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CYCLICALITY OF SOCIAL SPENDING IN WEST AFRICAN COUNTRIES: EVIDENCE FROM GHANA AND NIGERIA

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ABSTRACT

This study investigates the behaviour of government social spending in two West African economies of Ghana and Nigeria. It seeks to discover if government spending in health and education is procyclical, acyclical or counter-cyclical. Findings show that government spending in this sector in the short run is mixed but predominantly counter-cyclical. In the long run, however, government social spending is procyclical, increasing as output growth increases. We also document the inapplicability of the Armey Curve for the two countries, as results show that the squared term of social expenditure is an increasing function of output growth. A significant policy implication of these is that when government is cutting down on its outlays in periods of economic booms to stabilize growth, it should do this without compromising on quality. In particular, while government cuts down on education, for instance, it should not cut down on health expenditure because it would be damaging for growth stability. Furthermore, since procyclical tendencies of developing countries may be attributable to weak institutions and corruption, government must possess the political will to fight institutional graft by building durable processes and systems that would outlive any administration.

KEYWORDS: Procyclicality, Fiscal Policy, Social Spending, Health, Education, Ghana, Nigeria

JEL Classification: E62

INTRODUCTION

Government social expenditure, a subset of aggregate government expenditure, is a measure of the extent to which countries assume responsibilities for supporting the standard of living of disadvantaged or vulnerable people. Thus, spending on roads, agriculture, health, power, education, etc. are known as social spending. Social spending comprises cash gifts, direct in-kind provision of goods and services, pensions, allowances, tax breaks with social purposes are targeted at low income households, elderly, disabled, sick, unemployed or young persons. Social spending narrows the inequality and poverty gap and also has beneficial effect on output in the short run (OECD, 2007).

Both in empirical and theoretical literature, consensus as to the 'true' effects of government spending in stabilizing macroeconomic growth is lacking. From the perspective of economic theory, Keynes advocates fiscal intervention to stimulate aggregate demand and smoothen output fluctuations, while non-advocates of Keynesianism advocate minimal government intervention in the economic sphere. They believe in the economy's self-regulating mechanism.

However, socioeconomic conditions in most West African countries (which plays host to almost 40 percent of the twelve poorest countries in Africa, namely: Malawi, Burundi, Central African Republic, Nigeria, Liberia, Democratic Republic of Congo, Madagascar, Ethiopia, Eritrea, Togo, Sierra Leone, and Mali) characterised by poverty, widening inequality gap, illiteracy, unemployment,

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low productivity, a general lack of social inclusion, as well as persistent macroeconomic instability, would not admit of such passive role for the government. A panacea to this has been the advocacy for increased government spending in infrastructure and other social overheads. For instance, the Maputo Convention called for reforms in spending to be biased in favour of those services most beneficial to the poor and vulnerable. These sentiments are embodied in various strategies, programmes and economic plans of several West African countries, from Vision 2020 in Nigeria to devaluation policies in the Gambia and Togo as well as structural adjustment programmes. It could be surmised therefore that one of the causes of variations in growth and economic instability across these countries are probably due to the patterns, structure and behaviour of government social spending (Mitchel, 2011; Barro and Salai-i-Martin, 2004).

While some empirical studies have focussed on aggregate public spending, others have looked at the components of public spending that actually have larger effects on growth. Economic theory predicts that increases in public spending engender growth. Among the components of public spending, social expenditure is often ignored. Previous studies which analysed social spending effects considered either investment or poverty as the recipient variables. Few studies, however, attempted to link different types of government spending to growth. Furceri and Zdzienicka (2010) for instance observed that social spending particularly devoted to health and unemployment benefits are those which have greatest expansionary effects on GDP. Furceri (2009) reported that social spending devoted to old age and unemployment are those that contribute significantly to provide economic stabilization more than the other areas of social spending. Festus and Adekola (2015) concluded that social spending on adult education programmes is a veritable tool designed to equip adults who are the economically productive and active citizens with required knowledge, attitudes, skills and commitment needed for meaningful socio-economic development.

Studies on the stabilization effect of social spending in advanced countries have shown that social spending by government have significantly helped in the stability of the economy of such industrialized countries. But few studies exist that have attempted to evaluate the relative stabilization effect of government social spending on middle and low income countries. Based on this observed gap, this study therefore undertakes an investigation into the stabilization effect of government social spending in two of West Africa's significant economies. It considers health and education as recipient variables, by analysing their effects in stabilizing the economies of Ghana and Nigeria from 1980 to 2015.The choice of the selected countries was influenced by the mean of sixteen West Africa countries' social spending on health and education. They ere chosen on the basis of their having the highest means of public expenditure amongst other West African countries. It seeks to inquire the behaviour of public social spending in these countries (i.e. whether it is counter-cyclical, pro-cyclical or acyclical). Additionally, it investigates if the behaviour of social public spending in these countries exhibit the prediction of the Armey Curve.

EMPIRICAL LITERATURE AND THEORETICAL ISSUES

EMPIRICAL LITERATURE

A stabilization policy is a macroeconomic strategy enacted by governments and central banks to keep economic growth stable, along with price levels and unemployment. Examples include monitoring the business cycle and adjusting benchmark interest rates to control aggregate demand in the economy. The goal is to avoid erratic changes in total output, as measured by Gross Domestic Product (GDP) and large changes in inflation. Stabilization of these factors generally leads to moderate changes in the employment rate.

There is extensive literature on the issue of cyclicality of fiscal policy in general, including its implications for macroeconomic stability and growth. The cyclicality of fiscal policy has also been examined in a cross-country framework, with evidence indicating that it is mostly counter-cyclical/acyclical in advanced economies. On the contrary, empirical evidence indicates a pro-cyclical behaviour of fiscal policy in developing countries, demonstrating thereby that fiscal policy tends to expand in periods of economic growth, while it contracts during recessions or slowdowns (Lane 2003; Talvi and Vegh 2000).

