WEST AFRICAN INSTITUTE FOR FINANCIAL AND ECONOMIC MANAGEMENT (WAIFEM)

WEST AFRICAN FINANCIAL AND ECONOMIC REVIEW

Volume 19 **June 2019** **Number 1**

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Published in Lagos, Nigeria by
West African Institute for Financial and Economic Management (WAIFEM),
Central Bank of Nigeria Learning Center, Navy Town Road, Satellite Town,
PMB 2001, Lagos, Nigeria.

ISSN 0263-0699

Printed by
Kas Arts Service Ltd.
08056124959

FISCAL DEFICIT AND ECONOMIC GROWTH IN THE WEST AFRICAN MONETARY ZONE: AN EMPIRICAL RE-EXAMINATION

Emmanuel Onwioduoiki[1] and Kenneth Onye*[1]

Abstract

This study investigates the part that fiscal deficit played in driving economic growth in the West African Monetary Zone(WAMZ) over the period of 2000 to 2016. The study adopts the Blundell and Bond (1998) dynamic panel system GMM and the Arellano and Bond (1991) difference GMM that accommodates potential endogeneity issues, corrects for possible serial correlation, and overcomes potential problem of weak exogeneity of instruments in the model to analyse the dynamic effect of deficit and other macroeconomic fundamentals on growth. The findings from the study reveal that apart from broad money supply, other variables met the theoretical a priori expectation and significantly impacted real GDP growth in the Zone. Importantly, fiscal deficit was found to exert a deleterious (but weak)effect on growth in the Zone – a result that is not too surprising given the large, growing, and unsustainable levels of fiscal deficits that seemingly characterized the fiscal operations of member countries of the Zone in the period under review. A possible explanation of the weak effect of deficit is that it is a pointer to the apparent limited role accorded fiscal deficit (and its discretionary/structural component) as a counter-cyclical stabilizing tool by countries in the zone. In the light of this, it is recommended that governments of WAMZ should adhere conscientiously to the fiscal deficit criterion (which is an integral part of the WAMZ convergence criteria). This will help to ensure a more sustainable level of fiscal deficit and eliminates the negative effect of deficit on growth for the economies in the Zone.

Keywords: Fiscal Deficit, Economic Growth, WAMZ

JEL Classification : C2, E1, E2, O4, O5

1. Introduction

The purpose of fiscal policy is fundamentally to encourage economic growth and development. Nonetheless, the degree to which fiscal policy, especially deficits stimulates economic growth continue to evoke theoretical and empirical discussion

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particularly in the developing countries, including the West African Monetary Zone (WAMZ) countries[2]. Fiscal deficit has become a protuberant and entrenched feature of the (WAMZ) economies in recent years. It has occupied the center stage in recent policy debates especially as fiscal deficit as a ratio of GDP, one of the convergence criteria in the WAMZ monetary integration agenda, has recently been modified. While the issues of budget deficits are undoubtedly not new, the size of government fiscal deficits in the recent times and the inability of WAMZ countries to satisfy and sustain the convergence criteria have rekindled interest in the subject (Onye and Okon, 2018).

Government borrowing is an essential part of fiscal policy and management of the aggregate demand. When the government runs a fiscal deficit, it means that in that given year, total government expenditure exceeds total income. The government can borrow to finance the deficit through the issuance of debt instruments, such as Treasury Bills and long-term bonds. There is a near consensus in the literature that a persistently large fiscal deficit creates macroeconomic instability (Onwioduokit, 1999). Thus, excessive fiscal deficits are generally expected to be growth-retarding, all things being equal. This can arise because total savings are reduced (if the private sector does not fully adjust its savings or government borrowing finances consumption goods provision), consequently reducing factor accumulation. On the other hand, if deficits are perceived as unsustainable, then changes in tax/expenditure policy and/or monetary policy will be anticipated. Either these or both is likely to retard growth via effects on investment – from increases in expected inflation or uncertainties associated with possible fiscal policy changes – even if monetary policy is designed to counteract the inflationary effects of a budget deficit. In this regard, growth would still likely be inhibited by the associated increases in interest rates (Tanzi and Zee, 1997). The above theoretical narrative notwithstanding, the argument on the expediency of fiscal deficit as a tool for stimulating growth and development is largely unsettled, given the contradictory results of empirical studies.

A study on the potential role of fiscal deficit as a means of inducing growth and stabilizing output is important for the WAMZ countries in many folds. First, it is particularly critical for the future monetary union (EWOWAS monetary union) when countries in the zone would rely mainly on fiscal policy as a stabilizing tool having

[2]West African Monetary Zone was created in 2000. Gambia, Ghana, Guinea, Liberia, Nigeria, and Sierra Leone are members.

lost the autonomous monetary policy tool to the central monetary authority. Second, focusing on the WAMZ region is also apt in view of the proposed lunch of the ECO now set for 2020 because although there is avalanche of studies on deficit-growth nexus at the individual country contexts, there is scarcely any robust empirical evidence on this for the WAMZ as a regional bloc. Third, the dearth of empirical evidence in this area appear to be compounded by the fact that there is some knowledge on the effect of deficit, including discretionary deficit on growth (and output stabilization) for the EMU and some Asian countries (see e.g., Gali et. al. 2003; Allsopp and Vines, 1996 for the EMU countries, and Chang, Liu and Thompson, 2002 for Asian countries). Similar empirical evidence for the WAMZ economies is conspicuously lacking in the literature.

The objective of this paper is to investigate the relationship between fiscal deficit and economic growth in the WAMZ. In pursuance of this objective, the rest of the paper is organized as follows: Section 2 presents a brief on the WAMZ economies with special emphasize on fiscal developments and economic growth, while Section 3 contains a brief review of the theoretical and empirical literature. Section 4 dwells on analytical methodology and presentation of results, while Section 5 contains a summary, some concluding remarks and policy implications.

2. Overview of Recent Development Profile in the WAMZ and Brief Literature

2.1 Economic Performance of WAMZ Economies

Looking at the countries' scorecard on economic growth, the real GDP growth was uneven among the countries in 2016. The Gambia recorded a growth rate of 1.6 percent in 2016, compared with 4.7 percent in 2015 and 0.87 in 2014. The growthrate in Ghana decelerated marginally to 3.5 percent in 2016, from 3.9 percent recorded in 2015. Compared to 2012 growth rate, the services remained the largest contributor to the GDP (49.5 percent) in 2015, against 48.4 percent recorded in 2012, and the fastest growing sector (8.9 percent). Industry and agriculture grew by 7.0 and 5.2 percent, respectively. In Guinea, real GDP growth was lethargic between 2012 and 2015, plummeting from 3.9% in 2012 to 2.2 % in 2013 and 0.3% (2014) and 0.095 in (2015). However, large recovery was made in 2016 when real GDP in Guinea grew by over 5.2 % (Table 1).

Table 1: Development Profile of WAMZ Economies (2000-2016)

COUNTRY								
GAMBIA/Year	**2000-04**	**2005-09**	**2010-11**	**2012**	**2013**	**2014**	**2015**	**2016**
Real GDP (USD	698.7	810.59	931.82	964.62	1010.74	1019.6	1067.69	1085.04

Million)								
RGDPG (%)	4.39	3.2	1.1	5.86	4.78	0.88	4.72	1.63
GDP diff. (USD Million)	30	24	10	50	40	0	100	0
Fiscal Def. (% of GDP)	3.04	2.89	4.74	4.38	8.54	5.86	8.67	10.17
REER (%)	132.14	104.19	96.22	90.09	83.39	76.05	75.83	80.89
Real Int. (%)	17.36	25.08	22.16	23.32	20.81	18.88	.	.
INV (USD Million)	187.36	239.94	204.31	225.59	219.88	220.05	229.29	209.2
GDP Deflator (%)	8.83	3.4	4.37	3.79	5.95	8.09	7.54	4.19
Trade Open. (%)	60.18	61.95	66.77	74.92	70.07	64.42	54.19	65.9
M2GDP (%)	26.93	41.61	51.8	53.29	55.01	54.99	.	.
Labour Sup.	546600	640345	716380	751320	776318	802655	830679	858184
GHANA	**2000-04**	**2005-09**	**2010-11**	**2012**	**2013**	**2014**	**2015**	**2016**
Real GDP (USD Million)	20108.7	26551.5	34434.4	40103.8	43036.4	44751.8	46504.3	48167.6
RGDPG (%)	4.6	6.13	10.97	9.29	7.31	3.99	3.92	3.58
GDP diff. (USD Million)	4180	1600	3500	3000	3000	2000	2000	1000
Fiscal Def. (% of GDP)	4.35	6	8.75	11.29	12	10.94	5.3	8.31
REER (%)	94.61	102.54	97.52	88.99	89.56	69.45	70.42	81.22
Real Int. (%)	–	–	–	–	–	–	–	–
INV (USD Million)	0	6498.38	7995.7	12107.1	13018.1	13382.4	13747.3	.
GDP Deflator (%)	25.58	29.88	15.26	15.21	15.58	16.68	17.8	17.42
Trade Open. (%)	104.11	74.11	80.84	93.17	81.65	88.45	99.25	88.6
M2GDP (%)	31.5	27.36	30.08	30.36	29.25	33.1	33.95	34.2
Labour Sup.	8499973	9539956	1.1E+07	1.2E+07	1.2E+07	1.3E+07	1.3E+07	1.3E+07
GUINEA	**2000-04**	**2005-09**	**2010-11**	**2012**	**2013**	**2014**	**2015**	**2016**
Real GDP (USD Million)	3922.4	4472.99	4828.52	5115.17	5232.82	5253.75	5259	5532.47
RGDPG (%)	2.98	2.38	2.92	3.94	2.3	0.4	0.1	5.2
GDP diff. (USD Million)	-8780	100	150	200	100	100	0	200
Fiscal Def. (% of GDP)	4.88	1.88	7.62	3.27	5.3	4.22	8.99	0.37
REER (%)	NA	NA	na	.	.	.	.	.
Real Int. (%)	12.3	NA	na	.	.	.	.	.
INV (USD Million)	NA	388.18	514.7	545.2	560.29	562.94	576.89	594.63
GDP Deflator (%)	8.18	19.78	19.97	12.89	6.29	7.5	7.82	10.58
Trade Open. (%)	53.82	70.13	71.63	91.69	83.06	80.62	78.1	69.62
M2GDP (%)	14.56	22.43	37.31	29.32	30.74	31.99	35.46	33.53
Labour Sup.	3602468	4110184	4561415	4757593	5406768	5553328	5707556	5869021

Source: WEO, WDI, 2017

In Liberia, real GDP grew by 0% in 2015 and retarded in 2016 with the country posting a negative real GDP growth rate of -1.6%. The situation in Nigeria closely mimics that of Liberia over the same period. Real GDP in Nigeria plummeted from 6.3% in 2014 to 2.6% in 2015 and by 2016 Nigeria consistently posted negative growth rate in the first, second and third quarters of the year- a situation of economic recession. As Onye and Umoh (2017) documents, Nigeria's recent economic recession is one that was orchestrated by plummeting price of crude oil (the major source of foreign exchange) which resulted in a drastic drain of the country foreign exchange reserve. The country pulled out of inflation in 2017.

Regarding developments in producer price inflation, we look at the development of production cost using the GDP deflator. We rely on GDP deflator which is a measure of the cost of locally produced goods (the other being CPI-based inflation) because it is the variable for which we can find consistent data for the countries in our sample over the period of study[3]. In The Gambia, GDP deflator rose to 8% in 2014 (from 5.9% in 2013) before declining to 7.5% in 2015 and 4.1% in 2016. In Ghana, the general cost of production has been rising since 2013; increasing from 15.5% in 2013 to 16.6% in 2014 and 17.8% in 2015. By 2017, the GDP deflator in Ghana stood at 17.4%.

Table 1 (contd.): Development Profile of WAMZ Economies (2000-2016)

LIBERIA/ Year	2000-04	2005-09	2010-11	2012	2013	2014	2015	2016
Real GDP (USD Million)	1043.53	1070.73	1345.7	1510.52	1641.99	1653.5	1653.5	1627.05
RGDPG (%)	1.55	7.06	7.15	7.99	8.7	0.7	0	-1.6
GDP diff. (USD Million)	-926	66	100	100	100	100	0	-100
Fiscal Def. (%	0.03	2.48	4.38	1.64	4.7	1.78	10.21	5.9

[3] The percentage increases in GDP deflator from one period to the other measure the rate of inflation (from the producers' standpoint). Similarly, the growth rate of CPI measures the rate of inflation from the consumers' of cost of living standpoint. CPI is a measure of cost of living while DGP deflator is a measure of cost of producing (Ireland, 2010).

of GDP)								
REER (%)	na	na	na	.	.	.	.	.
Real Int. (%)	17.94	3.6	5.63	9.17	9.99	10.52	12.43	8.21
INV (USD Million)	116.37	153.84	285.42	400.32	451.72	452.92	440.07	431.01
GDP Deflator (%)	2.02	11.96	7.98	3.99	3.18	2.7	1.04	4.97
Trade Open. (%)	114.25	229.64	114.02	122.17	130.99	136.97	126.02	121.69
M2GDP (%)	12.65	27.18	37.37	34.91	37.26	34	35.71	.
Labour Sup.	1043323	1214957	1390660	1452404	1490517	1532548	1579632	1628379
NGERIA	**2000-04**	**2005-09**	**2010-11**	**2012**	**2013**	**2014**	**2015**	**2016**
Real GDP (USD Million)	186538	301170	378081	403665	425440	452285	464282	457127
RGDPG (%)	11.52	6.34	6.36	4.28	5.39	6.31	2.65	-1.54
GDP diff. (USD Million)	49680	18000	25000	10000	30000	20000	10000	0
Fiscal Def. (% of GDP)	-1.1	-2.57	2	-0.09	2.47	2.21	3.53	4.43
REER (%)	74.83	91.59	100.15	111.39	118.81	127.1	126.07	115.66
Real Int. (%)	6.14	7.16	-18.18	6.88	10.25	11.36	13.6	6.65
INV (USD Million)	18998.3	35481.72	58579.69	57490.89	62012.45	70338.55	69410.29	.
GDP Deflator (%)	17.16	10.13	56.67	9.27	5.87	4.66	2.86	9.58
Trade Open.	68.05	61.32	47.72	44.38	31.05	30.89	21.12	.

(%)								
M2GDP (%)	21.78	29.17	20.85	21.89	21.51	20.19	19.69	20.36
Labour Sup.	40201460	45420189	50083974	52229485	53743748	55332260	57011781	58672107
SIERRA LEONE	**2000-04**	**2005-09**	**2010-11**	**2012**	**2013**	**2014**	**2015**	**2016**
Real GDP (USD Million)	1594.16	2233.18	2679.54	3158.83	3813.21	3986.97	3170	3362.33
RGDPG (%)	8.32	5.59	5.09	15.18	20.72	4.56	-20.49	6.07
GDP diff. (USD Million)	-91620	120	100	500	600	200	-800	200
Fiscal Def. (% of GDP)	3.98	-2.16	4.77	5.16	2.39	3.61	4.26	4.77
REER (%)	118.54	97.52	100.3	117.28	126.89	130.71	142.35	129.46
Real Int. (%)	7.05	12.12	3.31	8	12.75	17.3	-0.76	13.31
INV (USD Million)	146.88	219.7	958.79	833.41	702.08	664.84	563.26	561.2
GDP Deflator (%)	19.78	10.75	17.25	12.04	6.93	1.8	19.63	4.18
Trade Open. (%)	44.93	41.96	65.62	93.27	87.45	83.19	66.8	77.46
M2GDP (%)	14.36	16.74	21.06	20.43	17.52	20.4	23.97	25.56
Labour Sup.	1787549	2208592	2438348	2539590	2612668	2688573	2767219	2846484

Source: WEO, WDI, 2017

Overall, except in three countries (The Gambia, Ghana, and Sierra Leone) where the GDP deflator declined in 2016 against 2015, the general cost of producing in all other WAMZ countries (Nigeria, Guinea, Liberia) increased in 2016 vis-à-vis 2015. For instance, Nigeria posted a GDP deflator of 9.5% in 2016 (against 7.8% in 2015).

Guinea posted GDP deflator of 10.5 % in 2016 (against 7.8% in 2015) while Liberia recorded a GDP deflator of 4.9% in 2016 (against 1.04% in 2015). This scenario depicts a situation of variegation in the cost of production.

With respect to the fiscal outcomes, the overall fiscal deficit (including grant) as a ratio of GDP for the Zone averaged 3.4 percent in 2015, a deterioration, in relation to 2.9 percent in 2012. In The Gambia, the deficit (including grants), though still high, improved to 8.8 percent of the GDP, compared to 12.5 percent in the previous year. The overall budget deficit was financed mostly from domestic source. The overall fiscal deficit (including grants) in Ghana as a ratio of GDP was 6.1 percent in 2015 relative to 5.3 percent in 2012. Total expenditure increased to 28.1 percent of GDP in 2015, from 27.9 percent in 2012, due to increases in recurrent expenditure, predominantly compensation of employees and interest payments. The deficit was financed essentially from domestic sources.

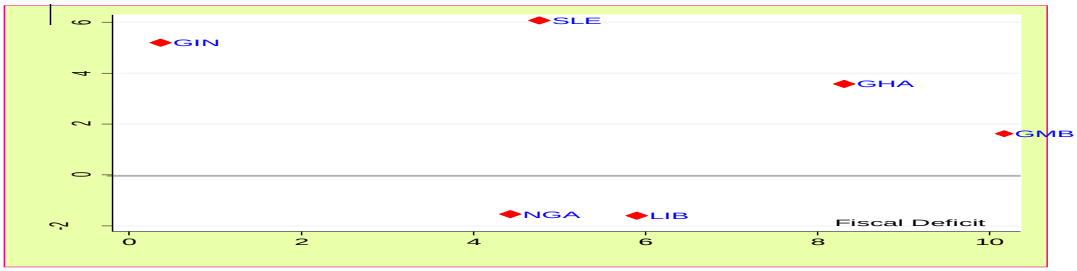
In Guinea, overall deficit (including grants) worsened to 5.5 percent of GDP, from 3.5 in 2012 as total expenditure increased by 11.0 percent in 2015, driven by spending on infrastructural developments and increase recurrent expenditure, including interest on external debt, subsidies, and transfers, as well as wages and salaries. The deficit was mostly financed from domestic sources, the banking system. Fiscal performance improved in Liberia in 2015, as the overall fiscal balance (including grants) recorded a surplus equivalent to 4.3 percent of GDP against a deficit equivalent to 1.8 percent of GDP in 2012. The improved performance was largely attributable to sustained revenue mobilization efforts.

Nigeria's fiscal operations resulted in a deficit of 2.7 percent of GDP, deterioration from the 2.5 percent in 2012, partly because of the high investment expenditure (domestic), wages and salaries, as well as interest payments on domestic and external loans. The deficit was financed from the domestic sources (81.2 percent) and Federal Government Share of Stabilization Account (17.2 percent). Fiscal outcome in Sierra Leone improved significantly, as the deficit including grants declined from 8.1 percent in 2012 to 4.1 percent in 2015, basically because of improved tax revenue. In addition, growth in government expenditure decelerated during 2015, due to government's commitment to control both recurrent and capital expenditure. Fiscal deficit was largely financed from external sources.

Given the above characterization of real GDP and fiscal deficit in the WAMZ, the next basic question we ask is; can fiscal deficit tell us anything about the growth

performance of economies in the zone? We endeavour to provide answer to this question by first taking a perceptive look at the cross-sectional scatter plots of fiscal deficit and growth rate in the Zone.

Fig 1: Cross Sectional Scatter Plots of Deficit and Economic Growth (2016)

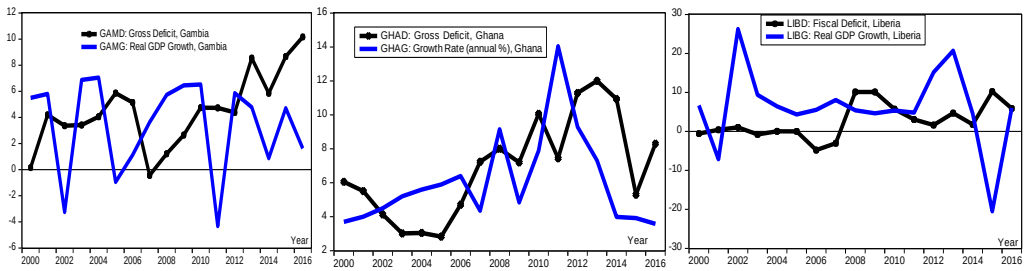


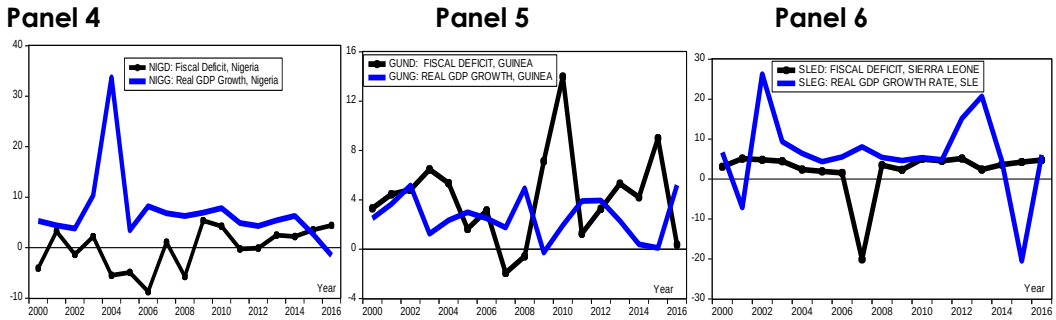
Source: Authors

As Figure 1 clearly shows the performance of WAMZ countries on the economic growth scorecard cannot easily be delinked from the size of fiscal deficit. The said Figure 1 buttresses a situation where countries with relatively large deficit also recorded impressive growth performance. This appears to be the situation for The Gambia, Ghana, and Sierra Leone. Nigeria and Liberia posted negative growth rates with the comparatively lower size of deficit. Guinea appear to depict an outlier situation as it recorded a growth rate of over 5.6% in 2016 with fiscal deficit of less than 1percent. However, as this analysis is only a snapshot of the growth-deficit nexus at a specific point in time, it is apropos not to attach any structural interpretation to it. In what follows, therefore, we examine the trend characterization of fiscal deficit and growth with a view to gaining further insights about the unconditional relationship existing between them (see Figure 2)

Figure 2: Trend Characterization of Deficit and Growth

Panel 1 **Panel 2** **Panel3**

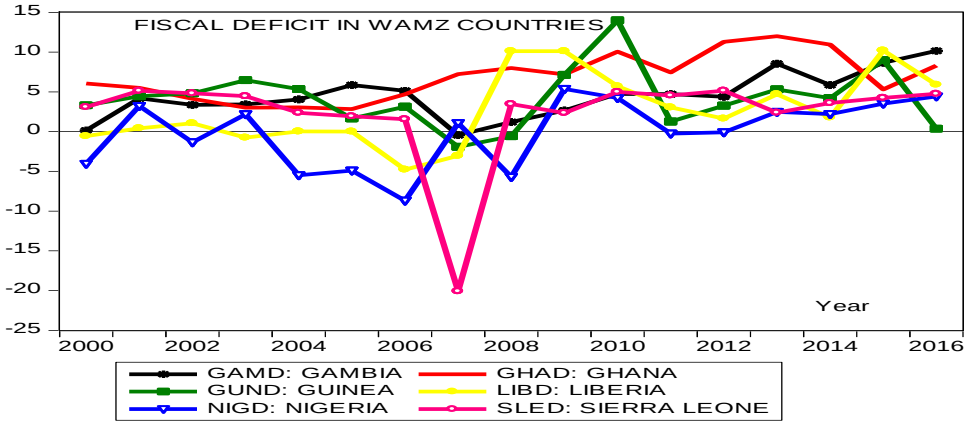




Source: Authors

Figure 2 comprises of 6 panels – indicating the trend of the deficit and real GDP growth rate in six WAMZ countries: Gambia (Panel 1), Ghana (Panel 2), Liberia (Panel 3), Nigeria (Panel 4), Guinea (Panel 5), and Sierra Leone (Panel 6). The trend of GDP growth in the WAMZ countries appears to be one that is closely tracked or associated with the size of fiscal deficit. The situation seems to be much more pronounced for Nigeria where GDP growth have closely followed the size and tendency of fiscal deficit for the past 17 years, 2000 to 2016 (except in 2015). The exception in 2015 can, of course, be explained by the recent spell of economic recession in Nigeria which started in late2015.

Figure 3: Trend of Fiscal Deficit in WAMZ Economies (2000-2016)



Source: Authors.

Note: Trend above the zero line indicates fiscal deficit while trend below the zero line indicates fiscal surplus.

In Figure 3, the trend of fiscal deficit in the six WAMZ countries is superimposed to clearly show the characterization of fiscal deficit in the zone. Since deficit is technically defined as the amount by which government spending exceeds government revenue, a negative deficit implies fiscal surplus. As indicated in Figure 3, beginning from 2009, fiscal deficit has been persistent as all WAMZ countries incessantly operated a fiscal deficit. However, the pre-2009 period in the zone can be regarded as an era in WAMZ when many countries (typically Liberia and Nigeria) recorded fiscal surplus. The Gambia is one country in the zone that have consistently run fiscal deficit over the past 17 years under review.

Overall, the general picture that emerges from the foregoing unconditional trend analysis is that the behaviour and trend of real GDP growth rate cannot easily be delinked from the fiscal policy stance of the governments in the Zone. We leave any structural interpretation of the relationship between deficit and real GDP growth rate to the more robust A-B dynamic panel data Generalized Method of Moments that is employed in the study.

2.2 Theoretical Literature

The theoretical literature on the relationship between deficit and economic growth is diverse. Essentially, there are three broad schools of thought regarding the impacts of fiscal deficit on growth; Neoclassical, Keynesian, and Ricardian. In the Neo-classical perceptive, individuals plan consumption over their own life cycles. Therefore, fiscal deficits winch total lifetime consumption by shifting taxes to succeeding generations. This school assumes that economic resources are fully employed, therefore increase consumption inevitably implies diminished saving; thus, interest rates would unavoidably rise to bring about equilibrium in the capital markets. Consequently, fiscal deficit "crowd out" private capital accumulation, diminished investment, and ultimately retards output growth.

In the Keynesian viewpoint, a substantial fraction of the population is assumed to be liquidity constrained. The propensities to consume out of current disposable income for these individuals are assumed to be very high. A momentary tax reduction accordingly has an instantaneous and quantitatively significant impact on aggregate demand. If the economy's resources are at the outset underemployed, national income increases, thus generating second-round effects and the renowned Keynesian multiplier. Given that deficits motivate both consumption and national income, saving and capital accumulation need not be

negatively affected. Thus, aptly timed deficits have positive consequences on economic growth.

Many Keynesians – including Aschauer (1989) and Eisner (1989)–have argued that deficits need not crowd out private investment. They suggested that increased aggregate demand enhances the profitability of private investments which leads to a higher level of investment at any given rate of interest. Thus, deficits may stimulate aggregate saving and investment, even though they raise interest rates. They concluded that deficits do not 'crowde-out' investment, but rather a 'crowding in' could be expected. These authors averred that that public capital crowds out or crowds in private capital, depending on the relative strength of the two opposing forces: as a substitute in production for private capital, public capital tends to *crowd out* private capital; but by raising the return to private capital, public capital tends to *crowd in* private capital. Consequently, on balance, public capital will crowd out or crowd in private capital, depending on whether public and private capital are gross substitutes or gross complements.

Aschauer (1989) further argued that higher public investment raises the national rate of capital accumulation above the level chosen (in a presumed rational fashion) by private sector agents; therefore, public capital spending may crowd out private expenditures on capital goods on an *ex-ante* basis as individuals seek to re-establish an optimal inter-temporal allocation of resources. On the other hand, public capital, mostly infrastructure, including highways, and airports is likely to bear a complementary relationship with private capital. Hence, deficit that is utilized in higher public investment may raise the marginal productivity of private capital and, in that way, "crowd-in" private investment.

The Ricardian paradigm assumes that successive generations are associated through planned, altruistically motivated resource transfers. Within definite circumstances, this implies that consumption is determined as a function of dynastic resources, to be specific, the total resources of a taxpayer and all his descendants. Because deficit simply shifts the payment of taxes to upcoming generations, the current discounted values of taxes and expenditures must be equal, in so doing, it leave dynastic resources unaltered. Thus, fiscal deficit is a matter of indifference, it neither impact growth positively nor negatively.

Other theoretical contributions essentially identify the conduits through which deficits can potentially affect economic growth as being varied. A noteworthy

channel through which deficit can impact growth is through a long-term interest rates changes. Higher long-term interest rates, resulting from more government budget deficits, can crowd-out private investment, thus dampening potential output growth. As noted by Elmendorf and Mankiw (1999), this may cause a rise in private interest rates and a reduction in private consumption of both the households and firms.

Modigliani (1961), advanced contributions by Buchanan (1958) and Meade (1958), and contended that deficit is a burden for next generations, which comes in the form of a reduced flow of income from a lower stock of private capital. Apart from a direct crowding-out effect, he underscored the impact on long-term interest rates, possibly in a non-linear form if the government deficit is of substantial proportions. It may considerably drive up long-term interest rates since the reduction of private capital will tend to increase its marginal product. Even when the national debt is generated as a counter-cyclical measure and despite the easiest possible monetary policy with the whole structure of interest rates reduced to its lowest feasible level, the deficit financing will mainly not be costless for future generations even though it might be expedient for the present generation. He highlighted exceptions to this general assertion by noting that the gross burden of deficit may be offset in part or in whole when current deficits contribute to the real income of future generations, through productive public capital formation.

Saint-Paul (1992) and Aizenman et al. (2007) analyzed the impact of fiscal policy, proxied *inter alia* by the level of public debt, in endogenous growth models and reported a negative relationship as well. Adam and Bevan (2005) found interaction between deficits and debt stocks, with high debt stocks worsening the adverse consequences of high deficits. In a simple theoretic model that integrated the government budget constraint and debt financing, the authors averred that an increase in productive government expenditure, financed out of a rise in the tax rate, would be growth-enhancing only if the level of (domestic) public debt is low.

2.3 Empirical literature

A number of researchers have variously applied the methods of OLS, Panel fixed effect and random effect in Cross country studies to investigate the effects of deficit on economic growth (see e.g., Kelly, 1997; Ahmed and Miller 2000; Bose and Osborn, 2007; and Onwioduokit and Bassey, 2015). For instance, Ahmed and Miller 2000 in their study, examine the growth effects of deficit among selected developing and industrial countries and found that deficits are positively and

significantly correlated with economic growth. On the other hand, the studies by Landau (1983), and Kumar and Woo (2010) found negative relationship between budget deficit and GDP growth. This implies that the adverse impact of deficit on growth appears to be larger in emerging economies. Meanwhile, Kormendi and Meguire (1985) using data of forty-seven countries over the period, 1950-1977, found no significant cross-sectional relationship between the growth rate of real GDP and the budget deficits in the studied countries.

In an attempt to establish the causal relationship between budget deficit and economic growth, some studies have adopted the use of Granger causality test. Guess and Koford (1984) in their study, using annual data for seventeen OECD countries for the period 1949 to 1981concluded that budget deficits do not cause changes in output. Also, Ahmad (2015) using time series data for Pakistan for the period of 1971-2007, ascertained that there is bi-directional causality running from budget deficit to GDP and GDP to budget deficit. Relatively, Onwioduokit (1999) set out to ascertain the impact of fiscal deficits on inflation as well as impact of inflation on deficits spending in Nigeria from 1970-1994. In other words, he wanted to establish whether it is deficit spending that causes inflation or the other way around. Using Granger Causality test, he found that fiscal deficits cause inflation. He recommended that government should not only control deficit spending but also the mode of financing the deficits.

Various studies have also utilized cointegration test as well as the Granger causality test with the purpose of testing for the long-run relationships and the inter-temporal causal effects between deficit and economic growth. To this regard, Anusic (1993) applied data of the Republic of Croatia from (1991-1992) and from his findings, concluded that the impact of budget deficit on overall economy is harmful, nonetheless, it also depends on the internal condition and option of financing of the deficit by the country. In corroboration, Ezeabasili et al (2012) examined a case of Nigeria over the period, 1970-2006 and adopting the cointegration and structural analysis technique, the results indicated that fiscal deficit affects economic growth negatively. A different study by Ghali (1997) reported a neutral relationship between budget deficit and economic growth using annual data over the period 1960-1996 for Saudi Arabia. While also investigating for United Arab Emirates over the period 1973:1-1995:4, Ghali and Al-shamsi (1997) reported a positive effect of deficit on economic growth. In agreement, Larbi (2012) in a case study of Ghana found that budget deficits have a positive and significant relationship with growth.

The studies of Onwioduokit (2012a), (2012b), (2015), and Akosah (2015) sought to ascertain the nature of relationship between fiscal deficits and economic growth, as well as to establish the fiscal deficit threshold that is consistent with economic growth in the West African Monetary Zone (WAMZ) and other African countries. Their empirical evidences indicated a positive relationship with economic growth. Also, in deciding the threshold level of deficit that is consistent with economic growth, Onwioduokit (2012a), (2012b), (2015) estimated 3.0 percent for Guinea, 5.0 percent for WAMZ, and 2.0 percent for Nigeria, while Akosah (2015) estimated 4.0 percent for Ghana. The studies therefore noted that fiscal restraint to the level below the thresholds would both stimulate a sustainable economic growth and overall stability.

An evaluation of the literature reviewed indicates that many of the past studies suffer weak methodological approach. For instance, a number of them have either used the OLS, fixed effect model, Granger causality or co-integration frame work(see e.g., Onwioduokit (1999); Guess and Koford (1984); Ghali and Al-shamsi (1997); and Ahmad (2015) for Granger causality and Kelly (1997); Ahmed and Miller, (2000) for OLS. However, due to the known fact that cyclical indicators such as output gap and GDP growth could be affected by exogenous fiscal shock and may also be jointly determined with the fiscal policy itself, there could be the possibility of endogeneity problem. In the presence of such endogeneity problem, the OLS estimation of the empirical model will be biased (Gali et al 2003). This inform our choice of a system dynamic panel data GMM which is able to overcome such endogeneity issue, correct for potential serial correlation and heteroskedasticity and minimize data loss in panels with gap (see the section on methodology). A second major conspicuous gap in the literature is that of very scanty studies that focus specifically of on the nexus between fiscal policy and economic growth in the WAMZ area (the only related works are those of Onye and Umoh, 2018; Onwioduokit, 2012b). Yet a study of the effect fiscal policy on economic growth in the zone is very important, particularly, for the future monetary union (in the ECOWAS region) when the individual countries in the zone would have surrendered their autonomous monetary policy tool. This study therefore adds value to the literature in this area.

3. Methodological Framework and Empirical Strategy[4]

3.1 Methodological Framework

The analytical framework adopted for this study follows Onwioduokit (2012) which drew mainly from the Keynesian framework. Educed from a simple Keynesian framework, desired aggregate demand relationship is specified in the goods market:

$$Y = C + I + G + (X - M) \quad \text{----------1}$$

With the following behavioural equations:

$C = a + bY^d, \quad b > 0$

$Y^d = Y - T$

$I = \delta + \gamma i, \quad \gamma < 0$

$G = \bar{G}$

$X = s + \sigma e, \quad \sigma > 0$

$M = m + \phi Y^d, \quad \phi > 0$

Where *Y* is output; *C*, consumption; *I*, investment; *G*, government spending which is assumed to be exogenous; *X*, exports; *M*, imports; Y^d, disposable income; *T*, tax revenue; *i*, interest rate; *e*, exchange rate.

In equilibrium (after substituting behavioural equations into the desired aggregate demand equation (1)), output will be given by

$$\bar{Y} = \frac{A}{\theta} + \frac{1}{\theta}\left(\gamma i + \sigma e + G - (b - \phi)T\right) \quad \text{----------2}$$

Where $\theta = 1 - b + \phi, \quad A = a + \delta + s - m$

From equation (2), increasing taxes will reduce output, while increasing government spending will increase output.

But fiscal deficit (*FD*) is given by

$$FD = G - T \approx G - (b - \phi)T \quad \text{----------3}$$

Fiscal deficit is the excess of government expenditure over its revenue. Assuming that the government derives its total revenue from tax sources (which is quite realistic), G-T gives the deficit position of the government. Since individuals do not

[4]Adapted from Onwioduokit (2012b).

spend all their income, the total revenue that could be generated from consumption expenditure is $(b-\phi)T$. Thus, subtracting this from government expenditure will give approximate position of the fiscal balance.

Putting (3) into (2) gives

$$\bar{Y} = \frac{A}{\theta} + \frac{1}{\theta}\left(\gamma i + \sigma e + FD\right) \quad \text{----------4}$$

Given that the countries in the WAMZ are essentially small-open economies (without ability to influence international price developments) and for holistic treatment of the economy, the model is extended to incorporate the money sector as well as the external sector. The money market in an open economy can be represented by the following equations:

Money Demand Function: $$\frac{M^D}{P} = kY + \lambda i, \qquad k > 0, \ \ \lambda < 0 \quad \text{---5}$$

Money Supply Function: $$\frac{M^S}{P} = m_1 \frac{B}{P} + m_2 i, \qquad m_1, m_2 > 0 \quad \text{---6}$$

Equilibrium Condition: $$M^D = M^S \quad \text{----7}$$

where $P \equiv$ is the general price level, $B \equiv$ international reserves held by the central bank and m_1, m_2 are coefficients.

From the above money market model, the LM schedule can be specified as

LM Schedule: $$i = \psi \frac{B}{P} + \varphi Y, \qquad \psi < 0, \ \ \varphi > 0 \quad \text{----8}$$

Given the importance of the external sector in the countries of study, the influence of the sector is incorporated through the balance of payments schedule. The balance of payments schedule is given as

BP Schedule: $$B = A_2 - \theta_0 Y + \theta_1 e + \theta_2 i, \qquad \theta_0, \theta_1, \theta_2 > 0 \quad \text{----9}$$

where A_2 is the aggregate of exogenous components in the net export function and $\theta_0, \theta_1, \theta_2$ are coefficients.

Putting equation (8) into (3) gives

$$Y = A_1 + \beta_1 \frac{B}{P} + \beta_2 Y + \sigma e + FD \quad \text{----------10}$$

where $\beta_1 = \frac{\psi\gamma}{\theta}$ and $\beta_2 = \frac{\phi\gamma}{\theta}$

Putting equation (9) into (10) produces

$$Y = A_1 + \frac{\beta_1}{P}\left(A_2 - \theta_0 Y + \theta_1 e + \theta_2 i\right) + \beta_2 Y + \sigma e + FD \quad \text{----------11}$$

Isolating like terms and re-arranging equation (11) gives

$$Y = C + \frac{1}{P}\left(\alpha_1 e + \alpha_2 i\right) + \alpha_3 e + \alpha_4 FD \quad \text{----------12}$$

where

$$1 + \beta_1\theta_0 - \beta_2 = \varphi, \quad C = \frac{A_1 + \beta_1 A_2}{\varphi}, \quad \alpha_1 = \frac{\beta_1\theta_1}{\varphi}, \quad \alpha_2 = \frac{\beta_1\theta_1}{\varphi}, \quad \alpha_3 = \frac{\sigma}{\varphi}, \quad \alpha_4 = \frac{1}{\varphi}$$

Recasting the second term on the right-hand side of equation (12) in logarithmic generic term gives

$$Y = C + \lambda e + \alpha_2 i - \pi + \alpha_4 FD \quad \text{----------13}$$

where $\pi \equiv$ the rate of inflation and $\lambda = \alpha_1 + \alpha_3$.

In equation 13, equilibrium output is positively related to fiscal deficit.

3.2 Empirical Model: The System Blundell and Bond (1998) Dynamic Panel data GMM

From both the demand and supply sides of the economy, variables such as interest rate, exchange rate, inflation, fiscal deficit, investment (change in capital stock) and labour are identified as the key variables explaining growth. However, it is appropriate to include in the empirical model those reform variables that also influence economic growth. In the WAMZ countries, financial sector reforms have

been undertaken, while trade liberalization policies have also been implemented. Hence, it is appropriate to include financial reforms variable (broad money supply) and trade openness variable in the baseline empirical model.

As has been noted, this study relies on the Blundel and Bond (1998)[5] system Dynamic panel GMM in which GDP growth rate (y) is modelled, in line with standard business cycle model, as a function of a set of its hypothesized determinants– including: fiscal deficit (f), real effective exchange rate (e), real interest rate (r), investment (v), GDP deflator which is a measure of inflation rate from the producer point of view (n) as well as some reform variables, namely; trade openness (o) and broad money supply as a percentage of GDP (m) (see Gali, 1994; Fatas and Milhov, 2001a; Fatas and Milhov, 2001b for a related approach).

Perhaps, a short description of the system GMM which we adopted for the current study (as distinguished from the difference GMM) is in order. As Roodman (2006) notes, the two estimators are generalized estimators designed for panel data analysis. They embody the following basic assumptions about the data-generating process: (i) a dynamic process in which current dependent variable is influenced by their lags appearing at the right-hand side; (ii) existence of individual fixed effect – i.e., presence of unobserved heterogeneity arising from individual specific features – so that the dependent variable consistently changes faster for some observational units than others; (iii) presence of endogenous regressor, i.e., regressors are not strictly exogenous; (iv) idiosyncratic disturbances, i.e., apart from the fixed effects, there may be individual-specific patterns of serial correlation and heteroskedasticity; (v) the idiosyncratic disturbances are uncorrelated across individuals; (vi) the number of time period (T) may be small while the number of individuals (N) may be large; and (vii) since the estimators are designed for general use, they do not assume that good instruments are readily available outside the data and, therefore, makes used of internal instrumentation approach, i.e., uses lags as instruments. However, they allow inclusion of external instruments.

[5]GMM was originally developed by Lars Peter Hansen in 1982 as a general technique for solving the method of moments (MM) which was earlier developed in the late 19th century (1894) by Karl Pearson. The Arrelano and Bond (1991) difference GMM is so-called because the estimation technique starts by transforming all regressors (through differencing) and uses the generalized method of moment. Rather than the difference transformation, when the forward orthogonal deviation (FOD) transformation - due to Blundell and Bond (1998) and Arrelano and Bover (1995) – is used, the approach is called system GMM.

With these assumptions, the general model of the data-generating process can be specified (using the notations in Roodman, 2006) as follows:

$$y_{it} = \alpha y_{i,t-1} + x'_{it}\beta + \varepsilon_{it} \qquad \text{----------14}$$

$$\varepsilon_{it} = \mu_i + v_{it}$$

$$E[\mu_i] = E[v_{it}] = E[\mu_i v_{it}] = 0$$

Where: y represents the level of growth rate of output. The disturbance term (ε_{it}) has two orthogonal (non-correlated) components, namely: the fixed effects (μ_i) and the idiosyncratic shocks (v_{it}). As we shall see in the sequel, a transformed version of equation 14 will become our estimable system GMM model following a forward orthogonal deviation (FOD) transformation.

A major problem in applying OLS to equation 14-type model, in general, is that the lagged dependent variable ($y_{i,t-1}$) is endogenous to the (individual) fixed effect in the error term. This gives rise to the so-called 'dynamic panel bias'. Interestingly, two basic approaches have been designed to address this endogeneity problem in panel data models. The first approach which is at the heart of difference GMM simply transforms the data by differencing it to remove the fixed effects. The second approach which is at the heart of system GMM does two things-namely; transforms the data by forward orthogonal deviation (FOD) and instruments the lagged dependent variable, $y_{i,t-1}$ (and other similarly endogenous variables) with variables thought to be uncorrelated with the fixed effect. Other related, but less effective, approaches that are typically used to address the endogeneity (to the fixed effect in the error) problem include: (i) the least square dummy variable (LSDV) estimator which essentially draws the fixed effects out of the error term by simply entering dummies for each individual; (ii) taking advantage of the stata option xtreg together with the fixed effect (fe) option ; and (iii) by partitioning the regression into two steps, namely; by first 'partialling' the 'individual' dummies out of the other variables with the stata command stata, and secondly, by then running the final regression with the residual. However, and as has been noted, because the within group approaches employed by the last three techniques do not completely eliminate 'dynamic panel bias' (see Nickel 1981, Bond 2002), the difference and system GMM remains the method of choice[6].

