Thailand and The World Economy
P-ISSN: 2630-0931
E-ISSN: 2651-0529
Homepage : *https://www.tci-thaijo.org/index.php/TER*
Vol. 42, No.3, September - December 2024 **Page [138-166]**

Composition of Growth, Institution and External Debt Reduction in Africa

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Received 1 March 2022, Received in revised form 26 August 2022,
Accepted 5 September 2022, Available online 5 September 2024

Abstract

This study investigates the link between the composition of growth, institutions, and external debt reduction. Despite the rising external debt stock profile and dwindling domestic revenue of almost all the African countries, very few or no studies have investigated the composition of growth-external debt link to determine which productive sectors of the economy contribute more resources for the purpose of policy targeting. Applying the 'System' generalized method of moments (Sys-GMM), Two-stage Least Square (TSLS) and Panel Ordinary Least Squares (POLS) estimation techniques on panel data from 41 African countries spanning the period 1980–2019, our results suggest that among the three productive sectors —agriculture, industrial, and services —only the services sector showed a significant positive impact on external debt stock. The results of the control variables are broadly consistent with theoretical expectations. A policy framework that encourages the improvement of institutional and macroeconomic qualities and huge investments in the three sectors (most especially in the services sector) will generate substantial resources to aid the servicing and repayment of Africa's high external debt obligations.

Keywords: Economic growth; External Debt; Institution; Panel Data; Africa.
JEL Classifications: C33; F34; O41; O55

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1. Introduction

Despite the several debt relief initiatives of the IMF and Paris Club, Africa's external debt (henceforth referred to as ED) stock, rather than declining, still rises even above the world's average. The issue of rising debt stock among many African countries has continued to pose far-reaching consequences on the already frayed socio-economic conditions of the region. According to the World Development Indicators (WDI, 2022), average public and publicly guaranteed (PPG) ED increased across the African region by 46% between 1990 and 2020. Many reasons have been adduced to be responsible for the rising debt profile in most of the countries (Adam & Bevan, 2005; Malone, 2010; Presbitero, 2012; Mustapha & Prizzon, 2018; Onafowora & Owoye, 2019; Ehikioya et al., 2020). Whereas some of these factors are contestable, the issues of weak domestic sources of revenue and institutional capacity remain highly incontrovertible in the maintenance of fiscal balance and sustainable growth in most of the African economies.

Development studies have shown that over the years, Africa's sources of revenue and institutional capacities have remained among the lowest, thus posing some serious regional growth and development challenges. Although the issue of high ED stock is not peculiar to African countries, economies of similar classification from other regions have adopted more robust and strategic approaches to managing their rising debt profiles. Received studies showed that ED stock reduction in Latin America and Asian countries was made possible through the strengthening of existing domestic institutions, macroeconomic environment and massive financial investments in specific sectoral components with high productive and absorptive capacities (Borensztein et al., 1998; Arslanalp & Henry, 2006).

Whereas growth in sectors with high productivity provides economies with the much-needed resources and structures to attain a higher level of economic progress (Benfica and Henderson 2020; Khan, 2022), robust domestic institutions and macroeconomic frameworks have been proven to be strategic in the sustenance of the growth and development architectures of many developed and developing economies alike (Kim et al., 2017; World Bank, 2019). However, this conclusion is rarely observed within Africa, as policy frameworks on economic growth and fiscal balance remain very ambiguous in many countries.

Rather than establishing structural frameworks that encourage financial and institutional quality, African policymakers are noted for designing policy frameworks that encourage (i) the running of inefficient institutional bureaucratic structures that are inimical to fiscal management progression; and (ii) the overreliance on the usual 'traditional' revenue generating approaches, even when these methods have proven overtime to be inadequate in providing the much-needed resources for the advancement of economic activities (Aiyagari & McGrattan, 1998).

