along with the neoclassical economists, the classical considers fiscal policies to be alien when it comes to national growth. Classical theories specify that government expenditure foster private investment and hinders economic growth in the short-run and declines long-run capital accumulation

(Diamond, 1989; cited in Saad and Kalakech, 2009: 3). Indeed, classical economists are of the view that under most situations increase in expenditure initiate price increment and briefly increases growth rate. This is because classical is of the notion that economy regulates itself from variation to long-run equilibrium which is due to the determinant of supply nature of employment and output.

Keynesians believes that government expenditure and taxes contribute significantly to growth through aggregate demand and government spending will have a multiplier impact on production and jobs. Increased spending will foster the economy's aggregate demand, which increases private investment profitability and leads to higher investment (Ramu & Gayithri, 2016). They also argued that during periods of crisis and in developing countries, deficit spending is necessary; several policymakers have argued that deficit financing can be an effective instrument to stimulate economic development within a large number of unutilized resources. (Nelson and Singh, 1994). Keynesians take on taxes suggest that a fall in taxes will lead to a rise in aggregate demand and economic growth in that fall in taxes increases disposable income which intends to increase consumption and private investment.

2.2 Empirical review on Fiscal Policy-Economic growth

Conflicting results have been outlined by a lot of scholars on fiscal policy tools and its economic impact for example Frimpong (2020) examined foreign direct investment, government expenditure and economic growth from 1992 to 2015 in Ghana. The findings revealed that government expenditure had a positive relationship with growth rate with an increase in expenditure causing a 5% increase in GDP. Results by Tan et al. (2020) on their studies on the impact of monetary and fiscal policies on economic growth in Malaysia, Singapore and Thailand from 1981Q1 to 2017Q1 showed that government spending has a

negative effect on economic growth in both Malaysian and Singapore but a positive impact in Thailand. From the findings, Thailand showed more efficacy with fiscal policy than Malaysia and Singapore. Tarawalie and Kargbo (2020) on their investigations on the efficacy of monetary and fiscal policy in Sierra Leone from 1980 to 2017. The ARDL bound test approach showed that variables are long-run cointegrated and also within the short-run dynamics government revenue and expenditure were the impacting variables of GDP growth.

Using ARDL Nakanlinzi (2019) researched government expenditure and economic growth in Uganda. Augmented Dickey-Fuller and Philip Perron unit root test were employed and the research showed no evidence of unit root at first difference. Moreover, government expenditure proxied as recurrent and development expenditure had a significant and positive impact on economic growth in Uganda in the long run. Sen et al. (2019) examined the impact of expansionary fiscal policy on output in Bangladesh economy. The study proxied expansionary policy as a total investment, total revenue and government expenditure from 1994-2017. A stationary test was carried out using augment Dickey-Fuller and the result showed that data was stationary at first difference. Moreover, the result reviewed that government expenditure influenced gross domestic product negatively while government investment and total tax revenue impacted GDP positively in the long-run.

Again, Mugableh (2018) analyzed fiscal policy instruments and economic growth in Jordan. The time series model showed the presence of cointegration and causal relation among variables used. Lastly, the study discovered a positive long-run relationship between government expenditure and economic growth whereas total tax rate had a negative influence on growth rate. Shevchuk and Kopych (2018) studied Ukraine fiscal policy and other

variables on output from 2001 to 2016. They found that government spending and net revenue have a strong positive relationship with output. It was also found in the study that an increase in government spending results in low mobility of capital. Studies conducted by Evans et al. (2018) on effect of monetary and fiscal policy on the economic development in Africa from the period 1995-2016 suggested that government spending and taxation have negative and positive impacts respectively on GDP per capita. Darko (2017) explored growth impact on government consumption and transfer payments from quarterly data of 1984 to 2015. The estimated values reviewed that government expenditure negatively impacted economic growth in Ghana for both the long and short run.

Moreover, using autoregressive distributed lag and vector error correction models, Ialomitianu et al. (2016) examined equilibrium relationships and dynamic causality analyses between economic growth and fiscal policy tools in Jordan for the period of 1978-2017. The findings indicate evidence of co-integration and causal linkages between economic growth and the instruments of fiscal policy. Government spending has a long-term positive effect on growth, indicating that general government spending has a positive impact on economic growth. Quashigah et al. (2016) empirically examined the potency of fiscal policy on the growth of Ghana. Quarterly time series data from 1983 to 2012 was analyzed and discovered that government tax revenue impacted growth positively while government consumption expenditure negatively affected economic growth.

Furthermore, findings by Takyi and Twum (2015) revealed fiscal policy tools have a positive and significant effect on growth in both the long and short term. Havi and Enu (2014) examined the potency of monetary and fiscal policies on Ghana's economy and established that fiscal policy influence

growth rate positively. Using the ARDL model approach Twumasi (2012) surveyed the impact of fiscal policy on the economic growth of Ghana. The bound test disclosed the presence of the long-run cointegrating effect of fiscal variables on growth. Empirically, the outcome suggested that government taxes and consumption spending negatively impacted growth in the long run. Lastly, Oriavwote and Eshenake (2015) found that petroleum profit tax and government expenditure significantly affected the level of economic growth in Nigeria.

Studies carried out by Frimpong, 2020; Darko, 2017; Quashigah et al., 2016; Takyi and Twum 2015; Havi and Enu 2014; Twumasi 2012 looked at the symmetric impact of fiscal policy tools on economic growth hence this study sought to investigate the asymmetric impact and causal effect of fiscal policy on growth rate in Ghana since most research failed to address that.