[6]The transformation in both are relatively canonical (Roodman, 2006: 19)

The first difference transformation of eq. 14 can be specified thus,

$$\Delta y_{it} = \alpha \Delta y_{i,t-1} + \Delta x'_{it}\beta + \Delta \varepsilon_{it} \quad \text{----------} \quad 15$$

Although the first difference 'transform' (equation15) now eliminates the individual fixed effects, the lagged dependent variable is still endogenous since the $y_{i,t-1}$ term in $\Delta y_{it-1} = y_{i,t-1} - y_{i,t-2}$ correlates with the $v_{i,t-1}$ in $\Delta v_{it} = v_{it} - v_{i,t-1}$. Similarly, any predetermined variables in x could be potentially endogenous because they too may be related to the lagged idiosyncratic shock, $v_{i,t-1}$. However, unlike with the mean deviation transformation, deeper lags of the regressor remain non-correlated (orthogonal) with the error and are available as instruments.

This notwithstanding, the difference transform has a major weakness; it magnifies gap in panels with gaps[7]. This motivates the forward orthogonal deviation (FOD) transformation that typifies the system GMM. The FOD transformation can be specified thus,

$$y^{\perp}_{i,t+1} \equiv c_{it}\left(y_{it} - \frac{1}{T_{it}} \sum_{s>t} y_{is} \right) \quad \text{--------} \quad 16$$

Where: y = variable to be transformed; T_{it} = number of available future observation used for the FOD transformation; c_{it} the scale factor.

Equation 16 represents the orthogonal deviation transform of the variable y. Instead of subtracting the previous observation from the contemporaneous one (as in the difference transform), what the forward orthogonal deviation (FOD) transformation does is to subtract the average of all future available observations of a variable from the contemporaneous observation. Thus, the system GMM is able to minimize data loss because it is computable for all observations except the last observation for each individual variable. And since lagged observations or variables (unlike in difference GMM) do not enter the formula, they are valid as instruments.

[7]However, the difference and system GMM produces similar result in balance panels (Roodman2006:??)

In practise therefore, our estimable system dynamic panel data GMM continue to retain the lagged dependent variable component as with the difference GMM, only that the FOD transformation (specified as equation 16) does not contain lags. This, as has been noted, makes the lags in the system GMM to be valid instruments (Roodman 2006:20). In this regard, we retain equation 14 as our estimable empirical system GMM following the FOD transformation. Our choice of system GMM (due to Blundel and Bond, 1998) over the Arrelano and Bond (1991) difference GMM is motivated by several advantages of the former, namely, because it is able: (i) to minimize data loss especially in panels with gaps (there are gaps in our panel); (ii) retain lags as valid instruments; (iii) better optimize the internation instrumentation process since its method of variables transformation, the forward orthogonal transformation, leave many of the lagged model variables as valid instruments (iv) maintain other desirable properties of the Arrelano and Bond (1991) difference GMM. However, by way of additional robustness check and for completeness, we report the result of both the system and difference dynamic panel GMM in this paper.

Following the above discussion, we re-specified equation 14 (incorporating the forward orthogonal transformation that typifies the system GMM) to align with the variable notations used in our paper:

$$y_{it} = \alpha y_{i,t-1} + x'_{it}\beta + \varepsilon_{it}$$

$$\rightarrow FODtransform: y^{\perp}_{i,t+1} \equiv c_{it}\left(y_{it} - \frac{1}{T_{it}} \sum_{s>t} y_{is} \right) \text{---------17}$$

Where: y represents growth rate of GDP while x stands for a vector of growth determinants and reform variables– including: fiscal deficit (f), real effective exchange rate (e), real interest rate (r), investment (v), GDP deflator which is a measure of inflation rate from the producer point of view (n) as well as some reform variables, namely; trade openness (o) and broad money supply as a percentage of GDP (m).

Where i=1, 2…6; for countries.
t = year 2000-2016-time period.
(see Table 1for data sources and variable description)

Equation 17 is our baseline estimable empirical model, the Blundell and Bond (1998) system GMM which is able to mitigate potential econometric issues that may be peculiar to the WAMZ, including: time variant (individual) country-specific effect such as demographic, political, institutional and geographic factor across WAMZ countries; the effect of lagged dependent variable, such as $y_{i,t-1}$ that might create autocorrelation problems; and possibility of weak instruments (Mileva, 2007).

A rationalization of the essence and expectation (a priori) of the right-hand variables is in order. Fiscal deficit is a significant variable influencing output growth rate. This variable is particularly important for most of the WAMZ countries where fiscal indiscipline appears to be rife as demonstrated by large and unsustainable deficit in the member states. Thus, growing deficit can result in the inability of these economies to meet and sustain the convergence criteria over nearly the past two decades or so(Onye and Okon, 2017; WAMI Report,2016). In general, very high levels of fiscal deficit may undermine economic growth. However, if the budget deficit is low, stable, and sustainable, it may be interpreted as an increased demand for goods and services (Onwioduokit, 2012). And if the economy is below its equilibrium on Keynesian cross, higher fiscal deficit; that is, increased government expenditures, should stimulate growth. Given the high and unsustainable deficit that have nearly become a stylized feature of WAMZ countries after the fiscal deficit benchmarks was adopted in form of the convergence criteria in 2002, we can expect a negative relationship between deficit and economic growth in the zone.

Real effective exchange rate development impacts the economic growth process. On balance, we expect a negative relationship between increase in real effective exchange rate and economic growth but a positive relationship between increase in nominal effective exchange rate (e.g., depreciation of local currency) and economic growth. It is remarkable to state that the potential effect of real exchange rate changes on growth is the reverse of that of nominal exchange rate on growth. This is because increase in real effective exchange rate implies that exports become more expensive and imports become cheaper (IMF, 2017). This would generally lead to decline in export volume and export revenue, and decrease in GDP. Thus, increase in real effective exchnage rate (the so-called real exchange rate depreciation) is expected to negatively impact economic growth. On the other hand, increase in nominal effective exchnage rate (nominal exchnage rate depreciation) is expected to positively impact economic growth.

Interest rate has an important role in economic growth. Higher positive and real interest rate reduces the growth of consumer spending, increase the level of savings and investment and, therefore, drives economic growth. This is because it creates more incentive to save and provides positive signals for potential investors to invest that would ultimately lead to higher growth rate. Consequently, a positive relationship is expected between real-positive interest rate and economic growth.

Increase in investment spending is expected to drive aggregate demand and lead to increase in GDP and so a positive relation is expected between investemnt and economic growth. Inflation is another significant variable influencing output growth rate. This variable is especially significant for in the WAMZ, where food price and other exogenous factors including high imports of food and intermediate products play very important role. This is particularly important too given the relatively abundant amount of raw material and labour, and therefore cheap labour and material cost. In general, very high levels of consumer price inflation may undermine economic growth. However, if the consumer price inflation rate is low, stable, and sustainable, it may be interpreted as an indicator of macroeconomic stability that would enhance growth. And if the economy is at equilibrium, higher inflation should impact adversely on growth. Hence, we expect to get inverse relationship between consumer price inflation and output growth. Nonetheless, where inflation is measured from the producer point of view using GDP deflator, for instance, a positive relation could be expected given avalanche of labour and raw material supply. This study uses a producer price inflation measure (for which we were able to find consistent data over the sample period), i.e., the GDP deflator and expect it to impact positive on economic growth in the zone.

The index of openness – using total trade (% GDP) as a surrogate – is expected to positively impact growth. All things being equal, the more open the economy, the more access to foreign capital. This would generally be expected to drive investment and economic growth. Thus, the level of openness of the economy is expected to positively impact economic growth. Also, financial deepening – measured by the ratio of M_2 (%GDP), M2GDP – essentially seeks to capture the role of the financial sector development (arising from reforms) on economic growth. The conventional theory predicts a positive correlation between the level of financial deepening and economic growth. In modern economic theory, the role of the financial sector is seen to be catalytic to the growth of the economy. But where the financial sector is shallow and distortionary, a negative correlation with growth may not be too surprising.

3.3 Variable Description and Data Sources

Table 2: Data Sources and Variables Descriptions

Variable	Code	Description	Source
Real GDP Growth rate	y	Growth rate of Real GDP ((constant 2010 US$). This is measured as ΔGDP	WDI
Fiscal Deficit	f	DEF is measures as the General Government expenditure less general government revenue (S-R)	WEO
Real Eff. Exch. Rate Index	e	Real effective exchange rate index (2010 = 100). Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.	WDI
Real Interest Rate (%)	r	Real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator. The terms and conditions attached to lending rates differ by country, however, limiting their comparability	WDI
Investment	v	Investment is measured by Gross fixed capital formation (constant 2010 US$)	WDI
Inflation Rate	n	Inflation rate is measured as GDP deflator rather than CPI (cost of living) or CPI growth rate (inflation). The GDP deflator captures inflationary spree from the producer (rather than consumer) standpoint since it is a measure of the cost of all locally produced goods in a country	WEO
Trade Openness	o	Total Trade (% of GDP). Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	WDI
Broad Money Supply	m	Broad money (% of GDP). Broad money (IFS line 35L..ZK) is the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveller's checks; and other securities such as certificates of deposit and commercial paper.	WDI

4. Results

This section discusses the result of the system and difference GMM employed in the study (Table 3).

Table 3: Fiscal Deficit and Economic Growth in WAMZ: System and Diff GMM Results

Variable	System GMM	Difference GMM (e and o excluded)	Difference GMM (e and o included)
Dep Var	**y**	**y**	**y**
Constant	2.73 (0.717)	NA	NA
L1.y	1.19 (0.001)**	0.78 (0.001)**	0.78 (0.001)**
L2.y	NA	0.03 (0.546)	-0.01 (0.847)
real int. rate(r)	4.82 (0.255)	6.46 (0.046)**	4.63 (0.007)**
L1.r	-6.11 (0.02)**	-7.65 (0.105)	-9.4 (0.089)
L2.r	1.63 (0.667)	NA	NA
Gross fixed capital form(v)	-7 (0.062)	-0.35 (0.005)**	-0.19 (0.05)**

L1.v	1.22 (0.048)	1.2 (0.001)**	1.11 (0.001)**
L2.v	-1.6 (0.002)**	NA	NA
GDP Price deflator, inf (n)	2.99 (0.935)	2.74 (0.156)	1.7 (0.166)
L1.n	-4.3 (0.011)**	-5.77 (0.033)**	-6.55 (0.02)**
L2.n	2.36 (0.201)	NA	NA
Financial deepening, M2 (m)	-1.1 (0.048)**	-3.44 (0.067)	-2.8 (0.019)**
L1.m	9.71 (0.595)	2.82 (0.153)	2.57 (0.057)**
L2.m	1.68 (0.024)**	NA	NA
Fiscal deficit(f)	-4.29 (0.89)	-1.38 (0.666)	-8.26 (0.784)
L1.f	1.72 (0.939)	-2.9 (0.651)	2.76 (0.57)
L2.f	-2.24 (0.552)	NA	NA
Real effective exchange rate(e)	NA	NA	6.45 (0.189)
L1.e	NA	NA	-5.57 (0.298)
Trade Openness(o)	NA	NA	-1.45 (0.193)
L1.o	NA	NA	5.01 (0.566)
AR(1)	(0.206)	(0.236)	(0.236)
AR(2)	(0.351)	(0.824)	(0.133)
Sargan χ2 (p)	38.66 [0.04]	37.7 [0.083]	37.79 [0.027]
Hansen χ2 (p)	0.001 [1.001]	0.001 [1.001]	0.001 [1.001]
Diff. Hans. χ2 (p)	0.001 [1.001]	0.001 [1.001]	0.001 [1.001]
Observation	42	39	39

Key: Using the xtabond2 command notation in stata, 'L1.' and 'L2.' are prefixes that stand for first and second lags of the respective variables. Our model (system and difference GMM) is estimated with the xtabond2 command. We remark that sample size is not an entirely well-defined concept in system GMM which runs on two different samples simultaneously (Roodman, 2006: 40).

Note: (i) The variables are as earlier defined where: y represents GDP growth rate; f represents gross fiscal deficit; e represents real effective exchange rate; r represents real interest rate; v represents investment; n represents GDP price deflator (a measure of producer-based inflation rate); o represents trade openness; m represents broad money supply; (ii) As a well for robustness check via iteration among alternative specifications of model variables and alternative measurement of the model variables, when e and o, the output returned a significant AR(2)i.e., with P>0.05 for both the system and difference GMM; (iii) We also report the result of the difference GMM that include e and o, for completeness.

Table 3 report the results of both the system and difference GMM. In all cases we implemented a one-step estimation using a maximum lag of 2. While Column 2 present the system GMM result, columns 3 and 4 present the result of the difference GMM under alternative specification of the model- incorporating alternative model variables that also serves as robustness check on the model specifications.

Our estimated models reported in Table 3 broadly passed the diagnostic tests (the AR test for serial correlation in the error term, and the Hansen and Sargan tests of over identifying restriction for the validity of our instruments). Only in the case of alternative specifications difference GMM does the two technique yield different results for the significance of the Sargan test of over-identifying restriction. Importantly, the test for AR (1) process is in first differences and, therefore, one would usually expect to reject the null hypothesis of no first order serial correlation (though not in all cases) (see Mileva, 2007:7; Baum, 2013). In fact, as Mileva, (2007:7) notes, the test for AR (2) in first differences is more important, because it will also detect autocorrelation in levels. Thus, for the AR (2) test of no auto-correlation to be valid, the null hypothesis of no AR (2) should not be rejected; in fact, it should be accepted. But this cannot be strictly said of the AR (1) because, as has been noted, although one would usually expect to reject the null hypothesis of no AR(1) (since it is designed to detect autocorrelation at differences), this is not a rule. As for the test of validity of instruments, the Sargan test has as its null hypothesis that "the instruments as a group are exogenous". As the same author notes, the higher the p-value of the Sargan statistic the better. In robust estimation, Stata reports the Hansen J statistic (not used here) instead of the Sargan with the same null hypothesis.

For the system GMM in particular, our test for first order serial correlation, AR(1), returned a probability value of 0.206 indicating that the test statistic falls inside the region of acceptance of the null hypothesis of no AR (1). This suggests that the test is insignificant and leads us to conclude that the panel does not suffer from serial correlation. Similarly, the Arrelano-Bond test for AR(2) returned a probability value of 0.331 which shows that the test statistics falls inside the region of acceptance of the null hypothesis of no AR(2). Thus, we are unable to reject the null of AR(2). This leads us to accept the null of AR(2) and conclude that, in fact, our panel indeed does not suffer from serial correlation (of order 2). As column 3 and 4 of Table 3 clearly indicate, a parallel analogy can be applied to the alternative specifications of the difference GMM result; this leads to similar conclusions – that our specifications of the difference GMM does not also suffer from serial correlation.

Looking at the Sargan statistic, the result returned a probability value of 0.04, suggesting again that the test statistics fall inside the region of rejection of the null hypothesis. Thus, we were unable to reject the null hypothesis that 'the instruments as a group are exogenous', i.e., we cannot reject the null hypothesis of over-identified restrictions for instruments. We conclude that our instruments are valid. The validity of the instrument is in fact further buttressed by the Hansen p. value of 1 which according to Roodman (2006:43) is a revealing sign for a good Hansen's statistics. However, while the difference GMM yield Hansen result that is suggestive of valid instruments (Hansen, P=0.027) for an open economy mode, i.e., when the model include real effective exchange rate and trade openness, the same cannot be said for our model in which these variables are omitted (see column 4 of Table 3).

Turning to the coefficient and significance of the model variables, both the system and difference GMM also yield broadly similar results. In general, a number of the explanatory variables impact output growth rate with a lag but this is not too surprising because while the dependent variable is measured as growth rate, many of these explanatory variables are on their level form (example GFCP, broad money supply, trade openness and fiscal deficit). We choose not to undertake additional log transformation since our estimation technique does a different type of transformation, the difference transformation (for difference GMM) and forward orthogonal deviation transformation (for the system GMM); the essence is to avoid potential data mining. The empirical estimates provide some support for the potential negative impact of large and unsustainable fiscal deficit among countries in the region. However, the coefficient of gross fiscal deficit now turns out to be statistically insignificant. In other words, neither the system nor difference GMM could detect any statistical significance of the fiscal deficit coefficient. As a robustness check, we also estimated the system GMM using alternative stata command (xtdpdsys) as suggested in Drucker (2008: 22). We found the result to be broadly in line with the xtabond2 result reported in this paper. The only major exception is that in the xtabond2 result, fiscal deficit turned to be insignificant although the sign remains negative. Of course, this could also be interpreted as a rationalization of the approach adopted in this paper.

Turning to the effect of real interest rate, investment (measured by gross fixed capital formation), broad money supply and inflation rate, these variables met the a priori expectations (although with some at their lags) and are all statistically

significant. In particular, investment is found to impact growth in the zone positively and significantly with parameter value of 1.22 for the system GMM (column 2) and 1.7 for the difference GMM (column 4) and probability value of 0.04 and 0.001 respectively. The coefficient of 1.22 indicates that a one-unit increase in investment (additional to capital stock) will lead to about 1.22 units increase in the growth rate of real GDP.

The GDP deflator which captures the cost of production is found to be positively and significantly associated with economic growth at first order lag value but negatively and significantly related to growth as expected at its level form. Against all odds, inflationary spree is theorized to have a deleterious effect on growth especially when it lies above the threshold level. But moderate and stable inflation is also known to be growth inducing – and this is generally the case during the early stage of economic boom in business cycles. Thus, the positive effect of GDP deflator on growth could be rationalized as a reflection of the abundance of cheap labour and raw material supplies in many countries of the zone. This is because a cheap supply of labour and raw material is known to lower production cost, encourage real investment and engender higher growth.

Real effective exchange rate impacted economic growth negatively (as expected) but with a lag and the coefficient is also statistically insignificant. The significant effect of real effective exchange rate on growth in the zone suggests a situation of real currency overvaluation in countries of the zone as it is generally under this scenario that real exchange rate could potentially impact growth negatively. This suggest that setting a moderate real interest rate for economies of the region is important in driving the process of economic growth in the zone.

Considering the effect of the two reform variables included in the study, namely; trade openness and a measure of financial depth (broad money supply in percent of GDP), trade openness is found to positively impact growth although insignificant. Financial deepening variable is found to be wrongly signed and significant (column 4). This may be attributed to a shallow and distortionary structure of the financial system in some Member States.

6. Conclusion and Policy Recommendations

This study examined the effect of fiscal deficit on economic growth performance for the West African Monetary Zone countries using the system A-B dynamic panel data estimation procedure for the period of 2000 to 2016. Two major set of variables

were employed for the study, namely; the financial reform variables (broad money supply and financial openness) and policy variables which include fiscal policy variable (deficit) and monetary policy variables (real effective exchange rate index, real interest rate and inflation rate) were employed.

The findings from the study indicate that apart from financial deepening variable, other variables met the theoretical a priori expectation and significantly impacted real GDP growth rate in the zone. Fiscal deficit is found to exert a deleterious (as expected) but weak effect on growth in the zone. The negative effect may have resulted from the large, growing, and unsustainable deficit that seems to have become a stylized feature of countries in the zone over the past 17-year period under review. The weakness or insignificance of this variable is a pointer to the extent that countries in the zone may have been utilizing discretionary fiscal policy as means of stabilizing output and inducing growth. As in Onye and Umoh (2018), we document that the unsustainable and growing deficit among countries in the zone is a major factor that have led to the inability of WAMZ countries to satisfy and sustain (till date) the convergence criteria which was adopted by the Member States since 2002. The same author investigates the extent to which countries in the zone have use discretionary fiscal policy as a stabilizing tool and whether the constraints on fiscal policy imposed by the convergence criteria may have limited the ability and/or motivation of countries in the region to use active counter-cyclical stabilization policy in the zone.

The results from our study further indicate that the economic reforms implemented in the zone over the past two decades had produced modest effect on economic growth in the region. The GDP deflator – a measure of producers' cost – impacted growth positively and significant which is indicative of the abundance of cheap labour in the zone and the well-known fact (in the literature) that a moderately rising price level is needed to drive economic growth.

Given the finding of negative effect of fiscal deficit on economic growth in the WAMZ, the Governments of the Zone's member countries should ensure more meticulous and stricter adherence to the fiscal deficit criteria (as an integral part of the convergence criteria). This will help to ensure a more sustainable level of fiscal deficit and eliminate the potential negative effect on growth of countries in the zone.

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Appendix

Table 4: System Dynamic Panel Data GMM using stata command stdpdsys (Drucker 2008:22)

```
. xtdpdsys dgdp def reer rint inv infd  opn m2gdp, noconstant lags(1) artests(2)

System dynamic panel-data estimation          Number of obs          =        44
Group variable: country1                      Number of groups       =         3
Time variable: year
                                              Obs per group:     min =        13
                                                                 avg =  14.66667
                                                                 max =        16

Number of instruments =     55                Wald chi2(8)           =     61.31
                                              Prob > chi2            =    0.0000
One-step results
------------------------------------------------------------------------------
        dgdp |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        dgdp |
         L1. |  -.0363772   .0237968    -1.53   0.126    -.0830182    .0102637
             |
         def |  -7.86e+08   2.75e+08    -2.86   0.004    -1.33e+09   -2.47e+08
        reer |  -1.28e+08   6.20e+07    -2.06   0.039    -2.49e+08    -6291147
        rint |   8.70e+08   2.91e+08     2.99   0.003     2.99e+08    1.44e+09
         inv |    .331826   .0951549     3.49   0.000     .1453258    .5183262
        infd |   5.08e+08   1.91e+08     2.66   0.008     1.33e+08    8.83e+08
         opn |   1.61e+08   8.60e+07     1.88   0.061     -7181041    3.30e+08
       m2gdp |  -9.38e+07   2.09e+08    -0.45   0.654    -5.04e+08    3.16e+08
------------------------------------------------------------------------------
Instruments for differenced equation
        GMM-type: L(2/.).dgdp
        Standard: D.def D.reer D.rint D.inv D.infd D.opn D.m2gdp
Instruments for level equation
        GMM-type: LD.dgdp
```

REMITTANCES, CAPITAL FLIGHT AND POVERTY: EMPIRICAL EVIDENCE FROM ECOWAS COUNTRIES

Lionel Effiom*[1] and Samuel Edet Etim[1]

Abstract

The study empirically analyses, using the ARDL econometric technique, the relative impact of remittances and capital flight on poverty in two leading West African economies, Ghana and Nigeria. Specific country effect of capital flight indicate that the latter has a more deleterious effect on poverty in Nigeria (0.86)than in Ghana(0.002), while remittances have a far more benevolent impact on poverty in Ghana (-8.00) than in Nigeria (-0.39). Our recommendations find common application for the two countries, since capital flight and remittances have similar relationships on poverty, albeit with differential rates of impacts.

Keywords: Remittances, Capital flight, Poverty, Nigeria, Ghana

JEL Classification: D78, E22, F65

Introduction

The overriding objective of development policy of nations is to curb the incidence of poverty across a broad segment of the population. This goal informed the drafting of the defunct Millennium Development Goals (MDGs) in 2000. Specifically, the MDGs sought to, among other critical objectives, "eradicate extreme poverty and hunger" by the year 2015. Targets at achieving this noble goal were the halving of the proportion of the population who spend below $1 a day, as well as cutting by half the number of people agonized by hunger. But eradication of poverty is predicated on consistent economic growth in the short to medium to long term which, with sound social welfare policies, would ultimately trickle down to the larger population. Indeed, the goal of poverty eradication is consistent with the philosophy of inclusive growth and development.

Yet, consistent and sustainable growth that would guarantee poverty eradication in African nations would require considerable amount of productive resources. Governments must generate and be in control of capital needed to

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be channelled into critical[2] sectors (transportation infrastructure, industry, agriculture, telecommunications, etc.) to grow the economy. The private sector on its part, responding to benevolent government policies, can complement government's efforts through investments and entrepreneurship to grow the economy. Two broad alternatives exist for government in garnering capital for financing development – the domestic and external fronts. The domestic sources of finance include tax revenues and royalties earned from the exploitation of natural resources; the external sources encompass loans, aid, overseas development assistance, foreign direct investment, and remittances. While other elements of external finance are bedevilled with stringent measures imposed by the donors, remittances are however generally less encumbered and are veritable potential source of external development finance (Ratha, 2006; Buch and Kuckulenz, 2004). Its antithesis is capital flight. While remittances injects capital into the economy, capital flight drains resources from the system, causing resource haemorrhage, low productivity, unemployment, and poverty.

Paradoxically, Sub Saharan African (SSA) nations are hugely "blessed" with these twin phenomena. They are amongst the highest recipients of remittances from their nationals around the world, and at the same time cursed with the scourge of capital flight. For instance, the IMF Global Financial Stability Report (2014) indicates that since 2000, emerging economies have witnessed capital flow out of their economies than in. Furthermore, Eurodad (2008) estimates that between 1991 and 2004, about $13 billion was lost annually from Africa through capital flight. This represents close to 8% of annual GDP of the continent. Sony (2007) submits that an annual global estimate of $829 billion capital flight from developing economies exceeds yearly flow of aid of $104billion. The negative effect on some developing countries' GDP even rises to as much as 10%. Within the context of the Economic Community of West African States (ECOWAS) bloc, estimated data from Boyce and Ndikumana (2012) show that in 2000, $4375.5billion left the sub-region, and within a period of three years, there was a significant increase in capital flight to $17,501.1, representing a massive 75% increase. By 2006 however, the quantum of productive capital leaving the bloc stood at $25,383.5, representing 31.1% increase from the previous year. This value sharply nosedived to $20,006.1billion in 2010. On the other hand, remittances as a source of domestic capital have been witnessing a surging trend over the last decade. The World Bank Group (World Bank, 2016) submits that officially documented remittances to developing countries was $431.6 billion in 2015 as against $430 billion in 2014, a rise of 0.4%. In SSA, it grew marginally by 1% in 2015 compared to the 0.2% increase in 2014. For the ECOWAS sub-region in particular, aggregate remittances grew from $19,266billion in 2006 to $21, 639 billion in 2009, representing about 11% growth rate. It further increased to $27, 789billion in 2015. This was a whopping 30.6% growth rate.

Given that current trends indicate that capital flight outpaces remittances (Global Financial Stability Report, 2014), what is the relative impact of capital flight or remittances on poverty in developing countries? This paper seeks answers to this research question.

Because both remittances and capital flight impact generally on growth and specifically on poverty in different ways, the objective of this paper is to investigate their relative impact on poverty on two leading economies in the ECOWAS sub-region – Ghana and Nigeria. A justification for their choice amongst other countries within the sub-region is because of the significant position the two economies occupy in the bloc. While Nigeria is undoubtedly the dominant player in the economics of the Community with its vast natural and human resources, Ghana is also a major participant in its own right with huge reserves of oil recently discovered. The two countries have a combined population of 199.71 million people (Nigeria 174.51 million and Ghana 25.2 million). The two economies represent close to 60% of the entire ECOWAS market and a combined GDP of $607,156 billion disaggregated into $38,648 and $568,508 for Ghana and Nigeria respectively, out of $731,542billion for the entire sub-region (WDI, 2015).

In terms of global remittances ranking, Nigeria was the fourth nation ($20,630.71) with the highest inflow of remittances in 2014, while the value of Ghana's remittance was $2,007.83. Within SSA, Nigeria ranks as the number one in remittances inflow, receiving about 65% of remittances to the region (World Bank, 2008). Comparing with capital flight, in 2012 alone about $991.2bn was siphoned out of developing countries due to tax evasion, corruption, and crime (GFI, 2014,). Growing at an average rate of about 12%, these outflows are equivalent to 10 times the yearly global aid flows and twice as much as the debt developing nations repay every year. And between 1970 and 2010, Nigeria topped the list of countries in SSA with the highest capital flight of $311.4b; Ghana's was $12.4b (Boyce and Ndikumana, 2012).

The literature is replete with studies which examine separately either the impact of capital flight or remittances on economic growth. To our knowledge however, this study is the first comparative study on the relative impact of capital flight and remittances on poverty in Ghana and Nigeria. Our empirical literature review consolidates and weaves the twin processes into an integrative whole and discusses them for the two countries. Extant literature deals only with either the poverty-reducing effect of remittances or capital flight.

Our findings provide useful insights for policy as these nations seek for new ways and mechanisms in achieving the sustainable development goals (SDGs), the

successor to the MDGs, of which poverty eradication is still at the core. The rest of the paper proceeds as follows. Sections 2 and 3 review relevant conceptual and empirical literature of key variables under investigation; sections 4, 5 and 6 present the underlying theory, model and results respectively. Section 7 is devoted to a comparative analysis of the results obtained for the two countries. The study concludes with section 8 with some policy recommendations.

2. Literature Review

2.1 Conceptual Issues

There is no unanimity in the literature on a clear-cut definition of capital flight. It has however been noted by Chang and Cumby (1991) that a viable definition of capital flight rest on the policy questions relevant to a country's estimation and the time period of consideration. Several definitions of capital flight seem to suggest that the phenomenon is both legal and illegal. It might be absolutely legal when a foreign investor, for instance decides to pull out capital from an economy in response to a political or economic crises. It is illegal when such outflows are not supported by conventional financial mechanisms and structures of the home country.

Nyong (2005), for instance, defined capital flight as all forms of irregular capital flows from economic agents in developing countries having the intention to cover such flows. Such flows may be in response to several factors including, strict capital controls, tax evasion, and overvaluation of exchange rate and so on. Generally, however, capital flight denotes the movement of capital from one country to another, exemplified by the huge relocation of currency across international borders. Cuddington (1986) and Dombush (1985)all agree that the underlying causes of capital flight include socio-economic and political crises in the home country, misalignment of exchange rate, deficit financing, policy summersaults, and macroeconomic mismanagement. Economic agents have a propensity of moving their financial assets to safe havens which act as a hedge against inflation and currency devaluation in the domestic economy. In so doing, they mitigate or out-rightly avert the capital loss associated with currency devaluation and other macroeconomic distortions in the home country. Expectations of higher taxes induce a relocation of investments by agents. Budget deficits imply that at some point, investors would ultimately be liable to shoulder the burden of inflation tax occasioned by the printing of more money, thus reducing the real holdings of the domestic currency by agents. All these exacerbate the tendency for capital flight.

While the above conceptualisation emphasises the portfolio and risk factors as drivers of capital flight, it however fails to incorporate a critical element of the

problem, namely, outflows of financial resources which are a direct consequence of the unlawful appropriation of the commonwealth through embezzlement, theft and sleaze. Thus, the term illicit financial flows is usually used to denote this condition where funds leaving the domestic economy do not reflect on the records of the country of origin, nor are their earnings ploughed back to where they originated. Aided by a shadow and an amorphous international financial system typified by 'tax havens', 'tax secrecy jurisdictions,' banking secrecy and weak financial regulations, illicit financial flows have assumed a global notoriety, especially with the publishing of the Panama Papers. This opaque international financial mechanism has helped corrupt elites of both developed and developing countries to plunder the resources of their countries. In sum, capital flight may be legal or illegal, while illicit financial flows are strictly illegal, and the latter is considered a significant component of the former. Thus whenever the movement of capital violates laws relating to its origin, movement, or deployment, it must be illicit.

The perspective of this study captures capital flight as composed of normal and abnormal capital outflows, albeit with a larger component of illicit flows facilitated by private agents. This approach is patterned after World Bank (1985) and Erbe (1985). The important thing is that highly indebted countries and those with great deficits find it increasingly difficult to finance their net imports caused by both normal and abnormal capital outflows (Ndiaye, 2014; Hermes, Lensink and Murinde, 2002a). Illicit financial flows as a component of capital flight is also significant. GFI reports that nearly two-thirds of illicit capital outflows are attributed to commercial flows from developing countries (Ndiaye, 2014; Bakare, 2006).

2.2 Remittances

Remittances constitute a private welfare system which enhances the transfer of purchasing power, mitigates poverty, regularises consumption, influences the supply of labour, offers a pool of working capital, and enhances spending with all its attendant multiplier effect. Conceptualised as money or private savings of migrant workers conveyed to their home country through online, mail, wire or other ICT mechanism, remittances constitute a veritable component of external ODA. Its stability and dependability is famously documented in the literature to outclass other types of capital inflows like FDI, ODA and portfolio equity. It exerts a counter-cyclical effect on the economy during recessions (Ratha, 2003; Buch and Kuckulenz, 2004). In 2014, for instance, global remittances amounted to $583 billion, with developing countries receiving $436 Billion. Specifically, India, China, and the Philippines received the largest share of remittances of $72

billion, $64 billion, and $30 billion respectively in 2015 (Migration and Remittance Factbook, 2016).

2.3 Poverty

Two broad conceptions of poverty are critical here: absolute poverty and relative poverty. The United Nations defines absolute poverty as "a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income but also on access to services" (Gordon, 2005). Absolute poverty is understood to mean the same thing irrespective of location. Relative poverty on the other hand "occurs when people do not enjoy a certain minimum level of living standards as determined by a government (and enjoyed by the bulk of the population) that vary from country to country, sometimes within the same country".

2.4 Poverty Reduction Programmes in Ghana and Nigeria

Poverty alleviation strategies have over the decades assumed dynamic cycles depending on the dominant development paradigm. From the trickle-down development approach which assumed that poverty would be extenuated with increasing economic growth rates in nations, to the empowerment paradigm which believed that the poor could get out of poverty if they got more access to productive resources and were made to be more involved in the implementation of development policies that affected them directly, ECOWAS nations, particularly Nigeria and Ghana have implemented copious doses of these approaches with varying degrees of success as well as failures.

For the two countries, the outcomes of these intervention programmes have been mixed but particularly gloomy for Nigeria. As reported by the World Bank (2015), the strong growth recorded in the Ghanaian economy helped significantly in cutting the country's rate of poverty, calculated based on Ghana's poverty line. This rate fell from 52.6 percent to 21.4 percent between 1991 and 2012. This was indeed less than the African average of 43 percent. Equally remarkable was the decline in the extreme poverty rate from 37.6 percent in 1991 to 9.6 percent in 2013. There were also improvements in the non-monetary indicators of poverty. For instance, reductions were recorded in infant mortality from 57 deaths per 1000 live births in 1998 to 41 in 2014. Similarly, under-5 mortality declined by more than half. Reasons for this remarkable progress include an increasingly skilled labour force, geographic mobility and structural transformation of the economy.

However, Cooke, Hague and McKay (2016) in their comprehensive assessment of Ghana's efforts at poverty reduction note that though substantial progress has been made in halving the poverty rate, "the annual rate of reduction of the poverty level slowed substantially from an average of 1.8 percentage points per year in the 1990s to 1.1 percentage point per year reduction since 2006," with rural poverty (38.2%) substantially higher than urban poverty (10.4%). Paradoxically, though poverty levels have decreased, the number of people living in poverty has only declined by 10 percent (from 7m to 6.4m). This means that population growth outpaces the rate of poverty reduction. Cooke et al (2016) also confirm that inequality has been steadily rising in Ghana since 1992, with the Gini rising from 37 to 41 in 2013.

The picture looks more cynical for Nigeria, as there seems to be a huge disconnect between the avalanche of Nigeria's poverty eradication programmes and the reality on the ground. Empirical evidence by both local and international scholars point conclusively to the fact that poverty in Nigeria is increasing. The proportion of people in poverty seem to be rising in tandem with population increase, skyrocketing from 69 million in 2004 to 112 million in 2010. For instance, extreme poverty increased from 6.2% in 1980 to 29.3% in 1996, dropping to 22.0% in 2004(NBS, 2010). In 2016, out of 188 countries ranked by living standards, Nigeria was graded the 152nd, and more than 80 million people were documented as living below $1.25 a day. There is also a concurrent rise in inequality as measured by the Gini index. The commitment to reducing inequality (CRI) index which measures the commitments of governments to reducing inequality ranked Nigeria at the bottom of the index for the second conservative year. The report laments that Nigeria's spending on the three core areas captured in the study (education, health, and social protection) are shamefully low, with the country playing host to the highest number of out of school children (Commitment to Reducing Inequality Index, 2018). Perhaps, in one of the shocking reports in recent times, Nigeria was shown to have overtaken India as the world's highest concentration of extreme poverty, hosting about 87 million extremely poor people compared to India's 73 million people. She is expected to stay as the world's poverty capital for at least a generation. Comparatively, Ghana seems to be on track in meeting the Sustainable Development Goals (SDGs) of ending extreme poverty by 2030 (Kazeem, 2018). Table 1 catalogues some selected poverty-alleviation strategies initiated and implemented in Ghana and Nigeria.

Table1: Selected poverty-reduction policies of Ghana and Nigeria.

Ghana		Nigeria	
Poverty Programmes	Objectives	Poverty Programmes	Objectives
National Action Programme for Poverty Reduction (NAPPR)	• Generally aims at eliminating extreme deprivation by encouraging enterprise, creativity, and productivity. • Increased agricultural productivity and small scale enterprises, social services, etc.	Operation Feed the Nation (OFN) Green Revolution River Basin Development Authority	Targeted at improving food production Emphasis on food production Focus on Agriculture, irrigation, cheap farm inputs
Programme of Action to Mitigate the Social Consequences of Adjustment (PAMSCAD)	Reduction in the negative outcomes of structural adjustment programmes of the 1980s	Poverty Alleviation Programme (PAP) National Poverty Alleviation Programme	Targeted the poor and vulnerable, especially in the rural settings.
Ghana Vision 2020 (1995)	To become a dynamic and buoyant middle income country by 2020 beginning from 1995	Peoples Bank	Provision of cheap credit to entrepreneurs
Livelihood Empowerment Against Poverty (LEAP) (2008)	Mitigating of extreme poverty and achieving the United Nations MDGs	Directorate for foods Roads and rural infrastructure (DFRRI)	Provision of rural infrastructure and basic amenities to ameliorate poverty

Ghana Poverty Reduction Strategy (GPRS I, II & III) (2003-2009)	Stem the tide of rural poverty via modernization of agriculture.	Nigerian Agricultural Land Development Authority (NALDA)	Reduction in subsistence agriculture to give way to commercial agriculture.
Ghana Shared Growth and Development Agenda	Targeted at key sectors of fisheries, agriculture, sanitation, education, SMEs, basic nutrition, etc.	Family Support Programme (FSP)	Alleviation of poverty via skills acquisition – soap making, garri production, animal husbandry, etc.
		National Directorate of Employment (NDE)	Empowerment/training of school leavers with requisite skills.
		YOUWIN	Provision of cheap credit to entrepreneurs.
		School Feeding Programme	Improving nutrition/health of indigent children in public schools

Source: Authors' survey of the literature.

3. Empirical Literature

3.1 Capital Flight and Poverty

There are different transmission mechanisms through which capital flight affects poverty, Nkurinzinza (2014) identifies five major transmission paths drawing largely from AfDB (2012) and Nkurinzinza (2012). First is the loss of potential investment. Investing in sectors of the economy that have strong linkages with the poor such as agriculture and infrastructure will create greater impacts than other sectors like mining and other extractive sectors. Fofack and Ndikumana (2010) have estimated that Africa's ratio of investment to GDP would increase from I9 percent to 35 percent if a quarter of the stock of flight capital were repatriated and reinvested in the continent. UNECA (1999) estimated that an investment to GDP ratio of 34 percent was needed to record a growth rate of 7 percent per annum in other to halve poverty by 2015.

A second channel is through aid. Nkurunzinza (2012) remarks that anecdotal evidence suggests that not all aid reach the poor. And a large part of it is amassed by more influential citizens, possibly ending up as capital flight. Closely associated with this is the finding that capital flight has the potential of reducing a nation's source of external funding. This makes it more difficult to implement relevant policies and worsens the social conditions of the people (Beja, 2006). The third channel through which capital flight affects poverty is through the repayment of debts. Ndikumana and Boyce (2011a) observe that a greater part of the external public debts owed by African countries could be odious. Repaying these debts obviously limits the resources that should have been spent on social amenities and poverty reduction programmes.

Capital flight also perpetuates poverty through a fourth channel, inequality. The inequality line is broadened when elites engage in mis-invoicing, leaders loot funds and the illicit wealth is transferred to safe heavens where they cannot be accessed. Even in cases where capital flight is attributed to the need to diversify and secure investment portfolios, it is only the wealthy few that have the privilege to do so (Rodriguez, 2004). Whereas the majority of citizens in the country of origin continue in abject poverty, a tremendous amount of possible development funds is stashed abroad (Nkurunzinza, 2014; Ndikumana and Boyce, 2011a). Majority of the poor depend on public services for health and education. They suffer when this cannot be provided by public funds. When illicit capital flight causes devaluation, again the poor are vulnerable to its effects whereas the rich who hold external assets are secure. Ajilore (2010) revealed that mis-invoicing and under-reporting of trade is the major cause of capital flight in some examined African countries including Nigeria. This really hinders long run economic growth.

Poor governance is the fifth channel through which capital flight worsens the poverty problem in Africa. Poor governance as manifested in severe corruption is responsible for the neglect of essential social services. It discourages foreign investment which further triggers capital flight (Nkurunzinza, 2014). Weak policies also contribute to the inequitable distribution of the gains from economic growth. This is responsible for the paradox of poverty amidst growth in Nigeria (Effiom and Effiong, 2015).

3.2 Capital flight and Poverty in Ghana and Nigeria: the evidence

Specific country studies of the direct impact of capital flight on poverty in ECOWAS countries is scarce. Several studies however exist on its effect on economic growth and indeed a few on its impact on economic development, from where its implication on poverty can be inferred. It is to be expected that

since the overall African evidence of the poverty effects of capital flight is positive, specific country findings should not be contrary. Thus the following lines of studies document a negative and significant impact of capital flight on economic growth (Samson and Edeme, 2012; Olawale and Ifedayo, 2015; Obidike, et al 2015). Umoro (2013) in particular investigates the effect of capital flight on GDP growth rate in Nigeria using different measures of capital flight, and concludes that on all measures, capital flight adversely impacts on economic growth. Adaramola and Obalade (2013) study however reveals rather interesting but mixed results of the impact of capital flight on economic growth. They find that the adverse impact of capital on economic growth holds only in the short run, but that in the long run, capital flight enhances economic growth through the mechanism of capital goods importation which is used to augment the productive base of the economy, and so ultimately improves economic growth. In a study of Ghana and Nigeria, together with 19 other African countries, Ajayi and Ndikumana (2015) find a negative effect of capital flight on economic development. In the light of these studies, we conclude that capital flight worsens poverty through its negative effect on economic growth. A more direct investigation into the capital flight impacts on poverty was carried out by Onyele and Nwokocha (2016), where they employed the Johansen cointegration technique on data spanning 1986 to 2014, and found that capital flight had a positive impact on poverty (proxied by the discomfort index). In other words, increases in capital flight increased the Nigerian discomfort index, thereby aggravating poverty.

The poverty effect of capital flight in Ghana is not so clear compared to that of Nigeria. Owusu (2016) investigates the impact of capital flight on economic development in Ghana and Nigeria, using the human development index (HDI) as a proxy for economic development. She finds, inter alia, that capital flight is severer in Ghana than in Nigeria in absolute terms, but on per capita, it is worse in Ghana. In particular, the study documents that while capital flight impacts positively and significantly on economic development in Ghana, it is however negative in Nigeria.

Per capita capital flight estimates for Ghana by Owusu (2016) show that capital flight increased from $33 in 2000 to $53.2 in 2002 rising steadily to $298.4 (2008) to its peak value of $475.6 in 2013, before falling marginally to $358.1 in 2014. Within the same period, unemployment reached its zenith of 10.4% in 2000, but decreased dramatically to 2.4% in 2014. Similarly, while the HDI index for Ghana stabilized around 0.548 in 2000 and 0.579 in 2014, her national poverty rate decreased steadily from 56.5% in 1992 to 31.9% and 24.2% in 2005 and 2012 respectively (Ghana Statistical Service, 2016).

There are several channels through which remittances ameliorate poverty. Growth has been identified as the main channel. Remittances exerts an influence on poverty through growth following the private investments, balance of payments, the exchange rate, and the multiplier effect on non-remittances receiving households Ratha (2005). Several country studies back the claim that remittances could reduce poverty through growth, while some cross-sectional studies do not converge on this. Durrand, Prarrado and Massey (1996) in their study of Mexico observed that a growth of $6.5 billion was stimulated by an increase of remittances by $2 billion. Mazzucatto et al. (2008) report that conservative estimates of migrant remittances by the Bank of Ghana made up about 13 percent of Ghana's GDP. This has also been an important source of foreign exchange which exceeds the rate of ODA. Anyanwu and Erhijakpor (2010) embarked on a study of remittance and its impact on growth using a sample of 35 African countries over the period of 1990 to 2005. It was found that a 10 percent increase in remittances as a share of GDP led to a 2.9 percent drop in the number of persons living in poverty. The impact of remittances on poverty in Africa was found to be positive but smaller for Africa than other developing regions (Gupta, Patillo, and Wagh, 2009). However, Chami et al. (2003) showed that remittances produces a negative influence on the saving effort of households, but if it is used in financing basic consumption, poverty maybe reduced even though it would have little effect on growth. Pant (2008) opines that remittances would generate a multiplier effect on the economy as whole by prompting demand for other goods and services.