However, while many African countries are constantly making significant efforts to increase domestic revenues, the management of these resources by relevant institutional bodies poses severe challenges to the region's efforts in achieving greater economic prosperity. A World Bank reports (2019) revealed that African countries have one of the poorest average country policy and institutional assessment (CPIA) structures among international development association (IDA)-eligible countries. The report stated that among IDA-eligible countries, Africa's overall CPIA score was 3.1 in 2018, the same as in 2017. This score reflects the slow progress the region has made in accelerating the pace of policy and institutional reforms to foster rapid economic growth and poverty reduction. Is this current institutional structure responsible for Africa's present debt

challenges? Which of the productive sectors has the capacity to generate a higher economic impact and by extension, provide the needed resources to aid in the reduction or management of Africa's high ED stocks? These questions are important because, as Danso (1990) posited, 'Africa's crushing debt burden has become one of the most important factors constraining recovery and development' (p.5).

This study identifies the following gaps in the literature. While there is much documented evidence on the external debt and economic growth link (Checherita-Westphal & Rother, 2012; Woo & Kumar, 2015 Mensah et al, 2020; Sharaf, 2022); growth composition-economic growth link (Loayza & Raddatz, 2010; Jarreau & Poncet, 2012; Diao et al 2019); and ED-institutional capacity link (Ramzan & Ahmed, 2014; Kim et al., 2017; Dey & Tareque, 2020; Hassan & Meyer, 2021), the growth composition-institution-ED link remains unattended to in growth and development studies. Therefore, in order to fill this gap in the literature, this study was conducted using Africa as a case study. Secondly, in view of identifying the actual sectors with the highest capacity to provide the much-needed resources that could drive economic growth and ED reduction, this study adopted both the aggregated and disaggregated sectors' output shares in GDP.

One important reason for applying the disaggregated data of the sectors is to identify the actual sub-sectors that are the key drivers of revenue growth in the African region for the purpose of policy targeting on ED reduction. This study argues that relying on the results of an aggregated dataset only presents incomplete information for proper policy prescriptions that are aimed at tackling the twin albatross of weak economic growth and high fiscal imbalance facing the region. Furthermore, the study also disaggregated the entire dataset into different categories of income level (low-income, low-middle income, and upper middle income)[1] to ascertain the performances of the various sectors within these income groups in the provision of quality revenues that supports ED stock reduction.

The rest of the paper is structured as follows: Section 2 reviews relevant literature on the debt-growth nexus; Section 3 presents research methodology and data estimation techniques; and Section 4 presents the empirical analysis and robustness checks. Section 5 concludes the study with some policy recommendations.

1.1 Africa's external debt structure

A review of African countries' ED structures showed that over the last three decades, a number of structural changes have occurred. These changes occurred in the composition of ED outstanding and the structure of debt services for public and publicly guaranteed (PPG) debts. Table 1 shows Africa's debt structure between 1990 and 2020. A look at the statistics shows that both the total ED stock and the resources devoted to debt servicing by various countries have been on the increase. Between 1990 and 2009, Africa's ED stock rose by 7% to US$301 billion. However, within a decade, total ED stock increased by over 56% to US$704 billion. The continuous rise in ED stock among developing economies, especially in Africa, has been linked to several factors. According to Ng'eno (2000), the continuous rise was a result of deterioration in the terms of trade of many countries, public sector deficits, and exchange rate misalignment.

Górniewicz (2009) argued that the direct cause of rising global debt was the increase in commodity exchange between well-developed countries and the countries still

[1] According to the World Bank (2022), low-income economies are defined as those with a GNI per capita of $1,085 or less; lower middle-income economies are those with a GNI per capita between $1,086 and $4,255; upper middle-income economies are those with a GNI per capita between $4,256 and $13,205; and high-income economies are those with a GNI per capita of $13,205 or more.

considered developing. Onafowora & Owoye (2019) and Ehikioya et al. (2020) said it was a result of overreliance on borrowed funds, foreign equity portfolio investment (FEPI), and a low level of domestic economic activity. The low level of domestic economic activities that guarantee quality internally generated funds has become the driving motive for different African countries to resort to the use of external borrowings to address the challenges of economic growth and development and this has become an issue of necessity that is difficult to avoid. While ED stocks are growing at a startling rate, the amounts earmarked for the services of PPG debt also rise astronomically.