III. DATA SOURCE AND ECONOMETRIC METHODOLOGY

Most of the studies conducted in this area have looked at the linear function in determining the effect or impact of fiscal policy variables on economic growth by evaluating the long and short-run dynamics of fiscal policy variables on growth as symmetric. That is to say, researchers pursue testing causal relationships between the fiscal variables and economic growth to measure the direction and the extent of the impact. For the period 1988-2018, the evidence of fiscal policy indicators was obtained from the (BoG, 2020) and WDI 2020. The variables include government tax revenue (TR), government expenditure (EXP). According to the keynesian, government ability to tax and to spend improves the performance of economy and performance of economic growth is critical as its miles backing to the overall performance of GoG. Therefore, tax revenue and expenditure are used as an effectiveness indicator for fiscal policy (Frimpong, 2020; Nakanlinzi, 2019; Ialomitianu et al. 2016). GDP

is used as a proxy for economic growth (Mugableh 2018; Shevchuk and Kopych 2018; Oriavwote and Eshenake (2015) whereas labor force and capital formation are used as control variables. **Table 1** reports the descriptive information of the variables. the study employed ADRL and NARDL in achieving the objective of the study. The advantage of the NARDL is to help explore the impact of positive and negative shocks of TR and EXP on GDP. Studies in Ghana have not looked at the asymmetric effect of fiscal policy tools on growth rate. Therefore, we have:

Table 1 Variable description

Var	Description	Data Source
GDP	GDP per capita growth (annual %)	WDI (2020)
TR	Government tax revenue (% GDP)	BoG (2020)
EXP	General government final expenditure (% GDP)	WDI (2020)
LAB	Total Labour Force	WDI (2020)
CAP	Gross fixed capital formation (% GDP)	WDI (2020)

$$GDP = f(\text{government tax revenue, government expenditure, labour, capital}) \tag{2}$$

Out of Eqn. (2) we had

$$\ln GDP_t = \varphi_1 + \varphi_2 \ln TR_t + \varphi_3 \ln EXP_t + \varphi_4 \ln LAB_t + \varphi_5 \ln CAP_t + \varepsilon_t \tag{3}$$

In Eqn. (3) lnGDP, lnTR, lnEXP, lnLAB, lnCAP are the natural log of economic growth, government tax revenue, government expenditure, labour force and capital. $\varphi_{2,3,4,5}$ are the respective coefficients of the variables. ε_t is the stochastic error term. In determining the validity of the data set, a stationarity test was conducted using ADF (1979) and PP test (1988) of a unit root. The null hypothesis of the unit root was tested against the alternative of no unit root. The calculated t-statistics were compared with a 5% critical value and there is a rejection of the null hypothesis when absolute values of the t-statistic are lesser than the 5% critical value. Then unrestricted ARDL and ECM model is formulated as:

$$GDP = f(\text{Fiscal policy, Labour, Capital}) \tag{1}$$

$$\begin{aligned} \Delta \ln GDP_t = & \vartheta_1 + \sum_{i=1}^a \vartheta_{2i} \Delta \ln GDP_{t-i} + \sum_{i=1}^b \vartheta_{3i} \Delta \ln TR_{t-i} + \sum_{i=1}^c \vartheta_{4i} \Delta \ln EXP_{t-i} + \sum_{i=1}^d \vartheta_{5i} \Delta \ln LAB_{t-i} \\ & + \sum_{i=1}^f \vartheta_{6i} \Delta \ln CAP_{t-i} + \delta_1 \ln GDP_{t-1} + \delta_2 \ln TR_{t-1} + \delta_3 \ln EXP_{t-1} + \delta_4 \ln LAB_{t-1} + \delta_5 \ln CAP_{t-1} \\ & + \gamma ECT_{t-1} + \mu_t \end{aligned} \tag{4}$$

From Eqn. (4) ϑ_1 represent the constant term, Δ indicate difference operator, $\vartheta_{2,3,4,5,6}$, and $\delta_{1,2,3,4,5}$ are the coefficients of a short and long run. a, b, c, d and f are the optimal lag length to be determined by SC (Schwarz) information criterion. The null hypothesis proposed that ($H_0: \vartheta_1 = \vartheta_2 = \vartheta_3 = \vartheta_4 = \vartheta_5 = \vartheta_6 = 0$), assuming no cointegration among variables is tested against the alternative ($H_0: \vartheta_1 \neq \vartheta_2 \neq \vartheta_3 \neq \vartheta_4 \neq \vartheta_5 \neq \vartheta_6 \neq 0$), assumes the presence of cointegration among variables. The null hypothesis of no cointegration is rejected when the computed F-statistics is greater than the upper bound critical value I (1). Similarly, the null hypothesis is accepted when the F-statistic is smaller than the critical values I (0). Finally, the result is indecisive when it falls in between the lower and upper bound, γ is the adjustment speed of short-run deviation to long-run equilibrium and μ_t is the stochastic error term (Pesaran et al., 2001; Romilly et al., 2001).