Since the 1960s, economists have different opinions of government expenditures and its influence on economic growth. Extensive research has been undertaken in an attempt to gauge the extent to which government spending (GS) affects economic growth. Theoretically, the pendulum appears to sway towards the

conventional wisdom that, GS is a source of economic instability. From an empirical perspective, however, the evidence generated suggest a twin effect of GS on growth, implying that it can cause stability or instability in the economy (Alexiou, 2009). Divergences in opinion have been driven by different analytical approaches. Recently, many researchers have attempted to investigate the relationship between social expenditure and economic growth. Blanchard and Perotti (2002) for instance find evidence of a growth-enhancing effect of fiscal policy. Baldacci, Clements, Gupta, and Cui(2004) on their part demonstrate that the economies of low income countries in sub-Saharan Africa respond more positively to fiscal stimulus by the government, while Wibbels and Rodden (2006) conclude that expenditures and revenues for Indian states were pro-cyclical, suggesting in their recommendation that policies of decentralisation in developing countries could accelerate aggregate pro-cyclicality in education and health expenditures.

In a study of 21 Organisation for Economic Cooperation and Development (OECD) countries from 1982-2003, Darby and Melitz 2008 found that some fiscal expenditure items like health, retirement benefits, incapacity and sick pay and unemployment compensation responded in a stabilising manner to business cycle fluctuations. Furceri 2009 empirically assessed the ability of social spending to smooth shocks in output and provide stability. The study found out that social spending is capable of smoothening out 15 percent of shocks in GDP. The study also established that social spending in health, old age benefits and unemployment are more effective and that the smoothening capability of social spending is larger for countries who have larger percentage of their income devoted to social expenditures and for those countries for which social spending is quite stable.

Baxa 2010 reported similar findings for Czech Republic as Blanchard and Perotti 2002, namely, that government expenditure was found to have a positive effect on economic activity. Similarly, Furceri and Zdzienicka 2010 examined the impact of social spending on economic activity, using data from a Panel of OECD Countries from 1980 to 2005. They found that social spending does have an expansionary effect on GDP. Explicitly, the study established that a 1 percent increase in social spending has a proportionate expansionary effect on GDP by 0.1 percent. Similar results were arrived at by Kraay and Aart 2012.

BRIEF OVERVIEW OF EDUCATION EXPENDITURE IN GHANA AND NIGERIA

In Nigeria, the story of government investment in education has not been a pleasant one. With the least public financial commitments in education in Africa, governments throughout the 1980s and in most parts of the 1990s invested an average of under one percent of GDP in the education sector. However, between 1997 and 2006, government expenditure as a percent of GDP in the sector averaged 9.5 percent. This was a huge contrast to Ghana which spent about 4% of GDP and 24% of its budgetary expenditure on education, while Malaysia devoted 5% of its GDP and 20% of total budget to the sector (Inimino, Tubotamuno, and Shaibu, 2017; Umo, 2012). Indeed, for Nigeria, the trajectory of financial commitments to the education sector has not changed, for in 2012 only 8.43% of the national budget was appropriated to education, with a marginal increase to 8.67% the following year. In the same fiscal year of 2013 Ghana committed 31% of its budget expenditure to education (Ojewumi and Oladimeji 2016).

Table 1 and its associated Figure 1 brings into sharp relief current dollar expenditure in the education sector from 1980 for both countries. It also declares the growth rates of these investments for comparison purposes. For the 30-year period covered, Ghana recorded a negative growth rate of investment in the sector for 14 years, with the remaining 16 years witnessing paltry growth rates of less than one percent. Similar patterns are shown for Nigeria, which recorded a negative growth rate for 17 years.

Table 1: Education spending in Ghana and Nigeria at current prices (millions $US)

Year/ Country	Education Spending in Ghana	Growth Rate	Education Spending in Nigeria	Growth Rate
1980	115,085,100		185,714,200	
1981	71,562,090	-0.378	127,752,200	-0.312
1982	72,458,820	0.013	376,130,000	1.944
1983	65,871,000	-0.091	468,001,300	0.244
1984	61,102,970	-0.072	575,574,100	0.230
1985	110,624,200	0.810	461,360,600	-0.198
1986	184,842,200	0.671	1,178,125,000	1.554
1987	157,976,400	-0.145	748,970,000	-0.364
1988	152,000,000	-0.038	1,208,267,000	0.613
1989	159,150,900	0.047	1,080,053,000	-0.106
1990	161,749,400	0.016	2,028,570,000	0.878
1991	184,417,100	0.140	3,038,154,000	0.498
1992	179,655,700	-0.026	2,516,300,000	-0.172
1993	166,731,800	-0.072	1,578,398,000	-0.373
1994	151,909,500	-0.089	1,130,221,000	-0.284
1995	180,348,000	0.187	1,007,268,000	-0.109
1996	193,429,200	0.073	608,941,200	-0.395
1997	192,467,100	-0.005	584,650,600	-0.040
1998	208,747,900	0.085	508,345,700	-0.131
1999	280,720,100	0.345	392,461,200	-0.228
2000	221,623,700	-0.211	365,400,600	-0.069
2001	283,772,100	0.280	211,962,000	-0.420
2002	357,182,700	0.259	223,987,300	0.057
2003	476,671,200	0.335	114,262,700	-0.490
2004	594,798,500	0.248	133,731,900	0.170
2005	678,441,700	0.141	223,774,100	0.673
2006	880,236,000	0.297	278,435,400	0.244
2007	1,080,758,000	0.228	285,482,600	0.025
2008	1,423,384,000	0.317	248,014,300	-0.131
2009	1,234,658,000	-0.133	342,022,300	0.379
2010	1,480,799,000	0.199	340,363,800	-0.005
2011	3,128,231,000	1.113	450,664,900	0.324
2012	3,180,800,000	0.017	509,967,100	0.132
2013	2,712,895,000	-0.147	662,893,800	0.300
2014	2,154,910,000	-0.206	840,489,700	0.268
2015	1,596,925,000	-0.259	1,196,690,000	0.424