From 1990 to 2020, Africa's ED (both public and private guaranteed), rose by 45%. A breakdown of Africa's PPG debts into long-term and short-term debt structures shows that short-term debt stock is higher than long-term debt by 6%. A look at the structural change of the two debts reveals that, while the percentage change of the long-term debt stocks stood at 58%, that of the short-term ED stocks stood at 62%. These figures imply that overall, the entire African continent is seriously grappling with a huge debt burden, which has negatively impacted on available resources for the development of critical infrastructure for economic growth and development. Studies by Kodongo & Ojah (2016) and Chukwu et al. (2021) argued that Africa is faced with a huge infrastructural deficit, and as such would require huge resources for investment in critical sectors of the economy. According to Kodongo & Ojah (2016), Africa requires an annual investment of US$ 12 billion for the development of the ICT sector and USD 14 billion for operations and maintenance to increase electricity production capacity to 7 GW per year. The study further stated that for Africa to meet its increased domestic demand from agriculture, power, tourism, and transport, the region would also require additional annual funding of at least USD 11 billion over a period of 5 years.

Table 1: Africa's External Debt Composition, 1990 -2020 (US$ Billions)*

	1990-1999	2000-2009	2010-2020	1990-2020 (% increase)
Debt service on external debt, public and publicly guaranteed (PPG)	203.42	227.69	392.20	48.13
Debt service on external debt, total	249.48	295.52	626.88	60.20
External debt stocks (% of GNI)	43.35	32.96	21.13	-105.16
External debt stocks, long-term	244.74	256.15	575.47	57.47
External debt stocks, public and publicly guaranteed (PPG)	236.42	219.61	434.88	45.64
External debt stocks, short-term	359.58	436.02	947.61	62.05
External debt stocks, total	289.81	310.05	704.57	58.87
Total debt service (% of exports of goods, services and primary income)	20.68	51.09	32.60	36.56

Source: Authors' compilation from World Development Indicators (WDI, 2022)

A closer look at Africa's ED stock profile by the region's leading economies reveals that all the ED indicators are on a continuous rise. Table 2 shows that between 2016 and 2020, ED as a percentage of gross domestic product (Debt/GDP) increased, although marginally, implying that most of the countries' domestic revenues are on the decline and unable to provide the desired funds to finance high infrastructural deficits. The statistics show that apart from Algeria, Botswana and Nigeria (whose debt/GDP ratios are relatively lower, below 20%), the other economies' have debt to GDP ratios higher than 20% but less than 55% of the acceptable threshold level. However, countries like Angola, Senegal and Tunisia, have a debt ratio above 75%, which is a reflection of increased borrowing, weak domestic resource mobilization, and a lack of appropriate fiscal adjustment.

A report by the International Monetary Fund (IMF, 2022) on Sub-Saharan Africa argued that "without fiscal adjustment, public debt is projected to grow steadily in the coming years, reaching 84% of GDP by 2026" (p.4). Increasing potential growth and maintaining debt sustainability hinge on the timely implementation of credible fiscal policies and structural reforms, including a product market regulatory framework, labour market flexibility, management of state-owned enterprises (SOEs), and acceleration of the energy transition" (P.4). The report further stated that although Sub-Saharan Africa's public debt has increased steadily for more than a decade, this has placed severe strains on debt sustainability in many of the countries with very low output growth.