Another major channel through which remittances transmits to poverty reduction is through income inequality. Based on a study of Tonga and Mexican households, Ahlburg (1996) and Taylor and Wyatt (1996) revealed that the Gini index of total revenue would decline to 0.34 from 0.37 due to received remittances. But few studies showed that remittances increase the level of poverty (Rodriguez's (1998) study of the Philippines and Adam's (1991) study of Egypt). According to Legolf (2010), this could possibly be due to the fact that it is mainly rich families that are able to send migrants abroad. This being the case, migrants remittances mostly return to this richer households thereby making them richer and widening the inequality gap. The study of Beyene (2014) on Ethiopia however showed that the magnitude of inequality warranted by remittances is negligible. The Gini coefficient rose slightly from 21.2 percent to 22.5 percent. Even though only 14 percent of the population received remittances, there was a very significant drop in poverty. The headcount ratio reportedly dropped to 25 from 30 percent, the poverty gap reduced from 6.6 percent to 5.2 percent, and the squared poverty gap narrowed to 1.7 percent from 2.2 percent.

3.4 Remittances and Poverty in Ghana and Nigeria: the evidence

Empirical studies on the nexus and impact of migrant remittances on poverty in ECOWAS countries generally, and in Nigeria and Ghana in particular are scanty. However, the few extant studies do not differ from the general evidence in the literature regarding these phenomena. In particular, Adams (2006) classify remittances in Ghana into internal and international remittances and show their relative impact on different measures of poverty. He finds that these categories of remittances decrease the depth, severity and level of poverty in Ghana, with differential impact on the different poverty measures. Specifically, the study finds that international remittances leads to more poverty reduction than internal remittances, especially when measured against poverty gap and squared poverty gap. With the latter, international remittances reduces poverty by 34.8 percent, while internal remittances mitigates poverty by a paltry 4.1 percent. The poorest of the decile household group obtains 22.7 percent of their aggregate household income (expenditure) from international remittances as against a meagre 13.8 percent income from internal remittances, even though the proportion of internal migrants to the population is greater than that of international migrants.

But Adams, et al. (2008) in a similar study still on Ghana arrive generally at similar conclusions on the impact of remittances on poverty. However, the magnitude of the impacts of the different categories of remittances differ on their effect on poverty. Here, poverty levels falls by 88.1 percent when international remittances are included in households' income as against 69.4 percent reduction in poverty when internal remittances are received. In other words, the two studies differ only on the degree of poverty reduction. However, both types of remittances causes inequality to rise. For receivers of internal remittances, the Gini coefficient rises by 4 percent, while the Gini coefficient rises by as much as 17.4 percent with the receipt of international remittances. These findings were latter corroborated by Gyimah-Brempong and Asiedu (2011), while Quartey and Blankson (2004) and Quartey (2006) conclude in their separate studies that remittances lead to income smoothening in Ghana.

The poverty-reducing impact of remittances in Nigeria is generally similar to that of Ghana. In a study of the impact of international remittances on household welfare in Nigeria, Fonta, Onyukwu, and Nwosu (2011), employing Gini decomposable techniques and poverty measures, find that "household poverty declines across all the geopolitical zones by sex and locality as a result of remittance inflows". Specifically, poverty declines in the south-south region from 0.35 to 0.30; declines in the North-Central region from 0.67 to 0.60, in the South-East region (0.27 to 0.22), and in the South-West region (0.43 to 0.36). It also falls

from 0.71 to 0.66 in the North-West as well as from 0.72 to 0.66 in the North-East region. The study also documents that by using the Gini decomposition, there is a poverty-ameliorating effect of remittances more in urban areas than in rural areas. Generally, the "effect of remittances on poverty was found to be larger in the South-West region than in the South-East and South-South regions."

3.5 Capital flight, remittances and poverty: Stylised facts from Nigeria and Ghana.

Boyce and Ndikumana (2012) document that capital flight had assumed alarming dimension in Sub-Saharan Africa. Indeed between 1970 and 2010, aggregate flight capital from SSA countries reached a whopping $814.2 billion with these countries losing $202.4 billion between 2005 and 2010. Specifically, Ghana and Nigeria have not been immune to the negative impact of this phenomenon. For instance by 2010 Nigeria's total capital flight had risen to $311431.3million compared to Ghana's $12354.7 million. This translated to a capital flight to GDP ratio of 158.2% for Nigeria and 38.4% to Ghana. In the long term (1970 -2010), the proportion of real GDP lost to capital flight for Ghana and Nigeria stood at 1.3% and 4.7% respectively. On the other hand, growth rate of remittances for the two countries have been exhibiting upward trends for most of the years. In a recent study by Ubi and Ebi (2017) on the net effect of remittances and capital flight on poverty, they find that capital flight worsens poverty than remittances improve poverty, implying a negative net effect of these phenomena on poverty. Table 2 summarizes the trend of capital flight and remittances in these countries within the period 2000 and 2015.

The general trend in both variables shows that Nigeria's capital flight and remittances exceed that of Ghana considerably. This is not surprising judging from Nigeria's huge population and the size of its economy relative to Ghana's. Varying degrees of remittance and capital flight growth rates are also noticed for each country.

Table: 2 Remittances and Capital Flight for Ghana and Nigeria (In $US billion)

Year	**Remittances**				**Capital flight**			
	Ghana	Growth Rate	Nigeria	Growth Rate	Ghana	Growth Rate	Nigeria	Growth Rate
2000	324	-	13,918	0	622		517.6	
2001	459	41.67	11,665	-16.2	692.5	11.33	3356.5	548.5
2002	435	-5.23	12,089	3.64	1052.3	51.96	2723.1	-18.9
2003	651	49.66	10,628	-12.1	-30.6	-102.91	13106.9	381.3
2004	823	26.42	22,726	4.64	94.9	-410.1	9812.1	-25.1
2005	99	-88	14,640	-35.6	957.1	908.5	29263.4	198.2
2006	105	6.06	16,932	5.64	-1548.8	-261.82	24307.3	-16.9

2007	117	11.43	18,011	6.37	5015.5	-423.8	26908.4	10.7
2008	126	7.69	19,206	6.64	6896.9	37.51	37990.8	41.19
2009	114	-9.52	18,368	-4.36	3594.8	-47.9	29029.3	-23.6
2010	136	19.3	19,745	7.64	5949.4	65.5	18454.6	-36.4
2011	2,135	1470	20,617	4.42	7993.8	34.36	18735.2	1.52
2012	2,155	0.94	20,543	8.64	9572.7	19.75	23038.8	22.97
2013	-	0	20,797	1.24	12442	29.97	26544.9	15.22
2014	2,008	-6.82	20,829	9.64	9593.4	-22.9	28260.1	6.46
2015	-	0	20,771	-0.28	10536	9.83	31245.8	10.57

Source: Migration and Remittance Factbook, (2016); Boyce and Ndikumana (2012) Owusu, F.A. (2016). Growth rates computed by Authors.

However, on per capita terms, figures 1 and 2 show that while Ghana was worse hit by capital flight than Nigeria, the latter benefited more from remittances than the former. With regard to poverty in 2014, the HDI for Nigeria and Ghana stood at 0.51 and 0.57 respectively (HDI Report, 2015). The report ranked Nigeria 152nd and Ghana 140 in the world. Life expectancy as at 2014 was 52.8 (Ghana) and 61.4 (Nigeria). The number of people in multidimensional poverty and living below income poverty line stood at 12.1 and 28.6% for Ghana, 18.4 and 62% for Nigeria, while GDP per capita for these countries stood at $3864 and $5422.7 for Ghana and Nigeria respectively. Figure 3 shows the relative poverty positions of the two countries, using poverty headcount ratio of $1.90 a day 2011 (PPP)

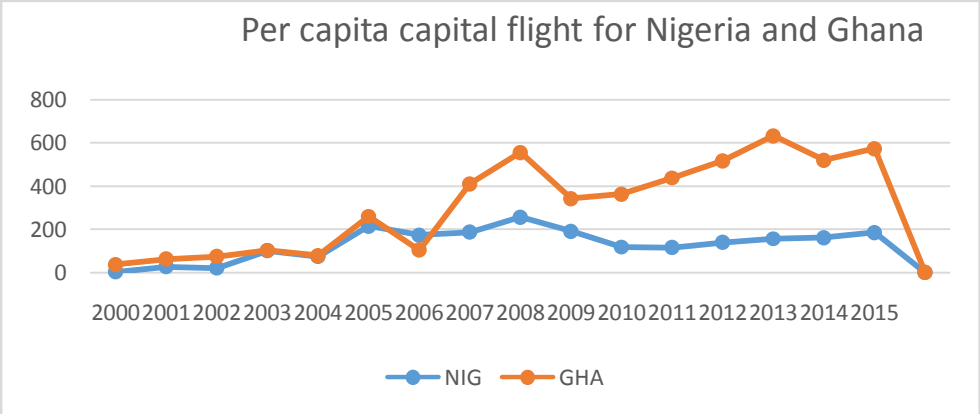

Figure 1: Per capita capital flight for Ghana and Nigeria

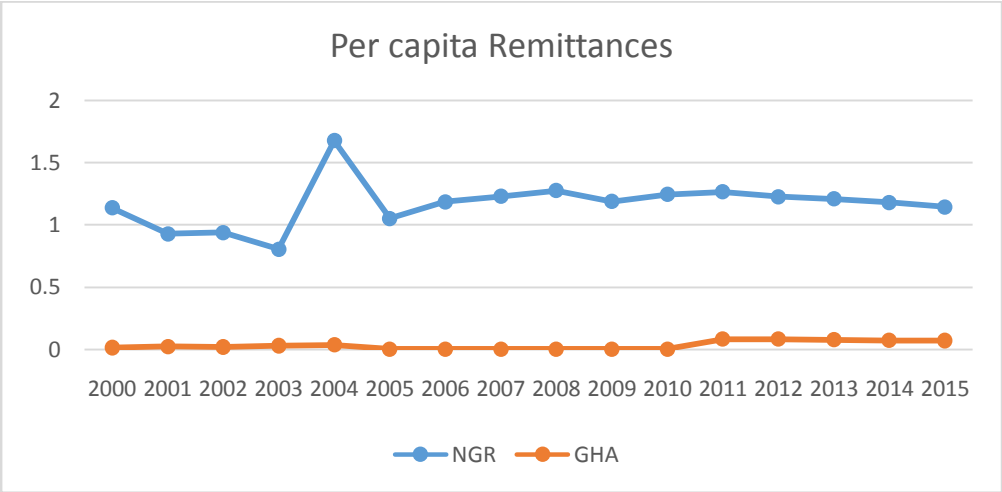

Figure 2: Per capita Remittances for Ghana and Nigeria

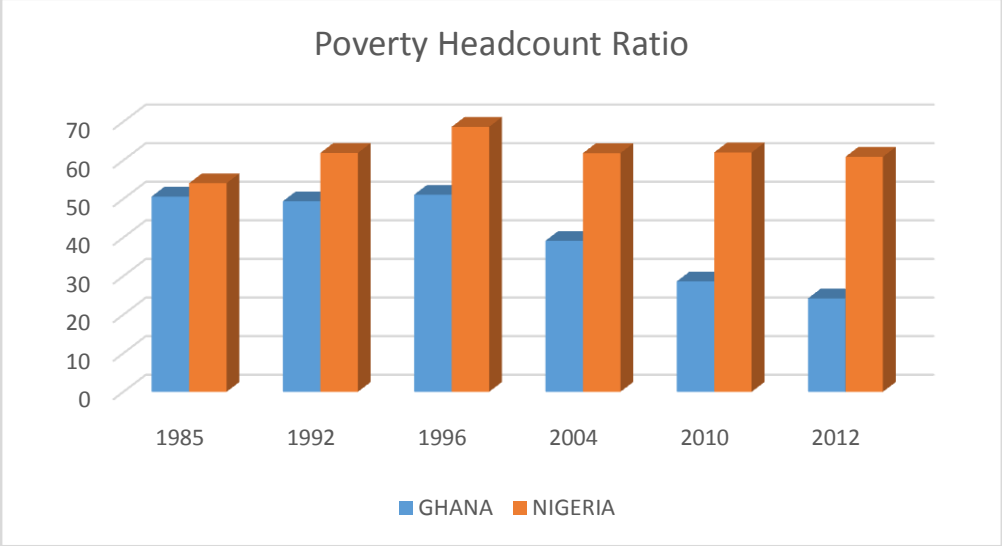

Figure 3: Poverty Headcount ratio for Ghana and Nigeria.

4. Theoretical Framework

Since the basic objective of the study is to investigate the relative effects of capital flight and remittances on poverty, the theoretical premise simply adopts a theory of poverty that comprehensively captures the explanatory variables of our empirical model. In this connection, there is no scarcity of theories in the poverty literature. For instance, the classical theory of poverty firmly places the responsibility of poverty on the door steps of individuals, claiming that poverty results from the decision-making attributes of individuals. This conclusion draws heavily on the assumption that the market system, its exchanges, processes and

outcomes are efficient, so that wages truly reflect individual productivity. And so poverty is a consequence of individuals' poor choices, principally seen in their lack of self-control and poor judgments which negatively affect their productivity. Since individuals are poor because they are lazy and fail to respond to market incentives, the classical theory lays the foundation for laissez faire policies, advocating that individuals must respond to market incentives. Governments' role was to be very minimal (Davis and Sanchez-Martinez, 2014). While the classical theory of poverty and its variants (e.g. behavioural/decision-based theory and the sub-culture of poverty theory) are not apt in our present context, it is briefly highlighted to show its evolution to the neoclassical theory, which aptly captures the underlying variables of our proposed model.

The neoclassical theory of poverty, like its classical counterpart consist of several variants, among which is the monetary approach to poverty. The dominant thought in the neoclassical paradigm, irrespective of the variants, is that individuals' welfare can be measured by consumption. Thus income and consumption assume a prominent role by constituting the main variables of concern in the analysis of poverty. The monetary approach in particular assumes that uniform monetary measures can aptly capture all critical heterogeneity across households and their situation. Thus as argued by Bhalla (2002) the primary consideration in the alleviation of poverty should be income, because it enhances the purchasing power of the poor, creates access to resources hitherto beyond their reach, which inevitably reduces the problem of resource inequality. With income, the poor is also able to purchase or obtain public goods freely. Laderchi et al. (2003) also adopt different methods to show that the monetary measure of poverty can be used to account for the value of non-marketed goods and services.

The monetary approach to poverty variant of the neoclassical school is appealing because welfare can be quantified as the aggregate consumption of individuals, proxied either by data on income or expenditure. This allows poverty to be conceived as a deficit below some threshold level of resources defined by the definite poverty line. In the following empirical model, we adopt the neoclassical paradigm of poverty as it furnishes the theoretical apparatus for the inclusion of the explanatory variables.

5. Empirical model, Data and Methodology

We specify our empirical model based on the monetary approach to poverty of the neoclassical school and in the spirit of Gupta, Pattillo, and Wagh (2007) and Adams and Page (2005) wherein they examined the impact of remittances on poverty. Poverty was modelled as a function of remittances, an appropriate

measure of income distribution, and mean income. Our baseline model is represented below:

$P_t = \alpha + \beta_1 \log(\mu_t) + \beta_2 \log(\pi_t) + \beta_3 \lambda_t + \beta_4 \log(\delta_t) + \varepsilon_t$, (1)

Where P is poverty at time *t*; μ is real per capita GDP which proxies average income; π is capital flight; λ is remittances; δ is a set of other explanatory or control variables, and ε is the time-varying error term. In the monetary approach of the neoclassical school, per capita GDP and remittances reflect the quantum of monetary resources available to households for consumption. Remittances augment household incomes and thus increase quantity of goods and services consumed. Welfare is improved in the process.

Equation (1) is further modified to a log-linear form to specifically include the notations of the variables to be estimated thus:

$POV_t = \alpha_i + \beta_1 \ln PGDP_t + \beta_2 \ln CFLT_t + \beta_3 \ln REM_t + \beta_4 YINQ_t + \beta_5 INFL + \varepsilon_t$ …. (2)

The corresponding ARDL structure of equations (1) and (2) are presented in equations (3) and ((4) respectively:

$$P_t = \alpha_0 + \beta_1 P_{t-1} + \beta_2 ln\mu_{t-1} + \beta_3 ln\pi_{t-1} + \beta_4 ln\lambda_{t-1} + \beta_5 ln\delta_{t-1} + \sum_{i=0}^{k} \lambda_1 \Delta P_{t-1} + \sum_{i=0}^{k} \lambda_2 \Delta ln\mu_{t-1} + \sum_{i=0}^{k} \lambda_3 \Delta ln\pi_{t-1} + \sum_{i=0}^{k} \lambda_4 \Delta ln\lambda_{t-1} + \mu \quad \text{.....(3)}$$

$$POV_t = \alpha_0 + \beta_1 POV_{t-1} + \beta_2 lnPGDP_{t-1} + \beta_3 lnCFLT_{t-1} + \beta_4 lnREM_{t-1} + \beta_5 YINQ_{t-1} + \beta_6 INFL + \sum_{i=0}^{k} \lambda_1 \Delta POV_{t-1} + \sum_{i=0}^{k} \lambda_2 \Delta lnPGDP_{t-1} + \sum_{i=0}^{k} \lambda_3 \Delta lnCFLT_{t-1} + \sum_{i=0}^{k} \lambda_4 \Delta lnREM_{t-1} + \sum_{i=0}^{k} \lambda_5 \Delta YINQ_{t-1} + \sum_{i=0}^{k} \lambda_6 \Delta INFL_{t-1} + \mu \quad \text{....(4)}$$

Where POV is poverty, PGDP is per capita real income, CFLT is capital flight. REM is remittances, YINQ is income inequality proxied by the Gini index, and INFL is inflation. Inflation and inequality enter the model as control variables. From literature, an increase in the general price level worsens households' real disposable income, exacerbating poverty. Similarly, as income inequality widens, poverty increases. Thus controlling for them, we estimate the direct impact of capital flight and remittances on poverty. On a priori therefore, we expect β_2, and $\beta_4 < 0$, This is because as aggregate mean income rises, poverty reduces; remittances, as shown in the literature triggers a poverty-reducing effect on the economic conditions of households. On the other hand we expect capital flight, income inequality and inflation to impose a deleterious effect on households, leading to increased poverty and misery.Thus, β_3, β_5, and $\beta_6 > 0$. Poverty is measured by the headcount poverty rate, which indicates "the percentage of the population living on less than one PPP dollar a day"; remittances and capital flight enter the model as a ratio of GDP of the two countries; and inflation is measured as the annual change in the consumer price index (CPI). Data for the study are sourced from the World Development

Indicators, (WDI, 2015), and spans from 1980 to 2015. Poverty and income inequality data are from PovcalNet database (available at http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp).

The ARDL model above is disaggregated into the long run and short run components, with β_1 to β_6 (i.e. equation 4) being the long run multipliers, while $a_0$is the intercept and μ the error term. The short run coefficients to be estimated are represented by $\lambda_1$to λ_6. The ARDL proceeds with an initial determination of the existence or otherwise of a long run relationship among the variables. If they are cointegrated, the long run and short run models are estimated respectively.

Pesaran, Smith and Shin, (2001) show the inherent merits of the ARDL approach. 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 (Laurenceson and Chai, 2003; Ajide, 2014). Fifth, the diagnostic tests of the estimated equation are more reliable (Gerrad and Godfrey, 1998, p 235).And finally, the ARDL model captures the spill-over effect in the lag structure. In other words, it accommodates the previous impacts of the variables (e.g. poverty) on the current regime (Ogbuagu and Udo, 2012).

Because of the inherent instability of macroeconomic time series data, we carried out unit root tests on all the variables to ascertain their stationarity status and consequently their order of integration. To ensure robustness of our results, we employed the twin techniques of Augmented Dickey Fuller (ADF) and Philips-Perron (PP) tests, whereupon we utilised the Wald bounds testing Cointegration approach of Pesaran et al (2001) to evaluate the short and long term relationship between capital flight/remittances and poverty on the one hand, and their impact on poverty on the other. Post-estimation tests were conducted using the Breusch-Godfrey Serial Correlation LM Test, the Q-statistics as well as Ramsey Reset test to ascertain the stability and linearity of our preferred model.

6. Results

6.1 Unit Root Test

Tables 3a and 3b presents the results of the unit roots tests using the Augmented Dickey Fuller (ADF) and Philips-Perron (PP) tests for Ghana and Nigeria

respectively. The results for both tests are similar. All the variables are integrated of order one [1(1)], except for inflation (INFL) which was stationary at levels. This provides a justification for the running of the Cointegration tests to determine the existence or otherwise of a long run integrated relationship amongst the variables. Eviews Version 9 offers a flexible tool for determining the lag length and the most preferred estimated model, as well as other post-estimation diagnostic statistics.

Table 3a: UNIT ROOT TEST - Ghana

Variables	ADF Statistics (Computed)		Remark	Philips-Perron (PP) Test		Remark
	Level	1st Difference		Level	1st Difference	
POV	-1.141932	-3.338965	1(1)	-0.387291	-5.297653	1(1)
PGDP	-0.237734	-2.678330	1(1)	-2.062817	-10.48001	1(1)
CFLT	-0.474210	-5.108211	1(1)	-0.676318	-4.266284	1(1)
REM	-0.397579	-10.01335	1(1)	0.103264	-5.500349	1(1)
YINQ	-1.999487	-6.317758	1(1)	-1.302165	-7.806628	1(1)
INFL	-3.460641	-6.683355	1(0)	-3.365227	--11.33283	1(0)
Critical ADF value at level: 5% = -2.929734						
Critical ADF value at 1st Diff: 5% = -2.931404						
Critical PP value at level: 5% = -2.929734						
Critical PP value at 1st Diff: 5% = -2.931404						

Source: Computed by authors using E-views 9

Table 3b: UNIT ROOT TEST - Nigeria

Variables	ADF Statistics (Computed)		Remark	Philips-Perron (PP) Test		Remark
	Level	1st Difference		Level	1st Difference	
POV	-1.316392	-5.577012	1(1)	-0.320314	-4.582246	1(1)
PGDP	-0.493694	-4.603638	1(1)	-0.652809	-8.349487	1(1)
CFLT	-0.962527	-8.148139	1(1)	-1.268474	-5.410930	1(1)
REM	-1.181042	-5.412346	1(1)	-0.252281	-5.577582	1(1)
YINQ	-0.242478	-5.577582	1(1)	-0.636653	-6.229451	1(1)
INFL	-3.679324	-6.391510	1(0)	-8.459300	-9.812886	1(0)
Critical ADF value at level: 5% = -2.9527						
Critical ADF value at 1st Diff: 5% = -2.9632						
Critical PP value at level: 5% = -2.9527						
Critical PP value at 1st Diff: 5% = -2.9632						

Source: Computed by authors using E-views 9

6.2 Cointegration Tests

Tables 4a and 4b present the ARDL Bounds test for cointegration for the estimated Ghana and Nigeria models respectively. Both results indicate the existence of a long run cointegrating relationship (Ghana: F-stat, 4.30 > II Bound, 3.61) and (Nigeria: F-stat, 5.40 > II Bound, 3.79).

Table 4a – ARDL Bounds Test for Co-integration - Ghana

Test Statistic	**Value**	**K**
F- statistic	4.3003538	5
Critical Value Bounds Significance Level	I0 Bound	II Bound
5%	2.45	3.61
Decision:	There is co-integration	

Source: Authors' Computation

Table 4b – ARDL Bounds Test for Co-integration - Nigeria

Test Statistic	**Value**	**K**
F- statistic	5.407494	5
Critical Value Bounds Significance Level	I0 Bound	II Bound
5%	2.62	3.79
Decision:	There is co-integration	

Source: Authors' Computation

6.3 Estimated ARDL Results for Ghana

Table 5: Long Run Static ARDL Model – Ghana

Dependent Variable: POV

Variable:	Coefficient	Std. Error	t-statistic	Prob.
C	2082.669	72.75460	28.62594	0.0222
LOG(PGDP)	11.48669	0.39876	28.80634	0.0221
LOG(CFLT)	0.002780	0.000562	4.950434	0.0006
LOG(REM)	-8.001559	0.26152	-30.59634	0.0208
INFL	1.722162	0.06295	27.35614	0.0233
YINQ	4.605901	0.14857	31.00157	0.0205
@TREND	2.919473	0.065271	44.728278	0.0142

Our preferred model as automatically selected by Eviews is ARDL (4, 4, 4, 4, 4, 4) for the Ghana and Nigeria equations. It includes 4 lagged estimated coefficients for each of the dynamic regressors. However, we went further to

confirm this auto-selected lag length by comparing the values of several model selection criteria, namely Akaike information criterion (AIC), Schwarz criterion (SC) and Hannan-Quinn criterion (HQ). These all had their minimum values at the fourth lag length.

Table 5 is the long run ARDL model for Ghana. Very interesting outcomes can be deduced there from. It can be observed that per capita GDP, a proxy for income, has a positive sign contrary to theory, indicating that poverty accelerates as the economy or income grows. In particular, a one percent increase in income induces 11.48% increase in poverty. A possible explanation could be the insufficiency of the aggregate income that trickles down to households or that the population growth rate acts as a constraint in reducing poverty. In other words, the growth rate of population outstrips the rate of income growth, perpetuating poverty in the process. Capital flight accentuates poverty as indicated by the positive and significant capital flight coefficient. The coefficient of remittances posted a negative sign consistent with theoretical postulations. An inverse relationship between remittances and poverty suggest that a one percent increase in the inflow of migrant transfers reduces headcount poverty by 8%.By reducing the constraints on households' budget, remittances enhance the capacity for consumption. As expected, inflation and a widening income inequality exert deleterious consequences on households' ability to escape poverty. A one percent increase in the Gini index exacerbates poverty by 4.6%.

Table 6: Error Correction ARDL Model – Ghana

Dependent Variable: LOG(POV)

Variable:	Coefficient	Std. Error	t-statistic	Prob.
C	-0.301285	0.072212	-4.172244	0.0004
DLOG(POV(-1))	0.281047	0.091400	3.074901	0.0054
DLOG(POV(-2))	0.365279	0.127682	2.860844	0.0088
DLOG(POV(-3))	0.822349	0.037975	21.655247	0.0294
DLOG(PGDP)	-1.249171	0.098971	-12.621560	0.0503
DLOG(PGDP(-1))	-0.664153	0.125143	-5.307157	0.0000
DLOG(PGDP(-2))	-0.123692	0.054021	-2.290084	0.0315
DLOG(PGDP(-3))	3.293774	0.192783	17.085362	0.0372
DLOG(CFLT)	0.183599	0.056437	3.253180	0.0035
DLOG(CFLT(-1))	0.008924	0.004142	2.154418	0.0391
DLOG(CFLT(-2))	1.114736	0.051742	21.544186	0.0295
DLOG(CFLT(-3))	2.994978	0.130540	22.943036	0.0277
DLOG(REM)	-0.344251	0.075099	-4.583960	0.0001
DLOG(REM(-1))	-0.001477	0.001126	-1.311242	0.1981
DLOG(REM(-2))	0.003819	0.053830	0.070955	0.9440

DLOG(REM(-3))	0.891001	1.017956	0.875284	0.3874
DINFL	0.147537	0.045616	3.234295	0.0029
D(INFL(-1))	0.007062	0.000552	12.801738	0.0496
D(INFL(-2))	0.014661	0.000599	24.464118	0.0260
D(INFL(-3))	0.023621	0.000977	24.187561	0.0263
DLOG(YINQ)	0.003730	0.000803	4.646178	0.0009
DLOG(YINQ(-1))	0.354271	0.039478	8.973910	0.0706
DLOG(YINQ(-2))	0.398076	0.122997	3.236465	0.0029
DLOG(YINQ(-3))	0.192343	0.020951	9.180665	0.0691
D(@TREND())	0.303155	0.014064	21.555576	0.0295
CointEq(-1)	-0.301285	0.072212	-4.172244	0.0004
R-squared: 0.743490	Adjusted R-squared: 0.660745		D.W 1.89	
F-statistic: 8.985300			Prob.(F-statistic)	0.0000

Source: Authors' computation

Table 6 presents the short run dynamic error correction model for Ghana. The error correction term is negative and significant at the one percent level, with a modest speed of adjustment of 30 percent to long-run equilibrium values. The Durbin-Watson statistic of 1.89 suggests the absence of autocorrelation, while the adjusted R-squared indicates that the explanatory variables explain 66 percent of variations in the dependent variable.

The results further show the outcomes of our key variables of interest – capital flight and remittances. Generally, the signs of the short run coefficients are consistent with those of the long run, indicating very little variation between the short and long run dynamics. In specific terms, all the coefficients of the lagged difference of capital flight for the three periods exhibit positive and significant relationship with poverty. Thus, the short run impacts of capital flight on poverty are carried even to the long run, leading to a worsening of the economic conditions of households. The coefficients of the various lags of remittances, however, post contradictory results. For instance, the first difference of current remittances and its first lag are negatively signed, indicating the poverty-reducing impact of remittances. Yet, while remittances at current levels were significant, its first lag is not. And yet, we estimate positive and insignificant elasticities for the second and third lags of remittances, contrary to a priori expectations.

The implications of these results are interesting when compared to the outcome of the signs and statistical significance of the capital flight estimated parameters. First, it suggests that while the negative impact of capital flight on poverty is persistent from the short to the long-run, the positive impact of remittances on poverty is somewhat inconsistent. In the circumstance, the

persistent negative effect of capital flight on poverty prevails and overwhelms the positive effect of remittances, leading to an overall long-run net negative impact of capital flight. Estimated Inflation and income inequality parameters are all consistent with theory; they are both positive and significant. The estimated coefficients of first, second and third lags of poverty indicate positive relationship with the current level of poverty. This tells a simple but trite story, namely, that poverty reinforces poverty. Thus lagged periods of poverty correlate positively with current poverty levels.

Ramsey Reset test of linearity (F-stat = 0.25434; *p*= 0.7085) indicates that the estimated model does not suffer from mis-specification or nonlinearity. We tested for the presence of serial autocorrelation by deploying both the Breusch-Godfrey Serial Correlation LM Test and the Q-statistics. Both results indicated a high probability value of 0.7834 and 0.8502 respectively. We thus accepted the null hypothesis of no serial autocorrelation.

6.4 Estimated ARDL Results for Nigeria

Table 7: Long Run Static ARDL Model – Nigeria

Dependent Variable: LOG(POV)

Variable:	Coefficient	Std. Error	t-statistic	Prob.
C	0.299555	0.150090	1.995828	0.0336
LOG(PGDP)	-3.079701	1.211006	-2.543093	0.0154
LOG(CFLT)	0.864442	0.047120	18.34557	0.0347
LOG(REM)	-0.399582	0.145179	-2.752343	0.0092
INFL	0.001913	0.000762	2.509451	0.0167
LOG(YINQ)	0.536729	1.983486	0.270599	0.7882
@TREND	0.301055	0.021762	13.83400	0.0459

Source: Authors' computation

The long-run ARDL model results for Nigeria generally exhibit estimated elasticities consistent with expectations. Elasticity estimate of mean income is inversely and significantly related to poverty; inflation and the inequality index worsen poverty, though the latter is not significant for Nigeria. Our policy variables are all consistent with a priori:a10% increase in capital flight accentuates poverty by 8.6%, while a 10% increase in remittances reduces poverty by 3.9%. Next, we present the result of the dynamic error correction model.

Table 8: Short Run Error Correction ARDL Model – Nigeria

Dependent Variable: LOG(POV) - Nigeria

Variable:	Coefficient	Std. Error	t-statistic	Prob.
C	3.524444	1.482457	2.377435	0.0229
DLOG(POV(-1))	0.247518	0.109701	2.256296	0.0302
DLOG(POV(-2))	0.517911	0.186472	2.777412	0.0095
DLOG(POV(-3))	-0.001190	0.000749	-1.588772	0.1432
DLOG(PGDP)	-0.030236	0.007485	-4.039629	0.0003
DLOG(PGDP(-1))	-0.974345	0.151378	-6.436521	0.0000
DLOG(PGDP(-2))	-0.015806	0.002887	-5.473962	0.0000
DLOG(PGDP(-3))	-0.002185	0.000894	-2.445695	0.0345
DLOG(CFLT)	1.306512	0.370349	3.527789	0.0014
DLOG(CFLT(-1))	1.960569	0.800048	2.450565	0.0367
DLOG(CFLT(-2))	1.993765	0.588892	3.385622	0.0069
DLOG(CFLT(-3))	-2.377858	0.982839	-2.419378	0.0387
DLOG(REM)	-0.244000	0.101102	-2.413404	0.0239
DLOG(REM(-1))	-8.813397	0.232821	-37.85480	0.0000
DLOG(REM(-2))	0.000459	9.17E-05	5.006733	0.0000
DLOG(REM(-3))	0.300657	0.143604	2.093651	0.0436
DINFL	0.005574	0.003556	1.914281	0.0503
D(INFL(-1))	0.092574	0.017910	5.168735	0.0004
D(INFL(-2))	0.103275	0.024289	4.251882	0.0017
D(INFL(-3))	0.050007	0.017924	2.789973	0.0191
DLOG(YINQ)	0.117958	0.018215	6.475904	0.0001
DLOG(YINQ(-1))	-0.000243	0.000533	-0.455499	0.6585
DLOG(YINQ(-2))	0.958926	0.205531	4.665606	0.0000
DLOG(YINQ(-3))	0.003730	0.000803	4.646178	0.0009
D(@TREND())	0.003827	0.000894	4.279611	0.0016
CointEq(-1)	-0.029524	0.01047	-2.819866	0.0072
R-squared:0.615585 Adjusted R-squared:0.506302 Durbin-Watson:1.979863				
F-statistic: 43.28584			Prob.(F-statistic) 0.00000	

Source: Authors' computation

Table 8 presents the error correction representation for Nigeria. Successive episodes of poverty, indicated by the first and second lags of poverty, accounts substantially for poverty occurrences in the current period. Aggregate mean income in their respective lags correlate negatively and significantly with poverty, consistent with expectation. The short run dynamics of Inflation and inequality are maintained even to the long run, as both estimates are positively and significantly correlated with current poverty levels, except for the first lag of

the first difference of inequality. We estimate positive and significant capital flight elasticity for all the lagged periods. It is striking that the estimated coefficient of capital flight increases for each succeeding period, thus reinforcing itself over the long run. As in the Ghana short run results, estimated coefficients of remittances reveal contradictory relationships within the lagged periods. While the first difference and the first lag of remittances are negatively signed, suggesting that remittances ameliorate poverty, the second and third lags however indicate the opposite. The error correction term reveal a weak speed of adjustment of 2.9 percent to long run equilibrium.

Stability diagnostics of the results show that our estimated model is linear and correctly specified as evidenced by the Ramsey Reset test (F-stat = 0.87542; *p*= 0.72005). The absence of serial autocorrelation in the residuals earlier tested by the DW statistic is further confirmed by the Breusch-Godfrey Serial Correlation LM Test and the Q-statistics. The former had a non-significant probability value (*p* =0.56211), while the latter had high probability values across all the estimated lag lengths.

7. Ghana and Nigeria: A comparison of Empirical Results

A common denominator underlying the empirical results is the incontrovertible fact of the negative long-term impact which capital flight has on the Ghanaian and Nigerian economies. This is abundantly asserted in the literature (Ajayi, 1999; Ajayi and Khan, 2000; Boyce and Ndikumana, 2001; Samson and Edeme, 2012; Boyce and Ndikumana, 2012;Umoru, 2013; Usman and Arene, 2014). Specific country effects of capital flight on poverty however indicate the relative severity of the malaise. Our estimated capital flight elasticity coefficients reveal that the phenomenon is more severe in Nigeria (0.86) than it is in Ghana (0.002). This is alarming for it implies that a 10% increase in capital flight in the two countries yields huge differential impacts – 8.6%and 0.2% respectively for Nigeria and Ghana. This is not surprising, given the unfolding events in the on-going war against graft in Nigeria, and the sheer size of the Nigerian economy relative to Ghana.

Our result on the impact of remittances on poverty converges with empirical evidence in the literature (Bayar, 2015; Gupta, Pattillo, and Wagh, 2007; Nyeadi and Atiga, 2014). We estimate a negative correlation between remittances and poverty, suggesting a poverty-reducing effect of remittances on the two economies. However, our findings indicate that remittances had a far benevolent impact on poverty in Ghana (-8.00) than in Nigeria (-0.39). This is indeed surprising because Ghana is one of the countries with the lowest inflow of remittances in SSA. Nigeria is the second highest recipient behind Kenya. This

conclusion, though, is at variance with Nyeadi and Atiga (2014) who found a marginal impact of remittances on growth in Ghana. Perhaps, the difference may be on account of methodology, and the model specification (which was a regression of real GDP on remittances, imports and exports only).Our results, nonetheless are consistent with Quartey and Blankson (2004) who find evidence of a countercyclical impact of remittances on poverty in Ghana. In particular they submit that remittances have helped cushion household consumption and welfare pressures overtime.

A comparison of the short run effects of our policy variables reveal mixed positive impacts of remittances on poverty as against the persistent negative impact of capital flight on poverty. Our conclusion then is that these contradictory short run effects aggregate to an overpowering net negative effect of capital flight on poverty in the long run, extinguishing any poverty-reducing effect of remittances that may have accrued within the same period. This singular finding answers the research question we put forward at the onset. Generally, other explanatory variables exhibit elasticity coefficients in tandem with theory, though with varying levels of significance.

8. Concluding Remarks

This objective of this study was to investigate the net impact of capital flight and remittances on poverty in two of ECOWAS leading economies. Our results are consistent with extant literature, but go further in revealing that capital flight significantly worsens poverty in Nigeria than it does in Ghana. Empirical evidence also suggests that though Nigeria receives more remittances than Ghana, the magnitude of remittances' impact on poverty in Nigeria is less than it is in Ghana. A common denominator for the two countries is that capital flight exerts a more persistent negative impact on poverty than does remittances, so that in the long run the poverty-inducing effect of capital flight outstrips the poverty-reducing impact of remittances.

Arising from the above empirical findings, our recommendations find common application for the two countries since capital flight and remittances have similar relationships on poverty, albeit with differential rates of impacts. One, since capital flight responds positively to unstable macroeconomic conditions in the source economy, governments in the two countries must take concrete steps in targeting inflation to single digit. A stable economic environment conveys confidence on investors and promotes positive risk taking to the advantage of investments and job creation as against an unstable one which erodes the value of capital. Two, the fight against graft lies squarely within the domain of the political economy of the two countries. And it remains the single

most significant factor in stemming the tide of illicit capital outflows from Ghana and Nigeria. Governments must strengthen institutions at all levels of society to obviate the need for the economy to rely on personality cults (specifically, the President) to fight graft, only for such "steam" to evaporate when these personages are off the political scene. Three, governments of the two countries should ensure that the poverty-reducing effect of remittances is made more widespread through the provision of basic infrastructure (in healthcare, schools, communication, banking infrastructure, etc.) in rural communities where migrant funds are spent.

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RICARDIAN EQUIVALENCE HYPOTHESIS IN NIGERIA: AN EMPIRICAL INVESTIGATION

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Abstract

The empirical investigation of the Ricardian equivalence proposition remains inconclusive in spite of many empirical studies undertaken in this area. This paper investigates the validity of Ricardian equivalence hypothesis in Nigeria using annual time -series data from 1981 to 2016 employing an auto regressive distributed lag (ARDL) model. The result shows that government expenditure, debt stock, debt service interest payment, inflation and interest rate have negative impact on private consumption whereas GDP per capita and tax revenue have positive impacts. On a general note, in terms of the baseline specification, from the perspective of this study, we may conclude that the validity of the Ricardian Equivalence Hypothesis is rejected in Nigeria (except in the case of government expenditure as indicated by our empirical outcome or tax revenue in the case of robustness checks). Arising from the findings, government should adopt appropriate macroeconomic policies that will enhance revenue and expenditure frameworks so as to boost private consumption expenditures in Nigeria

Keywords: Consumption, Government Spending, Inflation, Debt, Interest Rate, Tax Revenue, Auto Regressive Distributed Lag (ARDL) Model, Nigeria.

JEL: C20 E4 E21 E31 H5 H6 H63.

I. Introduction

A seemingly general consensus in economic discussions is that increase in government expenditure and debt have strong expansionary effect on private consumption. There is however, far less agreement about exactly how government expenditure and debt exert their influence. The Ricardian Equivalence Hypothesis(REH) in its original form makes a counter claim that debt is neutral and increasing public expenditure has no effect on private consumption.

Studies on the test of the validity or non-validity of the Ricardian Equivalence Hypothesis (REH) in Nigeria are mainly concerned about the outcomes of the test

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without determining the dynamic effects of the macroeconomic variables that are relevant to the test of the Ricardian equivalence hypothesis (See Oseni and Olomola, 2013; Ogba, 2014; and Aderemi, 2014).

This study unlike previous studies in Nigeria test the Ricardian Equivalence Hypothesis, which states that private consumption remains unchanged regardless of fiscal operations of the government. The motivation for the study is to provide strong empirical footing for or against the believe of the proposition of the Ricardian equivalence hypothesis that fiscal policy measures would have no effect on private consumption in particular and aggregate demand in general. This study fills this gap by empirically examining the validity of the Ricardian Equivalence Hypothesis in Nigeria's fiscal space.

Following section one, section two reviews some related literature relevant to this study. The theoretical framework and model specification are considered in section three, while section four presents and interprets the econometric results. Section five provides policy implications of the results while section six provides recommendations and conclusion for the study.

II. Review of Related Literature

Kazmi (1994) explains that the debt-neutrality postulate is popularly termed as the Ricardian Equivalence Hypothesis (REH) because the fundamental logic underlying this hypothesis was originally presented by David Ricardo. He identified the two fundamental questions of the debt-neutrality hypothesis to include; (i) given the volume and composition of government expenditures, does it matter whether they are financed by taxes or debt servicing? (ii) Do public deficits absorb private savings that otherwise finance private capital formation? He affirmed that the exponents of debt-neutrality make the counter-claim that debt is neutral and public deficits have no "crowding-out" effects on private saving or investment. Basically, his study of the validity of the debt-neutrality hypothesis revealed that with the positive but insignificant coefficient of the critical values of government expenditure, the Ricardian Equivalence Eypothesis is rendered untenable.

Kazmi (1992) examines the econometric tests of the validity of the Ricardian equivalence in Pakistan between the period of 1960 to 1988 where he pointed out the categorization of the REH to include; (i)'The composite models of REH' – concerning the relationships between fiscal deficit, public debts, levels of consumption and savings (ii)'The decomposed models of REH' – examines such

variables as taxes, subsidies, interest payments, wealth and public debt, and (iii)'The Euler equation models' – concerned consumers' inter-temporal optimization behaviour under budget constraints imposed by consumer's personal resources and public sector budget constraint. Though in this study he concentrated on the composite models and found out that the coefficient of disposable income and government deficit are divergent from each other and that with such divergence, there is hardly any support for the REH in Pakistan during the period studied.

According to Whalen (1991), the Ricardian Equivalence Hypothesis states that "economic agents perceived the future tax liabilities implicit in government debt issue and thus that increasing government expenditure partially crowds out private sector consumption through its effects on perceived permanent income'. He concluded after thorough examination of the results from previous studies that those who advocate that fiscal contractions can have expansionary effects may need to look to other theories which, perhaps, do not require economic agents to have the ultra-rationality and foresight required of them by the Ricardian Equivalence Hypothesis.

Horvath (2009) in his study of the effect of government spending shocks on consumption under an optimal stabilization framework, gave an interesting description and insight about private consumption. He described private consumption as the largest component of aggregate demand and also assumed to be a principal determinant of agents' welfare. Economic theory has yet to come up with a general guidance regarding the dynamic effects and welfare implications of shocks to public spending. He further revealed in his study that an increase in private consumption following a positive innovation in government spending would require an undue degree of volatility in the economy, which would hurt agents through lower welfare overtime.