However, to study the non-linear or asymmetric relationship between fiscal policy variables and growth. Shin et al. (2014) proposed the NARDL model which accounts for the asymmetric partial sums of expenditure and tax revenue into positives and negatives when they are decomposed. Possibly, government expenditure and tax revenue could react differently to positive or negative shocks and therefore, these variables may have an asymmetric impact on economic growth. So, the partial sums of negative and positive changes in expenditure and tax revenue are introduced as:

$$TR_t^+ = \sum_{i=1}^h \Delta TR_i^+ = \sum_{i=1}^h \max(\Delta TR_i^+, 0) \tag{5}$$

$$TR_t^- = \sum_{i=1}^h \Delta TR_i^- = \sum_{i=1}^h \min(\Delta TR_i^-, 0) \tag{6}$$

$$EXP_t^+ = \sum_{i=1}^j \Delta EXP_i^+ = \sum_{i=1}^j \max(\Delta EXP_i^+, 0) \tag{7}$$

$$EXP_t^- = \sum_{i=1}^h \Delta EXP_i^- = \sum_{i=1}^h \min(\Delta EXP_i^-, 0) \tag{8}$$

Shin et al. (2014) replaced the positive shocks by (TR_t^+, EXP_t^+) and (TR_t^-, EXP_t^-) as negative shocks variables in the unrestricted ARDL and ECM models in equations (4) as:

$$\begin{aligned} & \ln GDP_t \\ &= \vartheta_1^* + \sum_{i=1}^g \vartheta_{2i}^* \Delta \ln GDP_{t-i} + \sum_{i=1}^h \vartheta_{3i}^* \Delta \ln TR_{t-i}^+ + \sum_{i=1}^j \vartheta_{4i}^* \Delta \ln TR_{t-i}^- + \sum_{i=1}^k \vartheta_{5i}^* \Delta \ln EXP_{t-i}^+ + \sum_{i=1}^l \vartheta_{6i}^* \Delta \ln EXP_{t-i}^- \\ &+ \sum_{i=1}^m \vartheta_{7i}^* \Delta \ln LAB_{t-i} + \sum_{i=1}^n \vartheta_{8i}^* \Delta \ln CAP_{t-i} + \delta_1^* \ln GDP_{t-1} + \delta_2^* \ln TR_{t-1}^+ + \delta_3^* \ln TR_{t-1}^- + \delta_4^* \ln EXP_{t-1}^+ + \delta_5^* \ln EXP_{t-1}^- \\ &+ \delta_6^* \ln LAB_{t-1} + \delta_7^* \ln CAP_{t-1} + \gamma ECT_{t-1} \\ &+ \mu_t \end{aligned} \tag{9}$$

Normally equation 9 is stated as the non-linear/ asymmetric model whereas equation 4 the linear symmetric ARDL model. Few hypotheses in asymmetric should be considered. Firstly, whether $\Delta TR_{t-i}^+(\Delta EXP_{t-i}^+)$ and $\Delta TR_{t-i}^-(\Delta EXP_{t-i}^-)$ accept different lag orders in either model which will depict short-run asymmetry. Secondly, if by the same lag i the estimated coefficient of $\Delta TR_{t-i}^+(\Delta EXP_{t-i}^+)$ will be different from $\Delta TR_{t-i}^-(\Delta EXP_{t-i}^-)$ which depicts the short-run asymmetric effects. Thirdly, strong asymmetric short-run effect will be accepted if the proposition $\sum_{i=1}^h \vartheta_{3i}^* \neq \sum_{i=1}^j \vartheta_{4i}^*$ and $\sum_{i=1}^j \vartheta_{5i}^* \neq \sum_{i=1}^l \vartheta_{6i}^*$ is nullified in the asymmetric model in Eqn. (9) by Wald test. Lastly, whether Wald test annulled $\delta_2^*/\delta_1^* \neq \delta_3^*/\delta_1^*$ and $\delta_4^*/\delta_1^* \neq \delta_5^*/\delta_1^*$ in Eqn. (9), the asymmetric long-run impact of government tax revenue and expenditure on economic growth be will determined. In the next section both symmetric and asymmetric models in Eqn. (4) and (9) are estimated.

IV. EMPIRICAL RESULTS

Table 2 shows descriptive statistics and a correlational matrix of regressor and explanatory factors for the study, which used time series data from 1988 to 2018. All other variables, with the exception of GDP, are regularly distributed. In terms of mean, the greatest value was reported by LAB, followed by CAP, TR, EXP, and GDP in

that order. Again, EXP has the lowest standard deviation, indicating that it is the least volatile of the variables analysed, whereas LAB has the largest standard deviation, indicating that it is the most volatile. The remainder of the variables, with the exception of CAP, are favourably skewed. Since $k > 3$, GDP is concentrated towards the tail end. GDP has a positive relationship with TR, EXP, and CAP, according to the correlational matrix.

Table 2 Descriptive statistics and correlation matrix.

Statistics	LNGDP	LNTR	LNEXP	LNLAB	LNCAP
Mean	2.7937	16.5835	10.6503	90.129	20.5063
Median	2.1107	16.2600	10.1716	89.000	21.1308
Maximum	11.3154	22.0500	15.3082	13.000	29.2463
Minimum	-0.1139	10.7700	7.0695	60.000	11.2395
Std. Dev.	2.3594	3.1657	1.9716	20.266	5.6137
Skewness	1.7766	0.0473	0.5260	0.1802	-0.0997
Kurtosis	6.6817	2.2244	2.7782	1.9069	1.8449
Jarque-Bera	33.816	0.7885	1.4932	1.7111	1.7746
Probability	0.0000***	0.0741*	0.0473**	0.0025***	0.0117*
Correlation Matrix					
LNGDP	1.000				
LNTR	0.3307	1.0000			
LNEXP	0.4074	0.0282	1.0000		
LNLAB	0.4396	0.6509	-0.2822	1.0000	
LNCAP	-0.3441	0.4032	0.3025	0.3072	1.0000

Note ***significant at 1%, **significant at 5% and *significant at 10%.