Table 2: Selected African Countries' External Debt Composition, 2016 -2020*

	Debt service on external debt, PPG (US$ Billion)					Total debt service (% of exports of goods, services and primary income)					Debt –to-GDP ratio				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Algeria	165.9	166.3	147.5	115.5	99.0	1.0	0.6	0.5	0.5	0.7	3.4	3.4	3.3	3.2	3.6
Angola	9,385.2	8,149.6	9,312.7	10,837.9	6,886.1	38.3	25.5	26.4	32.4	39.3	106.3	79.9	75.8	85.6	108.0
Botswana	159.8	173.2	175.2	181.1	169.0	2.0	2.5	2.4	3.0	3.8	14.1	10.8	10.5	9.4	10.7
Cameroon	445.3	415.0	609.5	671.6	885.2	5.9	6.1	5.6	5.9	13.4	23.3	27.9	27.3	32.4	34.0
Egypt	6,127.8	6,139.5	7,236.0	7,860.6	10,975.8	19.5	15.4	15.1	16.1	29.5	20.8	35.9	40.1	38.0	36.0
Ghana	1,566.6	1,944.1	2,524.3	2,353.1	2,558.4	9.5	10.1	11.7	9.8	12.0	37.5	36.8	34.4	39.1	44.7
Kenya	769.7	1,174.6	2,310.5	3,982.8	2,422.9	11.2	14.6	23.7	38.4	27.8	28.1	32.8	34.0	34.8	37.9
Morocco	3,029.3	3,316.6	2,978.1	2,971.4	4,188.6	11.1	10.1	9.0	9.3	13.5	46.1	46.5	42.7	45.9	57.3
Nigeria	354.7	344.0	1,434.3	1,391.1	1,556.8	6.3	6.8	7.9	7.1	13.4	8.8	12.2	13.6	13.4	16.3
Senegal	289.7	487.2	657.4	883.9	1,335.4	9.6	14.4	15.2	14.8	15.0	39.6	46.8	54.8	64.7	70.4
South Africa	5,689.2	5,529.7	15,697.8	8,573.3	11,653.1	14.6	13.3	23.6	20.0	28.2	44.5	45.9	43.0	47.8	50.9
Tanzania	616.0	700.8	918.9	1,137.6	1,198.1	8.6	10.1	12.1	12.6	14.6	39.1	40.2	39.2	39.5	40.9
Tunisia	1,658.1	2,233.6	1,949.2	2,504.2	2,396.7	12.0	17.0	15.2	16.3	19.6	65.0	79.5	82.0	94.3	96.5

Source: Authors' compilation from World Development Indicators (WDI, 2022)

An analysis of the debt service to export ratio (Debt/Exports) between 2016 and 2020 also showed that the debt/export ratio increased marginally in almost all the countries, with the exception of Kenya, whose ratio increased by over 70%. Although the entire African countries' net present value of Debt/Exports ratio is still far below the 150% threshold level (Asiedu, 2003), the continuous rise in debt service/exports ratio of these countries is a reflection of rising financing pressures in the midst of slower growth of exports. While a slower pace of growth of exports is an indication of declining fiscal space and has debt sustainability implications for ED, the key challenge for African countries is the need to invest in infrastructure (human capital, electricity, roads and rail lines, etc.) that will ease supply-side constraints and leapfrog growth in the real sectors of the economy (especially in the manufacturing sector), hence strengthening growth.

2. The Literature

2.1 The link between ED -growth and the theoretical framework

A review of the development literature suggests a dearth of studies in support of the composition-of-growth-institution-ED relationship. However, while there seems to be a scarcity of studies in this regard, literature abounds on growth composition, income growth, and growth-ED nexus. While the literature on the growth-ED nexus examines the effects of ED on aggregate growth, the growth composition-economic growth studies explain how the composition of growth can affect the different levels of aggregate growth in countries. The major conclusions from these two strands of studies suggest that growth composition leads to an increase in aggregate income (De Janvry & Sadoulet, 2009; Ferreira et al., 2010), while growth in aggregate income leads to a reduction in the stock

of ED (MohdDauda et al., 2013; Lee & Ng, 2015). The peculiar nature of this study therefore suggests that literature around these two strands of studies would suffice in the review of the composition of growth-institution-ED relationships. Consequent upon this, this study adopts the theoretic and empirical literature on (i) the three-sector hypothesis (Fourastie, 1949; Lewis, 1954; Loayza & Raddatz, 2010); and (ii) the traditional neoclassical growth theory of "perfect capital mobility" (Barro et al., 1995) to address the central focus of the study.