Saeed and Khan (2012) examine the validity of the Ricardian Equivalence Hypothesis for Pakistan from the period of 1972 to 2008 employing the unit root tests, Johansen co integration technique and the error correction mechanism. Their results suggest that budgets have no impact on private consumption, and that people generally follow a particular path pattern of expenditure and therefore the substitution of debt for taxes has little impact on the household's consumption level.

Ogbonna (2014) investigates the twin deficits hypothesis in South Africa for the period 1960 to 2012 employing co-integration analysis and VAR Granger non-

causality process to investigate the existence of short term causalities for the economy. The author found that the absence of the twin deficits phenomenon for South Africa in the short-run time frame suggests that the Ricardian equivalence proposition holds for the economy within such time horizon.

Using cross country data, Mohabbat and Ashraf (2003) attempt to verify the role of an ever increasing national debt on economic activity by examining the debt neutrality hypothesis in four South American countries, viz., Costa Rica, El Salvador, Guatemala and Uruguay. Their results do not support the debt neutrality hypothesis and they show that economic agents consider government bonds as net wealth affecting consumption in a positive way.

In the studies of Organization of Economic Cooperation and Development (OECD) Countries, Berben and Brosens (2005) establish a non-linear relationship between private consumption and government debt between the period of 1983 to 2003. Their study found out that with high government debt, a fiscal expansion is partly crowded-out by a fall in private consumption, and also that in low debt countries, private consumption is insensitive to changes in government debt, and hence, fiscal policy becomes less effective in stabilizing business cycle fluctuations at higher levels of government debt.

Bhattacharya and Mukherjee (2010) attempt to explore the hypothesis that the propensity to consume out of income varies in a non-linear fashion with fiscal variables, and in particular with government debt per capita using data from eighteen OECD countries so as to examine if there is empirical evidence to support the hypothesis that households move from non-Ricardian to Ricardian behavior as government debt reaches high levels and as uncertainty about future taxes increases. Their results provided support for this hypothesis and also suggested that private and government consumption are substitutes in the household utility function.

Cho and Rhee (2013) investigate the non-linear effects of government debt on private consumption in 16 OECD countries using a Panel Smooth Transition Regression (PSTR) model over the period 1983 to 2011. Their study revealed that a non-linear smooth transition exists between two regimes for the consumption function, depending on the level of government debt. They also found that a higher level of government debt crowds out private consumption to a greater extent, and that the degree of crowding out effects falls in periods of global

financial crises. More seriously, their study revealed that the Ricardian Equivalence Hypothesis becomes more significant as the government debt to GDP ratios increases.

In examining the long-run relationship between public debt and private consumption in order to test for the validity of the REH in OECD countries, Gogas, Plakandaras and Papadimitriou (2013) use panel data, the univariate times series, panel co-integration approaches as well as VAR and VEC models for the period 1980 to 2010. Their study fails to provide empirical evidence in support of the REH for all the countries of the samples since the assumptions proposed by the REH cannot be fulfilled.

Arab and Haghighat (2014) examine the impact of government spending on private sector consumption using panel data for twenty-one OECD countries for the period 1998 to 2012, employing Lin, Pasaran and Shin Unit root test, Pedroni co integration test, Flimer Panel data test and the Hausman test for the selected variables during the period under review. They confirmed that there is positive effect of government spending on private consumption in these countries.

Odior and Banuso (2011) explore the household welfare effect of macroeconomic volatility on private consumption expenditure in Nigeria over the period 1980 to 2008 using a dynamic macroeconometric stochastic model. Their results revealed that personal consumption expenditure respond more to the structural innovation in inflation than other endogenous variables, and also that inflation innovations play a larger role in explaining forecast error variance in the long-run than they do in the short-run and that this will generate negative net effects on welfare.

Akekere and Yousuo (2012) investigate the impact of change in income on private consumption expenditure in Nigeria from 1981 to 2010 using the Ordinary least squares analysis, and obtained a significant positive impact of change in income on private consumption expenditure in the period under review. In another study, Ibrahim (2014) examined the critical parameters of private consumption function in Saudi Arabia for the period 1986 to 2008, employing the dynamic ordinary least squares approach .He showed that there exists a significant relationship among the real private consumption in Saudi Arabia and both of real income and real interest rate, but insignificant relationship with financial wealth.

Oseni and Olomola (2013) in their study of the test of Ricardian Equivalence Hypothesis in Nigeria for the period 1981 to 2011 used the error correction methodology, unit root test, the Johansen co-integration methodologies, the cumulative sum and cumulative sum of squares to check for structural stability of the model. They found that increases in government debt are associated with increase in private consumption, albeit far from being a one-to-one effect, thus providing evidence against the Ricardian Equivalence Hypothesis in Nigeria.

Some more recent studies testing the validity of the Ricardian Equivalence Hypothesis REH) or the Debt Neutrality proposition are those by Aderemi (2014) and Ogba (2014). Aderemi empirically examine the applicability of the debt neutrality to the Nigerian economy using annual time-series macroeconomic data for the period 1982 through 2012, using unit root tests, co-integration, Chow structural break test and the ordinary least squares regression method. He found that government spending and domestic debt which are the key variables in testing the validity of the REH did not support the case of debt neutrality in Nigeria. Ogba investigates the REH in Nigeria from 1980 through 2010 using the unit root and the ordinary least square methodologies, and his study showed that Nigerians will respond positively to change in government policy such as change in debt interest rate and fiscal deficit, but his study did not provide any strong evidence in support of the REH in Nigeria.

III. Theoretical Framework and Model Specification.

Taking a clue from Feldstein (1982), the study adopts his consumption expenditure function but with some modifications. Therefore, we will test the validity of the Ricardian Equivalence Hypothesis in Nigeria by estimating the following econometric model:

$C_t = \beta_o + \beta_1 Y_t + \beta_2 G_t + \beta_3 D_t + \beta_4 T_t + \mu_t$ .....(1)

Where C is private consumption per capita, Y is real income (or real GDP), D is domestic government borrowing (as opposed to total borrowing), G is government expenditure and T is total tax revenue. The acceptance of the Ricardian equivalence hypothesis is interpreted as implying traditionally that $\beta_2 = 0$, but in a less extreme case β_2 is expected to be negative and significant with its magnitude being less than unity, whereas taxes is expected to have a positive and significant coefficient and domestic debt is expected to have positive but insignificant coefficient.

To examine the validity of the Ricardian equivalence hypothesis, this study draws on the empirical model of Feldstein(1982) – See equation 1. Hence, we specify an unrestricted error correction auto regressive distributed lag model to investigate the relationships among per capita private consumption (pcep), government expenditure (gexp), domestic debt(debt), GDP per capita (gdppc) (as a proxy for real income), inflation (infl), debt servicing (dser) interest rate (intr) and total tax revenue (taxr). The compact and the explicit models for the study are specified below:

$$\Delta \ln pcep_t = \alpha \eta_{t-1} + \sum_{j=1}^{k} \varphi_t \Delta \ln pcep_{t-1} + \sum_{j=0}^{p} \delta_t \Delta \ln X_{t-1} + \mu_i + \varepsilon_t \quad \text{.....(2)}$$

$$\Delta \ln pcep_t = \alpha \eta_{t-1} + \sum_{j=1}^{k} \phi_i \Delta \ln pcep_{t-1} + \sum_{j=0}^{p} \lambda_i \Delta \ln g\exp_{t-1} + \sum_{j=0}^{m} \alpha_i \Delta \ln debt_{t-1} + \sum_{j=0}^{n} \vartheta_i \Delta \ln gdppc_{t-1} +$$

$$\sum_{j=0}^{q} \varpi_i \Delta \ln taxr_{t-1} + \sum_{j=0}^{h} \theta_i \Delta \ln dser_{t-1} + \sum_{j=0}^{r} \sigma_i \Delta \ln \inf l_{t-1} + \sum_{j=0}^{y} \chi_i \Delta \ln \text{int} r_{t-1} + \mu_i + \varepsilon_t \text{.....(3)}$$

Where, X is the vector of other variables except private consumption, α is the error correction coefficient, η_{t-1} is the error correction term, μ_i 's represents time effects, ε_{it} denotes the error term, p and k represents the lag structures. Choosing the appropriate lags was used to resolve the problems of autocorrelation and endogeneity. In this study, we adopted the Akaike Information Criterion (AIC). As a preliminary estimation exercise, the study conducts unit root and Johansen co-integration tests as well as estimates the Pairwise Granger causality test to establish causal relationships.

Ricardian Equivalence preposition explained that the consuming pattern of the individuals is not affected by the government fiscal choices. This implies that debt stock exerts no wealth effects on private consumption – the coefficient is expected to be zero. Also, government expenditures negatively affects private consumption – the coefficient is expected to be less than unity. Also, the higher the interest rates, individuals will substitute their current consumption with future consumption – it is expected to exert negative impact on private consumption, and since government interest payments on the outstanding debt are expected, its coefficient should be zero. Inflation lowers the real value of assets and incomes, and it is expected to have negative impact on private consumption.

This study employs annual time series data on private consumption per capita, government expenditure, GDP per capita, domestic debt, interest rate, interest payment on debt servicing and inflation rate and total tax revenue for the period from 1981 through 2016. The data set used was sourced from the Central Bank of Nigeria Statistical Bulletin and the World Bank's World Development Indicators dataset and estimated with Eviews 9.0 econometric software.

IV. Empirical Results

Summary Statistics

Table 1: Descriptive Statistics

variable	*observations*	*mean*	*median*	*maximum*	*minimum*	*std. dev.*
pcep	36	2477.47	2522.70	3354.50	1490.60	607.87
gexp	36	1525.34	594.08	5185.32	9.64	1850.78
debt	36	2013.47	677.82	11058.20	11.19	2914.61
intr	36	11.49	11.11	23.24	5.27	4.09
gdppc	36	1648.44	1413.12	2548.43	1147.07	458.30
taxr	36	777500.00	195400.00	2950600.00	3000.00	1035431.00
dser	36	256.25	74.81	1584.11	1.01	362.50
infl	36	19.44	11.90	72.84	5.38	17.75

Source : Authors' Estimation using Eviews 9.0.

The results in Table 1 shows that the average and median values for all the variables employed for this study are in conformity with normal annual time series data behaviours. For instance, the average value of private consumption is about 2477.47, while those of government expenditure, debt stock, interest rate, GDP per capita, tax revenue, debt service interest payment and inflation are 1525.34, 2013.47, 11.49.1648.44, 777500,256.25 and 19.44 respectively. The level of variability in private consumption expenditure is 607.87, and those of the independent variables ranges between 4.09 to 1035431. On a general note, there are significant variations between private consumption and the respective factors determining the behavioural dispositions of various household consumers in Nigeria.

Table 2: Correlation Matrix

variables	*pcep*	*gexp*	*Debt*	*intr*	*gdppc*	*taxr*	*dser*	*infl*
pcep	1.00							
gexp	0.69	1.00						

debt	0.60	0.94	1.00					
intr	-0.41	-0.32	-0.32	1.00				
gdppc	0.77	0.91	0.88	-0.49	1.00			
taxr	0.67	0.98	0.97	-0.34	0.91	1.00		
dser	0.60	0.88	0.97	-0.24	0.82	0.91	1.00	
infl	-0.43	-0.36	-0.31	0.45	-0.41	-0.35	-0.30	1.00

The empirical evidence in Table 2 establishes the degree, extent and direction of relationships among the variables, and we can see in general that the correlation among the variables are moderate in terms of private consumption, interest rate and there were a relatively high correlation between government expenditure and tax revenue, GDP per capita and total debt stock. The result indicates negative relationships between private consumption and interest rate and inflation rate. These behaviours are expected at apriori, that rising inflation rate and interest rate will reduce private consumption expenditure. However, there were positive relationship between private consumption expenditure and other explanatory variables (like government expenditure, debt stock, debt service interest payments, tax revenue and GDP per capita) the high correlation between tax revenue and government expenditure as well as domestic debt is expected in Nigeria considering the falling non-tax revenues and escalating domestic debts in the recent past.

Unit Roots Test Results

Table3: Unit Root Test

	Levels				First Difference			
variables	AD-F Test Statistics	ADF-F Test Critical Value at 5%	prob.	Remarks	AD-F Test Statistics	ADF-F Test Critical Value at 5%	prob.	Remarks
lnpcep	-3.204	-3.553	0.101	Non-stationary	-8.347***	-3.548	0.000	stationary
lngexp	0.176	-3.553	0.997	Non-stationary	-4.602***	-3.553	0.004	stationary
lndebt	-1.797	-3.548	0.683	Non-stationary	-4.520***	-3.548	0.005	stationary

lnintr	-2.748	-3.568	0.233	Non-stationary	-4.592***	-3.562	0.005	stationary
lngdppc	-2.849	-3.544	0.190	Non-stationary	-5.328***	-3.548	0.001	stationary
lntaxr	-2.178	-3.544	0.486	Non-stationary	-7.212***	-3.548	0.000	stationary
lndser	-2.369	-3.544	0.389	Non-stationary	-7.526***	-3.548	0.000	stationary
dinfl	-3.720	-3.548	0.034	Non-stationary	-5.911***	-3.548	0.000	stationary

Testing for the stationarity of variables cannot be downplayed when analyzing macroeconomic time series data. The unit root test presented in Table 3 reveals that private consumption, debt stock, debt service interest payment, government expenditure, gross domestic product per capita, tax revenue, interest rate and inflation rate were not stationary at levels but became stationary after first difference. Thus, they are all integrated of order 1, that is, they are I(1) variables. The uniformity of the order of integration after first difference implies that the unit root test results provide the rationale for conducting the Engle-Granger residual-based Co-integration test.

Cointegration test

Table 4: ADF Residual - Based Co integration Test

Order of Integration: Level						
	AD-F Test Statistics	AD-F Test Critical Values			prob.	Remarks
		1%	5%	10%		
Residual	-6.51***	-4.27	-3.56	-3.21	0.00	stationary

From Table 4, the Engle-Granger residual –based tests for co-integration entails the unit root test for residual at levels without differencing the residual series. Hence, the stationarity of the residual value at 1, 5 and 10 percent significance levels indicate the rejection of the hypotheses of no co integration among the variables employed for this study. The co integration result implies that the variables are co integrated, and there exist long-run relationship among the variables.

Pairwise Granger Causality Test

This study conducted a univariate pairwise Granger causality test between the variables.

Table 5 :Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.	Nature of causation
GEXP does not Granger Cause PCEP	34	2.645	0.088	Unidirectional
PCEP does not Granger Cause GEXP		1.238	0.305	
DEBT does not Granger Cause PCEP	34	1.371	0.270	No causation
PCEP does not Granger Cause DEBT		0.180	0.837	
INTR does not Granger Cause PCEP	34	1.092	0.349	Unidirectional
PCEP does not Granger Cause INTR		3.410	0.047	
GDPPC does not Granger Cause PCEP	34	0.194	0.825	Unidirectional
PCEP does not Granger Cause GDPPC		2.616	0.090	
DSER does not Granger Cause PCEP	34	1.918	0.165	No causation
PCEP does not Granger Cause DSER		1.040	0.366	
INFL does not Granger Cause PCEP	34	0.180	0.836	Unidirectional
PCEP does not Granger Cause INFL		2.921	0.070	
DEBT does not Granger Cause GEXP	34	7.409	0.003	Unidirectional
GEXP does not Granger Cause DEBT		1.766	0.189	
INTR does not Granger Cause GEXP	34	0.920	0.410	No causation

GEXP does not Granger Cause INTR		1.349	0.275	
GDPPC does not Granger Cause GEXP	34	0.535	0.591	Unidirectional
GEXP does not Granger Cause GDPPC		3.909	0.031	
DSER does not Granger Cause GEXP	34	2.554	0.095	Unidirectional
GEXP does not Granger Cause DSER		0.144	0.866	
INFL does not Granger Cause GEXP	34	0.258	0.774	No causation
GEXP does not Granger Cause INFL		1.079	0.353	
INTR does not Granger Cause DEBT	34	0.252	0.779	No causation
DEBT does not Granger Cause INTR		1.815	0.181	
GDPPC does not Granger Cause DEBT	34	0.467	0.632	No causation
DEBT does not Granger Cause GDPPC		0.783	0.467	
DSER does not Granger Cause DEBT	34	1.304	0.287	Unidirectional
DEBT does not Granger Cause DSER		5.150	0.012	
INFL does not Granger Cause DEBT	34	0.198	0.822	No causation
DEBT does not Granger Cause INFL		0.730	0.491	
GDPPC does not Granger Cause INTR	34	2.061	0.146	No causation
INTR does not Granger Cause GDPPC		0.854	0.436	
DSER does not Granger Cause INTR	34	0.791	0.463	No causation
INTR does not Granger		0.534	0.592	

Cause DSER				
INFL does not Granger Cause INTR	34	2.704	0.084	Unidirectional
INTR does not Granger Cause INFL		5.896	0.007	
DSER does not Granger Cause GDPPC	34	2.393	0.109	Unidirectional
GDPPC does not Granger Cause DSER		1.692	0.202	
INFL does not Granger Cause GDPPC	34	0.321	0.728	No causation
GDPPC does not Granger Cause INFL		1.267	0.297	
INFL does not Granger Cause DSER	34	0.109	0.897	No causation
DSER does not Granger Cause INFL		0.860	0.434	

The empirical results from Table 5 show that there is a unidirectional causality running from government expenditure to private consumption expenditure at 10 percent significant level. This implies that total government spending Granger causes private consumption expenditure in Nigeria. Hence, the improvement in total government expenditures will stimulate the expenditure incurred by households on private consumptions. Again, unidirectional causality runs from private consumption expenditure to interest rate at 5 percent level. This implies that the expansion of private consumption expenditure or aggregate private demands may stimulate deposit interest rates.

There is a unidirectional causality running from private consumption expenditure to GDP per capita. This implies that significant improvement of private consumption expenditure Granger causes standard of living or level of development in Nigeria. Hence, improvement in private consumption expenditure will serve as a catalyst for improved standard of living in Nigeria. However, the findings from the causality tests provided no causal relationship between private consumption expenditure and debt in Nigeria within the period covered by this study.

Test for the validity of the Ricardian Equivalence Hypothesis in Nigeria

This study adopted the auto regressive distributed lag model to examine the relationship between private consumption expenditure, government expenditure, debt stock, interest rate, tax revenue, interest rate, debt service interest payment and inflation rate in Nigeria. The choice of this estimation technique is to allow us capture the idea that an equilibrium relationship links private consumption expenditure and other variables in the long run, and also to accommodate the long-run equilibrium as well as accommodates likely heterogeneous dynamic adjustment process. Again, the method is also applied to avert any likelihood of endogeneity bias among the variables of interest. However, we employed the Akaike Information Criterion for our lag selection. The ARDL methodology will enable us examine the existence or non-existence of the Ricardian Equivalence Hypothesis in Nigeria, considering the sign and size effects of the coefficient estimates and the accompanying test for individual significance. We adopted the General-to-Specific modelling approach (See Models 1 to 5) to avert likelihood of econometric bias. This is expressly examined in the Table 6.

Table 6: Unrestricted Auto regressive Distributed Lag Model Results

	model 1			*model 2*			*model 3*			*model 4*			*model 5*		
Variable	*Coeff.*	*t-Stat.*	*Prob.*	*Coeff.*	*t-Stat.*	*Prob.*	*Coeff*	*t-Stat.*	*Prob.*	*Coeff.*	*t-Stat.*	*Prob.*	*Coeff.*	*t-Stat.*	*Prob.*
lnpcep(-1)	0.08	0.54	0.60	0.55***	5.13	0.00	0.19	1.47	0.17	0.49***	4.11	0.00	0.55***	5.35	0.00
Lngexp	0.01	0.11	0.92	-0.27***	-2.91	0.01									
lngexp(-1)	-0.32***	-3.75	0.00	-0.16**	-2.22	0.04									
Lngdppc	0.41	1.56	0.14	0.53**	2.47	0.02	0.69**	-2.23	0.05	0.39	1.24	0.23			
lngdppc(-1)	-0.41	-1.49	0.16	-0.95***	-3.30	0.00	-0.56***	-4.05	0.00	-0.31	-1.03	0.31			
Lndebt	-0.35**	-2.55	0.02				-0.22**	-2.63	0.02						
lndebt(-1)	0.56***	4.12	0.00				0.12	0.99	0.34						
Lndesr	-0.08**	-2.37	0.03										0.00	0.04	0.97
lndesr(-1)	0.08*	2.07	0.06										0.05	1.31	0.20
lndesr(-2)	0.14***	3.11	0.01												
Lninfl	-0.12***	-3.86	0.00										-0.03	-0.94	0.36
lninfl(-1)	0.01	0.22	0.83												
lninfl(-2)	-0.11***	-3.47	0.00												
Lntaxr	0.01	0.18	0.86							0.04***	3.53	0.00			

lntaxr(-1)	0.04	0.77	0.46												
Lnintr	0.03	0.45	0.66	-0.13*	-1.99	0.06	0.10	1.80	0.10	-0.01	-0.13	0.90	-0.03	-0.53	0.60
lnintr(-1)				0.13*	2.07	0.05	0.01	-0.02	0.99						
ecm(-1)	1.56***	7.24	0.00	0.91***	6.41	0.00	0.83***	6.43	0.00	0.98***	4.81	0.00	1.06***	4.93	0.00
ecm(-2)	0.27	1.24	0.24	-0.41**	-2.30	0.03	-0.25	-1.79	0.10						
Constant	7.13	4.89	0.00	2.71***	3.07	0.01	0.81	7.41	0.00	2.83***	3.12	0.00	3.45***	4.04	0.00
R-squared	0.98			0.97			0.99			0.89			0.88		
Adjusted R-squared	0.95			0.94			0.97			0.87			0.86		
F-statistic	31.14***			43.70***			61.89***			35.67			32.77		
Prob(F-statistic)	0.00			0.00			0.00			0.00			0.00		
Mean dependent var	7.77			7.77			7.77			7.77			7.77		
S.D. dependent var	0.26			0.26			0.27			0.26			0.26		
Akaike info criterion	-2.47			-2.41			-3.11			-1.70			-1.62		
Schwarz criterion	-1.60			-1.81			-2.27			-1.38			-1.30		
Hannan-Quinn criter.	-2.18			-2.21			-2.84			-1.59			-1.51		
Durbin-Watson stat	2.53			2.56			1.71			1.89			2.10		

***/**/* = 1, 5 and 10 percent significant levels

Empirical Analysis of the test for the validity of Ricardian Equivalence Hypothesis in Nigeria: A Baseline Model Specification Result

The baseline model (that is, model 1) include private consumption expenditure as the dependent variable and the independent variables include: government expenditure, per capita GDP, debt stock, tax revenue, debt service interest payment, interest rate and inflation.

One-period lag of private consumption expenditure have a positive but not significant relationship with private consumption expenditure while current period of government expenditure have positive but not significant relationship with private consumption expenditure. However, a one-period lag of government expenditure have a negative and significant relationship with private consumption expenditure at one percent significant level. The coefficients of both the current and lag periods

government expenditures are less than unity. The result of the lag period of government expenditure being negative and significant, and less than unity validates the Ricardian Equivalence Hypothesis in terms of private consumption expenditure-government expenditure nexus. This may be made possible because government expenditure leads to higher future taxes.

There is a positive but not significant relationship between income per capita and private consumption expenditure in the current period. However, after the one-period lag, there exist a negative but yet not significant relationship between income per capita and private consumption expenditure.

The current debt stock have a negative and significant relationship with private consumption at 5 percent significant level, while the one-period lag of debt stock have a positive and significant relationship with private consumption at 5% significant level. The results of the current and lag periods of debt stock does not satisfy the condition for the existence of Ricardian Equivalence Hypothesis(REH). The significant effect of the debt variable implies that debt have wealth effect on private consumption, and this is at variance with the expected zero coefficient as proposed by REH.

There is a negative relationship between debt service interest payment and private consumption at five percent significant level. However, at one-period lag of the debt service variable, there exist a positive and significant relationship between the said variable and private consumption. Again, the coefficients of both periods are greater than zero; hence, they did not sufficiently meet the REH condition that their coefficient of the debt service payment be equal to zero.

There is a negative and significant relationship between the current level and two-period lags -of inflation and private consumption at one percent significant level. This is expected because inflation lowers the real value of assets and incomes. However, the one-period lag of inflation shows a positive and not significant relationship with private consumption. The result of the current level and two-period lags of inflation satisfies the expectation of the REH.

The current and one-period lag of total tax revenue exhibits a positive and not significant relationship with private consumption expenditure. The not significant effect of the results of both periods does not meet the condition of REH. Also, there is a positive and not significant relationship between interest rate and private

consumption expenditure. However, this contravenes the REH condition - that with higher interest rates, individuals will substitute their current consumption with future consumption.

The speed of adjustments of the model is negative, not less than unity and significant indicating that the speed of restoration to equilibrium is quite rapid. In terms of the coefficient of determination of the model, the result reveals that about 98% systematic changes in private consumption expenditure result from the explanatory variables with 2% effects unexplained. Also, the F-statistics is significant at one percent showing the joint or collective significance of the relationship between the regress and regressors.

On a general note, in terms of the baseline specification, we may conclude that the validity of the Ricardian Equivalence Hypothesis is rejected in Nigeria (except in the case of government expenditure as indicated by our empirical outcome). This implies that the Nigerian economy is not neutral to changes in government policies and also that the use of fiscal policy variables can enhance the level of aggregate demand and ensure internal macroeconomic stability in Nigeria.

Empirical Analysis of the test for the validity of Ricardian Equivalence Hypothesis in Nigeria: Stepwise Model Specification Results for Robustness Checks

Model 2:

This model includes private consumption expenditure, government expenditure, per capita GDP and interest rate.

There is a positive and significant relationship between one-period lag of private consumption expenditure and current consumption expenditure at one percent significant level.

There is a negative and significant relationship between the current and one-period of government expenditure and private consumption expenditure at one and five percent significant levels respectively, and both coefficient are lesser than unity. This further demonstrated the support for REH in terms of private consumption expenditure-total government expenditure relationships.

There is a positive and significant relationship between the current level of GDP per capita and private consumption expenditure at five percent significant level. However, a one-period lag of income shows a contrary result.

There is a negative and significant relationship between current interest rate and private consumption at ten percent significant level, but a one-period lag shows a positive and significant relationship.

The speed of adjustment of the model at a two-period lag is negative, less than unity and significant at five percent, indicating that the speed of restoration to equilibrium is moderate.

The coefficient of determination shows that the explanatory variables provide 97 percent explanations for the systematic variation in private consumption expenditure and the F-statistics provide a joint and significant relationships of the variables in the model.

This model provided more empirical evidence for the impact of government expenditure, per capita GDP and interest rate on private consumption expenditure in Nigeria. It also provided striking empirical evidence for the predominant influence of government expenditure in reassuring the REH in Nigeria's fiscal space.

Model 3:
This model includes private consumption expenditure, per capita GDP, debt stock and interest rate.

There is a positive and not significant relationship between the one-period lag of private consumption expenditure and current level of private consumption expenditure. Also, there is a positive and significant relationship between per capita GDP and private consumption expenditure.

There is a negative and significant relationship between current level of debt stock and private consumption expenditure at five percent significant level. However, the one-period lag of the debt stock variable shows a positive but not significant relationship between debt and private consumption expenditure.

Hence, the one-period lag result partially satisfies the REH that the coefficient of the debt variable be positive and insignificant, and in this case, the coefficient is not equal to zero as expected. The result reveals that debt exerts some wealth effect on private consumption.

There is a positive and not significant relationship between the current and one-period lag of interest rate and private consumption. This contravenes apriori expectation of a negative relationship between interest rate and private consumption.

The speed of adjustment of the model is positive and less than unity and significant, the positive effect of the coefficient contradicts theoretical expectation. However, the restoration to equilibrium in the event of displacement is high.

The coefficient of determination of 99 percent indicates that the explanatory variables adopted in this model provides about 99% of the systematic variation in private consumption. Also, the significant value of the F-statistics show that there is a collective significance among the variables for the study.

Model 4:
This model includes private consumption expenditure, per capita GDP, inflation and tax revenue.

There is a positive and significant relationship between the one-period lag of private consumption expenditure and current level of private consumption at one percent significant level.

There is a positive and not significant relationship between GDP per capita and private consumption expenditure. Interestingly, there is a positive and significant relationship between tax revenue and private consumption expenditure at one percent significant level. This result support the validity of REH in Nigeria in terms of tax revenue and private consumption nexus.

There is a negative but not significant relationship between interest rate and private consumption in Nigeria. The speed of adjustments of the model is positive, less than unity and significant but the positive effect of the coefficient contradicts theoretical expectations.

The coefficient of determination shows that the explanatory variables provide about 89% explanation for the systematic variation in the dependent variable. The significant F-statistics reveal a significant and collective relationship among the variables.

Model 5:
This model includes private consumption expenditure, debt service interest payment, inflation and interest rate.

There is a positive and significant relationship between one-period lag of private consumption and the current level of private consumption at one percent significance level. Also, there exist a positive and not significant relationship between current and one-period lag of debt service interest payment and private consumption expenditure.

There is a negative and not significant relationship between inflation and private consumption expenditure. Also, there is a negative and not significant relationship between interest rate and private consumption expenditure.

The speed of adjustment of the model is positive, greater than unity and significant, the positive and greater than unity component contravene the theoretical expectation guiding the error correction methodology.

The coefficient of determination shows that the explanatory variables provide 88% explanation for the systematic variations in the dependent variable while 12 % are unexplained. The significant F-statistics reveal that there are collective significance among the variables employed in the estimation of the model.

The variations in the empirical evidence of the baseline and stepwise specifications may be due to smaller sample size, and it may also have resulted from structural changes across the various models in terms of variable compositions.

V. Policy Implications

The empirical methodology adopted in this study produced impressive results from the relationships between private consumption, government expenditure, domestic debt, debt service interest payment, tax revenue, inflation and interest rate and gross domestic product per capita as well as the test of the validity of the Ricardian equivalence hypothesis in Nigeria. The findings of the study have some implications, which may be summarized as:

(i) Changes in private consumption expenditures are significantly responsive to changes in government's fiscal policies, most especially in the areas of government

expenditure, inflation and debt. The major implication here is that changes in fiscal policies are key predictors of the country's aggregate output.

(ii) Our empirical results show that private consumption expenditure Granger causes income per capita in Nigeria. Hence, private consumption expenditure stimulates the standard of living of Nigerians.

VI Conclusion and Recommendations

The analysis of the validity of the Ricardian equivalence proposition remains inconclusive in most empirical studies in developing and developed countries. This study employed ARDL estimation approach to examine the evidence of Ricardian Equivalence Hypothesis in Nigeria over the period 1981 to 2016. The result shows that government expenditure, debt stock, debt service interest payment, inflation and interest rate have negative impact on private consumption whereas GDP per capita and tax revenue have positive impacts. On a general note, in terms of the baseline specification from the perspective of this study, we may conclude that the validity of the Ricardian Equivalence Hypothesis is rejected in Nigeria (except in the case of government expenditure as indicated by our empirical outcome or tax revenue in the case of robustness checks). The findings of this study have far reaching implications which could contribute to the formulation of fiscal policy measures that would enhance private consumption patterns in Nigeria, as well as facilitating the growth and development of the economy. In light of this, the government should strengthen its revenue and expenditure frameworks as a key predictor and driver of private consumption in Nigeria.

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TAX PERFORMANCE, INSTITUTIONS AND ECONOMIC INTEGRATION IN ECOWAS

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Abstract

This study evaluates the effects of tax performance and domestic institutions on economic integration in ECOWAS through the facilitation of better compliance with convergence criteria. Using data for the period 2000 to 2015 and a panel of all ECOWAS countries, the study shows that improvement in tax performance (especially direct taxes) increases the number of convergence criteria met by countries and raises the probability that each country will meet both fiscal deficits and debt criteria. The study also finds that political institutions and ethnic tensions are the strongest factors that determine fiscal harmonisation and overall integration in the bloc.

Keywords: convergence criteria, fiscal harmonisation, ECOWAS, tax effort,

JEL Classification: F15, H21, H87, O17

1. Introduction

In the past few decades, there has been remarkable strengthening of regional integration and cooperation in the African continent as part of long term strategies to improve the prospects for economic development. This result from the perceived benefits of regional integration and cooperation which transcend economic, political and social structures of domestic economies. The particular gains from such regional cooperation include improvements in production efficiency (through specialization), reduction in unit costs arising from economies of scale, "standardisation and reduction of formalities, better bargaining position towards the rest of the world and consolidation of macroeconomic policy reforms" (European Union 1995, 9). In particular, regional integration among developing countries is generally structured to aid these economies to accelerate economic growth and consolidate development efforts (Simms and Simms 2007; Bossuyt 2016).

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Apparently, the attainment of virile regional blocs that facilitate development is faced with challenges, given that domestic development strategies are not only founded on economic needs, but they also possess political, cultural and social ramifications (European Union 1995; Adotevi, 1997; Azuka 2015; Exbrayat 2017). Member countries often seek to balance internal social, institutional and political demands with the struggle to obtain optimum economic benefits from participation in the economic integration pacts. Thus, when domestic economies are beclouded with weak institutional setups and weak government capacities, the political and social dimensions to the integration difficulties tend to increase, with less guarantee of sustainable support for regional policies (Matli 1999; Trebilcock and Howse 2005).

The Economic Community of West African States (ECOWAS) is a major economic integration bloc in Africa which is characterised by the constant challenges of achieving sustainable regional economic integration of the countries in the West African sub-region. Among the main pillars of the ECOWAS Monetary Cooperation Programme (EMCP) are the convergence criteria aimed at attaining price stability and public finance sustainability (ECA 2015). However, the struggle to keep fiscal deficit low by member countries has provided a formidable challenge for attaining price stability, public finance sustainability, and overall macroeconomic harmonisation in the sub-region. In 2016, the West African Monetary Agency (WAMA) reported average deficit ratio of 5.9 percent for the sub-region, far surpassing the target zone of 3.0 percent. For many of the countries in the sub-region, deficit ratios reached 8.5 percent (for Cape Verde), 9.1 percent (for The Gambia) and 6.4 percent (for Ghana). With unpredictable revenue inflows from commodity prices, the role of taxes in driving fiscal applications has come to deep focus. Yet, tax revenues in the sub-region has been among the lowest in the world. In 2015, tax to GDP ratio was 13.9 percent on average, in the sub-region, compared to the OECD average of 34.1 percent. Thus, low tax revenues have largely contributed to the poor domestic revenue capacity of the ECOWAS countries.

Apparently, improvements in the mobilization of tax revenue in each country is an important policy direction for improving fiscal positions, thereby facilitating macroeconomic harmonisation. However, the structural composition and institutional capacity of the economy should be potential concern for policy makers in realising optimisation of tax revenues. For the ECOWAS region, it has been noted that inadequate structural transformation and weak institutional capacities have created conditions of weak fiscal adjustments that often hinder standardised regional patterns among the countries. As Thompson and Rohlins (2012) noted,

large revenue losses in the tax systems have been noted in certain sectors while others have delivered inefficient fiscal outcomes even with fairly high tax burdens.
In this study, we investigate the effects of tax performance and domestic institutions among member States of ECOWAS on economic integration in the economic bloc. In particular, we consider how tax improvements can be used to promote fiscal discipline among Member States and facilitate fiscal harmonisation in the sub-region. The goal is to relate tax performance, not general tax outcomes, and the extent of institutional effects to certain convergence criteria in the roadmap for economic integration in ECOWAS. The focus on tax performance is important since the processes of taxation are important not just for the amount of taxes collected, but in securing distributional welfare and social equity in the tax system (World Bank 2008; Azuka 2015). These are the aspects of the tax system that provide foundations for encouraging integration among countries in any region.

2. Literature Review

Though there is no generally precise definition of regional integration, the practical implications of the concept are broadly agreed upon. According to the European Union (1995) report, regional integration is a general concept that refers to all efforts made by contiguous countries to address issues of common interest. Such efforts usually have the objectives of eliminating any policy-induced barriers to intra-group movement of economic resources and enhancing activities that lead to the furthering of interdependence of the economies. Thus, the economic aspects of regional integration would involve cooperation that enhance economic performance in the countries and entire region. In Balassas (1961) categorisation of economic integration, total integration was considered the highest degree. Apparently, economic integration also involves alignments in monetary, fiscal, social and counter-cyclical policies. The theoretical background for fiscal harmonisation in the pursuit of economic integration was provided by Velayos, Barreix and Villela (2008). In the framework, the authors built a fiscal harmonisation scale in a logical order using a criterion based on the political commitment assumed in tax negotiations, rather than economic or legal implications. The model showed that harmonisation of the fiscal system evolved from the simple adjustment of domestic tax regime (arising from the influence of globalisation) to the standardization stage where tax burdens are equalised across the countries.

The political economy of adjustments that can aid fiscal harmony have received a lot of attention in literature (see Gavin & Perotti 1997; Lane 2003; Kaminsky, Reinhart and Vegh 2004; Talvi and Vegh 2005 for general surveys). For these studies, the key

factors that aid domestic fiscal adjustments include political stability, vested interests, social divisions, and quality institutions. Alesina (1987), Havrilesky (1988) and Roubini and Sachs (1988) initially demonstrated that institutional arrangements in the political process among advanced economies explained the differences in their patterns of fiscal deficits. They argued that political conflict and the strength of governments are important political features of budget management and sustainability. Lavigne (2006) assessed the effects of institutional and political factors on the need and willingness of governments to make large fiscal adjustments and found that "political economy factors favouring the maintenance of sensible fiscal policies are different from those that increase the probability of achieving an exceptional adjustment". In the same vein, Adegboye (2015) investigated the role of political institutions in fiscal policy in Nigeria and found that internal political arrangements played strong roles in promoting fiscal instability in Nigeria.

Given that regional integration involves agreements among different countries, both domestic and external factors tend to explain the deepening and sustainability of regional integration. Mattli (1999) grouped the factors that explain the success of regional integration into demand-side conditions and supply-side conditions. He argued that the demand conditions entail desire of participating countries to build regional institutions that help to internalise externalities that overflow across international borders. Such externalities arise from economic and political uncertainty, and other financial risks encountered by domestic actors while interacting with foreign firms and governments. The supply-side conditions focus on political and social constructs of domestic economies in terms of their willingness and capacity to deepen integration. Thus, political leadership and efficiency are crucial supply factors in promoting integration. Casella (2003) also noted the will of the political system to follow through with agreements as crucial for integration success. Another dimension of institutional effects on integration was examined by Mansfield, Milner and Rosendorff (2002) who demonstrated that the most democratic countries are more likely to have deep economic integration.

In analyzing the processes and determinants of economic integration, Simms and Simms (2007) identified the potential for economic growth as crucial for the success of any economic integration arrangement in developing countries. They showed that Member states would only be willing to relinquish some of their economic and political autonomy in favour of regional economic group when there are prospects for gaining further development momentum. These economic benefits are only realised if the participating countries possess effective capacity to absorb larger

inflows of resources and if there are complementarities between production and trade flows among the countries. In this direction, Trebilcock and Howse (2005) highlighted the effects of the "overlapping production and trade flows" as capable of inhibiting the willingness for more economic integration agreements among African countries. Thus, for the African sub-region, the production structure combines with political institutions in lowering the potential for full economic integration.

Lessons from the EU integration strategy provide strong background for observing the determinants of economic integration. Malamud and Schmitter (2006) analyse these lessons and highlighted democratic entrenchment in countries, convergence of interests, and leadership as main driving factors. Márquez-Ramos, Martínez-Zarzoso and Suárez-Burguet (2011) have also found that social, political and economic structures have deep effects on economic integration. In the European Union (1995) report, the factors were presented as essential for sustaining deep economic integration to include political commitment, peace and security in the region, entrenchment of rule of law, democracy and good governance – in order to ensure the irreversibility of the process, and macroeconomic stability.

On the relationship between regional integration and taxes, most of the studies sought to establish the effects of integration on taxes. For instance, Haufler, Klemm and Schjelderup (2006) examined the effects of economic integration on voters' decision on redistributive income tax rate using a political economy model. Gastaldi, Liberati and Scialà (2013) investigated the implications of the degree of economic integration for central government tax revenues and the decentralisation of the public sector. Clausing (2008) examined the influence of increasing economic integration on corporate tax rates and corporate tax revenues among countries in the EU. Nnyanzi, Babyenda and Bbale (2016) investigated the impacts of regional integration of the East African Community (EAC) on tax revenue in the region.

In all of these studies, there was no attempt to explain how individual-country tax performance influences the depth of economic integration or the commitment of each country to the agreements. These outcomes are crucial, especially for developing countries where domestic revenue drive has become critical in recent periods. This study intends to extend literature in this regard and provide a template for observing tax performance impacts on ECOWAS countries' convergence and overall economic integration in the region.

3. Methodology

3.1 Model Specification

In the baseline panel regressions, the one-way error component panel regression with random effects specifications are employed. The random effect assumes that certain unobserved country-specific characteristics, which are correlated with the error term, are captured by the explanatory variables.

The specified random effects model is thus:

$$y_{it} = \alpha + \beta X_{it} + \gamma I_{it} + \delta Z_{it} + \upsilon_i + \varepsilon_{it} \quad \text{----------(1)}$$

where y_{it} represents economic integration (in terms of meeting convergence criteria and fiscal discipline) in country i during period t, X_{it} is tax performance indicator (taken as tax effort), the vector I_{it} is the set of institutional variables and Z_{it} is a vector of control variables. The institutional variables include corruption, rule of law, government stability, democratic accountability, ethnic diversity, and political willingness on integration procedures. The control variables include trade openness, size of government (to capture government capacity), output gap, macroeconomic stability (measured as inflation rates), and tendency of governments to embark on expenditure on subsidies and transfers (captured by proportion of population over 65 years). It has also been demonstrated that within the ECOWAS sub-region, the WAEMU countries have had more entrenched framework for integration agreements when compared with the WAMZ countries (Mansour and Rota-Graziosi 2013). This gives a unique leverage for enhancing integration in ECOWAS (Fielding and Shields 2003; Sy 2015). Hence a dummy variable that captures WAEMU membership is included in the model with expected positive sign.

3.2 Estimation Procedure

Due to the unique data setup of the dependent variables in the model, three estimation techniques are employed in the study. First, data for meeting convergence criteria (or not) is binary in nature, with meeting the target for a given year taking one (1) and not meeting the target taking zero (0). This indicates that the dependent variable for this model is qualitative in nature and it necessitates application of qualitative dependent variable estimation technique. A logit form is therefore specified to capture the probability of a country meeting the criteria (three are used in the study). In the model, the probability of meeting a criterion is assumed to depend on tax performance, institutional setups, and other factors, as well as membership of WAEMU. The model is specified as:

$$Pr(Y = 1) = f(X, I, Z, WAEMU) \quad \text{----------(2)}$$

In estimating the model, we consider that the response of Y, y_i can take the values one and zero with probabilities π_i and $1 - \pi_i$ respectively. For the individual countries $n_i = 1$ for all i. This defines the stochastic structure of the model. Suppose further that the logit of the underlying probability π_i is a linear function of the predictors

$$logit(\pi_i) = x_i'\beta \quad ----------(3)$$

where x_i is a vector of covariates and β is a vector of regression coefficients. Thus, β_j represents the change in the logit of the probability associated with a unit change in the *j-th* explanatory variable, holding all other variables constant. As demonstrated in Rodriquez (2007), exponentiating (3) provides the odds for the *i-the* country and is given by

$$\frac{\pi_i}{1-\pi_i} = \exp\{x_i'\beta\} \quad ----------(4)$$

Solving for the probability π_i in the logit model in Equation (4) gives the model,

$$pr(Y = 1/X, I, Z, WAEMU) = \pi_i = \frac{1}{1 + \exp\{x_i'\beta + \gamma_i'I + \delta_i'Z + \lambda_i'WAEMU\}} \quad ----(5)$$

The left-hand-side of Equation (5) is the probability scale, while the right-hand side is a non-linear function of the predictors. It is difficult to "express the effect on the probability of increasing a predictor by one unit while holding the other variables constant" (Rodriguez 2007,21). To address this problem, the marginal effects (which show the probability of meeting a criterion arising from proportional change increase in any of the independent variable) are computed. Marginal effects are obtained by taking derivatives with respect to the given independent variable as:

$$\frac{d\pi_i}{dx_{ij}} = \beta_j \pi_i(1-\pi_i) \quad ----------(6)$$

This implies that the marginal effect of the *j-th* explanatory variable on the probability π_i depends on the coefficient β_j and the value of the probability.