Source: World Economic Outlook (2016). Growth rates computed by Authors

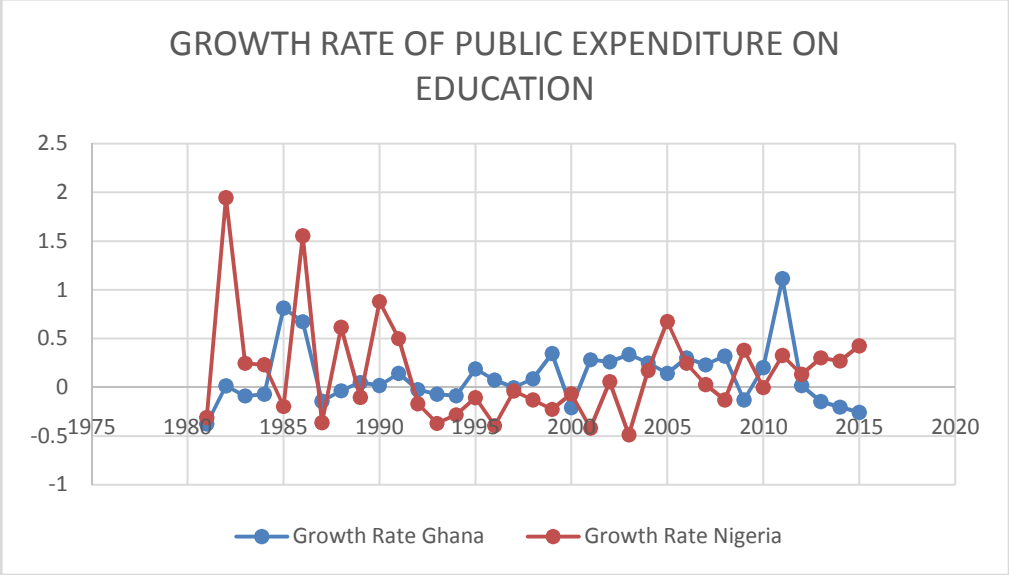

Figure 1. Source: computed from data derived from World Economic Outlook (2016)

BRIEF OVERVIEW OF HEALTH IN GHANA AND NIGERIA

Several objectives underpin the Ghanaian health sector. These include, inter alia, enhancing health outcomes, guaranteeing equal accessibility to health care services, as well as ensuring efficient healthcare delivery. Achieving these objectives demands increasing public expenditure in the health sector. Public health expenditure in Ghana includes capital and recurrent spending from the government budgets. It also consists of grants, borrowings from external sources as well as donations from nongovernmental organizations and NGOs. Government health expenditure as a percentage of total government expenditure in Ghana has remained relatively stable for over a decade beginning from 1995. Its highest share in government expenditure was in 2009 (16.45%) while its least share was in 2014 (6.82). Indeed, between 2001 and 2018, the proportion of government expenditure in the health sector has increased by 11%; this is about 15% higher than the corresponding increase in government revenue. (WHO, 2017)

In Nigeria, the health sector is concurrently run by the three tiers of government in line with the principle of federalism enshrined in the Constitution. The Federal government mostly superintends over teaching and specialist hospitals, while the subnational governments oversee general hospitals, leaving healthcare centres and primary health facilities to the control of local authorities. The health policy objectives of the Nigerian Economic Recovery and Growth Plan 2017-2020 envisages reduction in maternal and infant mortality rates, sustainability in healthcare financing, expansion in healthcare coverage local governments nationwide, and making quality healthcare services affordable, accessible, and available. These objectives are against the background that basic health indicators in Nigeria show she is ranked lowest amongst her peers even in Africa. For instance her average life expectancy is 52 years compared to Ghana's 61 years and South Africa's 57 years.

Table 2 and Figure 2 present a profile of public expenditure (in current US dollars) in the health sector for Ghana and Nigeria. For both countries, the pattern is typical of that noticed in the education sector. Over the 30 year period, average expenditure growth rates for both countries never reached one percent. However, when public health expenditure in Nigeria is considered as a proportion of total health expenditure, we notice that its value was 25.15% as at 2014, reaching a maximum of 36.77% in 2008 and a minimum share of aggregated health expenditure of 20.59% in 1996. As a proportion of government expenditure, its value has been mostly stable, hovering around 6% for the most part of the 1990s. It reached a peak of 9.19% in 2007 but marginally declined to 8.17% in 2014. (WHO, 2017). It is indeed because of this unstable investment in the health sector, coupled with institutional factors of leakages that Nigeria

remains a dominant contributor to Europe's medical tourism.

Table 2: Health spending in West African Countries at current prices(millions $US)

Year/ Country	Health Spending In Ghana	Growth Rate	Health Spending In Nigeria	Growth Rate
1980	310,700.00		324,480	
1981	288,610.00	-0.071	429,470	0.324
1982	537,655.00	0.863	455,100	0.060
1983	195,200.00	-0.637	364,720	-0.199
1984	140,535.00	-0.280	305,760	-0.162
1985	149,600.00	0.065	339,090	0.109
1986	134,335.00	-0.102	301,040	-0.112
1987	143,380.00	0.067	354,820	0.179
1988	163,800.00	0.142	430,000	0.212
1989	178,340.00	0.089	452,540	0.052
1990	223,960.00	0.256	729,220	0.611
1991	297,480.00	0.328	761,670	0.044
1992	318,095.00	0.069	805,040	0.057
1993	291,970.00	-0.082	889,200	0.105
1994	272,340.00	-0.067	1,291,660	0.453
1995	324,450.00	0.191	2,986,060	1.312
1996	389,850.00	0.202	4,499,720	0.507
1997	336,000.00	-0.138	4,785,880	0.064
1998	394,060.00	0.173	5,642,220	0.179
1999	388,080.00	-0.015	1,568,320	-0.722
2000	243,000.00	-0.374	1,740,920	0.110
2001	309,720.00	0.275	1,937,000	0.113
2002	307,000.00	-0.009	1,982,880	0.024
2003	386,880.00	0.260	3,863,700	0.949
2004	574,200.00	0.484	5,473,120	0.417
2005	789,250.00	0.375	6,773,280	0.238
2006	946,560.00	0.199	7,967,820	0.176
2007	1,314,400.00	0.389	11,510,250	0.445
2008	1,382,250.00	0.052	13,016,000	0.131
2009	1,344,200.00	-0.028	11,469,200	-0.119
2010	1,716,260.00	0.277	12,970,860	0.131
2011	1,904,760.00	0.110	15,453,720	0.191
2012	2,007,010.00	0.054	15,414,300	-0.003
2013	2,213,140.00	0.103	19,306,600	0.253
2014	1,374,160.00	-0.379	23,534,000	0.219
2015	896,400.00	-0.348	22,059,000	-0.063