The philosophy behind the three-sector economy hypothesis accentuates how higher national prosperity is achieved as economies transit from the initial stage of development to the second and third-tier stages of development. The crux of evidence surrounding the three-sector hypothesis is that at the initial stage of expansion, the primary sector tends to employ more labour (skilled and unskilled) than the secondary and tertiary sectors, although at a lower wage rate (Loayza & Raddatz, 2010). However, according to growth theory, the level of wage rate (or aggregate income) in a country varies when there are changes in the level of labour employment from one sector to another. As factor income shifts from labour-intensive (primary) sectors to capital-intensive (secondary and tertiary) sectors, national income improves because capital-intensive sectors are characterized by high productivity, high wages and high profit (Gupta, 1993).

Although the shift in labour might differ or remain constant across countries, what differentiates one country from another are the levels of factor endowments and the rates and magnitudes of spillover from one sector to another. According to Christiaensen et al. (2011), if one sector employs more people than the other and the rate of spill over is greater from the originating sector, then the contribution of that sector to economic growth becomes greater than the other. However, a sizable body of literature has argued that the rate of spillover from one sector to another in itself does not entirely have an overbearing influence on the size and direction of growth outcomes; it also depends on the resource inflows (foreign direct investments), productivity rates, and absorptive capacities of the destination sectors. A sector with high productivity and absorptive capacity creates more resources and employment in an economy and fosters more inclusive output growth than sectors with low capacities.

Examining how foreign inflows affect economic growth in 69 developing countries, Borensztein et al. (1998) reported that foreign resource inflows drive economic growth in economies with sufficient absorptive capability in advanced technologies and a high productivity level. Alfaro (2003) examined the effect of foreign resource inflows on growth in the agricultural, manufacturing, and service sectors in Asia and the Pacific, Africa, Latin America, and the Caribbean. The study found that while the effect of foreign resource inflows on the agricultural sector is negative, its effect on the manufacturing sector is positive and diverse in the service sector. Chukwu et al. (2022) also investigated the relationship between foreign inflows and sectoral growth. The study found that FDI promotes output in the manufacturing and services sectors more than in the agriculture sector due to the higher absorptive capacities of the two sectors.

On the debt-growth relations, literature showed that many studies relied mostly on the traditional neoclassical theory of "perfect capital mobility" to establish the debt-growth nexus (Eaton, 1993; Qayyum & Haider, 2012; MohdDauda et al., 2013; Lee & Ng, 2015; Onwuka et al., 2020). The theory explains that when countries borrow, they do so in order to boost investments in critical areas of the economy that eventually generate more resources to repay current and future debt obligations. Thus, a country willing to borrow to meet fiscal obligations will only do so when the marginal product of its capital is above the world interest rate and is sufficient enough to repay the interest on old debt and finance additional investment without raising the debt-output ratio.

However, a study by Eaton (1993) advances that 'if a country's output perpetually grew faster than the interest rate and it maintained a constant debt-output ratio, then net borrowing would perpetually exceed interest payments, meaning that the net transfer associated with debt would forever be positive' (p.10). But where aggregate output grows slowly, as is the case with most developing economies, interest repayment will continue to rise above net borrowings, thereby leaving net transfers in negative territory.

Examining the relationship between debt, interest rates, and current account balances among different economies, Aguiar & Gopinath (2006) and Onwuka et al. (2020) found that countries borrow less during economic recessions and more during periods of economic booms as a result of lower interest rates on capital. Over the past couple of decades, most developing countries (especially those in Africa) have constantly borrowed above their debt-to-GDP threshold limits owing to a decline in output growth and weak labour productivity rates. The effect of these is a consistent rise in net borrowings and occasional defaults in loan services and repayment schedules, as is the case with most highly indebted poor countries (HIPCs). A recent report by the World Bank (World Bank, 2020) stated that while Sub-Saharan Africa's total debt stock stood at US$ 704 billion in 2020, the debt repayment schedule for 2021 is US$69 billion, with another US$185 billion due between 2022 and 2024.