For the estimation of number of criteria met (out of the total 11), an ordered logit model is estimated. This is because the level of economic integration by a given country is assumed to be observed from the number of convergence criteria met. This number is therefore ordered with lower number indicating less integration. It is therefore noted that the dependent variable is a polychotomous (or a multiple-category) response variable. Marginal effects, like those obtained from the simple logit estimations presented above are also used to demonstrate the effects of each explanatory variables on the probability of a country meeting more criteria for integration.

3.3 Data Sources and Variable Characteristics

The study employs a panel of annual data for the period 2000 to 2015 and covers all fifteen (15) countries of ECOWAS sub-region. The data on convergence criteria, fiscal deficits, tax ratios, inflation rates, and number of protocols signed are obtained from the West African Monetary Agency (WAMA). The data for external debt rates, government size, trade openness, GDP growth and proportion of population above 65 years were all obtained from the World Bank, World Development Indicators. The other institutional quality variables are all obtained from the Political Risk components based on data from International Country Risk Guide (ICRG) rating.

In measuring economic integration, the convergence criteria of the ECOWAS bloc were taken into consideration. It is assumed that the depth of integration is measured by the level of cooperation of a country to the convergence criteria. We focus on the criteria that relate to fiscal performance – fiscal deficit and debt ratios and the ability to meet more criteria. Thus, there are three dependent variables in the study, including number of criteria met by a country, whether a country meets the budget deficit criterion in a given year, and whether the country meets the debt ratio criterion in a given year. Each of these dependent variables are expected to provide different dimensions to the economic integration status of a country.

There have been doubt about the extent of implementation of the convergence criteria in many of the countries in the community. As shown in Table 1, the worst performances among the countries came from fiscal harmonisation criteria, especially with respect to budget deficits and ratio of tax revenue to GDP. In most of the years, less than half of the countries in the community met the deficit criteria, while no more than two countries met the tax ratio criteria. The countries that had low fiscal deficit ratio (and met the criteria) were those with large earnings from commodity export sector (e.g. Nigeria, Ghana, and Cote d'Ivoire). For instance, Nigeria has very poor performance with respect to tax-GDP ratio, yet it was able to meet the maximum deficit criteria for almost all the years since 2000.

Table 1: Number of countries complying with the convergence criteria

Criterion	Target	2008	2009	2010	2011	2012	2013	2014	2015	2016
	Primary criteria									
Budget deficit	≤ 3%	10	6	7	9	7	6	7	6	3
Inflation	≤ 5%	1	11	10	9	8	10	12	14	12
Forex reserves	≤ 10%	1	9	10	10	1	9	14	11	12
Central Bank financing	≥ 6 months	13	12	12	13	14	15	13	12	13
	Secondary criteria									
Ratio of Tax Revenue / GDP	≥ 20%	1	1	2	1	0	1	2	2	2
Public debt	≤ 70%	12	12	14	14	14	14	11	11	11
Nominal exchange rate	± 10%	14	11	13	13	14	14	12	13	12

Source: WAMA, Central Banks

In this study, tax performance is measured as tax effort in a country. According to Ndiaye and Korsu (2011, 5), tax effort is a measure of "the extent to which a country has utilised its taxable capacity and the taxable capacity of a country in relation to actual tax performance." The stochastic frontiers approach was employed in estimating the tax effort in the study. Generally, tax performance in the ECOWAS bloc has not been quite encouraging. As suggested in Table 2, only Cape Verde met the EMCP criterion on Tax Revenue performance, which states that member countries should have tax revenue to be at least 20 percent of GDP. With recent improvements in tax policies and administration in Liberia, tax ratios in Liberia have reached over 20 percent since 2010, which underscores the importance of tax administration and proper policies in enhancing tax revenues. Moreover, indirect tax ratios have been higher than those of direct taxes. There is still more reliance on indirect tax revenues among the countries in the community.

Table 2: Tax to GDP Ratios in ECOWAS countries

Country	Total Taxes	Direct Taxes	Indirect Taxes
Benin	16.20	4.25	11.95
Burkina Faso	12.46	2.77	7.61
Cabo Verde	21.72	5.80	12.83
Cote d'Ivoire	15.69	4.61	10.54
The Gambia	15.71	4.03	9.31
Ghana	13.14	4.88	8.37
Guinea	13.51	5.49	8.03
Guinea-Bissau	6.17	0.63	2.10
Liberia	17.96	5.23	10.73
Mali	14.51	3.65	10.54
Niger	11.94	2.48	8.36
Nigeria	9.01	2.88	2.54
Senegal	18.03	4.01	10.78
Sierra Leone	8.89	2.72	6.17
Togo	14.66	2.01	4.96
WAEMU	12.90	3.06	7.60
WAMZ	12.05	4.0	6.88
ECOWAS	13.97	3.70	8.32

Apparently, the tax structure in many ECOWAS countries has been weak and actually formed strong inhibitions to sustainable tax regimes in the sub-region (Dieye 2008). This has further weakened the drive for integration and external competitiveness. As Ndiaye and Korsu (2012) noted, many countries heavily rely on international trade taxes at the detriment of other tax bases that could provide long term benefits. For instance, user charges and property/income taxes contribute insignificant proportions to total tax revenues in most of the countries, while "taxes on wealth, bequest, land and property exist in theory but have been rendered ineffective by design problems or lack of interest in its administration or a combination of both" (Ndiaye and Korsu 2012, 4). Generally, indirect taxation dominates tax revenues for the countries, with lower contributions of indirect taxes (perhaps due to structural difficulty and poor tax administration). For instance, the bases for income and corporate taxes are getting more narrow (due to increasing shadow economies) as a result of excessive rates which are often sub-optimal.

Institutional factors are included in the model to observe the effects of institutional quality, political commitment, and political willingness on deepening economic integration in the ECOWAS bloc. The institutional variables included are index of corruption (to capture institutional quality), ethnic tensions (to assess the degree of tension within a country attributable to social groupings over resources), democratic accountability, government stability and rule of law (to capture strength and capacity of political institutions). In each of these institutional variables, lower ratings are given to countries where the quality is low, with higher tendencies for political risks. It is expected in the study that better domestic institutions among the Member countries would improve economic integration in ECOWAS. The number of protocols ratified by individual countries is included to capture the willingness of an individual country to deepen integration in the Community or what Mattli (1999) refers to as "commitment institutions". A dummy variable that captures WAEMU membership is included in the model. It is expected that membership of WAEMU should imply that a country performs better in meeting the convergence criteria (as noted in Mansour and Rota-Graziosi 2013; Badiane 1997).

3.4 Characteristics of Variables

The summary statistics of variables used in the study are reported in Table 3. The estimated total tax efforts for the countries indicate that there is a lot of inefficiencies in the tax systems. Average tax effort of 62.75% reveals that the tax capacities are weakly used among the countries in the study. The maximum value of 123.88% was reported for Liberia, which has had very high tax effort since 2009, perhaps due to the tax reforms in the country. It is however seen in the Table that indirect tax effort was higher than both total effort and direct tax effort on average. Average indirect tax effort for the countries was 70.08%, suggesting that the ECOWAS countries are relatively more efficient in collecting indirect taxes. This is however to be expected given the extent of openness in the countries in the sub-region (75.14% on average), with large tax potentials especially in the import sector.

The average proportion of criteria met among the countries in the region was 0.53, indicating the low depth of participation in the integration process among the countries. The average number of 40 (out of possible 54) for protocols ratified by the countries also suggest the weak commitments to agreements in the bloc. This is more critical considering a minimum number of 24 protocol signed by a country in the region. Apparently, there is need for more political will and participation in deepening integration in the region. Average deficit ratio among the countries is -

6.4%, far beyond the -3.0% in the convergence criteria. Even after the signing of the convergence agreements in 2013, most of the countries have continued to run large fiscal imbalances, mainly due to the structural inadequacies in the domestic economies. Large countries like Nigeria, have managed to minimise annual budget deficits in the region, but the very high deficits for many of the countries ensured that the average value was quite large for the entire sub-region.

Table 3: Descriptive statistics of data

Variable	Mean	Maximum	Minimum	Std. Dev.
Total tax effort	62.75	123.88	26.07	21.12
Direct tax effort	46.05	131.06	22.86	25.74
Indirect tax effort	70.08	122.46	28.01	34.27
Proportion of total criterial met	0.53	0.89	0.11	0.17
Fiscal deficit ratio	-6.40	6.60	-14.7	3.66
Total debtratio	36.76	131.17	4.131	19.74
Government size	13.55	22.05	5.09	4.18
Trade openness	75.14	136.97	30.89	23.71
Inflation rate	5.80	20.80	-1.09	5.32
Output gap	-0.14	17.04	-20.63	4.27
Proportion of population over 65	2.79	3.51	2.33	0.30
Corruption index	1.93	2.88	1	0.40
Index of democratic accountability	3.48	5.50	1.58	1.20
Ethnicity	3.17	5	2	1.00
Government stability	8.40	11	6	1.45
Rule of law	5.04	6.5	3.25	0.85
Number of protocols signed	40	52	24	7.12

Source: Author's estimation

For the institutional variables, out of a maximum of 12, the countries in the region scored 8.4 on average in terms of government stability, suggesting the large improvements in terms of stable governments since the entrenchment of democratic rules in many ECOWAS countries. The rule of law component is however low, with a mean value of 5.04 (from possible 9). There is indication that even with democratic governments, not much of property rights are being protected and the legal system has not been as strong as expected. Recent designs by countries in the region (especially within the ECOWAS framework) to increase share of foreign investment are however providing improvements in rule of

law in the sub-region. Mean democratic accountability was just above average for the countries, while the index of corruption had the least score among the institutional variables. This reveals that corruption has remained a significant challenge for improving institutional quality in among ECOWAS countries.

4. Empirical Analysis

The results of the estimated equations are reported and discussed in this section. As noted in the methodology section, three dependent variables are used to capture economic integration in the ECOWAS sub-region. Moreover, the effects of total, direct and indirect tax efforts are estimated in each of the results and the robustness are tested while controlling for institutional effects. In Table 4, the results for the number of criteria met is presented. The results show that total tax effort has significant positive impacts on number of criteria met by the countries in the community. From the results, a one percent increase in tax efforts results in a 0.37% increase in the number of convergent criteria met among the members of ECOWAS. The result for the total tax effort effects is robust even while controlling for institutional quality effects.

Thus, there is strong indication that when tax performance in the domestic sectors of member States in the sub-region is improved, the chances of meeting all the convergence criteria improves for the countries. The effects of tax efforts on direct and indirect taxes also report positive coefficients that pass the significance test at the 10% level. For these effects, the sizes are reversed for the two tax components in terms of controlling for institutional quality. While the effects are stronger with institutional effects for direct taxes, the effects are stronger without institutional effects for indirect taxes. This again underscores the strong role institutional quality should play in order to improve the share of indirect taxes in the various economies. Such institutional quality would have to include regional collaborations in aiding individual countries overcome structural and political impediments as in the case of WAEMU (see Mansour and Rota-Graziosi 2013).

The other variables in the results also performed well. Most of the political institutions variables pass the test at 5%, except that of ethnic tensions. In the result, government stability, corruption index, and democratic accountability have positive impacts on the number of criteria met by the countries. This implies that with improved quality of institutions, the criteria for deeper integration in the region have more chances to be met. These results confirm those of Malamud and Schmitter (2006) and Martínez-Zarzoso and Suárez-Burguet (2011) that political

structure of a state, especially in terms of democratic entrenchment have strong binding roles on integration among economic blocs. Stable governments are also shown to improve the meeting of criteria, suggesting that more legislative support within the government can foster the willingness of political leadership to deepen integration in the region. On the other hand, rule of law has a significant negative impact on the number of criteria met by a country. Apparently, respect for legal decisions as well as protection of property rights do not improve the chances of meeting the convergence criteria, and hence integration, in ECOWAS.

Table 4: Results for number of convergence criteria met (marginal effects from multinomial logit regression)

Variable	Total Tax		Direct Tax		Indirect Tax	
	1	2	1	2	1	2
total tax effort	0.371* (0.199)	0.325*** (0.053)	-	-	-	-
direct tax effort	-	-	0.422* (0.229)	0.102* (0.061)	-	-
indirect tax effort	-	-	-	-	0.146* (0.081)	0.525* (0.292)
govt_stab	0.207** (0.079)	-	-0.237*** (0.32)	-	0.243*** (0.038)	-
ethnic	-0.010 (0.012)	-	-0.149 (0.135)	-	-0.167 (0.206)	-
corrupt	0.640** (0.237)	-	0.448* (0.250)	-	0.416* (0.236)	-
demacct	0.368*** (0.041)	-	0.382*** (0.075)	-	0.391*** (0.107)	-
protocols ratified	0.098*** (0.024)	-	0.120*** (0.016)	-	0.120*** (0.024)	-
rule_law	-0.522*** (0.061)	-	-0.352** (0.135)	-	-0.336 (0.386)	-
open	-0.004 (0.006)	-0.006* (0.004)	0.000 (0.133)	-0.002 (0.004)	0.000 (0.073)	-0.001 (0.026)
gsize	-0.147*** (0.027)	-0.077** (0.033)	-0.136*** (0.163)	-0.060* ().035)	-0.131*** (0.028)	-0.053 (0.056)
inflation	-0.143*** (0.024)	-0.128 (0.106)	-0.150*** (0.025)	-0.123*** (0.029)	-0.149*** (0.024)	-0.117*** (0.029)
ygap	0.009 (0.036)	0.007 (0.013)	0.017 (0.019)	0.012 (0.011)	0.019 (0.079)	0.016 (0.015)
pop_65	1.807***	0.205	2.090***	0.250	2.089***	0.171

	(0.370)	(0.151)	(0.303)	(0.274)	(0.529)	(0.138)
waemudummy	2.929*** (0.238)	2.346*** (0.188)	2.969*** (0.293)	2.592*** (0.238)	2.890*** (0.261)	2.461*** (0.225)
obs	208	240	208	240	208	240
Adj. R-sq	0.347	0.133	0.286	0.105	0.319	0.119

Source: Author's estimation

Note: ***, **, * indicate significance at 1, 5 and 10 percent level respectively. Standard errors of estimates in parenthesis.

The coefficient of the institutional variable that captures governments' commitment to agreements in the community is significant and positive. This shows that the more commitment exhibited by governments to the protocols of the community the more the criteria for integration that will be met. In the same vein, membership of WAEMU in the model has significant positive impact on the number of criteria met. This confirms the assumption that countries of WEAMU have performed better in terms of deepening integration in the ECOWAS bloc. The coefficient of WAEMU dummy is similar across the estimation outputs, indicating the strong robustness of the positive effects of WAEMU participation on ability of countries to meet ECOWAS convergence criteria.

The other variables in the model also have interesting results. Trade openness and government size have significant negative coefficients in the total tax effort result, suggesting that more openness in economies and larger governments tend to decrease the number of criteria met. More openness entails greater susceptibility to external influences outside of the ECOWAS sub-region, thereby causing unplanned shifts in domestic fiscal positions. Larger governments, on the other hand, tend to operate fiscal management structures that are influenced more by domestic factors than considerations for the regional arrangements (Kouassy and Bohoun 1993; Hansson and Olofsdotter 2004; Exbrayat 2017). Also, inflation rate has significant negative impacts on number of criteria met. These results are expected, since higher inflation rates directly reduce the convergence criteria met, as well as causing more fiscal deficits among the countries. The coefficient of the proportion of population over 65 years is positive but only significant for estimates with institutional factors. This indicates that tendency of governments to embark on expenditure on subsidies and transfers is only important when institutional factors are taken into consideration.

In Table 5, the results for probability of meeting deficit criteria among the countries is shown. In the results, the coefficient of total tax effort is positive and pass the test at 1 percent level for both total taxes and direct taxes. From the results, it is seen that a one percent rise in tax performance among the countries, leads to a 0.18 percent rise in the probability that a country will meet the deficit criteria in for the community. Though the coefficients are less for the direct tax performance, the effects are positive and strong. However, the coefficients of indirect tax performance fail the significance test at the 10 percent level, suggesting that improvements in capacity for administration of indirect taxes does not lead to higher probability of meeting the convergence criteria of fiscal deficits. Apparently, the capacity of direct taxes has greater implications for fiscal harmonisation and economic integration in the ECOWAS region. Thus, strengthening performance of direct taxes is essential for aiding the deepening of integration in ECOWAS.

The coefficients of institutional factors did not perform well in the total tax effort result. However, the coefficients of ethnic tensions, democratic accountability and rule of law pass the test at the 10 percent level. Again, the rule of law has an unexpected negative impact on the probability of meeting the fiscal deficit criteria, implying that rule of law among the ECOWAS countries plays only limited functions in supporting instructions that deepen integration. As expected, ethnic tensions reduce the probability of meeting the criteria since such tensions increase rent seeking by domestic groups thereby increasing the size of government (Lane and Tornell 1998; Adegboye 2015). On the other hand, democratic accountability has significant positive impact on the probability of meeting fiscal criteria. Indeed, fiscal institutions have been set up as one of the mandates to aid fiscal performance among ECOWAS countries and have played effective roles in managing fiscal activities in the community. The coefficient of WAEMU membership fails the significance test for this result. This implies that WAEMU members have not succeeded in addressing fiscal imbalances that have threatened integration in the community.

Table 5: Result for Probability of meeting deficit criteria (marginal effects)

	Total Tax		Direct Tax		Indirect Tax	
	1	2	1	2	1	2
total tax effort	0.185*** (0.026)	0.129***				
direct tax effort			0.094***	0.074***		
indirect tax effort					0.027	0.011
govt_stab	-0.015		-0.031		-0.049	
ethnic	-0.148*		-0.23***		-0.213***	
corrupt	-0.116		-0.031		0.013	
demacct	0.101*		0.119**		0.129**	
protocols ratified	0.012		0.013		0.010	
rule_law	-0.16**		-0.091		-0.082	
open	0.005**	0.004**	0.008***	0.006***	0.009***	0.007***
gsize	-0.077***	-0.067***	-0.065***	-0.058***	-0.062***	-0.053***
inflation	0.008	0.005	-0.007	-0.005	0.001	0.001
ygap	0.018**	0.014	0.016**	0.013*	0.019**	0.016**
pop_65	-0.173	-0.122	-0.213	-0.106	-0.111	-0.093
waemudummy	-0.635	-0.21	-0.472	-0.188	-0.410	-0.122
observations	208	240	208		208	240
r-squared	0.387	0.27	0.36	0.23	0.310	0.195

Source: Author's estimation

Note: ***, **, * indicate significance at 1, 5 and 10 percent level respectively. Standard errors of estimates in parenthesis.

Finally, the result for the probability of meeting the debt ratio criteria is reported in Table 6. In the result, only the coefficient of total tax effort is significant, and is positive. The coefficients are robust even when institutions are controlled in the model. Also, the sizes of the coefficients are smaller than those of probability of fiscal deficit criteria. This implies that using taxation to reduce fiscal deficits among countries in the community is easier than using taxes to reduce external debt accumulation. There is therefore need to employ stronger revenue drives to ensure minimisation of external debt accumulation in the region. Such measures would

include changing the structure of the economies from import-dependent to export-oriented in order to reduce incessant current account imbalances.

Table 6: Results for probability of meeting debt criteria (marginal effects)

Variable	Total Tax		Direct Tax		Indirect Tax	
	1	2	1	2	1	2
constant	0.634	-0.542***	0.428	-0.347*	0.409	-0.345*
total tax effort	0.062***	0.055***				
direct tax effort			0.005	0.011		
indirect tax effort					0.001	0.005
govt_stab	-0.019		-0.024		-0.025	
ethnic	-0.123**		-0.142***		-0.142**	
corrupt	-0.121*		-0.083		-0.08	
demacct	0.161***		0.158***		0.159***	
protocols ratified	0.007		0.011*		0.011*	
rule_law	0.029		0.050		0.051	
open	-0.003**	-0.003**	-0.002	-0.002**	-0.002	-0.002**
gsize	0.035***	0.033***	0.035***	0.036**	0.035***	0.036***
inflation	0.024***	0.012**	0.020***	0.009*	0.02***	0.011**
ygap	-0.007	-0.015**	-0.005	-0.014**	-0.005	-0.013**
pop_65	-0.512***	0.021	-0.41**	0.019	-0.406**	0.017
waemudummy	-0.454***	-0.362***	-0.392***	-0.227**	-0.846***	-0.51***
obs	208	240	208	240	208	240
R-squared	0.23	0.10	0.21	0.08	0.21	0.08

Source: Author's estimation

Note: ***, **, * indicate significance at 1, 5 and 10 percent level respectively. Standard errors of estimates in parenthesis.

The effects of institutional factors also indicate that ethnic tensions and democratic accountability have the strongest impacts on the probability of on meeting the debt criteria, among the countries. A one percent increase in democratic accountability raises the probability of meeting the debt criteria by 0.16 percent,

which is higher than the effect of improving total tax effort by the same one percent (the effect is 0.06 percent). Indeed, institutional support for attaining debt ratios in line with deepening integration in the region appears to be more important than merely focusing on tax performance. Surprisingly, the coefficients of the WAEMU dummy is negative and significant in each of the estimates. This indicates that WAEMU countries have the tendency of not meeting the external debt convergence criteria in the ECOWAS bloc.

5. Conclusion and policy Implications

In this study, the role of tax performance and domestic institutions in deepening economic integration in the ECOWAS community was examined. The focus was on evaluating how more tax revenues and better institutions could facilitate better compliance with the convergence criteria which are aimed at promoting integration in the sub-region. Using data covering the period 2000 to 2015, a panel of all ECOWAS countries was included in the empirical analysis. The results generally show that tax performance can effectively promote fiscal harmonisation and deepen economic integration in ECOWAS. The study also found that political institutions (in terms of government stability and democratic accountability) and ethnic tensions are the strongest factors that affect fiscal harmonisation and overall integration in the bloc. There were also slight differences in terms of the effects of tax composition performance on integration, with improvements in direct tax performance delivering greater impacts than indirect taxes.

Certain policy implications and recommendations are derived from the empirical results. First, the current realities in terms of structural and fiscal conditions in many ECOWAS States suggest the need for further reforming revenue sources, especially in line with regional agreements. This makes the role of the political institutions more essential at this period. The political institution plays crucial roles in public finances through their ability to continually negotiate with both the economic bloc and the citizenry during periods of reforms. This provides effective background to overcome apparently insurmountable obstacles that exist between domestic expectations and overall regional ability and willingness to pursue long-lasting social and economic transformation/restructuring. Moreover, the nature of the tax structure has to be considered in many ECOWAS countries in relation to sectoral performance. Apparently, the capacity of direct taxes has greater implications for fiscal harmonisation and economic integration in the ECOWAS region than indirect taxes. Domestic governments need to evolve structures to ensure increased direct tax components by employing more efficient laws and administrative capacities.

Finally, it has been seen in the study that States face structural difficulties in meeting criteria that border on fiscal adjustments such as the budget deficit or the tax ratio. The criteria on fiscal harmonisation therefore need to be fully considered in ECOWAS, given the current structural inadequacies of many of the countries. The focus should be on setting mandates on structural adjustments among the countries in the community in order to aid proper fiscal adjustments. In this direction, the protocols on Common External Tariffs (CET) and VAT policies proposed for the countries will go a long way in aiding such structural handles required in each country. Moreover, it should be noted that harmonisation of tax rates would have implications for fiscal and social disorder among ECOWAS countries. Therefore, the fiscal harmonisation has to ensure overall equity.

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IMPACT OF PRODUCTIVE EMPLOYMENT AND STRUCTURAL TRANSFORMATION ON INCLUSIVE GROWTH IN NIGERIA

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Abstract

This paper seeks to identify the channels through which productive employment and structural transformation impact on inclusive growth in Nigeria. A two-equation simultaneous equation model was specified and estimated using the two stage least squares (2SLS) estimator and data from 1991 - 2017. The empirical results demonstrate that productive employment, total government expenditure and investment are important determinants of inclusive growth in Nigeria. The policy implication of these results is that the country should implement policies that will facilitate the development of the manufacturing sector in general and labour-intensive sub-sectors in particular to accelerate inclusive growth. Such policies include measures that will remove impediments to growth in sectors with relatively high employment elasticity, and these include, fiscal and investment policies through interest rate reductions, tax incentives, and infrastructure investment. Policies that would accelerate the inflows of foreign capital and promote foreign direct investment should be adopted. In this regard, private sector participation should be encouraged in driving job creation to promote productive employment, by creating conducive environment, and by strengthening the legal and regulatory framework that will ensure rule of law and contract enforcement. In addition, appropriate labour market policy should be put in place to improve labour market access and promote labour mobility. This will ease the mobility of labour from low to high productivity sectors and reduce barriers that can exclude people from the labour force. Therefore, to make growth more inclusive, diversification policies and strategies should be implemented.

Key words: productive employment, structural transformation, labour productivity, inclusive growth, poverty, simultaneous equation

JEL classification: C3, E24, F43, L16, O10, and O40

1.0 Introduction

The recognition of the importance of productive employment and decent work as a vehicle for poverty reduction is in line with the new target of the Millennium

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Development Goals (MDGs), now Sustainable Development Goals (SDGs), to eradicate poverty and hunger by achieving full and productive employment and decent work for all. (Kamau, Kinyanjui, Akinyoade, and Mukoko, 2018). Improving access to productive employment is crucial for inclusive growth in any economy. Productive employment will not only lead to increase in the level of incomes, but also motivates skills acquisition and labour participation in an economy, (World Bank, 2013). Productive employment provides a key link between economic development and poverty reduction. Therefore, for growth to be inclusive, not only should it be pro poor, it should ensure equality and wider access to sustainable socio economic opportunities for a broader number of people and especially the marginally excluded groups, enhance human capabilities, and ensure equity in an environment of fairness, equal justice and good governance. (Vellala, Madala, and Chhattopadhyay, 2014; Asian Development Bank, 2013).

Nigeria experienced unprecedented growth and was among the world's ten fastest-growing economies. (Adamu and Oligbi, 2014), before it went into recession in 2015 - 2017. The recent rebasing exercise by Nigeria's National Bureau of Statistics showed that most of the increase in GDP came from changes in manufacturing, real estate, communications, and other services, which are all growing rapidly.

In spite of the robust growth in Nigeria between 2000 and 2014, the level of unemployment and underemployment has increased. The high economy growth performance has not translated into significant poverty reduction, nor has it been inclusive in terms of providing employment opportunities in the formal sector. Furthermore, the level of decent and productive employment has decreased due to the high rate of labour force growth viz-a-viz the low and dwindling rate of formal sector job growth. This has resulted in an increase in the informal sector employment, high rate of disguised unemployment and underemployment, (Sodipe and Ogunrinola, 2011). Thus, Nigeria faces tremendous challenges in terms of sustainable job creation and productivity. In fact, the incidence of high unemployment has become a major socio-economic challenge over the past decade, despite strong economic growth.

In the last few years, job creation and the quality of jobs have been marred by a slowdown in economic growth and the recession. Latest available data from the National Bureau of Statistics (NBS, 2018) puts Nigeria's unemployment rate at 23.1% as at Q3' from 18.8% in Q3'17. This shows an increase in unemployment rate by 4.3 percent during the same time period. Similarly, the

underemployment rate reached the highest on record at 21.2%, from 17.4% over the same period, (PwC, 2018).

Despite the rapid growth before the recession in 2015, the rate of unemployment, especially youth unemployment has continued to increase, (Adamu and Iyoha, 2016). There is therefore an urgent need for structural transformation and accelerated job creation in Nigeria. Creating productive employment prospects for vulnerable groups in the society is clearly essential to promote inclusive growth. Although strong and sustained economic growth is necessary to create more and better jobs, growth concentrated in employment intensive sectors and in areas where the poor and vulnerable live would generate huge development payoffs.

Rapid pace of growth is unquestionably necessary for substantial poverty reduction, but for this growth to be sustainable in the long run, it should be increasingly broad-based across sectors, and inclusive of the large part of the country's labour force (Adamu and Iyoha, 2015). The high level of unemployment and underemployment, as well as, vulnerable employment and the working poor seriously undermine the efforts in improving inclusive and sustainable growth, employment and decent work for all as envisioned in the global agenda 2030 for sustainable development. Economic growth would create productive employment through rapid growth of output, optimal utilization of abundant labour, innovation and an increase in productivity. In addition, structural transformation towards more dynamic and high productivity sectors that would absorb labour and provide quality jobs, would promote productive employment. (Kamau et al, 2018).

Inclusive growth is broad based high growth from which the poor not only benefit, but also participate and contribute to the growth process. Not only that it creates new economic opportunities but also ensures equal access to them by all, particularly the poor. The paradigm shift to inclusive growth was partly driven by the failure of the Washington Consensus in the early 1990s to address the problems of inequality and poverty, and the subsequent commitment of the International Monetary Fund (IMF) and World Bank to the Pro-Poor Growth (PPG) initiative (Vellala, Madala, and Chhattopadhyay, 2014). The need to rethink growth as a means and not as an end, and to quantify the trade-offs between alternative policies and growth strategies, necessitated the need for broad-based inclusive growth. Under this, it is expected that priority would be given to the quality of growth over the quantity of growth. Hence, inclusive growth implies participation and benefit-sharing, (Ramos and Ranieri, 2013).

Over the years, the Nigerian government has been committed to promoting industrialization as a means to structural transformation by putting in place different initiatives to actualize the objective. These have included: the Economic Stabilization Programme in 1982, Structural Adjustment Programme in 1986, Privatization Programme in 1988, Guided Deregulation/Privatization Programme in 1993, Vision 2010 in 1997, Poverty Reduction Strategy Paper in 2002, New Partnership for Africa's Development (NEPAD) in 2004, National Economic Empowerment and Development Strategy I (NEEDS I) in 2004, NEEDS II in 2006, Seven point Agenda in 2007, Vision 2020 in 2010, and Transformation Agenda in 2012 (Adamu, et al, 2014).

However, in Nigeria, the manufacturing sector is still in its infancy. To raise manufacturing output, suitable policies should be adopted and implemented to support the industries where Nigeria has comparative advantage. Accordingly, the Nigeria Industrial Revolution Plan (NIRP) has pioneered the creation of policies for automotive and sugar sectors. NIRP seeks to improve access to these sectors and improve the business environment to encourage investment in local manufacturing. Also, there is the need to attract foreign direct investments (FDI) in non-oil sector that would provide maximum employment opportunities (McKinley, 2010). It is also recognized that the key factors contributing to the failure of inclusive growth in the country are: low growth, weak employment and persistently high inequality (National Economic and Development Authority, 2011).

In spite of these initiatives and the high growth rates in the country, the level of industrialization and structural transformation in Nigeria has been unimpressive, as it has not translated to inclusive growth in terms of employment generation, poverty and inequality reduction, and participation of the poor in the growth process.

The aim of this study is to investigate the impact of productive employment and structural transformation on inclusive economic growth in Nigeria. Specifically, the study will: (i) investigate the degree of inter-relationship among productive employment, structural transformation and inclusive growth in Nigeria; (ii) identify the channels through which structural transformation promotes productive employment; (iii) identify the channels through which productive employment impacts on and accelerates inclusive growth; (iv) examine the extent to which Nigeria's impressive growth rates of the last decade has been accompanied by increases in employment and the key sectors driving it; (v) provide theoretical framework for an inclusive growth model which would aid future research in measuring inclusive growth for economic progress in Nigeria;

and (vi) proffer suggestions to policy makers on the optimal mix of policies on productive employment for accelerating inclusive growth in Nigeria.

The paper is structured into six sections. Following the introductory section is section two which reviews the relevant literature. Section three proceeds to present stylized facts on output growth, labour market dynamics and employment in Nigeria. Section four discusses the theoretical framework and methodology, while section five presents and analyzes the empirical results. Section six concludes the paper.

2.0 Literature Review

2.1 Theoretical Literature

Productive employment is defined as employment yielding sufficient returns to labour to permit workers and their dependents a level of consumption above the poverty line. Productive employment is part of the concept of decent jobs, and an essential factor for poverty reduction. Productive employment indicators have been identified as the growth rate of labour productivity, employment to population ratio, proportion of employed people living below the poverty line, proportion of own account and contributing family workers in total employment, that is, vulnerable employment rate (ILO, 2009). There is need for structural transformation which involves reallocation of economic activity across the broad sectors of agriculture, manufacturing and services that translate into employment generation to accelerate growth and development. Thus, sectors that have relatively high elasticities of employment must be the drivers of growth. Structural shifts are movements of labour from low productivity sectors to high productivity sectors. The increase in the share of employment in sectors with above average productivity will have a positive effect on productivity generally. In other words, the outflow from low productivity sector will contribute to increase in output per worker, whereas, the converse will be the case if labour moves out of above average productivity.

However, there is no consensus on which sectors are most important in terms of creating more jobs. Some postulate that growth in labour-intensive sectors like agriculture contributes more to inclusive growth, while others contend that growth in urban sector-based services and manufacturing activities is more beneficial (Akinkugbe, 2015). Structural transformation was found to have contributed little to growth in Kenya and Nigeria because majority of workers leaving the agricultural sector are absorbed into the service sector where productivity is comparatively low. (Kamau, et al, 2018; Ajakaiye, Jerome, Nabena and Alaba, 2016).

The World Bank (2012) defines inclusive growth as "growth that allows people to contribute to and benefit from economic growth". Inclusive growth targets a large part of the country's labour force, where inclusiveness refers to equality of opportunity in terms of access to markets, resources and unbiased regulatory environment for businesses and individuals (Ianchovichina and Lundistoram, 2009). It is a multidimensional concept which includes poverty reduction, equity and equality in the economy. The poor should contribute to delivery of growth and benefit from growth for sustainability. Public policies should also be sufficiently inclusive, by being labour intensive and inequality reducing through equitable access to basic services, such as, education, health, housing, etc., and removal of constraints that often exclude the poor from participating in the growth process. If the poor get benefits but do not participate in the growth process it could widen inequality. Therefore, policy maker should focus on reducing inequality by creating new economic opportunities that would ensure equal access to such opportunities by all, especially the poor, in terms of employment, health, education, as well as ensure that everyone benefits from the growth process. (Vellala, et al, 2014; Ramos et al, 2013; Ianchovichina and Lundistoram, 2010; Mckinley, 2010; World Bank, 2009; Kakwani and Pernia, 2000). These policies for inclusive growth are an important component of most government strategies for sustainable growth. For instance, a country that has grown rapidly over a decade, but has not seen substantial reduction in poverty rates may need to focus specifically on the inclusiveness of its growth strategy, that is, on equal opportunity for individuals and firms. (World Bank, 2008). Generating productive employment opportunities for vulnerable groups of the society is therefore essential to promote inclusive economic and social development.

There is a paradigm shift from pro-poor growth to inclusive growth in the growth-development discourse. This is because in the past two decades, growth has not resulted in economic development, even though there could be growth without development. If an economy is growing but unemployment is rising, health services are deteriorating, and there is no access to education, no portable water, inadequate housing and food, as well as, widening inequality, then that economy is not experiencing development. At least 80 percent of the population must benefit from growth for there to be economic development (Ekpo, 2012a; 2012b; 2016). Hence, economic growth is only a necessary condition for development. The implication of this is that a country cannot develop without sustained positive growth trajectory (Ekpo, 2016). Growth is pro poor if it reduces poverty, inequality and enhances the income share of the poor (Haan and Throat, 2013).

Inclusive growth can be achieved through massive investment in infrastructure, transparent and responsive governance, human development and improved social services, competitiveness to generate employment, and access to financing. Inclusive growth can also be attained through the manufacturing sector. This is very important because there is need to create adequate jobs for the teaming population. Manufacturing promotes backward and forward linkages in the chain of production. Thus, it spurs growth in other sectors like finance, health, and agriculture, etc., through more intensive efforts on agro-based industries. (Sandeep, 2012).

The economic development model which resulted in industrialization in advanced economies and East Asia followed a three-stage process where agriculture, industry and services sectors dominated output in the sequence. In contrast, structural change in India has made a positive contribution to growth and employment, driven by the expansion of the high productive activities within the services sector, largely Information Technology (IT) and Business Process Outsourcing services (BPO). Nigeria also evolved in similar manner as declining share of output and employment in agriculture have been absorbed by the services sector. However, it was noted that the services sector jobs require a wide range of skills from artisan in traditional services to ICT experts in modern services for higher productivity and hence create more productive jobs. Hence, there is need to invest significantly in human capital development in order to enhance productivity in the services sector. (PwC, 2018).

Sustainable and faster economic growth is a pre-requisite for achieving the goal of inclusive growth. However, the main instrument for a sustainable and inclusive growth is assumed to be productive employment. Sustainable growth can be achieved with the adoption of industrialisation strategies geared towards promoting enterprise creation, growth in agro-business and manufacturing sectors to raise labour absorption and productivity levels outside agriculture, (Timmer, 2012).

The incidence of high unemployment in Nigeria is attributed to the slow pace of job creation, which has been considerably weaker than labour force growth. The average job growth between 2010 and 2017 was 1.6%, lower than labour force growth of 3.9%. (NBS, 2018). In addition, the provision of social safety nets – education, health and social services especially to the most vulnerable and deprived -- as well as access to productive opportunities, are fundamental elements of inclusive growth. Therefore, for growth to be inclusive, not only should it be pro poor, it should ensure equality and wider access to sustainable socio economic opportunities for a broader number of people and especially

the marginally excluded groups, enhance human capabilities, and ensure equity in an environment of fairness, equal justice and good governance. (Vellala et al, 2014; Asian Development Bank, 2013).

Inclusive growth is also seen as the elimination of growth constraints, improving productivity in agriculture and strengthening the manufacturing sector, improving health and education services and increasing social protection for the poor, as well as governance reform. Moreover, it is not only about wage-employment but also about self-employment which means that returns to capital, land and other assets matter to the income potential of the focus group. It is inclusive development that will result in poverty reduction. For example, Nigeria's economy grew by almost 6% between 2007 – 2014 but poverty incidence stood at almost 70 per cent while the rate of unemployment averaged 28 per cent. This situation is definitely not economic development, (Ekpo, 2012a), nor does it contribute to inclusive economic growth.

2.2 Empirical Literature

Empirical evidence shows that not a single country has been able to achieve significant income growth and poverty reduction without structural transformation and economic diversification (Imbs and Wacziarg, 2003). The inclusive growth approach takes a longer term perspective. This is necessary because of the emphasis on improving the productive capacity of individuals and creating a conducive environment for employment, rather than on income redistribution as a means of increasing incomes for excluded groups. Due to this longer term perspective, there is an explicit focus on structural transformation and internal migration in the inclusive growth analytics framework. In addition, the World Bank (2013) and Asian Development Bank (2013) undertook studies on how inclusive growth can be achieved. The World Bank (2013) study focuses its recommendations on eliminating growth constraints, improving productivity in agriculture and strengthening the manufacturing sector, improving health and education services and increasing social protection for the poor; while the ADB (2013) study comes up with similar recommendations, but emphasizes governance reform as an imperative.

Ajakaiye et al (2016), examine the relationship between growth and employment in Nigeria, using the Shapley decomposition approach for the period 2005 – 2014. The empirical results indicate the phenomenon of jobless growth in Nigeria because there was a reduction in the share of the employed in the total population of working age adults during the period of study. They also observe that structural changes in Nigeria do not seem to be growth-enhancing and lack employment generation capability, and conclude that the

high growth experienced by the country in the last decade and half is non-inclusive. In another study, Sodipe et al (2011) examine the employment and economic growth relationship in the Nigerian economy, using simple regression techniques. Their results indicate that the notion of jobless growth (where economic growth is negatively related to level of unemployment) does not apply to the Nigerian economy; rather, the high level of unemployment currently experienced in Nigeria can be attributed to the relatively low employment intensity of GDP growth.

Employment should be capable of reducing poverty and hasten inclusive growth. Inclusive growth can eliminate absolute poverty, reduce income inequality both vertical and horizontal, and enhance the quality of human capabilities. Employment growth generates new jobs and income for the individual - from wages in all types of firms, or from self-employment, usually in micro firms - while productivity growth has the potential to lift the wages of those employed and the returns to the self-employed.

Adamu and Iyoha (2015) identify drivers of inclusive growth to include economic growth, productive employment, poverty reduction, inequality reduction, human development – human capabilities, gender equality, basic social infrastructures, and governance. In their study on industrial policies, structural transformation and inclusive growth in Nigeria covering the period 1991 – 2015, they find that structural transformation, good industrial policy, and investment are significantly and positively related to inclusive growth in Nigeria. Lopez (2004) surveys the empirical literature and concludes that macroeconomic stability related to inflation, as well as education and infrastructure related policies seem to be excellent pro-poor policies that have both a positive effect on growth and a negative effect on inequality. Analysing the impact of policies on job creation, Zepeda (2008) posits that countercyclical fiscal and monetary policies as well as sustaining a competitive exchange rate, will increase growth and employment, while Cazes and Verick (2010); and Freeman (2007); find that market oriented labour policies that reduce distortions in setting wages and negotiating contracts are favourable for overall job creation.

Ramaswamy (2014) analyses the employment growth in household and small enterprises in Indian manufacturing in the 2000s in the context of inclusive growth, and finds that the employment share of household enterprises declined across industries and across states of India with the exception of Gujarat and Delhi. Employment outcome is an important outcome of inclusiveness. Akinkugbe (2015) assesses the historical capacity of the different sectors of the

Zambian economy to absorb labour, by reviewing growth trends in the economic sub-sectors and computing employment elasticity of growth for the period 1990 to 2008. The empirical results reveal that Zambian's economic growth did not translate into significant poverty reduction, and employment elasticities were positive and significant for most sectors with the exception of mining, and the finance, insurance and business services sectors which recorded negative elasticities. These imply declining propensities to generate employment in those sectors during the period of study. Similarly, Basnett and Sen (2013) reviewed empirical studies on economic growth and job creation in developing countries and came up with these findings that growth has a positive impact on employment (Khan 2007). Crivelli, Furceri and Toujas-Bernete, (2012), reveal that growth in manufacturing and services have positive impact on employment, while Melamed, Harting, and Grant (2011) opine that low skill manufactures are losing their place as drivers of job creation, while services are becoming more important.

Productive employment can increase labour productivity. Furthermore, in many low-income countries, the problem is not unemployment, but rather underemployment. Hence, inclusive growth is not only about employment growth, but also about productivity growth. Therefore, delivering jobs capable of boosting incomes and reducing poverty requires creating more high productivity jobs within the formal sector, (PricewaterhouseCoopers Limited, 2018). Usui (2012) argues that the root cause of the Philippines' poor growth performance is due to the stagnant industrialization and sluggish employment, and concludes that structural transformation that would generate productive job opportunities for the growing working age population is the imperative for inclusive growth in the Philippines.

None of these studies investigated the degree of inter-relationship among productive employment, structural transformation and inclusive growth in Nigeria. Thus, this study intends to bridge the gap by identifying the channels through which structural transformation promotes productive employment, and hence inclusive growth in Nigeria.

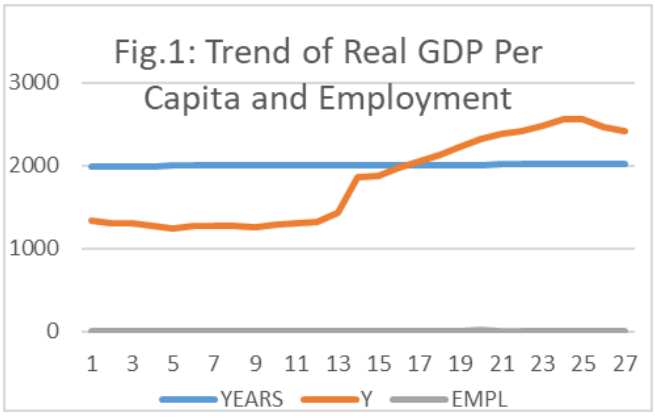
3.0 Stylized Facts on Labour Market Dynamics, Employment and Output Growth

The relationship between output growth and labour market performance may be said to have gained popularity with the seminal work of Arthur Okun, 1962, in which the famous "Okun's Law" was formulated. He postulates that a positive relationship exists between output and employment, since output depends on labour, among others. In other words, any deviation of unemployment rate from

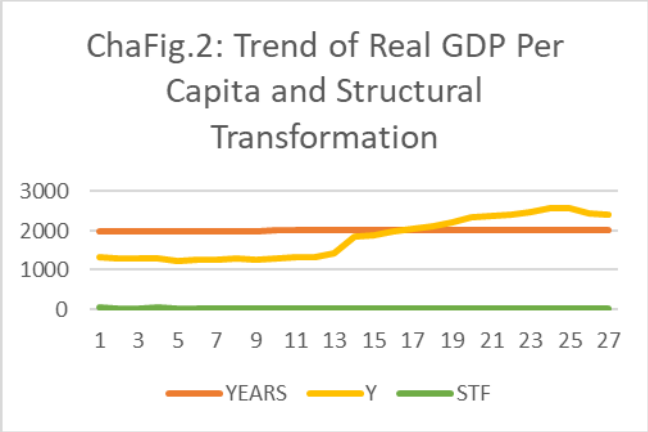
its natural level will induce a certain deviation of output from its long run or equilibrium trend, that is, "potential" output. (Sodipe, et al, 2011; Ajakaiye et al, 2016).