To evaluate stationarity, this section starts from the unit root analysis and it is important to exclude any variable that is integrated of order 2, I (2) which has no odds on the Pesaran boundaries. The stationary test results from ADF and PP in **Table 3** show no evidence of unit root for GDP, TR, EXP, LAB and CAP at all levels of significance. GDP and EXP showed level stationarity. However, all variables became stationary after the first difference and none of them was integrated at order 2, I (2). From the results, the study concluded a mixture of I (0) and I (1) which support the criterion of ARDL.

Table 3 Unit root Test at levels

Variable	Levels				First Difference			
	ADF Test		PP Test		ADP Test		PP Test	
	Value	Prob	Value	Prob	Value	Prob	Value	Prob
LNGDP	-3.557	0.014**	-3.556	0.0137**	-8.090	0.000***	-8.206	0.000***
LNTR	-2.030	0.273	-1.768	0.3881	-6.215	0.000***	-7.642	0.000***
LNEXP	-3.158	0.033**	-3.209	0.0293**	-5.489	0.000***	-7.796	0.000***

LNLAB	-21347	0.233	-1.169	0.6742	-3.304	0.024**	-3.362	0.021**
LNCAP	-2.735	0.080*	-2.751	0.0774*	-5.231	0.0002***	-5.310	0.000***

Note ***significant at 1%, **significant at 5% and *significant at 10%.

In determining the optimal lag for the symmetric model in Eqn. 4 the study employed the Schwarz information criterion and the result obtained from symmetric bound testing is displayed in **Table 4**. The F-statistic (F= 12.94961) is significant at all levels when compared with the critical lower and upper bounds, hence we established the existence of long-run symmetric cointegration among variables. The optimal lag specification for this study is (1,1,0,0,1).

Table 4 Symmetric Bound Test.

Statistic	F-Statistic	Significance	Critical Bounds	
			I (0)	I (1)
F- statistic	12.949	10%	2.2	3.09
		5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

To ascertain whether fiscal policy variables have either a symmetric or asymmetric effect on growth, the ARDL and NARDL models in Eqn. 4 and 9 were evaluated. **Tables 4** reports on both ARDL and NARDL. The positives and negative decomposition of government tax revenue and expenditure in **Fig. 2** to **Fig. 5** are examined to see if their relative shocks have a significant effect on growth.