Source: *World Bank World Economic Outlook, 2016*

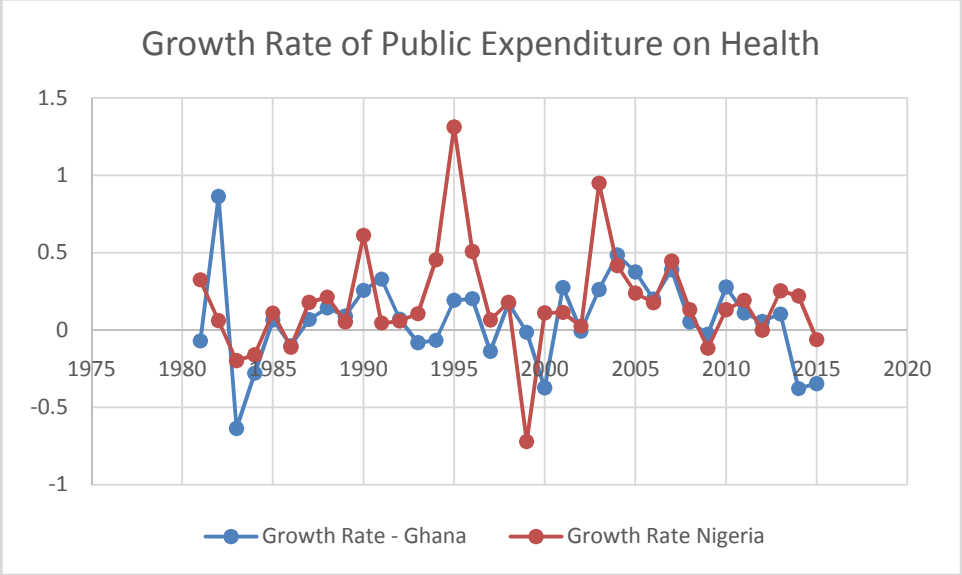

Figure 2.

Source: computed from data derived from World Economic Outlook (2016)

THEORETICAL ISSUES

The theoretical foundation for the specified model is eclectic, relying mainly on key known theories of economic growth. The exogenous and endogenous theories of growth for instance both postulate that economic growth can be initiated and guaranteed in the long term when labour, capital and technology are combined in their right proportions. While the exogenous theory is prostrate in explaining the determinant of technology or knowledge, which has been theoretically found to be the ultimate determinant of growth in the face of diminishing returns to capital and labour, the endogenous theory is much more forthcoming and concrete in explaining that technology or knowledge can be determined by deliberate investments by firms in education, research, skills, innovation, etc.

Wagner's theory of increasing state activity is also germane in our model specification. The theory specifies that the proportion of government expenditure in aggregate national expenditure increases as national income increases. Put differently, "public spending is an endogenous factor that is exogenously determined by the gross national income". It is a direct function of national income. Three principles relevant to this study are worth noting here: first, public sector spending must outstrip private sector expenditure as a nation strives to industrialise; second, social welfare needs (education, health, and other social safety nets) largely borne by the government would also increase; and finally, increased industrialization births monopolies which in turn puts pressure on the government to cushion their effects with the provision of public goods, thus driving up government expenditure.

Closely related to the Wagner theory of State activity is the Armey Curve which graphically establishes a link between the state and economic growth. Similar to the Kuznets and Laffer curves, the Armey curve submits that economic growth would be dismally low in the presence of dual extremes of either zero (0) government or full (100 percent) government presence. Armey 1995 argued "that low government presence will continue to be a rising function of economic growth until an optimum level, from which it becomes excessive and begins to debase growth". An initial expansion of public expenditure to provide for critical infrastructure will stimulate growth, but further government spending or increases in the public sector with its concomitant increases in taxation and regulation will stifle growth. Thus, at a certain point, the marginal benefit to output reaches zero, the adverse effect of a 'big' or 'over-sized' government begins to set in and reduces output.

THE MODEL

This paper draws inspiration from a lot of empirical studies e.g. Akitoby, Clements, Gupta and Inchauste, 2004; Alesina, Campante and Tabellini 2008; Arena and Revilla, 2009. Multiple regression technique was used to determine the relationship between social spending and its stabilization effects on economic growth for Ghana and Nigeria.

The behavioural pattern of government social spending in relation to output is referred to as its cyclicality. It indicates the pattern of movement of social spending in relation to output. Over time, several studies (see for instance, Afonso and Jalles, 2012) have adopted three basic approaches to measuring this cyclical nature of public spending: a correlation-based approach, an elasticity-based approach as indicated by the cyclicality coefficient and the error correction approach. The first approach focuses on estimating the correlation coefficient between output and cyclical components of government spending. The second approach estimates the elasticities of the government spending components in relation to output through a time series regression analysis while the third approach uses the two stage technique which predicts the co-movements between the spending variables and component of output within an error correction framework.

To determine the cyclicality of social spending as a key factor for growth stability, we follow the formulation by Lane 2003 by using the elasticity based approach. This emphasizes the degree of responsiveness of government spending to the rate of change in output as captured in the following model:

$$\mathbf{d}\big(\log(S_t)\big) = a + \beta.\, d\big(\log(Y_t)\big) + \varepsilon_t \quad - \quad - \quad - \quad - \quad (1)$$

Where S_t is government social spending in time t, and Y_t is real GDP; β represents the coefficient of fiscal policy (in this case social spending) cyclicality. A positive estimate of the coefficientβ will indicate that government social spending is pro-cyclical and counter-cyclical if it is negative (IMF, 2016). If the elasticity is above one, whether negative or positive, indicates a more than proportionate response in government spending to changes in output. Finally, government size of social spending is determined as a percentage of the total government social spending as a ratio of GDP.

To be considered as stable, the fiscal balance (in this case value of social spending) would need to increase when output increases and vice versa. That way, social spending as a discretionary fiscal policy would generate the necessary aggregate demand when productivity is weak and decrease demand during periods of boom. As a result, a measure of the stabilizing or destabilizing role of social spending (education and health) is the average change in the overall social expenditure balance (as a percent of GDP) that is linked to a percent change in output (IMF, 2015, 23). The stabilization coefficient is stabilizing when the response of output (GDP) to social spending is positive and destabilizing when this coefficient is negative. It is a useful metric to gauge the role fiscal policy plays in stabilizing output. Thus, the stabilization coefficient is a measure of the relationship between change in policies as implemented and the effect it has on output.