Okun's concept has been extensively used in explaining sectoral potential for generating employment, but it has some noteworthy weaknesses. According to Ajakaiye et al, (2016), the concept is unable to state the actual extent of job creation. For instance, a country that grew by 1 per cent and enjoyed a 1 per cent increase in employment would have the same employment elasticity rate as a country which had a 5 per cent growth rate accompanied by a 5 per cent increase in employment. Secondly, the measure does not take demographic changes into account, and lastly, the employment elasticity of growth is incapable of indicating the quality of new jobs created. In spite of these criticisms, employment elasticity of growth is a convenient tool for summarizing the employment intensity of growth or sensitivity of employment to output growth (Islam and Nazara, 2000).

Interestingly, the coexistence of high real GDP growth rates and rising unemployment is not peculiar to Nigeria but exists in numerous developing countries in Africa, Asia and Latin America. This has been a source of anguish to development economists for over 5 decades. The unemployment crisis has been attributed, *inter alia*, to four major causes, viz., (i) the labour force "explosion" arising from the population explosion in developing countries; (ii) the massive rural-urban migration in less developed countries; (iii) the failure of industrialisation to live up to the expectations of many as an effective means of generating employment in the manufacturing sectors of developing countries (see Fig. 2 below); and (iv) over-production of school leavers and graduates who are ill-equipped for the labour market. This is similar to the recent analysis by the International Labour Organization (ILO) (1995, p. iv), which states that "The causes of the unemployment crisis can be grouped under six headings: the phenomenon of "jobless growth"; macroeconomic instability, poorly functioning labour markets, institutional weaknesses, political instability, and lack of international competition" (Iyoha and Adamu, 2016). The jobless growth in Nigeria has also been



attributed to a number of challenges, namely, low industrial base, infrastructural deficits, poor governance and weak institutions, and insecurity (Ajakaiye, et al, 2016).



The high rate of growth experienced in Nigeria over the last decade and half is not sufficient to guarantee productive employment for all, as can be observed in Fig 1 above. Significant proportion of her population, and particularly the young, have remained unemployed, and are becoming frustrated by the day. Although many jobs have been created, these have not been enough to accommodate the number of young people in search of work. Indeed, since 2000 and before the recent recession, Nigeria has reported an average annual real GDP growth rate in excess of 7 percent, making it one of the fastest growing economies in sub Saharan Africa. The question remains, why is there disconnect between real GDP growth and employment growth in Nigeria. Why is the unemployment rate soaring while real GDP is growing rapidly? The question needs to be answered and the problem quickly corrected in order to guarantee the future of the youths in Nigeria and the continued existence of the country. The recent and ongoing menace of Boko Haram, as well as, youth restiveness in the Niger Delta should be a cause for alarm, as these are connected to the massive youth unemployment in the country (Iyoha, Adamu and Bello, 2013).

The latest statistics from the National Bureau of Statistics put the economically active or working age population (15 – 64 years of age) in Q3, 2018 as 115.5 million from 104.3 million in Q3, 2015, while the number of persons in the labour force (i.e. people who are able and willing to work increased from 75.94 million in Q3 2015 to 80.66 million in Q3, 2018. The total number of people in employment (i.e. with jobs) increased marginally from 68.4 million in Q3 2015, to 69.54 million in Q3 2018, while the number of the unemployed rose from 9.9 million in Q3, 2015 to 23.1 million in Q3 2018. The youth (15-34 years) unemployment rate rose from 26.6 percent in Q4, 2017 to 29.7 percent in Q3, 2018. Within the sub region, Nigeria had the highest rate of unemployment of 20.4 percent in 2017, compared to The Gambia, Ghana, Liberia and Sierra Leone which had 9.5, 2.4, 2.4, and 4.5 per cent respectively within the same

period. (NBS, 2018). The rising unemployment level in Nigeria shows that growth is weak, fragile and non-inclusive.

4.0 Theoretical Framework and Methodology

4.1 The Model

This study adopts the methodology of Adamu and Iyoha (2015) and Adamu and Oligbi (2014). It is imperative to specify a two-equation simultaneous equations model which will take cognizance of the inter-relationships among productive employment, structural transformation and inclusive economic growth in Nigeria. In the first equation, inclusive economic growth, proxied by per capita real GDP, is assumed to depend on productive employment (EMPL), trade openness (OPENX), investment (INV), and labour force participation rate by women (FPR), In the second equation, productive employment (EMPL) proxied by industrial employment, is hypothesized to depend on structural transformation (STF) proxied by the share of manufacturing in output, foreign direct investment (FDI), total government expenditure (GE), and labour force participation rate by women (FPR). The use of industrial employment as a proxy for productive employment may be justified by referring to the "surplus" labour in the agricultural and service sectors and recalling that employment in industry tends to "push" growth more.

It is generally believed that fiscal redistribution, monetary policy aimed at macroeconomic stability and structural reforms to stimulate trade, reduce unemployment and increase productivity, are important determinants of inclusive growth. Therefore, it may be postulated that the main components of inclusive growth include (i) rapid economic growth with shared prosperity; (ii) productivity improvement in agriculture; (iii) policies to strengthen the manufacturing sector; (iv) improvements in health and education services; (v) increasing social protection for the poor; (vi) governance reform; (vii) job creation (increasing wage and non-wage employment); (viii) policies and strategies to mainstream gender; and (ix) policies to achieve macroeconomic stability.

Per capita real GDP is preferred to real GDP as a proxy for inclusive growth because per capita real GDP is a measure of average real income of the country.

4.1.1 Equation explaining inclusive economic growth (per capita real GDP)

We begin with the basic Solow (exogenous) growth model which gives the level of real output or real income as depending on the rate of technological progress, labour and capital stock (Solow, 1956).

Consider the standard neoclassical production function

$$Y = F(A, K, L) \quad \ldots\ldots \quad (1)$$

Where:

A is the level of technology, K is the capital stock, L is the quantity of labour and Y is output. Assume that the production function is twice differentiable and subject to constant returns to scale, and that technical change is Hicks-neutral.

Differentiation of equation (1) with respect to time, dividing by Y and rearrangement of terms yields:

$$\acute{Y}/Y = \acute{A}/A + (F_K K/Y).(\acute{K}/K) + (F_L L/Y).(\acute{L}/L) \quad \ldots\ldots \quad (2)$$

Where:

$\acute{Y}/Y$ is the continuous time rate of growth of real output, $\acute{K}/K$ is the rate of growth of capital stock and $\acute{L}/L$ is the rate of growth of labour force; F_K and F_L are the (social) marginal products of capital and labour, respectively; and $\acute{A}/A$ is the Hicks-neutral rate of change of technological progress.

Thus, the basic Solow (exogenous) growth model gives the growth rate of real output or income as depending on the rate of growth of technical change, the growth rate of labour force, and the growth rate of the capital stock. In empirical applications, this basic Solow model has been modified to obtain the augmented Solow growth model, where the rate of growth of real income depends not only on technical change, labour and capital but also on policy variables like trade openness and inflation. See Barro (1991), Easterly and Levine (2001), Mankiw et al (1992), and Ologu (2003). In this paper, the list of policy variables is expanded. Disaggregating the total stock of capital into two components, namely, physical capital and human capital, and adding investment, labour participation rate by women, trade openness, and productive employment to the augmented Solow theory of economic growth yields the following specification for the determinants of inclusive growth in Nigeria:

$$Y = f(EMPL, OPENX, INV, FPR) \ldots\ldots (3)$$

$f_1, f_2, f_3, f_4, > 0$;

Where:

Y = inclusive growth (proxied by per capital real GDP)

$EMPL$ = productive employment (measured by industrial employment)

INV = real gross domestic capital formation

$OPENX$ = trade openness (measured by exports as a percent of GDP)

FPR = labour force participation rate by women (measured as the population of women in the manufacturing sector).

From *a priori* reasoning, productive employment, real gross domestic capital formation, trade openness, and labour force participation rate by women, are expected to be positively related to inclusive growth. These sign expectations come from economic theory. It is established in the development literature that industrialization promotes economic growth; hence the higher the level of productive employment in the industrial sector, the higher will be the output, and the more rapid will be the rate of inclusive economic growth, (Ajakaiye et al, 2016; Adamu et al, 2014; 2015; Usui, 2012; Sandeep, 2012; Sodipe et al, 2011; ECA, 2011). The higher the level of domestic investment is, the more rapid will be the rate of economic growth since investment increases the capital stock and boosts aggregate demand. The higher the degree of trade openness of a country is, the higher will be the rate of economic growth since increased trade openness facilitates greater integration into the global economy and promotes growth through the channels of better resource allocation, greater competition, innovation, transfer of technology, and access to foreign savings. The participation of women in economic activities will accelerate inclusive growth via reduction in poverty, hence a rise in the labour force participation rate by women, will increase the rate of inclusive growth.

4.1.2 Equation explaining productive employment

From knowledge of the development literature and using results obtained by previous researchers, it is postulated that productive employment depends on structural transformation, foreign direct investment, total government expenditure, and labour force participation rate by women. Thus, the following equation is specified:

$$EMPL = f(STF, FDI, GE, FPR).....(4)$$

$F_1, F_2, F_3, F_4 > 0$

Where:

STF = structural transformation (proxied by relative share of manufactures in GDP)

FDI = foreign direct investment

GE = total government expenditure

FPR = Female labour force participation rate (measured as the population of women in the manufacturing sector)

Note: that all the right-hand side variables are expected to be positively related to productive employment. In other words, the higher the degree of structural transformation, proxied by the share of manufacturing in output, the higher will be productive employment. Foreign direct investment promotes growth by increasing the capital stock, easing the foreign exchange constraint to

development, and encouraging the transfer of advanced technology and know-how from developed countries, thus increasing productivity. An increase in total government expenditure will spur productive employment. Finally, the higher the rate of female participation in economic activities, the greater will be the level of productive employment.

A two-equation simultaneous equations model will be estimated in order to fully analyse the inter-relationships among productive employment, structural transformation, and inclusive growth in the Nigerian economy. The Two-Stage Least Squares estimator will be employed in the econometric estimation. This estimator is considered appropriate as it is a generalised instrumental variable technique whose coefficient estimates possess the desirable properties of consistency, asymptotic efficiency and asymptotic normality.

4.1.3 A simultaneous equations model of productive employment and inclusive growth

In order to properly investigate the relationship among productive employment, structural transformation and inclusive economic growth in Nigeria, a 2-equation simultaneous equation model has been specified and will be estimated. Use of the ordinary least squares (OLS) technique is clearly inappropriate and inadvisable since this would result in biased and inconsistent estimates of the structural coefficients. Correct estimation of the coefficients of the model therefore requires the use of a simultaneous equation estimator such as Two Stage Least Squares (2SLS), Three stage Least Squares (3SLS), Limited Information Maximum Likelihood (LIML), or Full Information Maximum Likelihood (FIML) technique. The two stage least squares methodology is a generalised instrumental variable technique. Provided an equation is identified (either just identified or over identified), the 2SLS estimator yields consistent estimates of the structural coefficients of that equation.

A log-linear (or double log) specification of these equations will be estimated econometrically. One of the advantages of using double logarithms is that the coefficients obtained can be interpreted as elasticity values.

4.2 Estimation and Data Sources

The simultaneous equations model can now be formally written as:

$LEMPL = \alpha_0 + \alpha_1 LSTF + \alpha_2 LFDI + \alpha_3 LGE + \alpha_4 LFPR + \upsilon_1$……..…..... *(5)*

$LY = \beta_0 + \beta_1 LEMPL + \beta_2 LOPENX + \beta_3 LINV + \beta_4 LFPR + \upsilon_2$…..... *(6)*

Where "L" indicates logarithms of variables and u stands for the stochastic error term.

This system of simultaneous equations has 2 endogenous variables, namely, productive employment (EMPL), and per capita real income (Y), while there are 6 exogenous (predetermined) variables, viz., structural transformation (STF), foreign direct investment (FDI), total government expenditure (GE), labour force participation rate by women, measured as the population of women in the manufacturing (FPR), openness (OPENX), and real gross domestic capital formation (INV). Note that the two structural equations are identified. They both satisfy the ORDER condition (the necessary condition) of identification. In this context, it may be pointed out that using the ORDER condition of identification, each equation is over identified. The two structural equations also satisfy the RANK condition (the necessary and sufficient condition) of identification. See Appendix 1 for proof. The equations can therefore be estimated by the two-stage least squares (2SLS) regression technique. The 2SLS estimator, being an instrumental variable technique, yields estimated coefficients that are consistent, asymptotically normal and asymptotically efficient. Therefore, use of the 2SLS methodology is appropriate and justified. For more on this, see Wooldridge (2010), Iyoha (2004), and (Greene (2003).

Time series data of selected macroeconomic variables was used to examine the interrelationship among productive employment, structural transformation, and inclusive economic growth in Nigeria for the period 1991-2017. The required data is available from the World Bank database also published in World Development Indicators 2018, International Labour Organisation data, 2018 and Nigeria Bureau of Statistics, 2018.

5.0 Presentation and Interpretation of Empirical Results

The two-stage-least squares results are given below. The coefficient estimates were calculated using the EViews software. Recall that all the variables in the regression equations are in logarithms; the estimated regression coefficients should therefore be interpreted as elasticities. Also, note that 3 stars (***), 2 stars (**), and 1 star (*) indicate that a regression coefficient is significantly different from zero at the 1% level, 5% level, and 10% level respectively. The total absence of stars indicates that the regression coefficient is not significantly different from zero even at the 10% level.

5.1 LEMPL – The equation explaining productive employment

Estimation Method: Two-Stage Least Squares
Sample: 1991 – 2017
Included observations: 27
Total system (balanced) observations 54

	Coefficient	Std. Error	t-Statistic	Prob.
Constant	0.007802	0.149279	0.052262	0.9586
LSTF	-0.030585	0.009246	-3.307785	0.0019***
LFDI	0.001351	0.010714	0.126054	0.9003
LGE	0.032010	0.007284	4.394664	0.0001***
LFPR	0.693443	0.014537	47.70216	0.0000***

Determinant residual covariance	2.16E-07

Equation: LEMPL = C(1) + C(2)*LSTF + C(3)*LFDI + C(4)*LGE + C(5)*LFPR

Instruments: LSTF(-1) LFDI(-1) LGE(-1) LFPR LEMPL(-1) LOPENX(-1) LINV(-1) LY(-1) C
Observations: 27

R-squared	0.996881	Mean dependent variable	2.277521
Adjusted R-squared	0.996313	S.D. dependent variable	0.168794
S.E. of regression	0.010249	Sum squared residual	0.002311
Durbin-Watson stat	1.487994		

The equation explaining productive employment in Nigeria exhibits a very good fit with an adjusted R-squared of over 99 percent. This means that over 99 percent of the systematic variations in productive employment in the Nigerian economy are explained by the variables we have used as regressors in the equation. Going into details, the empirical results obtained show that productive employment in Nigeria depends positively on total government expenditure and labour force participation by women (measured as the population of women in manufacturing sector) as postulated by theory. The t-statistics for total government expenditure and labour force participation by women are 4.39 and 47.70 respectively. Thus, these variables are statistically significant at the 1 percent level. Structural transformation (proxied by the

relative share of manufactures in GDP) is negatively signed contrary to *a priori* expectation, but is significantly different from zero at the 1 percent level, while foreign direct investment is statistically insignificant. The perverse sign of the coefficient of the structural transformation variable is not surprising. In many developing countries like in Nigeria, the flip side of the manufacturing sector is the services sector, hence there has been a shift of labour from the manufacturing sector to the services sector, which still exhibits low level of productivity. In addition, the observed structural changes do not seem to be growth-enhancing and lack an employment generation capability. Thus, this type of growth is not inclusive.

5.2 LY – The equation explaining inclusive growth

Estimation Method: Two-Stage Least Squares
Sample: 1991 – 2017
Included observations: 27
Total system (balanced) observations 54

	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-0.268030	2.482806	-0.107954	0.9145
LEMPL	2.263777	1.018119	2.223489	0.0314**
LOPENX	-0.075741	0.056187	-1.348014	0.1846
LINV	0.290789	0.133637	2.175963	0.0350**
LFPR	-1.814945	0.624124	-2.907986	0.005***

Determinant residual covariance	2.16E-07

Equation: LY = C(6) + C(7)*LEMPL + C(8)*LOPENX + C(9)*LINV + C(10) *LFPR

Instruments: LSTF(-1) LFDI(-1) LGE(-1) LFPR LEMPL(-1) LOPENX(-1) LINV(-1) LY(-1) C
Observations: 27

R-squared	0.966069	Mean dependent variable	7.454244
Adjusted R-squared	0.959900	S.D. dependent variable	0.292232
S.E. of regression	0.058520	Sum squared residual	0.075340
Durbin-Watson stat	1.408426		1.408426

The overall fit of the equation explaining inclusive growth in Nigeria is good, showing an R-squared of 0.97 approximately. Productive employment, investment, and labour force participation by women variables are significantly

different from zero at the 5 percent level for productive employment and investment respectively, and 1 percent level for labour force participation by women. However, the labour force participation by women is wrongly signed. The perverse response of inclusive growth to variations in labour force participation by women is rather puzzling. This may be attributable to structural rigidities in the economy. It could also be the case that the quality of women participation is low resulting in lower productivity. It could also be attributable to the fact that the manufacturing sector is capital-intensive, such that the output will be high even with fewer women participating in the sector. The trade openness variable is statistically insignificant.

The hypothesis that productive employment and investment contribute positively to inclusive growth in Nigeria is therefore validated. It is worth noting that the elasticity of productive employment with respect to per capita real income is 2.26. This is a good result as it shows that a 10% increase in productive employment would on average raise per capita real income by 22.6% approximately in Nigeria. Thus, the impact of productive employment on inclusive growth is positive and significant. The elasticity of investment with respect to per capita real income is approximately 0.3, implying that a 10% increase in investment would on average raise per capita real income by approximately 3% in the Nigerian economy.

6.0 Summary and Conclusion

This paper has examined the degree of inter-relationships among productive employment, structural transformation and inclusive growth in Nigeria, using data from 1991 through 2017. It was also designed to identify the channels through which productive employment promote structural transformation on one hand; and accelerates inclusive economic growth in Nigeria, on the other hand. To achieve these objectives, a two-equation simultaneous equation model was specified and estimated using the two stage least squares (2SLS) estimator. This estimator is known to yield consistent and asymptotically efficient coefficient estimates of structural parameters. One of the contributions of the paper to the literature on productive employment and inclusive growth nexus in Nigeria is the use of simultaneous equations modelling and estimation. From our empirical findings, productive employment, total government expenditure and investment are significantly and positively related to inclusive growth in Nigeria. This result is consistent with some previous studies (Iyoha et al, 2013), which found that government expenditure and investment are major contributors to economic growth in Nigeria, while productive employment contributes immensely to inclusive growth. The policy implication of the result is that the country should implement policies that will facilitate the development of the

manufacturing sector in general and labour-intensive sub-sectors in particular in order to accelerate inclusive growth in the country. Some of such policies include measures that will remove impediments to growth in sectors with relatively high employment elasticity such as fiscal and investment policies through interest rate reductions, tax incentives, and infrastructure investment. It is also desirable to adopt policies that would accelerate the inflows of foreign capital and promote foreign direct investment. In this regard, private sector participation should be encouraged in driving decent job creation to promote productive employment, by creating conducive environment, strengthening the legal and regulatory framework that will ensure rule of law and contract enforcement. In addition, appropriate labour market policy should be put in place to improve labour market access and promote labour mobility. This will ease the mobility of labour from low to high productivity sectors and reduce barriers that can exclude people from the labour force. Therefore, to make growth more inclusive and job-rich, diversification policies and strategies should be implemented.

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APPENDIX 1: Proof of identification of equations of the model

We now show that each of the 2 equations specified in the paper satisfies both the ORDER condition (the necessary condition) and the RANK condition (the necessary and sufficient condition) of identification.

(i) Order condition of identification for equation j.

According to Greene (2003, 392), the ORDER condition of identification for equation j is that K_j^* (the number of exogenous variables excluded from equation j) be greater than or equal to M_j (the number of endogenous variables included in equation j).

LEMPL Equation: Kj*=2 and Mj=1. Since 2>1, this equation is over-identified.

LY Equation: Kj*=3 and Mj=2. Since 3>2, this equation is over-identified.

(ii) Rank condition of identification

According to Greene (2003, 392), the rank condition imposes a restriction on a sub-matrix of the reduced-form coefficient matrix in order to ensure that there is exactly one solution for the structural parameters given the reduced-form parameters.

To proceed, first arrange the structural parameters in a tableau and examine the sub-matrices one by one. For equation j, we form a sub-matrix of the structural coefficients in the other equations on variables that are excluded from equation j and check if all the elements of any column or row are all zeros. Such a result will indicate that the equation is not identified. Otherwise, the equation is identified.

The sub-matrix for LEMPL equation is: [1 1 1]

Examine the sub-matrix. There are 3 columns and 1 row. Since there are no columns or rows consisting of only zeros, we conclude that the equation is identified.

The sub-matrix for LY equation is: [1 1 1]

Note that there are no columns or rows consisting of only zeros. Therefore, we conclude that the equation is identified.

APPENDIX 2: Summary Statistics, using the observations 1991 - 2017

	LEMPL	LSTF	LFDI	LGE	LFPR	LY	LOPENX	LINV
Mean	2.275537	2.690100	21.63689	22.59200	2.303722	7.446086	3.369307	24.06003
Median	2.195121	2.633197	21.40745	22.22904	2.256436	7.395814	3.495754	23.70382
Maximum	2.649432	3.624567	22.90268	24.23841	2.702099	7.848970	3.946045	24.97659
Minimum	2.081065	1.864323	20.19204	21.10832	2.043685	7.125072	2.209933	23.29887
Std. Dev.	0.165971	0.500008	0.835749	1.298925	0.185817	0.290001	0.455320	0.610587
Skewness	0.848358	0.218188	0.019662	0.114637	0.510211	0.169705	-1.491393	0.398361
Kurtosis	2.250562	1.992189	1.651424	1.139134	2.229614	1.244596	4.369502	1.428539
Jarque-Bera	4.013921	1.407126	2.123572	4.101288	1.907217	3.729414	12.56798	3.621630
Probability	0.134397	0.494819	0.345838	0.128652	0.385348	0.154942	0.001866	0.163521
Sum	63.71503	75.32280	605.8329	632.5760	64.50421	208.4904	94.34061	673.6807
Sum Sq. Dev.	0.743753	6.750217	18.85888	45.55459	0.932256	2.270716	5.597548	10.06603
Observations	28	28	28	28	28	28	28	28

Correlation

Covariance Analysis: Ordinary
Date: 02/19/19 Time: 16:13
Sample (adjusted): 1991 2017
Included observations: 27 after adjustments

Covariance Correlation	LEMPL	LSTF	LFDI	LGE	LFPR	LY	LOPENX	LINV
LEMPL	0.027436							
	1.000000							
LSTF	-0.056830	0.230712						
	-0.714296	1.000000						
LFDI	0.080146	-0.314141	0.618295					
	0.615351	-0.831746	1.000000					
LGE	0.157634	-0.536807	0.918421	1.620880				
	0.747503	-0.877824	0.917421	1.000000				
LFPR	0.029513	-0.046386	0.058143	0.127352	0.034522			
	0.958960	-0.519759	0.397971	0.538371	1.000000			
LY	0.037256	-0.122229	0.196921	0.356318	0.031513	0.082237		
	0.784341	-0.887372	0.873297	0.975954	0.591442	1.000000		
LOPENX	-0.045387	0.101262	-0.119486	-0.292709	-0.048186	-0.081119	0.205844	
	-0.603955	0.464668	-0.334926	-0.506748	-0.571616	-0.623474	1.000000	
LINV	0.086435	-0.238538	0.382249	0.688050	0.081532	0.163089	-0.184305	0.364531
	0.864289	-0.822536	0.805158	0.895112	0.726798	0.941940	-0.672824	1.000000

ARE TRADE OPENNESS AND INSTITUTIONAL QUALITY IMPORTANT FOR FINANCIAL DEVELOPMENT?

Olaleka Charles Okunola[1], Taiwo Akinlo*[2], and Michael Oluwaseun Olomu[3]

Abstract

This study examines the importance of trade openness and institutional quality for financial development in sub-Saharan Africa. The study covers37 Sub-Saharan African countries over the period 1986-2016. Using the system Generalised Method of Moments technique, it finds that trade openness has a positive impact on financial development while only democracy accountability and government stability contribute significantly to financial development. The study finds that institutional quality does not complement trade openness to exact positive impacts on financial development. There is a need for policies that will foster the development of institutional quality in Sub-Saharan Africa.

Keyword: Trade openness, institutions, financial development, sub-Saharan, system *GMM*

JEL Classification: F14, O43, O55, Y01

1. Introduction

The financial sector involves a set of institutions, instruments, and markets which as claimed by Law and Demetriades (2006) perform an essential role in the process of economic development, primarily through their function in the allocation of financial resources to productive activities. Many studies in the literature like King and Levine, 1993a, 1993b; Levine, 1997; Rajan and Zingales, 1998; Demirgüç-Kunt and Maksimovic, 1998; Levine 2003; Demetriades and Andrianova, 2004; Law and Demetriades, 2006, have supported the claim that a well-functioning financial institution and market stimulate long-run growth in the economy. It is further established in the literature that a well-developed financial system reduces the risk of investors by channeling their savings into many different investments. A sound financial system helps in reducing asymmetric information between savers and

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investors as well as lowering the transaction costs in the economy. Financial development can as well promote economic growth through the mobilisation and distribution of savings to the needed investors. Schumpeter (1911) particularly argued that a well-developed financial system is a catalyst for technological innovation and economic growth by making financial services and resources available to investors who are capable of producing and developing innovative products and processes.

However, the question of why some countries have remained underdeveloped financially if the development in the financial sector is good for growth has been raised by some studies (Rajan and Zingales, 1998; Demetriades and Andrianova, 2004; Law and Demetriades, 2006;) Sub-Sahara African countries are among the countries that have the least developed financial sector across the world. According to David, Mlachila, and Moheeput (2014), financial sectors in Sub-Sahara African countries is the shallowest compared to other countries of the world. However, several factors have been attributed to this low level of financial development. For instance, Singh, Kpodar, and Ghura (2009) claimed that differences in institutional quality play a significant role in differences in financial development in Sub-Saharan Africa. Likewise, Rajan and Zingales (2003) stated that politico-economic factors and institutions as the most likely reasons why some economies have a well-functioning financial market, and others do not. On the other hand, Beck and Honohan (2007) emphasized that the role of informality, lack of scale in national financial systems, weak governance, and political and economic instability contributed to the poor development of the financial sector in SSA. Allen et al. (2012) in their study attributed small population density across the SSA countries to be a factor limiting financial sector development in Sub-Saharan Africa.

Levine (1997) stated that institutions perform a crucial role in the effectiveness of the financial markets. For instance, it is not possible for governments that are not stable to sincerely introduce and commit to policies which will encourage and stimulate entrepreneurial activity, savings, and the functioning of financial markets. Roe and Siegel (2007) emphasised that political instability will serve as an obstacle to sound macroeconomic policy and then hinder the development of financial infrastructure. Institutions can positively affect financial development by means of a decrease in the cost of financial intermediation and also improve access of small borrowers to the credit market. Olson (1982) stated that the institutional environment helps to determine the appropriate set of technologies in a country

and the degree to which the existing technology is efficiently used. Besides, it was argued by Beck and Levine (2003) and Beck, Demirguc-Kunt, and Levine (2003) that a proper functioning institution allows financial markets and financial institutions to channel funds to ultimate investors in an efficient manner, which has a positive impact upon economic growth.

However, a strand of study claimed that trade openness or financial openness couple with institutional quality would further enhance financial development. A well-developed institutional quality and trade openness can boost financial development in several ways. Trade openness promotes financial development by increasing the size of the market as well as increase the demand for financial services. In line with this, Svaleryd and Vlachos (2002) stated that increase in trade openness would lead to increase in demand for new financial products as well as an increase in demand for trade finance instruments and hedging of risks. Transfer of technology which is possible through trade openness allows financial institutions to have access to the latest technology thereby reducing their cost of transactions and promoting their efficiency.

The interaction of trade openness and institutions could better enhance financial development. For instance, as stated earlier that trade openness allows the transfer of technology for the efficient operation of the financial system, however, it is the institutions that will help to determine and adopt the appropriate technology. According to Chinn and Ito (2006), the relationship between trade openness and financial development depend on institutional quality. They emphasised that increased trade openness promotes financial development only after institutional quality exceeds a certain threshold. Hence, the conjunction of trade openness and institutions might offer a better opportunity for development for the financial sector.
Based on the existing literature, it is observed that most of the studies that examined the relationship among either trade openness or financial openness, institutions and financial development were interested in knowing if institutions matter for financial development. As a result, they summed up all the institutional variables and used it as a single indicator. This study deviates from this as it is not only interested in knowing if institutions matter for financial development but to know (1) the institutional quality variables that matter for financial development in sub-Saharan Africa (2) the institutional variables that complement trade openness to positively impact financial development (3) if trade openness matter for financial development in Sub-Saharan Africa.

Apart from the introductory section, section two of this paper briefly provided an overview of financial development in sub-Saharan Africa. Section three reviewed the literature on the links between openness, institutions and financial development, while section four discusses the data used in the study. Section five consists of the methodology used in the study. Section six presents the discussion of the results while the last section consists of the conclusion and implication of the study.

2. Overview of Financial Development in Sub-Saharan Africa

Financial development is defined as the comfort with which the financial system makes funding available for entrepreneurial activities and the level of availability of financial services in an economy. Financial-sector development is core in the discussion on how to stimulate economic growth in low-income nations and lower levels of poverty. For a few decades now, sufficient evidence that made use of different aggregation levels and methodologies has been gathered on the growth-enhancing role of financial-sector. The trends in African financial systems show that it is anchored on two main policy issues: the role of government and that of foreign banks. The governments substituting for market system approach was considered as essential in the 1960s and 1970s; this was replaced by the market system approach centering on liberalisation and privatisation in the 1980s and 1990s, before it was changed back into a somewhat more active, although different, purpose for government in the last few decades (Beck, Fluchs and Uy, 2009).

The approach concerning integration into global financial markets by sub-Sahara African countries also transformed radically in the last few years and as influenced by the financial crisis. Many sub-Sahara African nations moved from taking over foreign banks in the 1960s and 1970s to selling failed government-owned banks to international owners in the 1990s. Sub-Sahara African financial systems comprise some of the least globally, in both absolute terms and comparative to economic activity, with the exclusion of countries like Mauritius, South Africa, and a few offshore financial centers (Beck et al., 2009). Other features of sub-Saharan Africa's financial system as identified by Beck et al., (2009) are the small nature of the system; lesser to an average-sized bank in Europe, having overall assets lower than US$1 billion, which is connected to unproductivity and skill shortages preventing banks from manipulating scale economies and also discouraging them from carrying out huge investments in technology. Financial systems in sub-Saharan Africa have features such as a very limited outreach, holding less than one out of

five households accessing formal banking services such as savings, payments, or credit.

Furthermore, the banking system in sub-Saharan Africa is very expensive. This shows in the high-interest *spreads* and *margins*. The spread is denoted as the difference between the ex-ante contracted loans and deposit interest rates, while on the other hand, the margins refer to the received interest, as well as non–interest revenue on loans subtracting the interest costs on deposits (minus non-interest charges on deposits) (Beck et al, 2009:4). Compared with the other parts of the globe, sub-Saharan Africa's financial systems also carry a higher level of overhead costs. They claimed that despite higher costs and risks, banks are, nevertheless, very profitable.

Similarly, it is believed that banking system in sub-Saharan Africa is expensive for deposit customers, as manifested in the huge minimum balance requirements and annual fees not only for checking customers but also for savings account holders (Beck, Demirguc-Kunt and Martinez Peria, 2008; World Bank, 2008). Sub-Saharan Africa's stock markets are very small and illiquid. According to Beck et al. (2009:6), only one-third of the African region have stock markets. Some countries in sub-Saharan Africa have experienced corporate bond issues; among these cases, the issues have been most intense in telecommunications and banking sectors. Similarly, some signs of improvement were recorded, like the huge initial public offerings (IPOs) on the Ghanaian, Kenyan, and Nigerian stock exchanges. These advances are unlikely to make capital markets sustainable (IMF, 2008).

The IMF (2008) also claimed that the economic growth and financial deepening and broadening experienced between 2000 and 2007 by several nations in sub-Saharan Africa aside being propelled by demand and international capital inflows, was also driven by developments in the institutional framework of finance, like the creation of commercial courts and alternative dispute resolution systems, the creation or development of collateral registries and credit reference bureaus, and macroeconomic stability which all add-up to this development. Beck et al., (2009) however stated that technological developments had made Sub-Saharan Africa move into employing mobile telephone technology for increasing the portion of people gaining access to financial services, as the example of M-Pesa in Kenya has shown. The use of Bank's mobile phone applications has significantly eased off the queue and delays in bank transactions in Nigeria.

The disaggregation of Africa's financial sector has hindered the mobilization of financial resources and limited financial intermediation. The historically repressive financial regulation resulted in a lack of integration, as well as structural and institutional factors that have frustrated economic and financial development (Chipeta and Mkandawire, 1996). Reforms in many African countries have sought to eliminate these limitations by decreasing direct government interventions in the financial sector, but these have only recorded partial success. According to Chipeta and Mkandawire, (1996) it is also a challenge the lack of research on this disaggregation of Africa's financial sector, principally focusing on the structural and institutional bottlenecks that require elimination to enable more interaction amongst the formal, semi-formal, and informal parts of the financial sector. Griffith-Jones, Karwowski, and Dafe (2014) believed that Africa's financial sectors are still at the primary stage of development.

Furthermore, Africa's financial sectors, though largely still weak, are fairly growing. Coupled with sub-Sahara African countries' current vulnerabilities, like the narrow regulatory capacity, and vulnerability to external shocks, this portends danger to stability in the financial system. Despite the occasional presence of systemic banking crisis on the sub-Sahara African region in the past few decades, accelerated credit growth in some countries requires retrospection, indicating the reason why strong, and also countercyclical measures rule Sub-Sahara Africa's financial systems.

It is also noted by Laeven and Valencia (2008; 2012) that the number of banking crises in sub-Saharan Africa was markedly low during the period 2000-2009, hypothetically signifying amplified resilience of sub-Sahara African financial systems particularly compared with the periods of the 1990s. Some see only the Nigerian banking crisis as a 'sporadic outlier' (Beck et al. 2011b).

However, in order to aid the developmental ability of finance, several countries in sub-Saharan Africa deregulated their financial sectors during the periods of the 1980s and 1990s, mostly as dictated by the Structural Adjustment Programmes (SAPs) recommended by the IMF and the World Bank. Some of these policy reforms include the elimination of credit ceilings, deregulation of interest rates, reforming and sale of government-owned banks, the establishment of several guidelines to stimulate the advancement of private banking systems and financial markets. Complementing these guidelines were the bank's supervisory and regulatory schemes, plus the establishment of deposit insurance in some economies (Cull et

al., 2005). A more deregulated financial system has sprung up in sub-Saharan Africa due to financial sector reforms. Some of these restructuring were similarly promoted through rapid developments in international conditions and technology linking sub-Saharan Africa with the global system. Consequently, it is not surprising that sub-Saharan Africa started to record remarkable performance in both the real and financial sectors. Not until lately, sub-Saharan Africa had recorded continuous growth for about two decades and was for several years among the highest growth regions globally (IMF, 2013).

It would also be instructive to note that stock markets in sub-Saharan Africa have started performing well. Before the crisis period, stock markets in Sub-Saharan Africa were doing impressively in both absolute and risk-adjusted returns (Senbet and Otchere, 2010, Allen *et al*., 2011), despite the challenges they faced in terms of low capitalization and liquidity. Despite these good performances both in terms of development in the financial sector and economic growth, Sub-Saharan Africa's financial systems are seen as undeveloped compared with markets globally using all indicators of financial development (Green, 2013). The financial systems in most economies in sub-Saharan African are views as underdeveloped given the standards obtainable in low-income economies. Both development and financial inclusion gap are larger in the continent (Allen *et al*., 2016). The development gap refers to both banking and non-bank systems.

Aside from being underdeveloped, Sub-Saharan Africa's financial system survive the international financial crisis markedly well, particularly when put side by side with other regions of its equal. Several reasons have alluded to this: 1) the largely low integration with the rest of the international financial system meant the potential for direct contagion was minimal; 2) contagion effects were minimal, particularly in the banking system, even in some nations (i.e South Africa) with a well-integrated financial system, generally because of the robust guidelines in the banking systems in Sub-Saharan Africa (Kose and Prasad, 2010); 3) it may also be due to the weak financial deepening in the sub-Saharan Africa's financial system (Africa Growth Initiative, 2017). The international financial crisis opened up the regulatory gaps and distorted incentives in the banking system of several nations and thus inspired fresh works to improve the resilience of Sub-Saharan Africa's financial system by reducing the occurrence and sternness of further crises by among other things, the establishment of the Basel III accord (Africa Growth Initiative, 2017:2).

According to Beck and Maimbo (2013), the regulators of the financial sector in Africa also accommodated some ingredients of Basel III to reinforce their financial system by strengthening regulatory capital, making better risk management and governance, etc. Nevertheless, few other problems have been identified facing sub-Saharan African policymakers, they include, need to improve financial broadening through financial inclusion, as well as to deepen the financial system.

3. Literature Review

Looking at the determinants, financial development has become a growing issue in the literature in recent time. La Porta et al. (1997, 1998), Beck et al. (2003), Rajan and Zingales (2003) and Stulz and Williamson (2003), Huang (2005), Herger, Hodler, and Lobsiger (2007). La Porta *et al*. (1997, 1998) have contributed significantly to the debate on the legal factors determining financial development. By applying the settler mortality hypothesis of Acemoglu et al. (2001) to financial development, Beck et al. (2003) considered how institutions are important in determining financial development. Rajan and Zingales (2003) interest groups theory claim that political institutions are also crucial in fostering financial development. Stulz and Williamson (2003) in their work also claim that culture is essential albeit it may be tempered by openness. Furthermore, Huang and Temple (2005) investigated the role of trade openness, while Chinn and Ito (2005) concentrated on whether financial openness plays a vital role. Huang (2005) found that institutional quality is critical in deterring financial sector development of a nation; macroeconomic policies, and geographic characteristics, and also the level of income and cultural characteristics are the key determinant of financial development.

Acemoglu et al. (2001) identifies the role of institutional quality for financial development and claims that institutional quality is diverse across nations due to the diverse initial endowments. This hypothesis suggests that the disease environment met by European colonizing powers in past centuries, proxied in empirical studies by settler mortality, was a key impeding factor for the introduction of institutions that would stimulate long-run growth. It is claimed that European colonial powers set up extractive institutions inappropriate for long-term growth where the environment was unfavorable and institutions that were suitable for growth where they met favorable environments.

On the one hand, La Porta *et al*. (1997) argued that the systems based on common law from England, are more suitable than the systems based on civil law, from France, for capital market development. This is because the common law was

developed to protect private property while the civil law was developed to deal with the issue of corruption of the judiciary and to add the powers of the government (La Porta *et al*., 1997). That is why legal systems based on common law protects small investors better than legal systems based on civil law. Similarly, the *openness hypothesis* postulated that interest groups stand not to benefit from financial sector development because financial development breeds competition which corrodes their rents (Rajan and Zingales, 2000). As claimed, trade and financial openness limit the capability of incumbents to hinder financial market development but also because the fresh opportunities produced by openness may engender sufficient new profits for them that overshadow the negative effects of more competition.

Baltagi, Demetriades, and Law (2007); Law and Demetriates (2006) for example found both trade and financial openness, and also economic institutions have a statistically significant effect in determining the differences in the level of financial development across countries and over time since the 1980s. Furthermore, they established mixed support for the hypothesis that opening both trade and capital accounts concurrent is essential in stimulating financial development in a modern setting.

With a focus on Asia Le, Kim and Lee (2015) investigated the factors determining financial development in Asia and the Pacific from 1995 to 2011 and found that improved governance and institutional quality are the main factors determining financial development in developing economies while economic growth and trade openness are the main factors determining financial depth in developed economies. Asiama and Mobolaji (2011) focused on the effect of trade and financial openness along with institutional quality on financial development using dynamic panel data methods. They also tested the Rajan-Zingales' hypothesis in sub-Saharan Africa. For all indicators of financial development, they found that trade and financial openness increase financial development. They also found evidence that low quality of institutions impacts negatively on the development of the financial sector in the region and thus, supports the Rajan-Zingales hypothesis. Chinn and Ito (2005) investigated the relationship between capital account liberalisation, legal and institutional development, and financial development, particularly in equity markets. They claimed that a greater financial openness promotes equity market development if and only if a threshold level of general legal systems and institutions is reached, and this is said to be more prevalent among emerging market economies. Also, among emerging market economies, a

rise in bureaucratic quality, law, and order, coupled with lesser corruption, raises the influence of financial liberalization in promoting equity markets development. They, however, found the general legal/institutional variables to have more productive effects on capital account opening than the finance-related legal/institutional variables.

Similarly, Chinn and Ito (2002) looked at the relationship between capital controls and the financial development of credit and equity markets and found that the level of development in the financial sector is associated with capital account existence. They claim that the relationship between financial openness and financial development will be easily noticeable if the financial environment is branded with a better quality of legal and institutional development. Also, Chinn and Ito (2006) found in their study that institutional quality is a major factor that determines the kind of relationship that exists between trade openness and financial development. Specifically, they claimed that an increase in trade openness would only promote financial development after institutional quality exceeds a certain threshold.

In summary, from the bulk of the theoretical and empirical literature reviewed in this work, it established that both institutional factors and openness are important contributors to financial development. For instance, institutions that ensure the security of property rights are cardinal part of financial transactions. These institutions take the form of a legal framework designed to reduce the effect of asymmetric information and asymmetric bargaining power. Institutions are aimed at guaranteeing the adequate implementation of contracts and has key significance in financial contracting.

4. Data

This study covers the period 1986 – 2016 and included 37 countries. Some of the data used in this study are obtained from the World Bank (WDI) while some are obtained from the International Country Risk Guide (ICRG). Specifically, data on variables such as domestic credit to the private sector, domestic credit by bank, broad money, GDP per capita, trade openness and inflation are obtained from World Bank while all the data on institutional variables are obtained from International Country Risk Guide (ICRG). Data on financial openness is obtain from the financial openness data constructed byChin and Ito (2007) that is available for both developed and developing countries from 1970 to 2016. Financial development which is the dependent variable is proxied by domestic credit to the

private sector as a percentage of GDP, domestic credit by the bank as a percentage of GDP and broad money as a percentage of GDP. The independent variables include GDP per capita, trade openness, inflation, and financial openness. Democracy accountability, corruption, government stability, bureaucracy and law and order are the institutional variables used in the study. This study used unbalanced panel data due to incomplete data in some countries. The statistics summary of the variables is presented in table 1. Due to unavailability of stock market data in sub-Saharan Africa, the indicators of stock market development are excluded in this study. Appendix A consists of the list of the countries included in this study.

Table 1: Summary Statistics of the Variables

Variable	Notation	Mean	Std.Dev	Minimum	Maximum
Domestic Credit to the private sector	DCP	1.073	0.375	-0.387	2.026
Domestic Credit by bank	DCB	1.099	0.386	-0.387	2.204
Broad Money	BROAD	1.378	0.245	0.456	2.180
PDP per capita	GDP	3.024	0.470	2.119	4.308
Trade openness	OPEN	1.798	0.218	1.044	2.725
Inflation	INF	0.859	0.612	-1.436	4.387
Financial Openness	FINOPEN	-0.691	1.136	-1.910	2.359
Democracy Accountability	DEM	0.436	0.199	-0.380	0.740
Corruption	COR	0.751	0.243	0	1.041
Government Stability	GOVS	0.848	0.155	0	1.044
Bureaucracy Quality	BUR	1.177	0.198	-0.778	0.602
Law and Order	RUL	0.405	0.187	-0.301	0.778

5. Methodology

This section of the empirical study is focused on the methodological framework, which is equally divided into two parts. The first part is the model specification, and the second part presents the estimation strategy

5.1 Model specification

We follow Baltagi *et al* (2007) and Asiama and Mobolaji (2011) with a little modification, by specifying the functional relationship between financial development (FD), trade openness (OPEN) and institutions (INS) as;

$FD_{it} = f(OPEN_{it} + INS_{it})$ .....(1)

Trade openness allows the transfer of technology for the efficient operation of the financial system while the institution enables financial institutions to channel funds to ultimate investors in an efficient manner and to reduce the cost of financial intermediation.