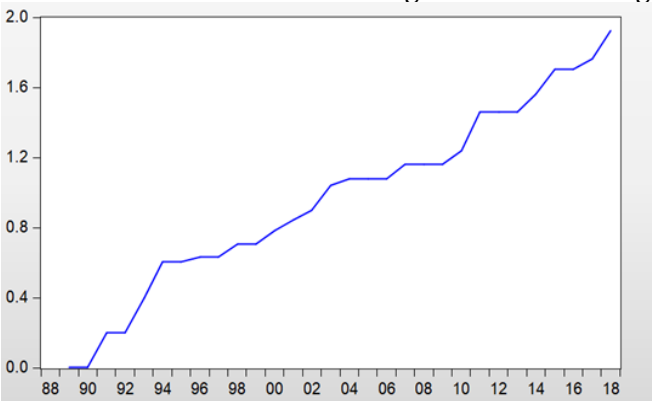


Fig. 2 Positive component of tax revenue

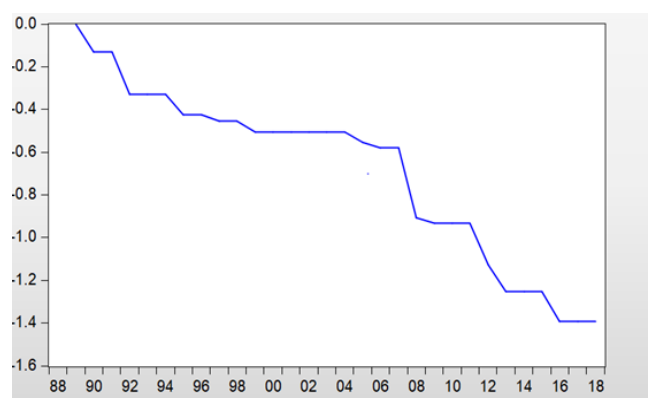


Fig. 3 Negative component of tax revenue

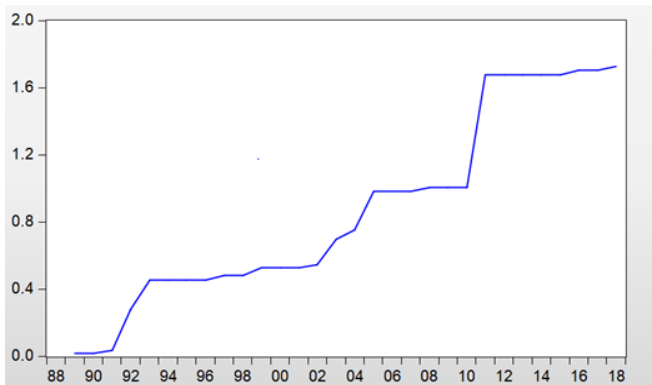


Fig. 4 Positive component of government expenditure

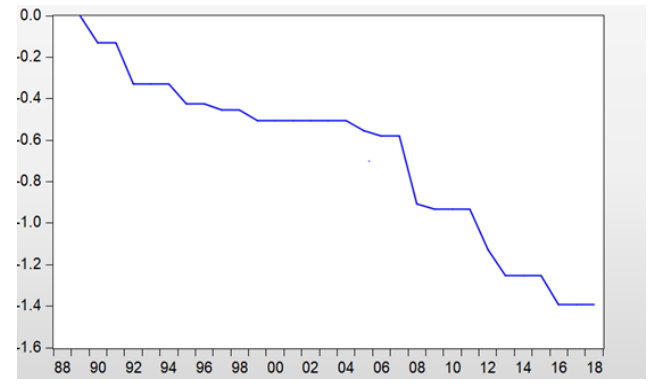


Fig. 5 Negative component of government expenditure

Tables 5 provide the short-run and the long-run basic evaluations of linear and non-linear ARDL specification models. The coefficients of TR and EXP showed a significant effect on GDP in Ghana for the short-run estimate. The positive and negative shocks exerted by TR and EXP have a rise or fall on GDP. Thus, a percentage increase (decrease) in TR or EXP will lead to an elastic increase (decrease) of 33.56% (19.03%) or 30.85% (56.98%) in GDP, respectively. Again, the upsurge of 1% of TR leads to a decline of 42.91% of GDP while that of EXP increases GDP by 56.62% in the short run. On the other hand, the results from NARDL revealed positive coefficients for both positive and negative shocks of EXP and TR in the long run. The positive and negative shocks of EXP and TR exerted a significant impact on GDP. Thus, a percentage increase (decrease) in EXP and TR leads to an increase (a decrease) in GDP by an elastic value of 63.94% (21.53%) and 20.66% (19.17%), respectively in the long run. Again, TR and EXP were statistically significant in the long-run ARDL model with negative and positive coefficients. A percentage improvement in TR shrinks economic growth by 74.86%, while EXP expands GDP rate by 37.64%, respectively.

However, LAB and CAP used as controlled variables for the study were statistically significant for both ARDL and NARDL in the long run. A rise of 1% in the size of the labour force in Ghana, as seen in **Tables 5**, will increase 92.34 and 64.08 percent expansion in GDP. Conversely, CAP had an inverse impact on GDP for symmetric and asymmetric models. A percentage increase in capital will cause a decrease of 61.81 and 39.59 percent in Ghana's GDP.

Table 5. Results of Symmetric and Asymmetric coefficients

Variables	Coeff	T-stat	Coeff	T-stat
Short-run estimates				
ΔLNTR	-0.429*	-1.974		
$\Delta \text{LNTR}(-1)$	-0.688**	-2.051		
ΔLNTR^+			0.335	1.568
ΔLNTR^-			0.190***	2.628
ΔLNEXP	0.5662*	1.873		
ΔLNEXP^+				0.309*
ΔLNEXP^-				0.569
$\Delta \text{LNEXP}(-1)$				0.028
ΔLNLAB	0.768***	2.948	0.870***	3.191
ΔLNCAP	-0.412	-1.439	-0.857	-1.704
$\Delta \text{LNCAP}(-1)$	-0.606***	-3.132	-0.771***	-3.556
Long-run estimates				
LNTR	-0.748***	-4.8328		
LNTR^+			0.206***	2.215
LNTR^-			0.197***	4.944
LNEXP	0.376***	5.994		
LNEXP^+				0.639***
LNEXP^-				0.215***
LNLAB	0.641***	3.315	0.923***	3.470
LNCAP	-0.396***	-4.793	-0.618***	-4.554
C	-0.912***	-3.686	-0.764***	-1.657

Diagnostics Test

ECT (-1)	-0.596***	-9.528	-0.624***	-3.563
X ² _{LM}	0.507		0.550	
X ² _{JB}	0.615		0.597	
X ² _{RS}	0.512		0.675	
R ²	0.786		0.821	
Adj-R ²	0.688		0.727	
Loglikelihood	15.088		10.032	
F _{test}	8.415***		7.706***	
X ² _{waldtest LR(TR)}	4.205**		3.636**	
X ² _{waldtest LR(EXP)}	3.097**		4.715**	
X ² _{waldtest SR(TR)}	4.526***		2.897	
X ² _{waldtest SR(EXP)}	3.566***		5.132*	

Note (+) and (-) indicate the positive and negative shocks of Fiscal policy. Diagnostic tests X²_{LM}, X²_{JB} and X²_{RS} representing heteroscedasticity, normality in residual distribution, and serial correlation. The NARDL model is carried out on an automatic ARDL framework using SIC. ***, **, and * represents the 1%, 5% and 10% rejection level respectively.

The lowest part of **Tables 4** present some diagnostics tests, from the estimated results of both ARDL and NARDL: the Ramsey Regression Equation; the LM test for residual; normality test; wald test and heteroscedasticity by Breusch–Pagan–Godfrey show a good fit that passes through all the test performed.

The Granger results

The Granger test is used to investigate the causality among the LNEXP, LNEXP_NEG, LNEXP_POS, LNTR, LNTR_NEG, LNTR_POS, LNLAB, AND LNCAP of the associations that exist amongst the variables Granger (1988). **Table 6** summarizes the Granger test, from the NARDL model, there is Uni-directional causation moving from LNEXP_NEG→LNGDP, LNTR_NEG→LNGDP, LNTR_POS→LNGDP while a bi-directional causality is recorded for LNEXP_POS→LNGDP and LNLAB→LNGDP. In the ARDL model bi-directional causality is recorded from LNEXP→LNGDP, LNTR→LNGDP and LNLAB→LNGDP (Hatemi, 2011; Chigbu, and Eze, 2012). In both model LNCAP show no causality.