Put in clear terms, the IMF 2015 states that "the stabilizing role of fiscal policy can be assessed by estimating the impact of changes in the output gap on the overall fiscal balance". In this case the government social spending is adjusted for cyclicality by deducting an indicator of cyclical government social spending (in this case) which is made up of the country-specific expenditure "sensitivity" parameter multiplied by the gap in output. This 'sensitivity' parameter captures the monetary value of changes in spending associated with a unit monetary change in the difference between actual and potential output as a result of the fiscal policy (Social spending). Following the work initiated by Romer and Romer 1989, Furceri 2009 and Furceri and Zdzienicka 2010, we begin the analysis to estimate the effects of social spending on growth by estimating a dynamic growth equation from which the impulse response functions of the estimated coefficients would be derived. The equation is of the following form:

$$\Delta y_{it} = a_i + b_t + \sum_{j=0}^{\delta} \delta_j \Delta s_{i,t-j} + \gamma^i X_{it} + \varepsilon_{it} \quad - \quad - \quad - \quad - \quad (2)$$

Where y is output in log form, s is aggregate social spending (or its sub-categories) in log form and a_i and b_t is country fixed effects and time effects respectively. X represents the vector of control variables which has the capacity to influence growth in the short run.

$$\Delta y_{it} = a_i + b_t + \sum_{j=0}^{3} \beta_j \Delta y_{i,t-j} + \sum_{j=0}^{3} \delta_j \Delta s_{i,t-j} + \gamma^i X_{it} + \varepsilon_{it} \quad - \quad - \quad (3)$$

As depicted by a growing number of empirical evidence, several categories of social spending might react to the economic cycle differently and several components of social spending such as unemployment benefits, spending on health and pensions are counter-cyclical (Darby and Melitz, 2008). Based on this, it becomes likely that $\theta = 0$. With the assumption that δj has positive values, then it means equations (2) and (3) will depict opposite coefficients in both spending and growth which implies that scaling the equation with a simple OLS will be biased. To deal with this issue (endogeneity) we will estimate a policy rule for social spending to enable us determine shocks in government spending Fatas and Mihov, 2006; Corsetti and Mueller, 2010; Furceri and Zdzienicka, 2010 .Thus we estimate each country's fiscal reaction functions as follows:

$$\Delta s_{it} = a_i + \mathrm{Trend}_t + \sum_{j=1}^{2} \alpha_j s_{t-j} + \sum_{j=0}^{2} \theta_j \Delta y_{t-j} + \varphi^i Z_t + \varepsilon_t \quad - \quad - \quad (4)$$

Where 'Z' represents a set of control variables. The procedure involves an estimation of the above equation for each country and the residuals of each country's regression, i.e. ε_t are then used in the next step to estimate the social spending output smoothening effects using the following regression:

$$\Delta y_{it} = a_i + b_t + \sum_{j=0}^{3} \beta_j \Delta y_{i,t-j} + \sum_{j=0}^{3} \delta_j \varepsilon_{i,t-j} + \gamma^i X_{it} + \varepsilon_{it} \quad - \quad - \quad (5)$$

Where Δy is growth in the GDP which proxies gap in output, ε residual obtained for each country from estimating equation (4), 'X' represents a set of control variables as follows: PG denotes the annual average growth rate of population in percentage and this coefficient is expected to be either negative or positive with growth; Open is the degree of openness to trade. G Size is Government size as proxied by aggregate government spending over GDP, DEBT is aggregate public debt and EXR is the exchange rate per $US.

The Auto Regressive Distributed Lag (ARDL) bounds testing approach is adopted for this study because of the underlying time series property of data. Preliminary data tests showed that they were stationary both in their levels I (0) and at first difference I(1).The ARDL approach confers many benefits compared to other techniques within the overall ordinary least squares (OLS) methodology. First, it overcomes the challenge of order of integration characteristic of the Johansen procedure Johansen and Juselius, 1990. Second, it is particularly adaptable to small sample size in contrast to the traditional multivariate Cointegration approaches. Third, it furnishes long run estimates that are unbiased even with endogenous regressors. Fourth, it accommodates adequate lag numbers to capture the data generating process from a general to specific modelling framework Ajide, 2014; Laurenceson and Chai, 2003. Fifth, the diagnostic tests of the estimated equation are more reliable Gerrad and Godfrey, 1998. And finally, the ARDL model captures the spill-over effect in the lag structure.

Following Pesaran, Shin and Smith 2001, the Error Correction Model (ECM) of the unrestricted Auto Regressive Distributed Lag (ARDL) equation in it broadest form is specified as follows:

$$\Delta GDPGR_t = \alpha_0 + \alpha_1 GDPGR_t + \alpha_2 LHLT_t + \alpha_3 LEDU_t + \alpha_4 DEBT + \sum_{i=0}^{k} \alpha_{5i} \Delta GDPGR_{t-i} + \sum_{i=0}^{k} \alpha_6 \Delta LHLT_{t-i} + \sum_{i=0}^{k} \alpha_7 \Delta LEDU_{t-i} + \sum_{i=0}^{k} \alpha_8 \Delta DEBT_{t-i} + U_t \quad 6$$

Where: U_t is the white noise error term.

The first part of the right hand side of equation (6) with parameters α_0 to α_7 represent the long-run dynamics of the models and second part with parameters α_8 to α_{15} represent the short-run dynamics of the models.

The ARDL method involves two stages for estimation of the long run and the short run relationship. First stage involves the examination of the existence of a long-run relationship among all variables in the equation. The second stage involves the estimation of the long-run and the short-run coefficients of the same equation. However, the second stage is mainly essential only when a long-run relationship in the first stage has been established Pesaran et al., 2000.

DATA DESCRIPTION AND SOURCES

The study utilizes annual time series data which include: government spending (on education and health), output growth rate, and government debt. The unavailability of social spending series makes it infeasible to work from 1970, so data span the period 1980 to 2015, and were drawn from database of the World Bank, IMF, World Economic Outlook, and the Penn World Tables.

RESULTS

UNIT ROOT TEST RESULTS

We test for the time series properties of the variables in the models specified using the Augmented Dickey Fuller (ADF) tests and the Phillips-Peron (PP) stationarity tests. Tables 3 and 4 indicate that the underlying data exhibit non-stationarity at levels. However, they became stationary upon first differencing I(1). These results justify the next procedure of testing for the existence of cointegrating long run relationship among the variables.