By adding initial financial development and expressing equation 1 in econometric form, it becomes

$FD_{it} = \alpha + \beta_1 FD_{it-1} + \beta_2 OPEN_{it} + \beta_3 INS_{it}$ .....(2)

It is evident from Baltagi *et al*. (2007) and Asiama and Mobolaji (2011) that many other factors are significant determinants of financial development. Therefore, we include financial openness (FIN) and inflation (INF) in the model as they also serve as control variables. By including the error term, the control variables, and interaction term. The interaction term is entered separately in the regression. The equation to be estimated becomes:

$FD_{it} = \alpha + \beta_1 FD_{it-1} + \beta_2 OPEN_{it} + \beta_3 INS_{it} + \beta_4 FIN_{it} + \beta_5 INF_{it} + \beta_6 GDP_{it}$
$+ \beta_7 (OPEN_{it} * INS_{it}) + \varepsilon_{it}$ .....(3)

Where FD = financial development

GDP = real GDP per capita in US dollars based on the 2010 constant price

OPEN = trade openness

FIN = financial openness

INF = inflation

INS = Institutional quality variables (DEM, COR, GOVS, BUREC, RUL)

$OPEN_{it} * INS_{it}$ = interaction effect of trade openness and institutional quality.

5.2 Estimation Strategy

This study employs system GMM to estimate financial development model specified in equation (1). System GMM was initially developed by Arellano and Bover (1995) and was later improved upon by Blundell and Bond (1998). Due to the disadvantages and limitations of difference GMM, as shown by Blundell and Bond (1998), this method is believed to be more superior. According to Bond *et al*. (2001), system GMM can correct unobserved country heterogeneity, omitted variable bias, measurement error, and potential endogeneity that frequently affect panel

estimation. The system GMM technique makes use of a set of differential equations which are instrumented with lags of the equations in levels. First-differencing controls for unobserved heterogeneity omitted variable bias as well as the time-invariant component of the measurement error. System GMM also corrects endogeneity bias (time-varying component) through instrumenting the independent variables. In addition to the advantages of system GMM mentioned above, we also prefer it as it is an estimator that is also useful when dealing with a situation where N>T, like in this study. Instruments for differenced equations are obtained from values (levels) of explanatory variables lagged at least twice, and instruments for levels equations are lagged differences of the variable. The estimation of two equations in a system GMM reduced potential bias and imprecision associated with a simple first-difference GMM estimator according to Arrellano and Bover (1995) and Blundell and Bond (1998). Based on the argument of Alonso-Borrego and Arellano (1999), and Blundell and Bond (1998), the lagged levels of independent variables become weak instruments for regression in differences when explanatory variables are persistent over time, and the weakness of the instrument, in turn, influences the asymptotic and the small-sample performance of the difference estimator. Asymptotically, variance of the coefficients will rise in a small sample, Monte Carlo experiments show that weak instruments can produce biased coefficients. Consistency of the GMM estimator depends on the validity of the instruments. As suggested by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998), two specification tests usually are used. The first is the Sargan/Hansen test of over-identifying restrictions which tests for overall validity of the instruments and the null hypothesis is that all instruments as a group are exogenous. The second test examines the null hypothesis that error term ε_{it} of the differenced equation is not serially correlated particularly in the second order (AR2). One should not reject the null hypothesis of both tests.

6.0 Results

In an attempt to examine if trade openness and institutions matter for the financial development in sub-Saharan Africa, financial development is proxied by domestic credit to private sector, domestic credit by the bank and broad money. We use three financial development indicators for the following reasons. First, in sub-Sahara African countries, the three financial development indicators mentioned above are more deepening than others. Therefore, using only one indicator might not produce results that will represent the whole countries in the region. Second, we want to see if financial development indicators will respond differently to institutional quality

variables. Three, the three indicators are the financial development indicators that we can find data for almost all the sub-Sahara African countries except those countries that have gone through instability in which data are not available.

In table 2, financial development is proxied by domestic credit by banks while in table 3 it proxied by domestic credit to private sectors and in table4, it proxied by broad money. Each of the tables consists of five models. Each model in each of the table focused on the interaction of a financial development indicator and a particular institutional quality variable. For, an instance in table 2, each model consists of the interactive term of domestic credit by banks with a particular institutional variable. This applies to table 3 and 4 where domestic credit to the private sector and broad money are used as financial development indicator respectively.

From table 2, where financial development is proxied by domestic credit by banks, the lagged domestic credit by banks has a positive and significant impact on the current domestic credit by banks. The coefficients of GDP per capita is positive in all the models but not significant in any of the models. The impact of trade openness on financial development is not different from GDP per capita as the coefficients of trade openness is positive but not statistically significant in any of the models. Inflation has a negative impact on financial development as its coefficient is negatively signed and statistically significant at 1% in all the models. Financial openness produced mixed results as it positively signed in models A1, A3 and A4 but it negative in models A2 and A5. However, the coefficient of financial openness is not significant in any of the models and as a result of this, no conclusion can be drawn. On the impact of institutional variables on financial development, the result in model A1 shows that democracy accountability has a positive and significant impact on financial development. The coefficient of democracy accountability is significant at 10%. This implies that a percentage increase in democracy accountability will lead to about 10.2% increase in financial development. In model A2, the coefficient of corruption is positive but insignificant. Government stability is positively impacted financial development in model A3, and its coefficient is significant at 10%. This implies that government stability is crucial to the development of the financial sector. The coefficient of bureaucracy is negative but not significant in model A4. In model A5, the coefficient of law and order is positive, but it is not significant.

Attention is now shifted on the interaction of trade openness and institutional quality variables. The interaction of trade openness and democracy accountability in model A1 is negative and significant at 10%. This result indicated that a percentage increase in the interaction term of trade openness and democracy accountability would reduce financial development by 61.4%. This is an indication that democracy accountability does not complement trade openness to promote financial development. On the interaction terms of trade openness and corruption and trade openness and government stability in models A2 and A3 respectively, their coefficients are negative but significant in model A3 only. In models A4 and A5, the interaction terms are positive but they are not significant.

On the diagnostic tests, the results show that they performed excellently. For instance, the first-order autocorrelation is not rejected but the second-order autocorrelation is rejected in all the models while the probability of Sargan test is not significant meaning that model specification supports the general validity of the instruments used in the estimations.

Table 2: The complementary effect of Financial Development and institutions
Dependent Variable: Domestic credit by Banks (DCB)

	Model A1 System GMM	**Model A2 System GMM**	**Model A3 System GMM**	**Model A4 System GMM**	**Model A5 System GMM**
Initial domestic credit by banks	0.944*** (0.000)	0.943*** (0.000)	0.944*** (0.000)	0.949*** (0.000)	0.937*** (0.000)
GDP per capita	0.019 (0.246)	0.021 (0.223)	0.019 (0.252)	0.022 (0.222)	0.016 (0.423)
Trade Openness	0.025 (0.304)	0.016 (0.575)	0.033 (0.214)	0.008 (0.751)	0.016 (1.779)
Inflation	-0.034*** (0.000)	-0.032*** (0.000)	-0.034*** (0.000)	-0.029*** (0.000)	-0.034*** (0.000)
Financial Openness	0.0004 (0.868)	-0.0003 (0.988)	0.0004 (0.867)	0.009 (0.629)	-0.0028 (0.381)
Institutions					
Democracy accountability	0.102* (0.097)	---	-	-	-
Corruption		0.048 (0.133)		-	-
Government stability			0.540* (0.073)		-

Bureaucracy quality				-0.0175 (0.882)	
Law and Order					0.032 (0.808)
Interactions					
Openness*Democracy accountability	-0.6155* (0.093)		-		-
Openness *Corruption		-0.0229 (0.315)			-
Openness *Government stability			-0.0410* (0.055)		-
Openness *Bureaucracy quality				0.0233 (0.735)	
Openness *Law and order	-	-	-		0.0166 (0.829)
AR1 (p-value)	0.004	0.005	0.004	0.008	0.004
AR2 (p-value)	0.465	0.522	0.453	0.506	0.668
Sargan Test (p-value	0.406	0.365	0.400	0.557	0.400
Hansen Test (p-value	1.000	1.000	1.000	1.000	667
No of countries	37	37	37	37	37

Notes: All the variables are in logs. The p-Values for the system GMM estimates are in parenthesis. ***p < 0.01, **p < 0.05, *p < 0.10.AR(1) and AR(2) represents the Arellano– Bond test of first and second-order autocorrelation respectively. The null hypothesis of the absence of first-order serial correlation (AR1) is rejected, but the null hypothesis of the absence of second-order serial correlation (AR2) is not rejected. The Sargan test confirms the validity of instrumental variables used by the panel GMM. The Hansen test does not reject the over-identification restrictions.

In table 3, domestic credit to the private sector is used to proxy financial development as earlier said. In all the models, the initial domestic credit to the private sector is positive and statistically significant in all the models. GDP per capita and trade openness like in table 3 are positively signed but not statistically significant in any of the models. Inflation is inversely related to financial development, and its coefficient in all the models are statistically significant at 1%. All the institutional variables are positive apart from bureaucracy quality which is negative. However, only democracy accountability and government stability are significant at 10%.

On the interaction terms, the results obtained in table 3 is the same as table 2. It is only the interaction of trade openness, and democracy accountability couple with the trade openness and government stability that are statistically significant at 10%. The diagnostic tests produced the expected results. The first-order autocorrelation is not rejected in any of the models, but the second-order autocorrelation is rejected. Concerning the Sargan test, it indicates that the model is correctly specified and validate the instruments used in the estimations.

Table3: The complementary effect of Financial Development and institutions
Dependent Variable: Domestic Credit to private Sector (DCP)

Variables	**Model B1 System GMM**	**Model B2 System GMM**	**Model B3 System GMM**	**Model B4 System GMM**	**Model B5 System GMM**
Initial Domestic Credit to private Sector	0.9341*** (0.000)	0.9312*** (0.000)	0.933*** (0.000)	0.940*** (0.000)	0.919*** (0.000)
GDP per capita	0.0136 (0.396)	0.0171 (0.309)	0.013 (0.410)	0.017 (0.369)	0.010 (0.608)
Trade Openness	0.037 (0.107)	0.027 (0.304)	0.044* (0.071)	0.023 (0.407)	0.027 (0.414)
Inflation	-0.3423*** (0.000)	-0.030*** (0.000)	-0.034*** (0.000)	-0.028*** (0.000)	-0.005*** (0.000)
Financial Openness	0.0001 (0.962)	-0.002 (0.912)	0.002 (0.928)	0.004 (0.846)	-0.005 (0.197)
Institutions					
Democracy accountability	0.1028* (0.082)		-	-	-
Corruption		0.047 (0.151)		-	-
Government stability		-	0.055* (0.076)		-
Bureaucracy quality				-0.046 (0.699)	
Law and Order					0.072 (0.601)
Interactions					
Openness*Democracy accountability	-0.0591* (0.088)		-		-

Openness *Corruption		-0.021 (0.352)			-
Openness *Government stability			-0.039* (0.084)		-
Openness *Bureaucracy quality	-	-	-	0.038 (0.572)	
Openness *Law and order					0.008 (0.914)
AR1 (p-value)	0.003	0.004	0.003	0.007	0.003
AR2 (p-value)	0.422	0.372	0.409	0.426	0.459
Sargan Test (p-value	0.157	0.140	0.149	0.259	0.192
Hansen Test (p-value	1.000	1.000	1.000	1.000	1.000
No of countries	37	37	37	37	37

Notes: All the variables are in logs. The p-Values for the system GMM estimates are in parenthesis. ***p < 0.01, **p < 0.05, *p < 0.10.AR(1) and AR(2) represents the Arellano– Bond test of first and second-order autocorrelation respectively. The null hypothesis of the absence of first-order serial correlation (AR1) is rejected, but the null hypothesis of the absence of second-order serial correlation (AR2) is not rejected. The Sargan test confirms the validity of instrumental variables used by the panel GMM. The Hansen test does not reject the over-identification restrictions.

In table 4, broad money is the dependent variable as well as the proxy for financial development. The lagged dependent variable exact positive and significant impact on the current dependent variable. The coefficient of GDP per capita is not significant but positive. The result of trade openness is different from previous results as positive and significant in all the models. Inflation negatively impacted financial development during the study period. The coefficient of inflation is statistically significant in all the models. Unlike the previous results, democracy accountability is positive but not significant in model C1. Surprisingly Corruption has a positive and significant impact on financial development. The coefficient of corruption is significant at 10%. Likewise, government stability positively impacts financial development at 10% significant level in model C3. The coefficients of bureaucracy quality and law and order are not significant in models C4 and C5 respectively.

Regarding the interaction terms, only the interaction of trade openness and government stability is statistically significant with a negative sign. This implies that government stability does not complement trade openness to promote financial development. The interaction of trade openness and democracy accountability, trade openness and corruption and trade openness and bureaucracy are also negative but insignificant. The interaction of trade openness and rule and order is positive but insignificant.

The Sargan test indicates an appropriate specification of the model and the Hansen test signifies the appropriate use of the methodology while the regression exhibit first order correlation but exhibit no second-order serial correlation.

Table 4: The complementary effect of Financial Development and institutions
Dependent Variable: Broad Money

Variables	**Model C1 System GMM**	**Model C2 System GMM**	**Model C3 System GMM**	**Model C4 System GMM**	**Model C5 System GMM**
Initial broad money	0.929*** (0.000)	0.928*** (0.000)	0.926*** (0.000)	0.931*** (0.000)	0.911*** (0.000)
GDP per capita	0.083 (0.483)	0.006 (0.673)	0.007 (0.563)	0.012 (0.354)	0.011 (0.482)
Trade Openness	0.054*** (0.011)	0.054** (0.023)	0.072*** (0.007)	0.041* (0.088)	0.056** (0.028)
Inflation	-0.021*** (0.000)	-0.029*** (0.003)	-0.022*** (0.000)	-0.013*** (0.001)	-0.018*** (0.002)
Financial Openness	0.002 (0.287)	-0.001 (0.445)	0.002 (0.314)	0.002 (0.269)	-0.001 (0.756)
Institutions					
Democracy accountability	0.126 (0.119)		-	-	-
Corruption		0.078* (0.088)		-	-
Government stability		-	0.064* (0.067)		-
Bureaucracy quality				0.138 (0.258)	
Law and Order					0.004 (0.965)
Interactions					
Openness*Democracy	-0.071		-		-

accountability	(0.110)				
Openness *Corruption		-0.032 (0.189)			-
Openness *Government stability			-0.050** (0.044)		-
Openness *Bureaucracy quality	-	-	-	-0.071 (0.299)	
Openness *Law and order					0.011 (0.824)
AR1 (p-value)	0.063	0.093	0.063	0.094	0.069
AR2 (p-value)	0.445	0.490	0.450	0.512	0.557
Sargan Test (p-value	0.999	0.988	0.999	0.999	0.997
Hansen Test (p-value	1.000	1.000	1.000	1.000	1.000
No of countries	37	37	37	37	37

Notes: All the variables are in logs. The p-Values for the system GMM estimates are in parenthesis. ***p < 0.01, **p < 0.05, *p < 0.10.AR(1) and AR(2) represents the Arellano– Bond test of first and second-order autocorrelation respectively. The null hypothesis of the absence of first-order serial correlation (AR1) is rejected, but the null hypothesis of the absence of second-order serial correlation (AR2) is not rejected. The Sargan test confirms the validity of instrumental variables used by the panel GMM. The Hansen test does not reject the over-identification restrictions.

6.1 Discussion of Results

It is obvious that irrespective of the indicators of financial development used, the lagged financial development has a positive and significant impact on financial development in sub-Saharan Africa. This finding is consistent with David, Mlachila, and Moheeput (2014). David *et al.* (2014) found that the lagged domestic credit to the private sector has a positive and significant impact on current financial development during their study period. Le, Kim, and Lee (2015) also found that lagged financial development has a positive and significant impact on current financial development. Equally according to Le *et al*. (2015) the significance of the lagged dependent variable is an indication that the dynamic GMM is an appropriate estimator and the empirical results can be relied upon for statistical inference.

In the three indicators of financial development used in this study, GDP per capita has a positive but insignificant impact on financial development in sub-Saharan Africa. This finding is in line with David, et al. (2014). This result is consistent with the

theory base on the sign of the coefficient. The insignificant of the coefficient of GDP per capita might be due to the level of development of the economy. Study like Kiprop, Kalio, Kibet, and Kiprop (2015) stated that the relationship between financial development and economic growth is determined by the level of financial development and economic growth. According to Odhiambo (2009), economic growth can promote financial development through the demand for financial services. This, therefore, led to the expansion of the financial sector through the establishment of new financial institutions to meet the demand of the rapidly growing economy. The demand for financial services caused by economic development can also promote efficiency in the financial sector as it can enable the financial sector to allocate their resources to the most productive investment in the economy. However, in a situation where the economy is not expanding and growing enough, its impact on the financial development might not be significant.

The insignificant of trade openness and financial openness in this study particularly when financial development is proxied by domestic credit to the private sector and domestic credit by banks is in line with studies such as Tressel and Detragiache (2008), and David, *et al*. (2014). It also conforms to some of the analysis of Gries, Kraft, and Meierrieks (2009). Tressel and Detragiache (2008) in their study which consisted of developing and advanced economies found that trade openness is not a significant determinant of financial development. Likewise, David*et al*. (2014) in their study conducted on sub-Sahara African countries found trade openness to insignificant impact financial development. Gries, Kraft, and Meierrieks (2009) in their study where they used single country time series techniques for 16 African countries, established a link between financial development and trade openness in some of the countries, but this link is not robust. However, when financial development is proxied by broad money, trade openness has a positive and significant impact on financial development. This result justifies the reason why we used different financial development indicators in this study.

The inverse relationship found between inflation, and financial development is in line with other studies such as Khan (2015) and Mahyar (2017). Altig (2003) theoretically shows that high inflation discourages the incentives to invest because it leads to a decline in return on investment. High inflation results in uncertainties and causes limitations in the financial system. Mahyar (2017) stated that inflation is promoting financial depression and has a negative effect on the development and activities of the financial Sector.

Though democracy accountability, government stability, and corruption significantly impact financial development, this result is not robust as it is only significant at 10%. This is an indication that institutional quality is very low in Sub-Saharan Africa. According to Yahyaoui and Rahmani (2009) and Yahyaoui, Rahmani and Chtourou (2010) institutions quality is capable of encouraging investment and as well helps the financial institutions to mobilize savings towards the most productive projects. Therefore, high institution quality will bring about an improvement in the health and efficiency of financial institutions. A high level of corruption coupled with a poorly developed legal system is an avenue for illegal transactions which serve as obstacles to the development of the financial sector. Generally, the majority of developing countries have low values for institutional quality. However, if the appropriate policies that can help in improving the institutions qualities is put in place then institutions will significantly enhance the financial development sub-Saharan African region. David*et al*. (2014) also stated that there is the presence of much weaker institutional frameworks in SSA compare with other regions.

The result shows that only the interaction of trade openness with democracy accountability (trade openness*democracy accountability) and trade openness and government stability (trade openness*government stability) is significant at 10% and negative. This implies that institution quality does not complement trade openness to have positive impact on financial development. This finding is contrary to the expectation. The implication of this result is that the financial development effect of trade openness is not enhanced by institutional quality in sub-Saharan Africa. Trade openness brings about the adoption and use modern technology in the financial sector and also allow investors from other countries to invest in the financial sector. However, the benefits and potential gains from trade openness can be prevented and eroded by the low level of institutional quality. Though Baltagi, Demetriades, and Law (2009) found complementary roles between trade openness and institutions, however, the study was conducted on a broader sample of countries. We can conclude that there is an indication that trade openness is more important for financial development in countries with better institutional quality.

7. Conclusion and implications of findings

This study examined both the direct and interaction effect of institutional quality variables and trade openness on financial development. This is in an attempt to test

if institutions complement trade openness to promote financial development in sub-Saharan Africa using the sample of 37 countries over the period 1986-2016.
From the empirical evidence presented in this study, it shows that only a few of the institutional qualities variables significantly impacted financial development. The study also found that institutional quality does not complement trade openness to enhance financial development positively. The estimations showed that inflation is inversely related to financial development. Trade openness is positive and significant impacted financial development particularly when the latter is proxied by broad money.

Two implications can be drawn from these results. First, we discovered that institutional quality does not enhance the relationship between trade openness and financial development. This implies that presently in Sub-Saharan Africa, institution is not a channel through which trade openness can promote financial development. Base on this, there is a need for the government of various African countries to put policies in place that will improve the quality of institutional variables. Improved institutional quality will enable sub-Saharan Africa countries to take advantage by opening up their capital accounts to deepen their financial system as well as opening their economy to benefit more from trade. This is based on the argument that developing countries can benefit more by opening their economy, unlike developed countries whose benefits from the further opening are limited.

Second, it is evident from this study that trade openness is more useful to promote financial development. This show that sub-Sahara African countries are likely to benefit more if appropriate trade policies are adopted by openning up domestic markets to other countries of the world, sub-Saharan African countries can boost real sector activity through bilateral trade, transfer of goods and services, technological transfer, mobilization of human and physical capital and flows of ideas which in turn enhance the development of financial sectors.

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Table A: List of the Selected SSA Countries

Togo	Burundi	Benin	Namibia
Botswana	Zimbabwe	Sierra Leone	
Kenya	Burkina Faso	Cameroon	
Sudan	Cote d'Ivoire	Central African. Rep	
Malawi	Gambia	Chad	
Mauritius	Ghana	Congo, Dem. Rep	
Mozambique	Cape Verde	Congo, Rep	
Rwanda	Guinea-Bissau	Equatorial Guinea	
Seychelles	Mali	Gabon	
Tanzania	Niger	South Africa	
Uganda	Nigeria	Swaziland	
Zambia	Senegal	Lesotho	

POST NON-FINANCIAL HORIZONTAL MERGERS AND ACQUISITIONS PERFORMANCE IN NIGERIA: ANY SPILL OVER EFFECT?

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Abstract

This study examines horizontal non-financial post mergers and acquisitions performance and spill over effect in Nigeria from 1991 to 2016 with 90 sampled entities using residual income valuation (RIV) for operating performance, non-parametric frontier *analysis data envelopment analysis and parametric model (stochastic frontier analysis) for efficiency and Malmquist productivity index for productivity. The results with robustness check indicate the realisation of expected merging firms' improvement in cost efficiency after mergers and acquisitions (M&A) but not on operating performance, technical and productivity efficiency. In addition, the results reveal a positive spill over effect after M&A on the non-merging firms' technical efficiency and a short-run operating performance improvement one year after activities. Also revealed is a significant decline in technological change after M&A. Improving and maintaining significant firms' growth after M&A implies some level of government course of action inventiveness. As a suggestion, this can be done by government liberalising economic atmosphere to entice investors that will not just be responsible for funds provision when taking over, but delivers needed current technological development to the companies. Thereafter there is need to continue to encourage development driven M&A between companies that deliberately preserve an advance principles and creating all-encompassing investment in research and development.*

Keywords: Post-Merger Performance, Spill-over effect, Residual income valuation, Data envelopment analysis, stochastic frontier analysis and Nigeria.

JEL Classification: G34, B26,

1.0 Introduction

Mergers come about when two establishments happily agree to work in partnership with each other by assembling their available assets, liabilities, and cultural values on a moderately equal basis across different businesses and industries. On the other hand, acquisitions occurs when one business buys and takes over the operations of

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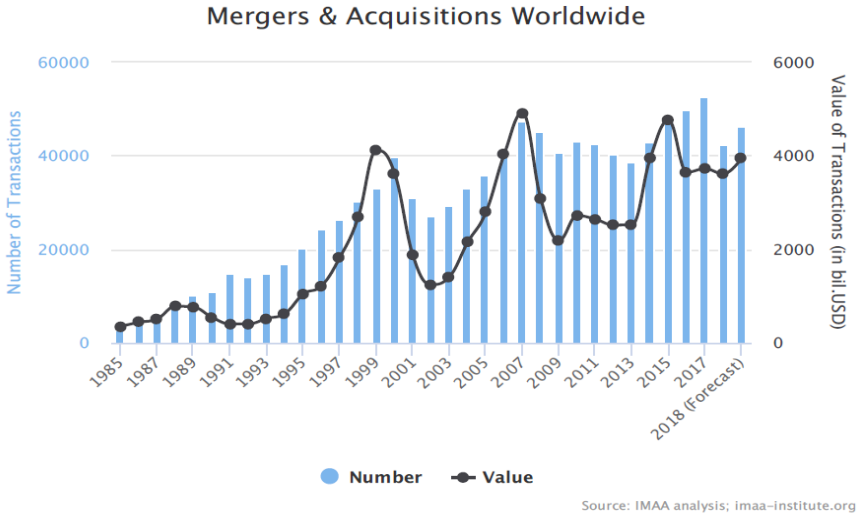
another organization. There are three major types of mergers and acquisitions (M&As), namely horizontal, vertical and conglomerate. Mergers permit firms to advantageously gain efficiencies and accomplish synergies by integration with horizontal peers or with customers and suppliers (vertically). Conglomerate comprises the coming together of two firms in different industries not related to each other. This implies that there is no common factor in conglomerate between the firms in terms of production, marketing, research and development (R&D) or technology, but a leading company that set in motion such a merger or acquisition. The primary objective of firms is to grow profitably and competitively. Such growth could be internal or external or both (Gaughan 2012). Internal growth, also known as organic growth, is a firm's expansion of its business operations by relying on and developing its own internal resources and capabilities for competitive advantage. It can be a result of developing new products, increasing the capacity of existing products, or sustained improvement in sales, developing new market such as exporting into other economies and growing a customer base through marketing.

External growth, also known as inorganic growth, is the ability of a firm to increase its business reach by using resources and capabilities that are not internally developed by the firm itself, but are obtained through merging with or acquiring of or partnering with other firms. An example is the experience of giant companies like Intel and Microsoft. Learning from Nokia crisis and the demise of DEC, Intel and Microsoft went into strategic alliance and built strategic resilience to deter competitors from market dominance. Both firms successfully created co-ownership of the industry standard for personal computers (PCs) which is windows operating system (WOS). Such alliance brings switching cost to competitors and creates an incomparable competitive advantage in the business of microprocessor for PCs for the firms. This way, even though competitors can create better microprocessors, they still have to switch, at a high cost, to using WOS, which has been made the industry's standard operating system to run their microprocessors in order to survive in the market (He, 2012). From this point, M&A is an important external growth strategy and has become a necessary tool used by firms to attain external growth (see, for example, Klimek, 2016; Vazirani, 2012; Golubov, Petmezas & Travlos, 2012a; Cameron & Green, 2015).

As an external growth strategy, M&As has increasingly become predominant features of global business growth strategies. It has become an all-embracing occurrence globally as a natural process of business restructuring (Han, Nanda &

Dino, 2016). The executives of the merging firms mostly take to M&A activity because of continuous pressure from the shareholders for a consistent improvement in expected investment results (Ellisson, 2011). Evidence from M&A worldwide transaction in Figure 1.1 attests to the growing global embrace of M&A. From about 2000 number of deals at about $300 billion in 1985, M&As have grown well above 40,000 number of deals at well above $3900 billion in 2017. Golubov, Petmezas and Travlos (2012) mentioned M&A activities come in different waves and the peak of the merger wave of 2007 witnessed significant increase in corporate spending, where more than $4 trillion US dollars or 7.5 percent of the world gross domestic product (GDP) were involved in M&As globally. IMAA (2018) result shows that by 2017, the value of global M&A is above 3900 billion USD and a number of transactions above 50,000. The is almost a consistent increase in number and value of M&As worldwide evidence (Figure 1.1) from 1985 to 2018 with the wave's corresponding significant increase. This implies that M&A is continuously growing and more likely wave expected in the future. M&As in developed countries facilitate rapid growth and development of their economies (Khanal, Mishra & Mottaleb, 2015).

Figure 1.1: Mergers and Acquisitions Worldwide



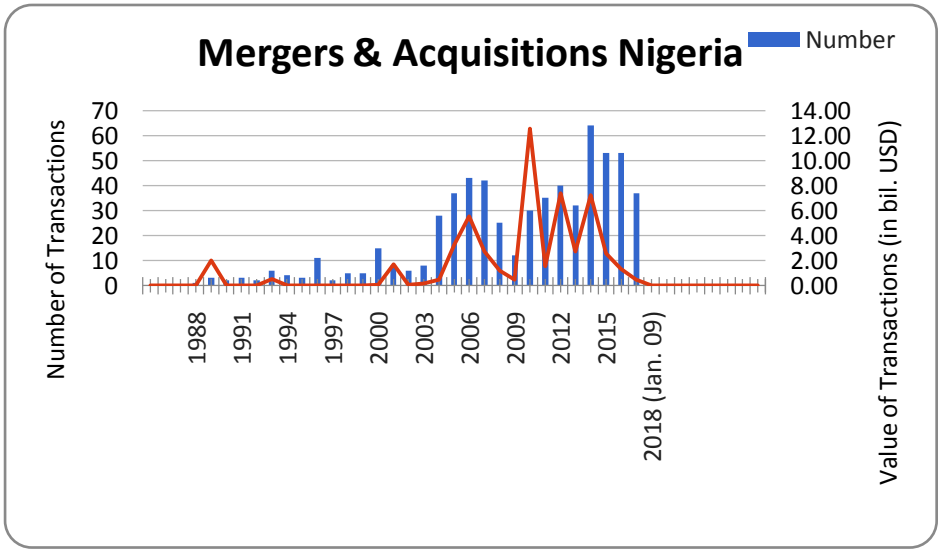
Source of Data: Institute of Mergers, Acquisitions and Alliance (IMAA, 2018)

M&As are implemented in developing countries as a means of combining resources and strengths to optimally create revenues and ensure survival, profitable growth, economic rationalisation, and economies of scales among other synergistic

improvements. As many countries have embraced M&A, Nigeria is no exception. Nigeria's M&As, like any other country with sound financial system, are directed with guiding principle, recommended procedures, and regulated by statutory bodies. This is to ensure that all M&A activities take place in an informed, competitive and efficient market. The law that controls M&As in Nigeria is predominantly the Investment and Securities Act 2007 (ISA), in collaboration with the rules and regulations of the security and exchange commission (SEC) as well as the corporate affairs commission (CAC) and the federal inland revenue services (FIRS). M&A in Nigeria comprises either purchase of possessions and obligations of another entity or the purchase of stocks in an existing Nigerian firm.

M&A literature in Nigeria indicates no significant activity until 1982 (Omoye & Aniefor, 2016). However, official statistics reveal that from 1992 onwards, there have been series of M&As in Nigeria (IMAA, 2017). Figure 1.2 shows the pattern of Nigeria's M&A activities to be consistent with the global M&A trend. The trend shows that from about 5 M&A deals in 1992 with an insignificant value, M&A deals increased to about 50 deals at a value of about 10 billion USD in 2016.

Figure 1.2: Mergers and Acquisitions in Nigeria



Source of Data: Institute of Mergers, Acquisitions and Alliance (IMAA, 2018)

Although it may raise concerns about M&As as most appropriate growth strategy as well as its potentials at generating expected gains, such non-linear trend

characterizes most dynamic economic systems. Most M&A activities in Nigeria involved the involuntary M&A related sector while voluntary M&As activities seem unnoticed to both the economy and in the sector. The involuntary related M&As took place in Nigeria particularly after the year 2004, as the federal government directed, through the central bank of Nigeria, that all banks should increase their share capital base from initial 2 billion Naira to 25 billion Naira by end of January 2005. Prior to the recapitalization exercise, there were 89 banks in Nigeria as at the year 2004. Out of this number, 25 banks came to exist after this dateline, indicating an uneven spread of non market driven involuntary M&As activity within one year. Furthermore, these involuntary related Nigeria's M&As are being examined mostly on short-term performance basis not on a long-term operating performance measure after M&A transactions. The direction of empirical inquest in Nigeria, is due to a number of empirically unresolved issues enshrined in the section that follows.

It is worthwhile to mention that in Nigeria, there are monopolistic tendencies by the horizontal M&As, because the economic sectors are not only small but also controlled by limited number of competitors. Consequently, this may lead to unnecessary price increase of goods and services if anti-trust laws are not fully implemented. M&A studies in Nigeria, mostly in the banking industry focused on short-term accounting returns, event study or on financial performance ratios (Umoren & Olokoyo 2007; Achua & Ola, 2013), stratified sampling technique (Onikoyi and Awolusi, 2014) and explorative research methodology by (Ebimobowei and John, 2011) making long-term investigation with frontier analysis scarce. Pevcin (2014) and Sav, (2012) remarked frontier analysis as one of the best approach to investigate efficiency, better than the traditional financial ratios as it uses input and output. This consist of data DEA non-parametric model and SFA models. The event studies evaluate the abnormal share prices of the bidder firms within the M&A interval as a signal of the observed economic effects of the amalgamation. The operating performance from the conventional financial ratio analysis is in determining if any significant changes in mainly performance associated ratios before and after M&A transactions. Residual income valuation (RIV), Guest, Bild and Runsten (2010) applied as suitable in investigating U.S public post M&A firms operating performance. Cost of equity is considered in the model that accounts for time value of money and risk of investment while Aggelopous and Georgopoulou (2015) applied in Greece post M&A operating performance. Malmquist productivity index (MPI) for productivity in measuring firms total factor productivity between two data points. Cummins and Xie (2008) stated MPI as suitable in studying M&A productivity as it's decomposed into catch-up and frontier

shift. Singh, Roy and Tripathi, (2013) remarked Mann Whitney U-test as appropriate significant test for two independent non-parametric data and Kruskal Wallis test for three independent groups. Kruskal Wallis test applied as a statistical test for robustness check, considering three groups: bidder, target and non-merging companies' measures. The assessment of these companies' performance after M&A, whether successful or failure needs to be considered and evaluated with the stakeholder's time value for money and risk of investment. This brings to fore the significance of cost of equity of the stakeholders' fund as an important variable in any approach applied in the firm's post-merger evaluation. This evaluation approach raises another fundamental issue of the merging firm's appropriate benchmark, as these merging firms are different from two separate firms there were before mergers.

Based on this, is the appropriateness of the external benchmark of control (non-merging) firms not involved in merger but on the basis of shared characteristics with the merging firms. This being better and only determinant of the shareholders return, as if there was no merger (Sudarsanam, 2010). This is because of the logical assumption, that firms sharing same characteristics would produce similar performance, yielding same returns to the shareholders. In addition to the benchmarking issue, is the appropriate timescale of evaluating the fundamental firm value, if any benefit (destruction) has been created to the stakeholder's investment. Ramakrishna (2008) investigated long-term post-merger evaluation of firms in India operating performance and efficiency utilised 3 years before and after mergers. Other long–term studies utilising three years before and after M&A in investigating operating performance include; (Ghosh, 2001), investigating if post synergy leads to improved operating performance and (Sharma & Ho, 2002) in Australia. The efficiency impact of mergers and acquisitions needs a sufficient long-term before evaluating. This is because, efficiency improvement occurs over a long time horizon, not with short intervals (Rahman, Lambkin & Hussien, 2016; Rahman & Limmack, 2004). Involuntary M&As studies in Nigeria is focused on how M&A activities impact performance of acquirer and target company share prices, mostly on short-term performance evaluation (see for example Onikoyi & Awolusi, 2014; Omoye & Aniefor, 2016). It does appear that little attention is paid to long-term impact of M&A and the non-merging competing companies, particularly the non-financial horizontal voluntary M&As. The short term performance study, according to Ramakrishnan (2008), is unable to determine whether M&A leads to long-term economic benefits, because of using accounting measure for post-M&A performance evaluation. This is because accounting data are short-term

economic measures and are characteristically imperfect and are affected by the M&A accounting methods (pooling or purchase) as well as payment method (cash, debt or equity or by combination). Furthermore, apart from the fact that such data are inappropriate for assessing long term economic performance, results obtained from such data for merged firm may be incomparable with other firms over time. An investigation of the competing companies' effect in combination with the conventional focus on amalgamation company effect that distinguish between synergistic consequence and market power effect in this disposition regarding M&A activity positively is deserved.

Peyrache (2013) stated that realization of efficiency impact in an M&A is not a short-term evaluation issue, because it takes longer time for efficiency to be realised. These references, therefore highlights the importance of horizontal voluntary M&A on a long term investigation. Based on these references, this study applied 3 years as an appropriate time in evaluating long term non-financial voluntary horizontal companies' performance that seem unnoticed or neglected in Nigeria. M&A literature reveals that most studies in Nigeria focus on involuntary related sector on returns on investment with mixed results (see for example, Efereakeya & Alagba, 2015; Aluko & Oyebode, 2014). Voluntary non-financial horizontal related M&As in Nigeria appears to have been overlooked or scarce in empirical studies thereby making its synergistic potentials open to questions, when it has been in existence and increasing since the 1990s. The involuntary M&As literature mostly investigated in Nigeria reveals that the merging firms (bidder and target) are examined for the impact of M&As on the bidder firms' stock (Achua & Ola, 2013). This suggests that the competitiveness of the non-merging involuntary rival firms appears to receive less attention in empirical studies. The consequence of this oversight along with the research gap is that performance of involuntary merging companies cannot be adjudged empirically as better than the non-merging companies. These studies in Nigeria are on involuntary not voluntary post-M&As operating performance. Current industry related M&As (1990s-2000s) suggest further study on market driven (Aik, Hassan, Hassan & Mohammed, 2015), in accordance with the M&A direction undertaken by the banking sector in Nigeria. Thus, in Nigerian context, investigating voluntary post M&A in terms of operating performance, technical, cost efficiency and productivity compared with the non-merging firms for any spill-over effect that is scarce becomes necessary. This is because, results on the financial related post M&A alone may not justify evidence of current M&A transactions in Nigeria in totality or being generalised or substituted for the voluntary M&A. Hence, a research gap existing on both post M&A

evaluation on voluntary M&A and the impact on the non-merging firm's (spill-over) literature in Nigeria in a long term. Rahman, Ali and Jebran (2018) and Sung and Gort (2006) remarked that share price investigation is an examination of the market confidence in benefits from merger. Thus, share prices and amalgamation positive relationship may not be a resounding confirmation of mergers expected benefits. Consequently, the abnormal returns' nonappearance after short interval M&A objectively serve as a strong signal that economic gains (synergies) must be transformed into performance gains with an additional period.

Therefore, different from the conventional short interval investigation, this study contributes by assessing real long-term benefits of non-financial voluntary horizontal M&A from 1991 to 2016 in Nigeria. It deviates from other M&A studies in Nigeria because it attempts not only to examine the fundamental value formation or (destruction) as a result of M&A, but also established whether the anticipated economic benefits are truly accomplished in the long term. Furthermore, this study attempts to advance on the proof from traditional analysis of financial ratios by investigating before and after M&A comprehensive information using frontier analysis. The frontier analysis employ both input and output in the model an important benefit over the accounting ratios before and after M&A. On the other hand, this study offers a complete empirically relative performance of non-merging firms competitors to bidder companies by evaluating competitive effect, which is not recorded or scarce in any past Nigeria's M&A writings. These study findings will guide significantly and be very useful to policy makers in the country in term of re-appraising or total review of mergers and acquisitions guidelines for continuous and steady result oriented effective M&A. These are the motivations for this study. The purpose of this paper is contributing to filling these gaps. This paper is structured as follows; Section 2 reviews the related literature and empirical findings on M&As. The description of data and methodology is in section 3. The presentation of results and discussion is in section 4 and conclusion in section 5.

2.0 Literature Review

The three major areas that past studies on M&A covered mostly in the developed countries like United States of America and European Union combined covered on failure or success (though not exclusively) are event studies, operating performance and dynamic efficiency. Event studies in principle, analysis abnormal share price changes of the amalgamating companies around M&A announcement, a pointer of seeming economic effect of M&A. Operating performance originates typically on the conventional performance connected

ratios before and after M&A activity while dynamic efficiency is from the rapid development of frontier methodologies. Share prices and accounting profits are valuable performance indicators but have been criticized for not reflecting real changes of companies in a long term (Guest, Bild & Runsten, 2010; Kohers, Huang & Kohers, 2000) as accounting methods are subject to manipulation and the efficient market hypothesis dishonored. The conventional stock market event analysis measurements of net returns of the bidder and target companies provides a forecast of expected benefits or losses to the shareholders of merging firms rather than evidence that the benefits (or losses) really occurred as argued by Aik, Hassan, Hassan and Mohamed (2015). Alexandridis, Antypas and Travlos (2017) investigation aim was whether M&A creates value to the bidder firms after M&A of listed target firms in US between 1990 to 2015. Grouping the data into 1990 to 2009 and 2010 to 2015 of several different industries not on specific non-financial or financial industry, the result showed a significant value creation for post 2009 M&A bidder firms' shareholders using event methodology. Alexandrou, Gounopoulos and Thomas (2014) studied all shipping mergers and acquisitions from 1984 to 2011 in the US. and the result indicated that shareholders of acquirers and targets realise average abnormal gains of 1.2% and 3.3% respectively and parties gain more from diversifying than focus-increasing deals. Acquirers gain more when paying with stock, in cross-border deals and from taking over public targets. Targets firms gain more from focus-increasing transactions using event methodology. Rao-Nicholsona, Salaberb and Cao (2015) considered post M&A in ASEAN countries from 2001 to 2011 taking three years pre and post period. The result industry-adjusted operating performance inclined to decline 3 years after an M&A. Thus, this suggests that M&As completed during the financial crisis are more profitable than those implemented before and/or after the financial crisis. The argument being mainly due to the synergies created between the firms' resources through the crisis which predict well for firms' economic performance. On the other hand, during the crisis, certain characteristics of the firms like the relative size of the target, acquirer's cash reserves and friendly nature of deals are important determinants of long-term post-M&A operating performance. Though, for M&As during the crisis, there seems to be no relationship between performance and firms' characteristics linked to M&A activity such as payment method, industry relatedness and percentage of target's share acquired. Wanke, Maredza and Gupta (2017) purpose investigated post M&A performance of banks in South Africa as a strategic assessment, using network DEA model to compute the impact of contextual variables on different types of efficiency scores resulting from the merged banks: global, technical

harmony and scale differences with a robustness regression. The result showed bank type and origin impact computer-generated efficiency.

Observing from these literature mostly from developed economies, there is none on developing economy such as Nigeria as well as on application of frontier methodologies (DEA and SFA) on non-financial M&As comparatively with the non-merging companies. This, according to (Akpan, Aik, Wanke & Wongh, 2018) is as a result of necessary data base for research and scholars on M&A are mostly in the American universities. These studies cover major aspects of the operating performance and the dynamic efficiency. Dynamic efficiency relates to the frontier methodologies incorporating both the parametric, stochastic frontier analysis (SFA) model and non-parametric, DEA models in examining efficiency and Malmquist index for productivity improvement after M&A of the merging firms (Aik, *et al.*, 2015). Charnes, Cooper, and Rhodes (1978) introduced DEA founded on Farrell's (1957) seminal paper on the public and not-for-profit businesses, where prices were probably not available or reliable and additionally where typical economic objective such as cost-minimization or profit-maximization may not be the ideal target. When there are multiple inputs and multiple outputs in a firm production, the simple ratio becomes inadequate. This is because efficient unit according to a ratio cannot be efficient according to another ratio (Karaduman, 2006). In preventing this deficiency, the ratio of virtual output to virtual input is use and the index of this ratio is total factor productivity (Karaduman, 2006). This implies that DEA performs through the concept of total factor productivity. DEA model was developed for the analysis of the technical efficiency of such entity. It is called DEA because statistics from the finest practice decision-making units (DMUs) create the production frontier then "envelopes" the statistics from other DMUs. Cummins and Rubio-Misas (2006) discussed the benefits of DEA that it does not require an outright specification of cost function but rather computes efficient "best-practice" production and cost frontiers obtained on linear combinations of firms in the industry. Efficiency is measured at a time while Malmquist TFP index enable the measurement of change in TFP over time between two data points and its separation into technical efficiency (catch-up) and technological change (frontier shift) . This becomes necessary as changes in efficiency each year is as a result of technical efficiency or technological change. Thus, making the Malmquist TFP application in this study significant.