Table 6. Granger Causality Test

Null Hypothesis:	NARDL			Direction of causality	ARDL			Direction of causality	
	Obs	F-Stat	Prob.		Obs	F-Stat	Prob.		
LNEXP_NEG→LNGDP	27	9.809***	0.005	Uni-directional	LNEXP →LNGDP	28	4.958**	0.031	Bi-directional
LNEXP_POS→LNGDP	27	6.807**	0.015	Bi-directional	LNGDP →LNEXP		6.024**	0.027	
LNTR_NEG→LNGDP		0.664	0.423						
LNTR_POS→LNGDP		3.280*	0.054		LNTR →LNGDP		7.024**	0.013	
LNLAB→LNGDP					LNGDP →LNTR	28	3.026*	0.072	

LNTR_NEG	27	6.282**	0.019	Uni-	LNLAB				Bi-directional
→LNGDP		2.073	0.163	directional	→LNGDP		11.931**		
LNGDP					LNGDP →		*	0.002	
→LNTR_NEG					LNLAB	28	5.1129**	0.032	
LNTR_POS	27	13.159***	0.001	Uni-	LNCAP				No-causality
→LNGDP		0.410	0.528	directional	→LNGDP				
LNGDP					LNGDP		0.754	0.393	
→LNTR_POS					→LNCAP	28	0.029	0.864	
LNLAB →LNGDP	28	11.931***	0.002	Bi-directional					
LNGDP →LNLAB		5.113**	0.033						
LNCAP →LNGDP		0.754	0.393	No-causality					
LNGDP →LNCAP	28	0.029	0.864						

***, **, and * indicate significant at 1%, 5%, and 10% levels, respectively.

V. RESULTS AND DISCUSSION

From the results obtained it was established that government tax revenue significantly influenced GDP, inferring that continuous increment in taxation by GoG impede the general performance of the economy. Profit made after-tax becomes too small for the companies to reinvest into projects or even sponsor new projects. On the side of individuals, increment in taxes affects purchasing power, leading to a fall in aggregate demand for goods and services, hence shrinking the growth of businesses through production and the growth rate of the economy. Comparing the impact created by taxation on growth, an increase in taxation exerted much decline in growth rate and development compared to decreasing tax rate.

Again, from the analysis, it was revealed that government expenditure has a significant influence on economic growth meaning that if the GoG should invest and spend on projects that are beneficial to the development of Ghana this will have a multiplying effect on the economic performance of the country as stated by Keynesian theory. Spending on public goods like education, healthcare, and infrastructure, for example, enhances the economy and increases productivity. Investing in the quality of labor for

future objectives is akin to educational expenditure. Moreover, investment in capital stock, such as infrastructure upgrades like better transportation and telecommunications, is another significant contributor to spending. Capital goods facilitate enhanced services, as well as additional revenue and employment for businesses and households. Government spending can improve the economy's ability to perform by increasing the value of public goods, and thus influence changes in production levels and national income. In Ghana most government projects are abandoned due to political changes and this act has gone a long way to hinder the growth rate and development of the country. The finding of this study is consistent with Frimpong (2020); Tan et al. (2020) with Thailand; Nakanlinzi (2019); Mugableh (2018); Shevchuk and Kopych (2018), and Ialomitianu et al. (2016) but inconsistent with the result of Tan et al. (2020) with Singapore and Malaysia; Sen et al. (2019); Evans et al. (2018); Darko (2017); Quashigah et al. (2016) and Twumasi (2012).

The positive coefficient of labour force stems from the traditional principle of productivity. The effect of the labour force on growth rate was projected to have a substantial positive impact on the long-run growth rate. An increase in the size or efficiency of the workforce inevitably contributes to a rise in demand

and, therefore, economic growth. Ghana has been faced with unemployment for the past decade. More than 70% of the skilled labour force are jobless, which has a more significant economic impact on production, hence impeding the country's growth. As far as the effect of labour on economic growth is concerned, studies have also confirmed the predictions of the production theory: Raleva (2014); Amanja and Morrissey (2005), and Gupta et al. (2005) but are inconsistent with Baafi Antwi (2010) who found a negative impact of labour on economic growth. Within the years the study was conducted, the country recorded the highest gross fixed capital formation in 2005 and 2015 with 29.0024 and 29.2463, respectively. The recent capital formation happening in Ghana are railways, roads, industrial and commercial buildings which are expected to lead to tremendous high turnover in the economic growth rate in the long term. And this does not coincide with Baafi Antwi (2010) findings of a positive effect of capital formation on the growth rate in Ghana.

The general meaning of the finding is that fiscal policies are an effective instrument for economic growth and development in Ghana. The results also imply that improvements in EXP improve economic activities, capital accumulation, labor force enhancement, and energy consumption levels within the economy, increasing the country's general growth rate. However, an increase in taxation rather shrinks economic activities, hence, development.