TABLE 3: UNIT ROOT TESTS FOR GHANA

Variables	ADF Test		PP Test		Decision
	Level	First Difference	Level	First difference	
GDPGR	-0.4780	-6.4210**	-3.1265	-8.1656**	I(1)
HLT	-3.8444**	-1.3054	-1.9525	-3.7408**	I(0)
EDU	0.6330	1.7867	-2.1173	-3.5548**	I(1)
DEBT	-2.0639	-5.8069**	-2.1171	-5.8176**	I(1)

Source: Authors' Computation

TABLE 4: UNIT ROOT TESTS FOR NIGERIA

Variables	ADF Test		PP Test		Decision
	Level	First Difference	Level	First Difference	
GDPGR	-5.2274**	-7.8671**	-5.4061**	-14.3127**	I(0)
HLT	-0.7162	-3.4718*	-1.8804	-5.4475**	I(1)
EDU	-0.8065	-5.4475**	-0.6131	-4.8579**	I(1)
DEBT	-2.5988	-4.7978**	-2.1644	-3.6525**	I(1)

Notes: The ADF and PP tests were estimated at linear trend. The optimal lag length was determined using the AIC with a maximum of 9 lags. ** determine stationarity at 5 percent and * denotes stationarity at 10 percent.

TESTS FOR COINTEGRATION

Tables 5 and 6 present cointegration results for Ghana and Nigeria, sequel to stationarity properties reported earlier. Results for both countries indicate that there are cointegrating relationships for the countries under investigation.

INDIVIDUAL COUNTRY COINTEGRATION TEST: GHANA
TABLE 5: ARDL BOUNDS TEST FOR GHANA

Equation	I(0) bound	I(1) bound	F-Statistic
Model 1:cyclicality			
LHLT = f(GDPGR, DEBT)	**5.15**	**6.36**	**7.28*** **
LEDU = f(GDPGR, DEBT)	**5.15**	**6.36**	**8.21*** **

Note: * denotes significant at 1% significant level**
Source: Author's computation

In table 5, we test for the possibility of long run relationship among the variables in the model (the cyclicality model) using the ARDL Bounds Testing approach to cointegration for Ghana. The test utilizes the I(0) and I(1) bound and compares the values with Wald F-statistic. The results reveal long run cointegrating relationship among the variables as the F-statistics are greater than the upper bound values.

INDIVIDUAL COUNTRY COINTEGRATION TEST: NIGERIA
TABLE 6: ARDL BOUNDS TEST FOR NIGERIA

Equation	I(0) bound	I(1) bound	F-Statistic
Model 1:cyclicality			
LHLT = f(GDPGR, LDEBT)	**5.15**	**6.36**	**13.82*** **
LEDU = f(GDPGR, LDEBT)	**5.15**	**6.36**	**9.83*** **

Note: * denotes significant at 1% significant level**
Source: Author's computation

In table 6, we test for the possibility of long run relationship among the variables in the modelusing the ARDL Bounds Testing approach to cointegration for Nigeria. The test utilizes the I(0) and I(1) bound and compares the values with Wald F-statistic. Similar to the results obtained for Ghana, the results indicate that the variables share long-run relationship since the F-statistic is greater than the upper bound [1(1) bound].

BEHAVIOUR OF GOVERNMENT SPENDING IN GHANA AND NIGERIA

The model specified above is analysed to determine if government spending is pro-cyclical, counter-cyclical or a-cyclical in Ghana and Nigeria. Cyclicality seeks to determine if government spending acts in a manner consistent with output or goes the opposite direction. Fiscal policy, in this case social spending, is pro-cyclical if it is expansionary during periods of booms and contractionary in economic crises or depression and vice versa for counter-cyclicality. This section analyses the cyclicality of two major components of government spending – health and education. To obtain the coefficients (which represents the elasticity of the expenditure component in relation to output) of health and education social spending, we estimated equation (1) by OLS for each of the country. The results of the analysis are presented below.

Table 7: Short-run Cyclicality coefficients of social spending in Ghana

Dependent Variable: LGDPGR

Variable	Coefficient	Std. Error	t-stat.	P-value
LGDPGR(-1)	**0.1663**	**0.1159**	**1.4354**	**0.1704**
LGDPGR(-2)	**-0.0482**	**0.1079**	**-0.4471**	**0.6608**
LGDPGR(-3)	**-0.0292**	**0.0971**	**-0.3003**	**0.7678**
LGDPGR(-4)	**0.1362****	**0.0517**	**2.6333**	**0.0181**
LEDU	**-0.5761***	**0.3037**	**-1.8968**	**0.0761**
LEDU(-1)	**1.3041*****	**0.2554**	**5.1054**	**0.0001**
LHLT	**-0.1907****	**0.0581**	**-3.2825**	**0.0047**
LHLT(-1)	**0.06968**	**0.1017**	**0.6852**	**0.5030**
LHLT(-2)	**0.0814**	**0.0931**	**0.8743**	**0.3949**
LHLT(-3)	**-0.1043**	**0.0721**	**-1.4454**	**0.1676**
LDEBT	**0.0727**	**0.0579**	**1.2568**	**0.2269**
LDEBT(-1)	**-0.0335**	**0.0847**	**-0.3953**	**0.6979**
LDEBT(-2)	**-0.1728***	**0.0946**	**-1.8269**	**0.0864**
LDEBT(-3)	**0.0942**	**0.0751**	**1.2547**	**0.2276**
LDEBT(-4)	**-0.1027****	**0.0443**	**-2.3206**	**0.0338**
Cons	**4.0547*****	**0.7742**	**5.2374**	**0.0001**
ECM(-1)	-0.7749***	0.1468	-5.2785	0.0001
Adj. R-squared = 0.92	F-stat = 12.43 (0.0000)		DW = 2.10	

Note: *, **and * denote significant at 1%, 5% and 10% significant level respectively**

Source: the researcher's computation

Results from Table 7 shows that in the first and fourth year, GDP growth improves current GDP growth while the effects are inimical after the second and third year. There is a strong evidence of counter-cyclicality of government spending in education and health in Ghana. The impact of government spending in education and health on GDP growth in the current year is negative and statistically significant at the 10% and 5% significant level respectively. One percent rise in education or health expenditure will cause GDP growth to fall by about 0.58% and 0.19% respectively.

However, result indicates that after the first year, the impact of government spending in education and health on GDP growth assumes positive. In the current year, debt has positive, though statistically insignificant impact on GDP growth in Ghana.

The error correction term (ECM) is correctly signed and statistically significant at 1% level of significance. This result indicates that about 77% of any disequilibrium in the model is corrected within one year. The general F-value suggests that all the partial coefficients are not simultaneously equal to zero and hence statistically significant at 5% critical value as indicated by its probability value. At 92 percent, the adjusted R-squared obtained is satisfactorily high, implying that the model explains about 92 percent of the variation in output growth rate. The Durbin-Watson test for serial correlation shows that the error terms are not serially correlated since it is approximately equal to two.