The increase in ED stock and debt servicing allotments has raised concerns about the likelihood of another debt crisis across the African region. However, this is not the case with most developing countries outside the HIPC classification, as they have tried to improve their national income levels through improved foreign equity portfolio investment, labour productivity rates, capital accumulation and investment in critical productive sectors with higher absorptive capacities (Berensmann, 2004; Hadlek & Mrad, 2014).

2.2 The structure and development of African countries' economies

In the past three decades, many African economies have been faced with a myriad of challenges, such as a weak output growth structure, a weak macroeconomic environment and fragile institutional framework. Aside from these challenges, there is an overdependence on primary commodity exports for national output growth, even when studies have proven that the primary export contributions to GDP are increasingly volatile, low in profit, and highly unsustainable. Hausmann et al. (2007) and De V. Cavalcanti et al. (2015) posited that countries that depend on primary commodities' exports as a hedge for national income growth are substantially exposed to revenue volatility and macroeconomic shocks. Conversely, Xu (2010), Lee (2011), and Jarreau & Poncet (2012) concluded that countries that specialize in sophisticated manufacturing exports tend to grow faster economically than those that maintain a 'traditional' export orientation. This is because traditional exports (that is, primary exports) exhibit higher volatility rates, which affect both output and price performance in both the short and long terms.

The improvement in aggregate growth architectures of the Asian and some Latin American economies centres mainly on the production and exports of manufactured and service goods rather than on primary commodities. According to Arora & Ratnasiri (2015), the Asian 'Tigers' relied principally on the development and growth of the industrial sector and intra-regional trade to rapidly transform their economic status from low-income to high-income economies. Dutta (2005) posits that through improved trade and industrial sector development, China was able to increase the share of GDP above two-thirds of the total aggregate growth in 2000. The improvements in aggregate growth of many Asian and Latin American countries were made possible through the targeting

of specific sectors with higher productivity growth rates, which strengthen domestic revenues.

However, in the case of Africa, the region is constantly faced with low domestic revenue in the productive sectors. Available statistics from the World Bank (2022) showed that between 1980 and 2020, the total contribution of the three main productive sectors (agriculture, manufacturing, and services) stood at (US$11079 billion), with the services sector contributing about 53% of the total revenue (see Table 3). However, while this might look huge, percentage-wise, the aggregate revenue is far lower than that of other regions of similar classification. A look at the statistics shows that the aggregate revenue from the productive sectors for South Asia, Latin America, and East Asia and the Pacific (excluding high income countries) stands at US$21397, US$30567 and US$82633 billion respectively, with higher contributions coming from the manufacturing sector.

Table 3: Sectoral Contributions by Regions, 1980-2020 (US$ Billions)

Regions	Agriculture	Manufacture	Services	Total contribution to GDP	% contribution		
					Agriculture	Manufacture	Services
Sub-Saharan Africa	1,163.6	4,102.9	5,812.2	11,078.7	10.5	37.0	52.5
South Asia	3,083.9	8,221.7	10,091.9	21,397.4	14.4	38.4	47.2
Latin America & Caribbean	3,696.8	19,886.4	6,983.5	30,566.7	12.1	65.1	22.9
East Asia & Pacific	7,093.8	53,560.9	21,977.9	82,632.6	8.6	64.8	26.6

Source: Authors' compilation from World Development Indicators (WDI, 2022)

One of the reasons identified for the weak contribution of the productive sectors in Africa is the nature and development of the sectors and the identification of sectors with strong sectoral linkages. Received studies show that sectors with stronger inter-sectoral linkages increase productivity and produce more resources for growth and development than those with weak linkages. The study by Chukwu et al. (2022) showed that inter-sectoral linkage is higher between manufacturing and services sectors within African countries. Apart from the issue of domestic sources of income to finance economic activities, the challenge of a robust institutional framework in the management of the received resources (domestic and external) and the quality of the macroeconomic environment have remained a serious challenge and have indeed impeded economic growth and development in the region.