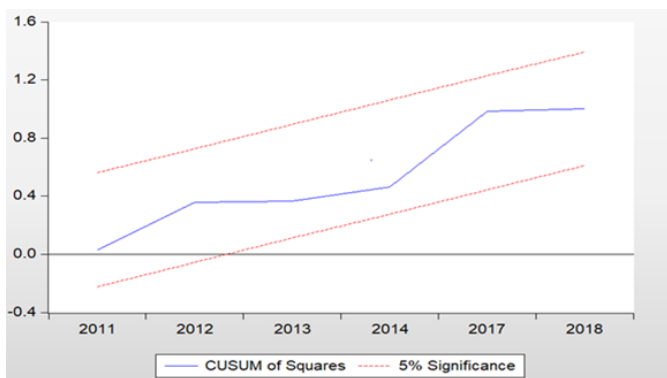


Fig 6 Cumulative sum of recursive residual

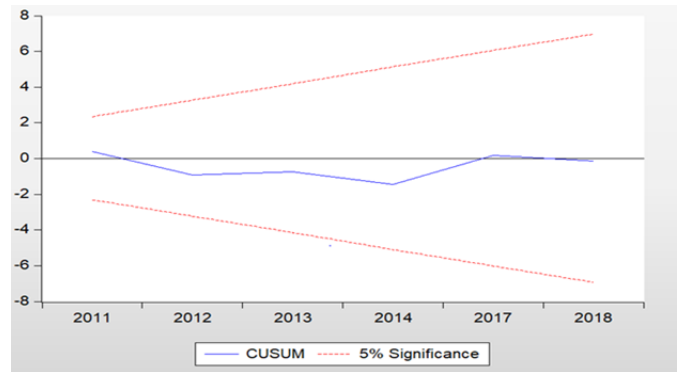


Fig 7 Cumulative sum of square recursive residual

In addition to the stability test carried out the study employed CUSUM and CUSUMSQ statistics test recursive plot, testing the break points and base on the null hypothesis of parameters not showing stability in Fig. 6 and Fig.7. i.e., the CUSUM and CUSUMSQ stability test examining the significance of trajectory at 95% bound. Concerning Fig. 6 and Fig.7 there is a rejection of the null hypothesis, therefore the conclusion of stable parameters for regression is accepted.

VI. CONCLUSION AND POLICY IMPLICATIONS

The research empirically examined the relationship existing between government tax revenue, government expenditure, labour, capital and economic growth using linear ARDL and non-linear ARDL models spanning from 1988 to 2018. To investigate whether there is possible association among the variables used. The ARDL bound test was first estimated, confirming the existence of long-run cointegration between fiscal variables and GDP. The study further tests the decomposition of positives and negatives shocks of TR and EXP on GDP. The findings from the proposed models suggest that fiscal policy variables influence GDP both in the short-run and long-run. The positive shocks of TR affected GDP compared to its negative shocks in the short-run. Estimations for the long-run suggested that positive shocks of EXP increase GDP whereas the negative shocks decrease GDP. In a nutshell, positive shocks of EXP exerted a heavy impact on GDP in the long-run compared to the short-run. However, positive shocks of TR influenced GDP in the short-run as compared to the long-run. Again, LAB and CAP were

statistically significant for both models in the long-run hence, the study concludes of strong asymmetric relationship between fiscal policy variables and economic growth.

The study, therefore, recommends that economic policymakers in Ghana should analyse the composition of government expenditure to boost growth due to its direct effect on growth and to avoid crowding out which is a result of borrowings used to sponsor unproductive public consumption. Moreover, it reprimands government to introduce policies that would expand the tax base rather than raising taxes. This includes measures that would remove dodging and include more formal and informal sectors contributions. The tax base in Ghana can also be broadened by considering policies that would raise the level of business activities. Another suggestion raised by this study is that, in long-run labour force has a strong and positive impact on growth therefore, the speed of Ghana's economy can be improved by policy that guarantees quality and sustainable growth.

Data Availability Statement

World Bank Group (2020) World Development Indicators 2020, Washington DC: World Bank. [Dataset for GDP, EXP, LAB and CAP]. <https://datacatalog.worldbank.org/dataset/world-development-indicators>. and BoG- [Dataset for TR] <https://www.bog.gov.gh/economic-data/>

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VII. REFERENCES

- [1]. Aisen, A., & Veiga, F. J. (2013). How does political instability affect economic growth?. *European Journal of Political Economy*, 29, 151-167.
- [2]. Alesina, A., Özler, S., Roubini, N., & Swagel, P. (1996). Political instability and economic growth. *Journal of Economic growth*, 1(2), 189-211.
- [3]. Asteriou, D., & Price, S. (2001). Political instability and economic growth: UK time series evidence. *Scottish Journal of Political Economy*, 48(4), 383-399.
- [4]. Baafi Antwi, J. (2010). *Ghana's Economic Growth in Perspective: A time series approach to Convergence and Determinants*.
- [5]. Bekhet, H.A. and B.N.S. Othman, 2012. Examining the role of fiscal policy in Malaysian stock market. *International Business Research*, 5(12). Available at: <https://doi.org/10.5539/ibr.v5n12p59>.
- [6]. Chugunov, I., Pasichnyi, M., Koroviy, V., Kaneva, T., & Nikitishin, A. (2021). Fiscal and Monetary Policy of Economic Development. *European Journal of Sustainable Development*, 10(1), 42-42.
- [7]. Chigbu, E. E., & Eze, L. (2012). An empirical study on the causality between economic growth and taxation in Nigeria. *Current research journal of Economic Theory*, 4(2), 29-38.
- [8]. Darko, E. A. (2017). *Growth impact of government consumption, transfer and interest payments in Ghana* (Doctoral dissertation, University of Cape Coast).
- [9]. Engen, E. M., & Skinner, J. S. (1992). Fiscal policy and economic growth. NBER working paper, (w4223).
- [10]. Evans, O., Adeniji, S., Nwaogwugwu, I., Kelikume, I., Dakare, O., & Oke, O. (2018). The relative effect of monetary and fiscal policy on economic development in Africa: a GMM approach to the St. Louis equation. *Business and Economic Quarterly*, 2, 3-23.
- [11]. Frimpong, Y. S. (2020). *Foreign Direct Investment, Government Expenditure, And Economic Growth in Ghana* (Doctoral Dissertation).