BEHAVIOUR OF GOVERNMENT SPENDING IN NIGERIA

Table 8: Short-run Cyclicality coefficients of social spending in Nigeria

Dependent Variable: LGDPGR

Variable	Coefficient	Std. Error	t-stat.	P-value
LGDPGR(-1)	**0.3538****	**0.1436**	**2.4635**	**0.0235**
LGDPGR(-2)	**-0.2259*** 0.1304**	**-1.7316**	**0.0995**	
LGDPGR(-3)	**0.2397 *****	**0.0659**	**3.6350**	**0.0018**
LGDPGR(-4)	**-0.2011****	**0.0726**	**-2.7700**	**0.0122**
LEDU	**0.3841*****	**0.1224**	**3.1370**	**0.0092**
LEDU(-1)	**0.2309**	**0.2155**	**1.0714**	**0.2974**
LEDU(-2)	**0.2301**	**0.1581**	**1.4561**	**0.1617**
LEDU(-3)	**-0.0528**	**0.1597**	**-0.3303**	**0.7448**
LEDU(-4)	**-0.2202*** 0.0819**	**-2.6873**	**0.0015**	
LHLT	**-0.1756**	**0.1567**	**-1.1203**	**0.2766**
LHLT(-1)	**-0.2595** 0.1163**	**-2.2308**	**0.0379**	
LDEBT	**0.0275 0.0633**	**0.4339**	**0.6693**	
Cons	**1.4581**	**1.6386**	**0.8898**	**0.3847**
ECM(-1)	-0.8335*** 0.1445	-5.7665	0.0000	
Adj. R-squared = 0.74	F-stat = 4.57 (0.0000)		DW = 1.91	

Note: *, **and * denote significant at 1%, 5% and 10% significant level respectively**

Source: the researcher's computation

Table 8 presents the short run ARDL estimated coefficients for Nigeria. The results show that in the first and third year, GDP growth improves current GDP growth while the effects become inimical after the second and fourth year. There is a strong evidence of both counter-cyclicality and pro-cyclicality of government spending in education and health in Nigeria in the short run period. While government spending in education in Nigeria is pro-cyclical, government spending on health acts counter-cyclical. The impact of government spending in education on GDP growth in the current year is positive and statistically significant at the 1% while the impact of health expenditure on GDP growth is negative and insignificant. One percent rise in education or health expenditure will cause GDP growth to rise or fall by about 0.38% or 0.17% respectively.

The result further indicates that after the first and second year, the impact of education spending on GDP growth remains positive and assumes negative after the third and fourth year. The impact of health spending on GDP growth remains negative after the first year and it is statistically significant at 5% level. In the current year, debt has positive, though statistically insignificant impact on GDP growth in Nigeria.

The error correction term (ECM) is correctly signed and statistically significant at 1% level of significance. This result indicates that about 83% of any disequilibrium in the model is corrected within one year. The general F-value suggests that all the partial coefficients are not simultaneously equal to zero and hence statistically significant at 5% critical value at indicated by its probability value. At 74 percent, the adjusted R-square obtained is satisfactorily high, implying that the model explains about 74 percent of the variation in the growth rate of output. The Durbin-Watson test for serial correlation shows that the error term are not serially correlated since it is approximately equal to two.

Table 9: Cyclicality coefficients of selected spending categories

Countries/Dependent Variables	Health		Education	
	Coefficient	Significant	Coefficient	Significant
Ghana	0.679187	0.6256	1.247803	0.2824
Nigeria	0.573077	0.5828	0.477863	0.6285
Panel Analysis	0.275502	0.2732	0.992167	0.0004**

Notes: ** determine significance at 5 percent and * denotes significance at 10 percent.

Source: Authors' computation

A perusal of Table 9 shows that all the components of public spending (health and education) for the selected countries showed a pro-cyclical behaviour. Also, most of the cyclicality coefficients were found to be statistically insignificant at 0.05 significance level except for the Panel analysis. Specifically, Ghana has 0.68 and 1.25 for health and education respectively, while Nigeria has 0.57 and 0.48 for health and education respectively. The panel analysis showed that overall social spending in these countries was pro-cyclical at 0.28 and 0.99 for health and education spending respectively. These findings violates or contradicts the proposition of Keynesianism that fiscal policy should be counter-cyclical in order to boost aggregate demand, keep unemployment on its path of equilibrium and output near its growth path trend (Lane, 2003). Thus, a stabilizing fiscal policy should be counter-cyclical to downswing expenditure during periods of depression and upswing spending during periods of booms (Halland and Bleaney, 2011). However, the study's findings are in consonance with those of Talvi and Vegh 2005 and Halland and Bleaney 2011 who found that pro-cyclicality is higher for developing economies than for developed ones. Gavin and Perotti 1997, Calderon and Schmidt-Hebbel 2008, Woo 2009, and Telvi and Vegh 2000 explained that the causes of these major deviations between countercyclical findings for developed or advanced economies and penchant for developing economies spending to be pro-cyclical is traceable to weak institutions plagued by corruption Alesina et al 2008, credit market restrictions both at the domestic and international levels which prevents borrowing during bad economic times and social inequality.

Next, we empirically verify the existence of the Armey curve for our case study countries, by deploying the first difference of equation (6)

$$\mathrm{GDPGR} = \beta_0 + \beta_1 \mathrm{SOCEXP} + \beta_2 \mathrm{SOCEXP}^2 + \varepsilon_t$$

- - (7)

It is expected that the linear form of government spending (SOCEXP) would be positively signed, indicating the positive effects of government social spending on output while the squared term ($SOCEXP^2$) would be negative indicating the presence of any contrary effects on output. The results of the analysis for the two countries and for the panel analysis are presented in Tables 10,11 and 12.

Table 10: Estimation Results of Equation (7) for Ghana

Countries	Health		Education	
	Coefficient	Significance	Coefficient	Significance
Constant	-17.297651	0.5376		
ΔSOCEXP	0.677483	0.0053	0.158905	0.0040
$\Delta SOCEXP^2$	0.887190	0.0251	0.248651	0.0054
R-squared	0.864257		Durbin-Watson stat	1.859349
Adjusted R-squared	0.832269		F-statistic	500.1584
S.E. of regression	57.25486		Prob(F-statistic)	0.000000

Notes: ** determine significance at 5 percent and * denotes significance at 10 percent.