Studies have revealed that in Africa, the management of domestic resources is a serious factor that has affected both the debt structure and economic growth performances of many countries. According to Qayyum et al. (2014), a robust institutional framework plays a key role in fostering economic growth and managing external borrowings. A World Bank development report (World Bank, 2019) posited that institutional quality and regulatory frameworks protect investors and play key roles in achieving sustained economic growth and development. However, it has been established in development studies that the structure of institutions and regulatory frameworks in many developing countries is weak, ineffective, and unable to drive policies and implement various forms of loan treaties that countries have signed.

Arslanalp & Henry (2006) stated that "the principal obstacle to investment and growth in the world's poorest countries is the fundamental inadequacy in these countries of the basic institutions that provide the foundation for profitable economic activity" (p.1). This view is further supported by Acemoglu & Robinson (2010), Presbitero (2012),

and Ramzan & Ahmed (2014). These studies conclude that debt is negative for growth among developing countries due to weak institutional capacity and poor macroeconomic policy frameworks, which act as wedges to the growth of many economies. Furthermore, the study by Kim et al. (2017) also observed a significant positive direct relationship between ED, economic growth, and quality of governance. Their study concludes that "to alleviate the negative effect of public debt on economic growth and to maintain economic sustainability, governments and international organizations should strive to enhance the quality of their institutions in order to maximize revenue utilization in the long run" (p.13).

However, despite this observation, growth and institutional capacity in Africa still remain feeble and unable to provide the necessary supports to promote fiscal balance and foster economic growth and development. Recent statistics show that Africa's growth rate and institutional assessment indicators are the lowest when compared with other regions of similar classification (see Table 4).

Table 4: Africa's Average Country Policy and Institutional Assessment (CPIA) Indicators

	Bottom		**Middle**		**Top**	
	2000	**2015**	**2000**	**2015**	**2000**	**2015**
Government effectiveness	-0.799	-1.000	-0.524	-0.762	-0.645	-0.611
Regulatory quality	-0.748	-0.851	-0.503	-0.747	-0.271	-0.375
Control of corruption	-0.804	-0.762	-0.617	-0.760	-0.685	-0.450
Voice and accountability	-0.978	-0.367	-0.445	-0.475	-0.638	-0.230
Political stability	-0.254	-0.308	0.000	-0.471	-0.702	-0.518
Rule of law	-1.092	-0.854	-0.713	-0.739	-0.873	-0.509

Source: African Pulse (World Bank, 2019)

A World Bank report (2019) on Africa's economic growth and institutional capacity assessment showed that while all the institutional assessment indicators fell in the negative territory in almost all the categories, the aggregate growth rate is far below the world's average and projected at 0.3 percentage points for 2019-2020. Although many studies have argued for and against the place of economic growth and institutions, a sustained GDP growth rate above 6% for an appreciable length of time and a workable institutional framework still remain a panacea for Africa's fiscal and development challenges. According to Acemoglu & Robinson (2010) and Presbitero (2012), growth and development of the economy arise when institutional transitions take place along a closely knitted policy framework that supports sound macroeconomic objectives.

From the foregoing, therefore, it is established that the issue of weak domestic sources of revenue that support fiscal structures and weak domestic institutional capacities that support the management of government finances has posed far-reaching consequences to most developing economies, both in terms of fiscal balancing, and economic growth. To ascertain the effect of these two factors, this study is undertaken to determine which of the growth compositions has the highest capacity to improve aggregate revenue and what level of institutional development is required to manage the accrued national resources. This is necessary for the African region to address the twin albatross of low-income growth and a high ED profile. Studies show that for Africa to address these twin challenges, the region must, as a matter of urgency, develop a framework that supports the generation of adequate and sustained revenue growth with a robust institutional capacity that takes into consideration the peculiar nature of the region.