- [12]. Granger, C. W. J., (1988) Causality, cointegration, and control, *Journal of Economic Dynamics and Control*, 12, 551-559.
- [13]. Gray, C. W., Lane, T., & Varoudakis, A. (Eds.). (2007). *Fiscal policy and economic growth: lessons for Eastern Europe and Central Asia*. World Bank Publications.
- [14]. Gyasi, G. (2020). *The Impact of Fiscal Deficit on Economic Growth: Using the Bounds Test Approach in The Case of Morocco*.
- [15]. Hatemi-J, A. (2011). Asymmetric panel causality tests with an application to the impact of fiscal policy on economic performance in Scandinavia.
- [16]. Havi, E. D. K., & Enu, P. (2014). The effect of fiscal policy and monetary policy on Ghana's economic growth: which policy is more potent. *International Journal of Empirical Finance*, 3(2), 61-75.
- [17]. Ialomitianu, R. G., Danu, A. L., & Bucoi, A. (2016). The effects of fiscal policies on the economic growth in Romania. *Bulletin of the Transilvania University of Brasov. Economic Sciences. Series V*, 9(2), 291.
- [18]. Idris, M., Bakar, R., & Ahmad, T.S. (2018). The Effects of Fiscal Operations on Economic Growth and Stability in Nigeria: Empirical Evidence Based on Time Series Data. *International Journal of Accounting and Economics Studies*, 3, 36.
- [19]. Ismail, S. F., & Sek, S. K. Investigating the Effects of Monetary and Fiscal Policy on economic Growth in ASEAN: A Threshold Modelling Approach.
- [20]. Jong-A-Pin, R. (2009). On the measurement of political instability and its impact on economic growth. *European Journal of Political Economy*, 25(1), 15-29.
- [21]. Keynes, J. M. (2015). *The Essential Keynes*. London: Penguin Classics.
- [22]. Lucas Jr, R. E. (1988). On the mechanics of economic development. *Journal of monetary economics*, 22(1), 3-42.
- [23]. Mugableh, M.I. (2018). *Fiscal Policy Tools and Economic Growth in Jordan: Evidence from Time-Series Models*. *International journal of economics and finance*, 11, 1-7.
- [24]. Nakalinzi, S. M. (2019). *Government Expenditure and Economic Growth in Uganda (Doctoral dissertation, Makerere University)*.
- [25]. Nelson, M. A., & Singh, R. D. (1994). The Deficit – Growth Connection: Some Recent Evidence from Developing Countries. *Economic Development and Cultural Change*, 43(1), 167-191.
- [26]. Oriavwote, E. V., & Eshenake, S. J. (2015). Does fiscal policy matters for economic growth? An empirical assessment of the Nigerian situation. *International Journal of Business and Social Science*, 6(11), 77-84.
- [27]. Pasichnyi, M. (2020). *Fiscal policy and economic development*. *University Economic Bulletin*, (44), 153-164.
- [28]. Piętak, Ł. (2014). *Review of Theories and Models of Economic Growth*. *Comparative Economic Research*, 1.
- [29]. Quashigah, P. O., Abebrese, G. O., & Pickson, R. B. (2016). Empirical analysis of the potency of fiscal policy on economic growth in Ghana. *International Research Journal of Finance and Economics*, 154, 26-37.
- [30]. Raleva, S. (2014). Impact of labour on economic growth in Bulgaria (1991-2013). *Economic Alternatives*, 3(2), 5-14.
- [31]. Ramu, & Gayithri, K. (2016). *Fiscal deficit composition and economic growth relation in India: A time series econometric analysis*. Munich Personal RePEc Archive.
- [32]. Saad, Wadad and Kalakeck, Kamel (2009). *The Nature of Government Expenditure and its Impact on Sustainable Economic Growth*. *Middle Eastern Finance and Economics*, Euro

- Journals Publishing Inc., Issue 4. www.eurojournals.com/mefe_4_03.pdf
- [33]. Sen, B.R., Alam, S., Rahman, M.M., & Hossain, M.I. (2019). Investigating Impact of Expansionary Fiscal Policy on Output in Bangladesh Economy: An Econometric Study. *Asian Economic and Financial Review*, 9, 936-945.
- [34]. Shevchuk, V. and R. Kopych, 2018. Fiscal policy effects in Ukraine. *Argumenta Oeconomica Cracoviensia*, 18: 33-50. Available at: <https://doi.org/10.15678/AOC.2018.1802>.
- [35]. Shin Y, Yu B, Greenwood-Nimmo M (2014) Modelling asymmetric cointegration and dynamic multipliers in a nonlinear ARDL framework. In: *Festschrift in honor of Peter Schmidt*. Springer, New York, pp 281–314
- [36]. Takyi, P. O., & Twum, A. (2015). Do Monetary, Fiscal and Trade Policies Matter for Economic Growth? Ghana's Experience. *Global Business and Economics Research Journal*, 4(3), 1-16.
- [37]. Tan, C. T., Mohamed, A., Habibullah, M. S., & Chin, L. (2020). The Impacts of Monetary and Fiscal Policies on Economic Growth in Malaysia, Singapore and Thailand. *South Asian Journal of Macroeconomics and Public Finance*, 9(1), 114-130.
- [38]. Tanzi, V., Zee, H (1997). Fiscal Policy and Long-Run Growth. *IMF Econ Rev* 44, 179–209 <https://doi.org/10.2307/3867542>
- [39]. Tarawalie, A. B., & Kargbo, N. (2020). Efficacy of Fiscal and Monetary Policy in Sierra Leone: An ARDL Bound Testing Approach. *International Journal of Economics and Financial Issues*, 10(3), 217-224.
- [40]. Twumasi, R. A. (2012). The impact of fiscal policy on economic growth in Ghana (Doctoral dissertation).
- [41]. Zagler, M., & Dürnecker, G. (2003). Fiscal policy and economic growth. *Journal of economic surveys*, 17(3), 397-418.
- [42]. Teles, V. K., & Mussolini, C. C. (2014). Public debt and the limits of fiscal policy to increase economic growth. *European Economic Review*, 66, 1-15.

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