Table 11: Estimation Results of Equation (7) for Nigeria

Countries	Health		Education	
	Coefficient	Significance	Coefficient	Significance
Constant	0.711342	0.2589		
ΔSOCEXP	0.223279	0.0021	0.854049	0.0008
ΔSOCEXP^2	0.610654	0.0010	0.710215	0.0029
R-squared	0.794829		Durbin-Watson stat	1.541982
Adjusted R-squared	0.736116		F-statistic	111.8814
S.E. of regression	55.82947		Prob(F-statistic)	0.000000

Notes: ** determine significance at 5 percent and * denotes significance at 10 percent.

Table 12: Estimation Results of Equation (7) for Panel

Countries	Health		Education	
	Coefficient	Significant	Coefficient	Significant
Constant	11159.53	0.0119		
ΔSOCEXP	0.503414	0.0001**	-0.123182	0.0004**
ΔSOCEXP^2	-0.772744	0.0000**	0.355838	0.0001**
R-squared	0.583939		Durbin-Watson stat	1.682793
Adjusted R-squared	0.565762		F-statistic	32.12443
S.E. of regression	425.0449		Prob(F-statistic)	0.000000

Notes: ** determine significance at 5 percent and * denotes significance at 10 percent.

An assessment of the results show that most of the estimated coefficients have the expected signs and all are found to be statistically significant at both 0.05 and 0.10 percent levels. Specifically the linear forms of social expenditures for both countries indicate an increasing relationship with output, suggesting that government social spending in these countries have beneficial effects on output growth. Ghana posted linear coefficients of 0.677483 and 0.158905 for health and education respectively, while the estimated coefficients of the squared term were 0.887190 (health) and 0.248651(education). A cursory examination of the size of the estimated coefficients suggests that health spending impacts more on output than education spending in Ghana.

Estimated results for Nigeria indicates a linear coefficient of 0.223279 and 0.854049 for health and education respectively. Our observation is that unlike results obtained for Ghana, education expenditure for Nigeria impacts more on output than public expenditure on health. Results obtained for the squared term ($SOCEXP^2$) shows that the coefficient is positively signed, a negation of the prediction of the Armey curve which postulates that beyond a certain threshold, government social spending decelerates growth. A possible explanation of this outcome could be that, in Ghana and Nigeria and indeed for developing countries generally, there exist high levels of unproductive human and material resources with potentially huge absorptive capacity which yields increasing returns to productivity instead of diminishing returns as predicted by the Armey curve. Furthermore, it is reasonable to believe that because of the perennially low public social expenditure in both countries, increases beyond the linear term ($SOCEXP^2$) may only compensate for the long years of low investment in the sector, and so instead of being a disincentive to growth, $SOCEXP^2$ actually leads to increased economic growth. However the panel result for the two countries shows a negative effect of the squared term ($SOCEXP^2$) of government social spending on output growth. All relevant coefficients were significant at acceptable levels.

CONCLUSION AND RECOMMENDATION

Our findings are varied in respect of the two time dimensions. In the short run, results were mixed, but mostly indicating a counter cyclical tendency of government social spending for both countries. However, in the long run, we observe that by

acting pro-cyclical as found in the two countries of our study, fiscal policy through government social spending significantly increased output volatility instead of reducing it (that is fiscal destabilization) as indicated for the two social spending components. Secondly, the Armey Curve seems not to hold for Ghana and Nigeria, and as earlier observed, long years of underinvestment in the social sector coupled with entrenched illiteracy as well as poor quality of healthcare delivery systems may be a plausible reason for increasing returns to output rather than diminishing returns as predicted by the Armey Curve.

A significant policy implication of these may be that when government is cutting down on its outlays in periods of economic booms to stabilize growth, it should do this without compromising on quality. Accordingly, while government cuts down on education, for instance, it should not cut down on health expenditure because it would be damaging for growth stability. Secondly, as suggested by Alesina et al 2008 and Telvi and Vegh 2000, procyclical tendencies of developing countries may be attributable to weak institutions and corruption. Corruption and compromised institutions mean negative net value to society of huge government investment in the social sector. It would mean poor quality infrastructure and lower returns on social investment in the face of rising public expenditure. As a panacea, government must possess the political will to fight institutional graft by building durable processes and systems that would outlive any administration.

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World Health Organization Global Health Expenditure database

APPENDIX

	Education Expenditure as a Percentage of GDP		Health Expenditure as a Percentage of GDP	
YEAR	Ghana	Nigeria	Ghana	Nigeria
1980	8.59	3.16	6.99	2.51
1981	8.69	4.97	6.84	2.7
1982	8.18	4.89	13.32	2.89
1983	8.62	4.52	4.81	2.3
1984	8.38	3.96	3.19	2.1
1985	8.24	3.48	3.32	2.17
1986	8.23	3.94	2.35	2.45
1987	8.11	4.43	2.83	2.47
1988	7.92	4.18	3.15	2.85
1989	8.03	4.62	3.4	2.87
1990	8.75	4.88	3.8	2.37
1991	8.54	4.77	4.51	2.78
1992	8.80	4.76	4.96	2.75
1993	8.79	7.72	4.89	5.63
1994	9.55	9.77	5	7.14
1995	9.79	10.79	5.02	10.46
1996	9.79	12.79	5.62	12.86
1997	9.89	13.89	4.88	13.36
1998	9.98	17.77	5.27	17.63
1999	10.45	7.95	5.03	4.37
2000	10.45	7.73	4.88	3.75
2001	10.34	7.1	5.83	4.39
2002	10.79	7.88	4.98	3.35
2003	11.78	9.67	5.07	5.71
2004	11.70	9.96	6.47	6.23
2005	11.32	9.16	7.35	6.03
2006	11.31	10.99	4.64	5.48
2007	11.37	10.98	5.31	6.92
2008	11.99	10.64	4.85	6.26
2009	11.75	10.75	5.17	6.77
2010	11.60	10.9	5.33	3.53
2011	11.91	8.78	4.81	3.78
2012	11.58	8.32	4.79	3.37
2013	11.67	8.92	4.63	3.8
2014	11.58	8.94	3.56	4.3
2015	11.25	8.16	2.39	4.53
Average	**9.99**	**7.947778**	**4.98**	**5.08**

Source: World Development Indicators (2016)