Scippacercola and Sepe (2014) argued that in DEA, many inputs and outputs are jointly considered, and that it uses the principle of linear programming to

investigate how a particular DMU operates relative to the other DMUs in the pool. Stochastic frontier also called composed error was introduced by Aigner, Lovell and Schmidt (1977). Sigala Jones, Lockwood and Airey (2005) argued that SFA is one of the most popular efficiency estimation methods, adding that it is simple and easier to use. Acquah *et al.* (2014) argued that since SFA is another model of evaluating efficiency it is important that SFA is applied also in order to see whether different methods used can affect the efficiency in the study. Pevcin (2014) used SFA and DEA comparatively to study the efficiency of Slovenian municipalities for the year 2011. The result showed that inefficiency from SFA model was between 22 to 25 per cent while DEA gave the range from 12 to 18 percent. In addition, DEA result implies that more technical efficiencies are obtained under it than under SFA. He further stated that the advantage of one sometimes represent the disadvantage of the other. On account of the arguments made for the use of SFA comparatively with DEA, this study applies both methods to ensure robust research outcome. The parametric (econometric) and the non-parametric (linear programming) evolution frontier efficiency methodologies in the study of firms operating performance has made the conventional techniques to become out-dated with regards to firm performance. The concept of the residual income valuation (RIV) eliminates all the uncertainties and the critics on accounting ratios and share prices because it considers the cost of equity in the evaluation of the fundamental value of the firms before and after M&A (Guest, Bild & Runsten, 2010). Guest*, et al.,* 2010) argued that both event study methodology and accounting returns methodology had limitations of not determining true fundamental valuation returns of an amalgamation. They adopted residual income valuation (RIV) in the comparison of the fundamental value of acquirers before amalgamation and after the amalgamation. If the difference between post and before is positive, it means that they have been a realisation of the synergy of the amalgamation, but its negative value implies non-realisation of the synergy. RIV has the following advantages: - Whether the company pays dividend or not or where dividend cannot be predicted, the free cash flow is negative for a comfortable forecast time period and the estimation of the terminal value is very uncertain (CFA Institute, 2017). Interesting, the target of each of these method and models is finding out if M&A improves the efficiency, operating performance of the merging firms relative to the industry (Cummins & Xie, 2008).

The reasons why firms are acquired by another or merge with another ranges from those predicting that M&A increases firm's value and those that argue that it reduces firm's value. The generally accepted three theories of M&A are efficiency,

agency problem and the hubris hypothesis. The fundamentals for M&A is the efficiency theory presented as value maximisation decisions, as it is expected that both the bidder and target firms shareholders will benefit from the expected economic gains. The managerial self–interest theories made up of both agency problem and the hubris hypothesis are non-value maximization decisions. This is because the bidder firm's management uses the target in extracting value from their shareholders then sharing it with the target shareholders. Because of this value extraction, is the expectation of positive gains by the target shareholder and negative for the bidder firms shareholders. The hubris theory is a situation that the management of the bidder firm's being made to over pay the target firm out of pride, leading to the same result as the agency problem as treasure is moved from the bidder firm shareholders to the target shareholders. In most cases the M&A rational are not inextricable; therefore, different theories may have related ramifications on M&A effect but work together in bringing about the deal. Fee and Thomas (2004) stated from their study on sources of gains in mergers from customer, supplier and rival firms, an improved productive efficiency and buying power as sources of gains to horizontal mergers. Du and Sim, (2015) studied mergers and acquisitions, and bank efficiency, and the result showed that target banks are more efficient after M&A. This further suggests that in emerging countries, bank's M&A can lead to efficiency improvement for the combined entity. In accrediting firms performance to an M&A, it is conventional to compare the treatment group (bidder and target firms) with the control firms; these control firms having similar characteristics with the bidder firms but not involved in an M&A, before and after M&A (Sudarsnam, 2010). Hence, any noticeable difference with some reasons can be mostly accredited to the M&A transaction. Bruhn (2017) investigated spill over effect in Brazil's domestic extracting and processing industries mergers and acquisition in the form of technological change (TC) and catch-up (EC) change. Using DEA and input-based Malmquist index but not considering the operating performance, the result indicates an affirmative relationship between TC and M&As carried out by Brazilian majority capital acquiring overseas-held capital, from a company established overseas.

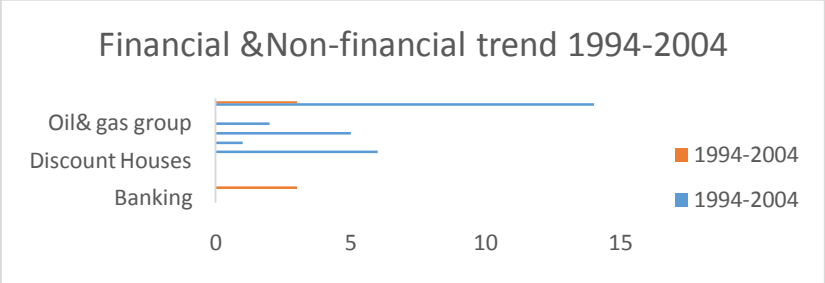
In addition, only those sectors proficient of cumulative productivity through TC benefited from the technology transfer. Past studies (Aik, *et al*., 2015; Ali & Gupta,1999), are studies documented in literature having included the control firms in their evaluation of M&A in providing a benchmark measure before and after M&A takeovers performance. The measuring of post-merger performance is better using external benchmark (Sudarsanam, 2010). These are those firms with the same

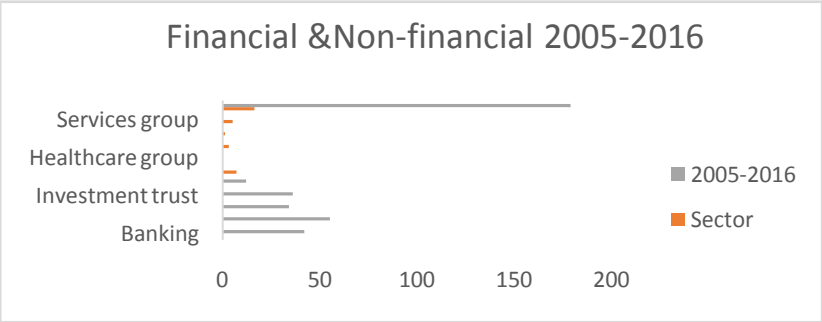
characteristics as the acquiring firm that are not involved in mergers called control firms or matching firms. The same merging firm's characteristics with the control firms make it proper benchmark of producing same shareholders' value performance without mergers, since they are also with same systematic risk. This is because, by capital asset pricing model (CAPM), the firm specific risk is eliminated through investor's well diversified portfolio (Sudarsanam, 2010). Past studies (Aik, *et al.*, 2015) presented here are mostly from the developed countries with few from other developing economies. Efficiency gains from M&A evidences are mixed. Studies from (Jin, Leem &Lee, 2016; Gomes, Angwin, Weber & Tarba, 2013) suggest mergers has potential in providing efficiency. Considering Nigerian case, M&A literature is concentrated on financial sector (Onikoyi & Awolusi, 2014) to the disadvantage of the customer goods industries and its accompanying spill-over effect on the non-merging firms may occur. This study provides contribution to literature not just by value creation or destruction investigation on a long-term bearer but importantly in the non-financial areas considering the impact of these M&As on the non-merging firms that is rare.

Nigeria's M&A contextual

The idea behind this is that, even if after M&A and not much significant improvement is achieved by the merging firms, it stimulates other non-merging firms. Hence, bringing about effective competition that benefits the consumers, as the likely unnecessary price increase may not occur. Nigeria is a small scale economy with a monopolistic tendency, thus anti-trust laws are not effective and well implemented. M&As literature reveals that most studies in Nigeria focus on involuntary related sector (see for example, Achua & Ola, 2013; Aluko & Oyebode, 2014; Efereakeya & Alagba, 2015). Voluntary horizontal related M&As in Nigeria appears to have been overlooked in empirical studies thereby making its synergistic potentials open to questions. There are quite a number of voluntary related M&As in Nigeria as presented in figure 1.1

Figure 1.1 Trend of Financial and non-financial M&A 1994-2016





Source: Researcher extracted data from the Nigerian Security and Exchange Commission

Nevertheless, there is little or no empirical proof of its strength in the non-financial sector, which plays a significant role in the development of Nigeria's commercial base and national economic growth within the period 1991-2016. Even when challenges of M&A integration is feasible, it cannot be ascertained or established. Consequently, this has created a research gap in involuntary and voluntary horizontal M&As in the non-financial sector in Nigeria. The involuntary M&As literature mostly investigated in Nigeria reveals that the merging firms (bidder and target) are examined for the impact of M&As on the bidder firms' stock. This suggests that the competitiveness of the non-merging involuntary rival firms appears ignored or overlooked. The consequence of this oversight along with the research gap is that performance of involuntary merging firms cannot be adjudge empirically as better than involuntary non-merging. It is crucial to carry out a comparative investigation of merging and non-merging involuntary (voluntary) firms that will establish or ascertain if any positive (negative) impact (spill over) effect occurs after M&A activity. Non-merging involuntary or voluntary firms are scarce or not addressed in Nigeria's M&A literature. Hence, from gaps identified in the literature, hypothesis of the study are as follows: H1: Due to better utilisation of fixed assets and lower cost, M&A in Nigeria produce higher value generation, stimulating the non-merging firms. H2: Nigeria's M&A produces higher operating efficiency on a long-term due to synergistic effect arising from moving toward the efficiency frontier of best practices. These hypothesis are tested against different time intervals using non-parametric, parametric and Malmquist TFP models advantages discussed above on the non-financial and efficiency evaluation. In the next section the justifications for the models are discussed.

3.0 Data and Methodology

3.1. The data

The sample is drawn from all listed non-financial merging companies that have initiated and completed M&A from 1991 to 2016. This period provides focus on M&A as well as ensuring sufficient pre-and post M&A data availability. The total bidder firms were 30 and 30 target firms. The sample selection criteria were as follows. (a) The bidder firm must be listed in NSE and acquired more than 60% voting rights of targets with the assumption that 60% is sufficient to give control as identified in section 313(1) of the reviewed Security and Exchange Commission Act of 2011. (b) The target firms being listed firms on the NSE. (c) The amalgamation is restricted to voluntary horizontal type of M&A that takes place in the same industry among companies with same or similar products, services, markets and technologies. (d) Both the bidder and target firms are Nigerian domiciled not foreign firms. (e) The amalgamation of businesses that acquirers already acquired more than 60% stake or related firms are excluded. This is because such arrangement or transactions do not show a firm's intention to seek external growth (Song, Alli & Pillay, 2005b), which is the responsive focus of this study. Thus, including them could amount to a spurious research finding. (f) The amalgamation involving investment trust and financial institutions (Banks and insurance firms) which are mostly involuntary with government interventions are excluded, because their accounting requirement needs to be treated separately. (g) The firms must have three years of pre-M&A, and post-M&A financial data available for use excluding the amalgamation year. A matching firm of similar asset base or market capitalisation, similar year of establishment, in the same horizontal business or services are generated. The study examines if there is any spill over effect of M&A on non-merged firms did as such, but relevant in an M&A study when comparing non-merging with the bidder firms post performance after the activity (Aik *et al.*, 2015).

3.2 Methodology

Four different measures are used in assessing the changes in performance before and after M&A. These are suitable in measuring the accomplishment level of anticipated improvement in companies' performance on a long term. Operating performance measured in terms of annual increases (decrease) in RIV. Others are technical efficiency, total factor productivity (TFP) and cost efficiency that uses same set of multiple inputs and outputs, exception being cost efficiency that requires additional price information

3.2.1 Residual Income Valuation

The Residual Income Valuation (RIV) - earlier applied by (Guest, *et al.,* 2010), Feltham and Ohlson (1995) to examine the value creation process in M&As – departs from the cost of capital, the interest discount rate, and the investment risk. The simple RIV model is equivalent to the present value of the expected dividends applied by Feltham and Ohlson (1995) is given as:

$$FS_t = \sum_{i=1}^{\infty} \frac{E_i[D_{i+1}]}{(1+r_e)^i} \quad \text{.....(1)}$$

Where FS_t is the stocks fundamental valuation at period t; $E_i[.]$ is the expectation from data available at period **t**; D_{i+1} is the dividend for the period t+1; and r_e is the cost of equity. Additional supposition is the clean surplus accounting relationship, which states that all the modifications in the book value of equity has to pass through the income statement:

$$BV_t = B_{-1} + NeI_t - D_t \quad \text{.....(2)}$$

Where BV_t the book is value of equity at time **t**, and NeI_t is net income for the time **t**. The origin of this assumption is that it allows dividends expressed in terms of future returns and book values. Ploughing eq. (2) into (1) it comes:

$$FS_t = BV_t + \sum_{i=1}^{\infty} \frac{E_i[\mathrm{Nel}_{i+1} - r_e.\mathrm{B}_{i+1-1}]}{(1+i)^i} - \frac{E_i[\mathrm{B}_{i+\infty}]}{(1+r_e)^{\infty}} \quad \text{..... (3)}$$

The last term in eq. (3) is assumed to be zero as the value tends to infinity while the second term is the present value of future residual income. Therefore, the present value sum of the future residual income becomes equal to the fundamental value:

$$FS_t = BV_t + \sum_{i=1}^{\infty} \frac{E_i[\mathrm{Nel}_{i+1} - r_e.\mathrm{B}_{i+1-1}]}{(1+i)^i} \quad \text{..... (4)}$$

Therefore, eq. (4) signifies the sum of the book value and the present value of the future residual earnings. The variance concerning the values computed using eq. (4) before and after the M&A gives the fundamental value created or lost by the acquisition. For further derivations (see Guest *et al*., 2010; Penman, 2004, 2007; Feltham & Ohlson, 1995).

Therefore, operating performance (OP) using residual income valuation (RIV) model as Guest (2010) applied is as follow:

$$FV_{before} = \frac{E_{-1}(DPS_0)}{(1+r_e)} + \frac{E_{-1}(BvPS_0)}{(1+r_e)} + \frac{E_{-1}(EPS_{+1} - r_e BvPS_0)}{(1+r_e)^2} + \frac{E_{-1}(EPS_2 - r_e BvPS_1)}{(1+r_e)^3} + \frac{E_{-1}(EPS_3 - r_e..BvPS_2)}{(1+r_e)^4} \quad \text{..... (5)}$$

$\mathrm{FV}_{\mathrm{before}}$ = value of acquirer company before M&A or pre acquisition value

E-1(DPS 0, 1, 2,3) = the expectation of dividend per share in year of acquisition, one year after acquisition, two and three years after acquisition.
E-1(BvPS 0, 1, 2, 3) = the expectation of book value per share in the year of acquisition, one year after, two and three years after acquisition.
r_e = the cost of equity

$$FV_{post} = \frac{DPS_0}{(1+r_e)} + \frac{BvPS_0}{(1+r_e)} + \frac{EPS_1 - r_e.BvPS_0}{(1+r_e)^2} + \frac{EPS_2 - r_e.BvPS_1}{(1+r_e)^3} + \frac{EPS_3 - r_e.BvPS_2}{(1+r_e)^3 r_e} \quad \text{.....(6)}$$

FV_{post} = value of acquirer after M&A or post acquisition value

DPS = dividend per share first term, BvPS = book value per share in the year 0 second term. r_e = the cost of equity, *EPS*= earnings per share.

Dependent variable (DV) is a variable expected to be determined by or initiated by another, which is independent variable while independent variable (IV) is a variable believe to cause or control a dependent variable (Babbie, 2010). $FV_{(post)}$ and $FV_{(before)}$ are dependent variables, independent variables are:- Dividend per share (DPS), BvPS (Book value per share, and r_e (cost of equity)

The difference between FV_{post} and FV_{pre} gives the fundamental value created or lost by the acquisition. A positive value indicates value created, negative value indicates value lost.

r_e = cost of equity, obtained and applied from the capital asset pricing model (CAPM).

CAPM is expressed as:

$$r_e = r_f + (r_m - r_f)\theta_i \quad \text{.....(7)}$$

Where r_f is the risk- free rate of interest

r_m is the return on the Nigerian stock exchange composite index (NCI)

θ_i is the beta of the ith firm.

An affirmative difference specifies that value has been created. (Bild, Guest, Cosh & Runsten, 2002) argued from the financial theory perspective, if the marginal returns from mergers is not greater than the marginal cost, no fundamental value is created. For additional derivations, readers should refer to these authors.

3.2.2 Technical Efficiency

The concept of technical efficiency by measuring the distance between the observed level of production and the production frontier was first introduced by

Farrell (1957). Since then, diversity methods have appeared too prominent and pioneering being non-parametric (DEA) and parametric SFA. DEA model for technical efficiency proposed by Charnes *et al.* (1978) in ratio form given as (Bader, Mohammed, Ariff and Hassan, 2008) did is expressed as follows:

$$\text{Max} \quad \beta\,(u_r v_i) = \frac{\sum_{r=1}^{s} u_r \varphi_{r0}}{\sum_{i=1}^{m} v_i x_{io}} \ldots\ldots\ldots \quad (8)$$

$$\text{Subject to} \quad \frac{\sum_{r=1}^{s} u_r \varphi_{rj}}{\sum_{i=1}^{m} v_i x_{i0}} \leq 1 \quad j = 0 \ldots n$$

$$\frac{u_r}{\sum_{i=1}^{m} v_i x_{i0}} \geq \varepsilon \quad r = 1, \ldots s$$

$$\frac{v_i}{\sum_{i=1}^{m} v_i x_{i0}} \geq \varepsilon \quad r = 1, \ldots m$$

ψ_{rj} is quantity of output r produced by firm j

x_{ij} is quantity of input i used by firm j

u_r is weight of output r

v_i is weight of input i

ε = the small positive number to hinder weight from becoming zero.

Because managers of firms are most easily in control of input variables, while maintaining at least a given output level, input-oriented DEA model following Fare, Grosskopf and lovell (1994a, 1994b) is used as this study is input-reducing focused with constant returns to scale (CRS). According to Coelli *et al.* (2005), choosing a model, whether input or output, should be based on what input agents (managers) are controlling most. Technical efficiency for a DMUj that produces b output with different c inputs is obtained as follows; first, is solving the equation (7) from the DEA fractional form. In solving this problem, linear programming is used to convert it to linear (Bader *et al.*, 2008). The achievement of this is by setting the denominator equal to a constant, thereby maximising the numerator (Bader, Mohammed, Ariff & Hassan, 2008) Thus:

$$Min_{\varphi\omega} \ \varphi$$

On the condition that: $u_{jb} \leq \sum_{J=1}^{J} \omega_j u_{jb}$ b = 1 …, M ..... (9)

$$\sum_{J=1}^{J} \omega_j x_{jc} \leq \varphi x_{jc} \quad c = 1 \ldots, N \qquad \ldots\ldots\ldots\ldots (10)$$

$$\omega_j \geq 0, \quad j = 1 \ldots J$$

Where $\varphi(\text{Dependent variable})$ is the quantity of efficiency to be measured and evaluated for each DMU $_j$, u_{jb} (indepent variable) is output quantity b (NOPAT) produced by DMU $_j$, x_{jc} (independent variable) is the input quantity c (total assets, labour cost and capital cost) produced by DMU $_j$, ω_j is the intensity variable for DMU $_j$. These same input and output variables are used in productivity efficiency

while input prices is additional information for the cost efficiency evaluation. Equations (9) and equation (10) specify the conditions of the output and input. When φ =1, it implies that the DMU is efficient, but if φ < 1 means that the DMU is not efficient.

3.2.3 Stochastic Frontier Model

In this study with three inputs and one output applying the SFA model to estimate technical efficiency, we applied Translog production function with truncated-normal distribution made popular by Fuss & McFadden, (1978). Translog functions do not require that the data fits any pre-specified pattern and incorporates input prices in a flexible way. This function can also be applicable for more inputs with prices (Sokic, 2015) The model is given as:

$\ln P_{it} = f(X_{it}; P) + (W_{it} - Z_{it})$

$= P_0 + P_1(\ln X_{1it}) + P_2(\ln X_{2it}) + P_3(\ln X_{3it}) + P_4 (\ln X_{1it})^2 + P_5 (\ln X_{2it})^2 + P_6 (\ln X_{3it})^2$

$+P_7(\ln X_{1it})(\ln X_{2it}) + P_8(\ln X_{1it})(\ln X_{3it}) + P_9(\ln X_{2it})(\ln X_{3it}) + (W_{it} - Z_{it})$ .....(11**)**

Where: P_{it} = the output of the i^{th} firm in the t^{th} time interval

X_{1it} , X_{2it} , X_{3it} = the input items of the i^{th} firm in the t^{th} interval

W_{it} **=** noise component assumed to be independently and identically distributed (iid) normal random variables with zero means and variances and independent of Z_{it}

Z_{it} = {exp [- a(t-T)]} Z_{it} where the Z_{it} are non-negative random variables that are assumed to account for the time differences of the technical inefficiency in production and assumed to be iid as truncations at zero of the N (z, σ_z^2) distribution, a = an unknown scalar parameter to be calculated. The technical inefficiency effect of the truncated-normal distribution **(**Z_{it}**)** is ψ **[**$Z_{it} \mid \xi_{it}$] being the "mean productivity inefficiency" for the i^{th} firm at any time t. This is presented as; ψ

$$[Z_{it} \mid \xi_{it}] = \frac{\sigma\beta}{1+\beta^2}\left[\frac{\theta\left(\frac{\xi_{it}\beta}{\sigma}\right)}{\gamma\left(\frac{\xi_{it}\beta}{\sigma}\right)} - \left(\frac{\xi_{it}\beta}{\sigma} + \frac{z_i}{\sigma\beta}\right)\right] \quad \text{..... (12)}$$

Where $\xi_{it} = W_{it} - Z_{it}$ σ **=** $(\sigma_w^2 + \sigma_z^2)^{1/2}$, β **=** σ_w / σ_z , $Z_i = -\xi\sigma_w^2 / \sigma^2$, $\gamma[.]$ is the density function, $\theta[.]$ is the standard normal distribution. Therefore the i^{th} technical efficiency at interval t^{th} is calculated as;

$$\psi E_{it} = e^{-E[Z_{it} \mid \xi_{it}]} \quad \text{..... (13)}$$

The input oriented measured 12 above takes the output data and calculates the inverse of the maximum realisable inputs. Z_{it} is bounded below zero and ψE_{it} is

situated between 1 for efficient firm, (with Z_{it} = 0) and 0 for inefficient firm (with Z_{it} tending to infinity).

3.1.1.4 Malmquist Total Factor Productivity

The change of efficiency by two data points is what Malmquist TFP index is used for measuring firms. This is necessary because of the difficulty to assess whether increase or decrease in the efficiency score of each year for firms is as a result of increase in technical efficiency or technological change. Mahadevan (2002) defines efficiency change as catching–up effect (reaching the production frontier) and the technical (technological) change as technological change frontier effect (shifting of production frontier). The distance function is used for this measurement. The output oriented Malmquist TFP change index between base time period r and period s is presented based on Fare *et al.* (1994) works as;

$$\varphi_0^s\ (A_r, B_r, A_s, B_s,) = \frac{\rho_0^S(A_s,B_s)}{\sigma_0^s(A_r B_r)} \quad \text{..... (14)}$$

If r reference technology is used 11 becomes

$$\varphi_0^r\ (A_r, B_r, A_s, B_s,) = \frac{\rho_0^r(A_s,B_s)}{\sigma_0^r(A_r B_r)} \quad \text{..... (15)}$$

Where $\rho_0^r(A_s, B_s)$ is the distance from period s observation to period r technology. If φ_0 is greater than one implies growth in TFP from period r to period s technology, less than one shows a decline. For two period r and s to be equivalent, according to Fare, Grosskopf and Roos (1994), it has to satisfy Hick output neutral; implying that the distance can be presented as;

$$\rho_0^S(A_s, B_s) = \text{Ϙ (s)}\ \rho_0(A_s, B_s) \text{ for all values of s.}$$

In order to avoid this imposed condition, Fisher *et al.,* (1982) define Malmquist TFP index as a geometric mean of two indices as;

$$\varphi_0\ (A_r, B_r, A_s, B_s,) = \left[\frac{\rho_0^S(A_s,B_s)}{\sigma_0^s(A_r B_r)} * \frac{\rho_0^r(A_s,B_s)}{\sigma_0^r(A_r B_r)}\right]^{1/2} \quad \text{..... (16)}$$

Rearrangement of equation 16 showed that productivity index is equal to product of technical efficiency index and technical change (Coelli *et al.*, 2005)

$$\varphi_0\ (A_r, B_r, A_s, B_s,) = \frac{\rho_0^S(A_s,B_s)}{\sigma_0^r(A_r B_r)} \left[\frac{\rho_0^r(A_s,B_s)}{\sigma_0^s(A_s B_s)} * \frac{\rho_0^r(A_s,B_s)}{\sigma_0^s(A_r B_r)}\right]^{1/2} \quad \text{..... (17)}$$

Where $\frac{\rho_0^S(A_s,B_s)}{\sigma_0^r(A_r B_r)}$ is the efficiency change, and $\left[\frac{\rho_0^r(A_s,B_s)}{\sigma_0^s(A_s B_s)} * \frac{\rho_0^r(A_s,B_s)}{\sigma_0^s(A_r B_r)}\right]^{1/2}$ is the technical change.

From M&As literature in Nigeria, it is rare or unrecorded for the application of the above models and Malmquist TFP in evaluating operating performance, efficiency and productivity in either the financial related or voluntary market driven M&A.

4.0 Analysis of empirical results

The results of operating performance using residual income valuation for bidder, target and control companies is presented below.

Table 1.1: Excess RIV of Bidder, Control and Target Firms after M&A

	Mean Excess RIV Results of Sample Firms		
	Mean	Mean	Mean
	After	Before	Excess
Firms	RIV	RIV	RIV
Bidder	-0.6430	0.7869	-1.430*
Control	-1.445	0.292	-1.737
Target	1.408	-1.165	0.243

Notes: RIV reflects economic value created (destroyed).
Positive value indicates value creation, negative is destruction.

The results from Tables 1.2 above means that three years after M&A activities, the operating performance of the bidder firms dropped significantly. The non-merging firms decline non-significantly, while the target firms improved non-significantly. This result reveals that after M&A in Nigeria, the expected operating performance improvement by the merging firms was not realised on a long term. Though the target firms operating performance improved non-significantly. The result of the operating performance shows that M&A did not have much impact on the non-merging firms for a significant improvement. Past M&A operating performance results in Nigeria, though from the financial sector (Umoren, 2007; Omoye & Aniefor, 2016), indicated an improvement in operating performance of the banking sector after M&A in a long term, thus, bringing about increased in profitability, leverage buy-out and shareholders' wealth argued the authors. However, our finding is supported by the result of Okpanchi (2011), Which states that the M&A banking sector showed decline in performance after taxes on post M&A in a long-term in Nigeria. Operating performance significant decline implication is likely that companies are not meeting set production targets and no benefit from economies of scale. The low company earnings and employment opportunities in the country means that contribution to economic growth is minimal.

The operating performance interval result for bidder, target and control companies is presented below using residual income valuation.

Table 1.2: Excess RIV on Sub-Intervals for Bidder, Target and Control firms

Mean excess RIV results of sample Firms in different Sub-Periods			
	Mean Excess RIV		
	Bidder Firms	Control Firms	Target Firms
One year after M&A	-2.01*	1.900*	0.05
Two years After M&A	-0.42*	1.508	1.14
Three years After M&A	-3.76*	-2.100*	1.12

Notes: * indicates 5% Mann whiney significance

The interval result from table 1.2 indicates that the bidder firms dropped significantly, one, two, and three RIV years consistently after M&A. On the other hand, the control firms operating performance significantly improved after one year's M&A, non-significantly two years after with a significant dropped three years after M&A. The target firms operating performance improved non-significantly in all the intervals consecutively after M&A. The interval results reveals that the operating performance of the non-merging firms improved significantly after one year M&A, indicating that M&A has a short run spill-over effect on operating performance on the non-merging firms only in Nigeria. This could be as a result of being able to remain in the competitive business after the merger deals. The bidder firms dropped significantly within the same interval with a non-significant improvement for the target firms.

The industry operating performance of the merging and control companies, using RIV is presented below.

Table 1.3: Excess RIV of Industries for Bidder, Target and Control Firms.

Mean excess RIV results of sample firms in different industries			
Mean Excess RIV			
Industry	Bidder Firms	Control Firms	Target Firms
Consumer Goods	-1.91*	1.55	0.70
Healthcare	-7.18*	0.81	-14.61
Industrial Goods	-2.09*	0.94	1.38
Oil and Gas	6.68	1.85	8.74
Services	-2.75*	0.64	-0.86

Notes: * indicates 5% Mann whiney significance

The industry effect results from Table 1.3 above indicates that, M&A did not benefit any of the bidder firms but diminished their values especially, consumer, healthcare, industrial and services group significantly with non-significant value added to the oil and gas sector. The control firms are all having a non-significant improvement in the industry. The target firms improved non-significantly with a non-significant dropped in the services sector and healthcare. The Industry effect result reveals, that M&A in Nigeria did not stimulate non-merging firms to any significant operating performance improvement.

Technical and cost efficiency of the merging and control firms three years after M&A, using both DEA and SFA models as well as intervals performance is presented below.

Table 1.4 Technical and Cost efficiency Bidder, Control and Target Firms three years After M&A with intervals Results

	Research Objective 2		Research objective 3	
3(YB)/ 3 (YA)	Technical TE(DEA)AV Inc./ Dec	Efficiency TE (SFA)AV Inc./ Dec	Cost Efficiency CE((DEA)AV Inc./ Dec	CE (SFA)AV Inc./ Dec
Bidder	-0.0007*	-0.0004*	0.0019*	0.0015*
Control	0.0062*	0.0004	0.0058*	0.0013*

Target	-0.0066*	-0.001	0.0023*	0.0002*
Intervals	-0.0028*	-0.0273*	-0.004	0.007*
Bidder	0.0016	-0.0008	-0.002	0.012*
	-0.002*	-0.0011*	0.002*	0.001*
	0.0038	0.0011	0.0059*	0.0009*
Control	0.0057*	0.0010*	0.0068*	0.0014*
	0.0066*	0.0005*	0.0056*	0.0017*
	-0.0045*	0.0007*	-0.001	0.002*
Target	-0.003	0.0014	0.0001	0.006*
	-0.0062*	-0.0018*	0.005*	0.012*

Notes: 3YB = 3years before M&A, 3YA= 3 years after M&A, Inc.= Increase, Dec= Decrease * Indicates 5% Mann Whitney U-Test significance

The technical efficiency Table 1.4 above shows that three years after M&A was a significant decline for the merging firms, while the control firms improved significantly. Pevcin (2014) stated that DEA produces more technical efficient result than SFA model but in this case, for the bidder firms, both models provides a significant decline. Thus, there was significant decline for the bidder firms' technical efficiency after M&A. The result of the intervals did not show any contradicting significant result improvement. The technical efficiency result indicated a significant technical efficiency improvement for non-merging firms after M&A in Nigeria in a long term. The cost efficiency results indicated a significant improvement for the merging and non-merging firms after M&A in a long term. Hence, that is realisation of expected cost synergy after M&A.

Technical and cost efficiency results using DEA and SFA models in the industry for the merging and control firms is presented below.

Table 1.5 Technical and Cost efficiency Bidder, Control and Target Firms Industry Results

		Research Objective No 2 Technical Efficiency		Research Objective No 3 Cost Efficiency	
	Industry	(DEA)	(SFA)	(DEA)	(SFA)
Bidder	CG	-0.001	-0.005	0.026*	0.018*
	HC	-0.529*	-0.082*	-0.649	0.044*
	IND	0.002	-0.01	-0.028	0.022*
	OG	-0.012	-0.03	0.133	0.034*
	SV	0.001	-0.007	0.084*	0.029*
Control	CG	-0.0102	0.0019	0.0182*	0.0025*
	HC	-0.468	0.022	0.0235	0.0388*
	IND	0.001	0.003	0.0213*	0.0058*
	OG	-0.024	0.0143	0.0556*	0.0141*
	SV	0.0092	0.0054	0.0083*	0.0092*
Target	CG	-0.008	-0.003	0.002	0.027
	HC	-0.093*	-0.017*	0.05	0.297
	IND	-0.023	-0.003	-0.001	0.047
	OG	-0.117	-0.029	0.037	0.098
	SV	-0.036	-0.016	0.012	0.082

Notes: CG is consumer, HC is healthcare, IND is industrial, OG is oil and gas, SV is services. * indicates 5% Mann Whitney significance.

The industry technical efficiency for the merging firms did not show any significant improvement as the DEA model that produces higher result was all non-significant and significant decline for the merging firms. The few merging firms industry decline in cost efficiency was non-significant and could be attributed to agency or hubris effect during the M&A. In Nigeria, Osamwonyi and Imafidon (2016) study on non-merging listed manufacturing firms on the stock exchange reported and improvement in technical efficiency. Therefore, it can be concluded that M&A in Nigeria stimulated a positive technical efficiency on the non-merging firms while both the merging and non-merging firms realised expected cost efficiency improvement after M&A. Implication of technical efficiency significant decline is that companies are not likely benefiting from economies of scale concept while implication for efficiency is likely that no excess cost after M&A.

The productivity results of merging and control firms, intervals and industry is presented in tables 1.6a, 1.6b and 1.6c respectively below, using Malmquist productivity index with DEA and SFA.

Table 1.6a Productivity Efficiency of Bidder, Control and Target Results three years before and after M&A, Intervals and Industry

Three years Before/After	**Research Objective No 4 Productivity Efficiency**		
M&A Firms		MPI (DEA)	MPI (SFA)
Bidder	Index	Inc./ Dec	Inc./ Dec
	Catch-up	-0.0351	-0.0017
	Frontier	-0.0404*	-0.0013
	MPI	-0.0323*	-0.0016
Control	Catch-up	-0.017	0.0024
	Frontier	0.0063	0.0023
	MPI	-0.0105	0.0008
Target	Catch-up	-0.1301	0.0048
	Frontier	0.0259	-0.0075
	MPI	0.0116	0.0024

Notes: MPI is Malmquist productivity index, * indicates 5% Mann Whitney significance. Mann Whitney statistical test for two independent group (Before and after M&A) was applied in the study while Kruskal Wallis statistical test for three independent group (bidder, target and non-merging) with same measures applied as robustness check of these results and confirmed the robustness test of Mann Whitney u-test. Result can be sent on request.

Table 1.6b Productivity interval

	Bidder Firms Mean Increase/ Decrease	DEA Control Firms Mean Increase/ Decrease	Target Firms Mean Increase/ Decrease	Bidder Firms Mean Increase/ Decrease	SFA Control Firms Mean Increase/ Decrease	Target Firms Mean Increase/ Decrease
Catch-up						
1YB&1YA	-0.005	-0.01	0.040*	-0.027	-0.016	0.002
2YB&2YA	0.008*	-0.002	-0.004	-0.001	-0.042	0.001
3YB&3YA	0.006	0.001	0.012	-0.001	-0.043*	-0.002
Frontier-Shift						
1YB&1YA	-0.008	-0.004	-0.009*	-0.0007	0.026	0.001
2YB&2YA	-0.003*	0.013	0.005	-0.0013*	-0.036	-0.003
3YB&3YA	-0.005	-0.014	-0.006	-0.0010	0.032*	0.001
MPI						
1YB&1YA	-0.007	-0.0073	0.004	-0.0012	-0.005	0.002
2YB&2YA	-0.013*	0.006	-0.008	-0.0016*	-0.003	0.001
3YB&3YA	0.009	-0.0248	-0.009	-0.0006	-0.011	-0.001

Notes:* indicates 5% significance Mann Whitney test, 1YB&1YA is I year before and 1 year after, 2YB&2YA is 2 years before and 2 years after. 3YB&3YA is 3 years before and 3v years after.

Table 1.6c Productivity Industry

	Bidder		**Target**		**Control**	
Catch-up	**DEA**	**SFA**	**DEA**	**SFA**	**DEA**	**SFA**
CG	**0**.0891	-0.0166	0.0338	0.0001	-0.08*	-0.036
HC	0.0054	-1.0801	0.0011	-0.235	0.001	-0.752
IDG	-0.0420*	-0.0175	0.0221	0.0010	-0.350	0.055
OG	0.1576	-0.0525	0.0941	0.2333	0.1170	0.083
SV	0.0125	0.0008	0.0094	-0.006	-0.531	-0.010
Frontier						
CG	**-**0.0513*	0.0079	-0.002	-0.0008	-0.011	0.031*
HC	-2.4117	0.6701	-1.4325	-0.0885	-2.705	0.590

IDG	-0.08	-0.0141	0.0424	0.1265	0.166*	-0.056
OG	0.0675	0.0413	0.8368	-0.1375	0.049	-0.193
SV	0.0744	-0.0026	0.0917	0.0054	0.235*	-0.047
Malmquist	-0.052*	-0.0114	0.0146	0.0005	-0.027*	-0.015*
CG	-2.3317	-0.0028	-1.4325	-0.0015	-2.705	-0.061
HC	-0.0732	-0.0048	0.0713	0.0027	0.121	0.012
IDG	0.1748	-0.0447	0.9441	0.1345	0.045	0.018
OG	0.1315	0.0017	-0.3949	-0.0047	0.132	-0.013
SV						

Notes: * indicates 5% significance Mann Whitney test.

The productivity result in Table1.6a shows a significant decline for the bidder firms with non-significant drop for non-merging firms, while the target has a non-significant improvement three years after M&A. There was no significant contradicting productivity efficiency improvement/decline during intervals and industry for both the merging and non-merging firms as shown in table 1.6b and table 1.6c. Past study on productivity efficiency in Nigeria (Umoh & Wokocha, 2014), though not on M&A but on corporate productivity performance with production control in the Nigerian manufacturing industry, remarked that resources invested into manufacturing sector by government and individuals has no noticeable outcome, as the sector productivity is extremely deteriorating. Anyanwa (2017), in his paper on manufacturing industry productivity in Nigeria, posit that productivity in Nigeria has been on the decline. The author name factors responsible for this decline to include low technological level, level of capacity utilisation is low, investment is low, high cost of production, performing infrastructure being poor and with high inflation. Therefore, as a way forward, Nigeria needs technological capacity upgrade, reduction in cost of production and improvement on investment. This is a disturbing situation and highly challenging for future M&A consideration. It has to improve with government having to join with practitioners to see how the challenging technical efficiency and technological change issues could be resolved. The basis for using two contending models DEA and SFA is to countercheck whether outcomes achieved by one can be confirmed by the other.

5.0 Conclusions and Policy Implications

There is a general expectation for a significant improvement for firms that undergone M&A, as a result of the realization of the synergistic benefits. Equally important is having comparative analysis of the merging and non-merging, so that even if the merging firms are not significantly improving in performance after M&A, it stimulates the non-merging resulting in competiveness as well as the spill over effect. By so doing would bring about a better effect to the consumers and the economy. The results from post M&A study in Nigeria's performance with robustness checks using residual income valuation for operating performance, frontier analysis, both non-parametric (DEA) and parametric (SFA) for efficiency and Malmquist TFP for productivity indicates the realization of expected improvement in cost efficiency only. There is no improvement on operating performance, technical, and productivity efficiency. The result revealed a positive spill-over effect of M&A on the non-merging firms on technical efficiency and a short-run operating performance of one year after M&A.

These results can be expected in a market that is not controlled and no antitrust agency involvements, as a result of no value development incentive that involves agency theory justification as a consequent of hubris effect. For the reason being that, this will not allow for acceptable and appropriate due diligence process during and after the M&A integration activities. As a result, the managers of bidder firms' over-pricing the target firms are due to over-valuation of the target firms' expected synergistic gains after M&A. It is significant that supervisory body and policy makers exert substantial responsibilities by putting into practice and ensuring due diligence during and after the M&A process selection of the potential target firms. This is one important way of checking agency and hubris negative motives and thereafter the realisation of expected improvement.

The result revealed a significant drop in the technological change after M&A. A significant increase for improving and maintaining productivity growth for firms implies some level of government course of action inventiveness. As a suggestion, this can be done by government liberalizing economic atmosphere to entice investors that will not just be responsible for funds provision, but delivers current technological development to the companies. There is need to continue to encourage development driven M&A between companies that deliberately preserve an advance principles and creating all-encompassing investment in research and development.

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Appendix

Table List of Bidder Firm in this Study

S/N	Bidder Firms	Year completed
1	Lever Brothers Plc *	1995
2	Sona Breweries Industries Plc	1995
3	Nestle Foods Plc	1996
4	Smith Kline Plc *	1996
5	Nigerian Bottling Company plc	1996
6	PZ Industries Plc	1996
7	CMB Plc.*	1997
8	Delta Glass plc*	1999
9	International textile limited Plc	1999
10	Total Nigeria Plc	2001
11	United Nigerian Textile Plc	2001
12	PZ Industries Plc	2001
13	Unipetrol Nigeria Plc	2002
14	Edo Cement Company Plc	2002
15	Jap Telecoms Plc	2006
16	Flour Mills of Nigeria Plc	2006
17	Oando Plc	2007
18	Tantalizers Plc	2008
19	Tower Aluminium	2008
20	MTN Nigeria Plc	2008
21	WAHU utilities	2009
22	Crown Flour Mills Plc	2009
23	Obajana Cement Plc	2010
24	Flour Mills Plc	2010
25	Nigerian Breweries Plc	2011
26	Nigerian Breweries Plc	2011
27	Visa Communication Plc	2011
28	Olam International Ltd	2011
29	Flour Mills Plc	2012
30	Nigerian breweries Plc	2012

Table 3.3: List of Target Firm in this Study

S/N	Target Firms	Year completed
1	Lever Brothers Nigeria ltd	1995
2	International Beer and Beverages	1995
3	Nestle Nigeria Ltd.	1996
4	Sterling product (Nig) Plc	1996
5	Sapanda Industries Ltd	1996
6	Thermo cool Engineering	1996
7	Canmakers Nigeria Ltd	1997
8	Guinness Glass Plc	1999
9	Platinum Textile Mill Ltd	1999
10	Elf Nigeria Ltd	2001
11	Nichemtex Industries ltd	2001
12	PZ Nigeria Limited	2001
13	Agip Nigeria ltd	2002
14	Bendel Cement Company Ltd.	2002
15	Danjay Telecoms Ltd	2006
16	Golden Fertilizer Co. Ltd	2006
17	Ocean & oil investment ltd	2007
18	Baytide Nigeria Ltd	2008
19	Cook N" Nigeria	2008
20	VGC Communications ltd	2008
21	Battery Manufacturing Company	2009
22	Interstate Flour Mills	2009
23	Benue Cement Company	2010
24	Nigeria Eagle Flour Mills Ltd	2010
25	Champion Breweries ltd	2011
26	Benue Breweries	2011
27	Cellcom Communication Ltd	2011
28	Crown Flour Mills	2011
29	Rom Oils Mill Limited	2012
30	Sona Systems and Life Breweries	2012

The List of Control Firm in this Study

S/N	Control Firms	Year completed
1	PZ Industries Plc	1995
2	Nigerian Breweries	1995
3	Nigerian Bottling PLC	1996
4	Pharma-Deko PLC	1996
5	Nestle Foods PLC	1996
6	Lever brothers Nigeria Plc	1996
7	Delta Glass Company PLC	1997
8	Carnaud Metal Box Nigeria plc	1999
9	United Nigeran textile Plc	1999
10	Mobil oil Nigeria PLC	2001
11	Afprint Nigeria PLC	2001
12	Unilever Nigeria Plc	2001
13	Texaco Nigeria Plc	2002
14	Eagle cement Plc	2002
15	Cellcom communication Ltd	2006
16	Cadbury Nigeria Plc	2006
17	African Petroleum PLC	2007
18	Big Treat PLC	2008
19	First aluminiun Plc	2008
20	Glo Nigeria Plc	2008
21	Tower Aliminium Nigeria PLC	2009
22	Flour Mills of Nigeria Plc	2009
23	Lafarge Cement Plc	2010
24	Big Treat PLC	2010
25	Guinness Nigeria PLC	2011
26	Guinness Nigeria PLC	2011
27	Etisalat communications Plc	2011
28	Northern Flour Plc	2011
29	Crunches Food Plc	2012
30	Guinness Nigeria PLC	2012