3. Model specification and Econometric methodology

As stated earlier in the literature, the model for this study is built around two frameworks: the three-sector economy hypothesis and the traditional neoclassical growth theory. The justification for adopting these frameworks is due to the peculiar nature of the study, which requires that we show how improvement in composition of growth affects growth of national income and how improvement in income could aid the reduction of high ED burdens of most indebted economies in Africa. As a result of the dearth of studies that investigate the impact of sectoral growth on ED, this study adopts the models of Loayza & Raddatz (2010) and Afonso & Jalles (2013) with slight modifications. The model is stated as follows:

$$\hat{d}_{jt} = \delta_j + \widehat{\delta_\iota d}_{j,t-1} + \sum_{i=1}^{n} \delta_i \,.\, s_{ijt} \,.\, \hat{y}_{ijt} + X_{it}\,\rho' + \gamma_j + \tau_t + \varepsilon_{jt} \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where, *i,j,t* represents sector, country, and time, respectively; $\hat{d}_j$ is the dependent variable and represents the rate of change of ED; defined as debt-to-GDP ratio; δ_j is the intercept; δ_i, represents the coefficient of the parameters; s_{ij}, represents share of each sector in GDP; $\hat{y}_{ij}$ represents annual rate of change of each sector value added in GDP; *n* represents the number of sectors of each economy; and X represents the vector of control variables for country *j*; γ_j and $\tau_t$capture respectively country and time fixed effects, measured by geographic and time dummies. ε is the error term, and *t* is time period.

Re-specifying equation (1), we have the following:

$$\hat{d}_{jt} = \delta_j + \widehat{\delta_\iota d}_{j,t-1} + \beta_1 S_{1jt}\hat{y}_{ijt} + \beta_2 S_{2jt}\hat{y}_{ijt} + \beta_3 S_{3jt}\hat{y}_{ijt} + \beta_4 CAB_{jt} + \beta_5 RINT_{jt} + \beta_6 GOVEFF_{jt} + \beta_7 INF_{jt} + \gamma_j + \tau_t + \varepsilon_{jt} - - - - - - - (2)$$

where, CAB represents current account balance, RINT stands for real interest rate, GOVEFF stands for government effectiveness, and INF represents inflation. The economic criteria for each of the sectors and CAB variables are expected to be positive, while the inflation variable sign is expected to be negative. A negative rate of inflation has positive consequences for the economy as it leads to an increase in the weight of national income. The sign outcome for the GOVEFF variable is expected to be positive. A positive sign indicates strong perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

The empirical literature on the relationship between public debt and interest rates is diverse. Ardagna et al. (2007) found that high debt-to-GDP ratio leads to lower negative interest rates in the short run, at a threshold below 66% and a positive long-run impact when the ratio is above the 146% threshold. While all the parameters are expected to meet a priori expectations, the magnitude of the coefficients is also projected to be large enough for policy decisions.

3.1 Econometric methodology

Taking into account countries' geographic differences, the issue of endogeneity, and the dynamic structure of our model, this study adopts the Generalized Method of

Moments (GMM) estimation technique. Unlike other instrument variables such as the ordinary least square (OLS) or the two-stage least square (TSLS), the GMM provides more superior and efficient estimates. According to Hansen (1999) and Bond et al. (2001), GMM estimates are known to be superiorly efficient asymptotically compared to the estimates of other estimators. The application of GMM in a panel data framework provides the opportunity to include the initial level of the dependent variable (that is, ED) at the lag level in order to correct for misspecification bias and account for conditional convergence across countries.

Although the lag of the initial level of the dependent variable may lead to the challenge of endogeneity and cause measurement errors in the model, the GMM estimator removes the endogeneity between the lagged dependent variable and other regressors. Secondly, the adoption of the GMM as the estimator eliminates the challenges of country-specific effects or time-invariant country-specific impacts, by taking into account the first differences of the equation. However, studies have shown that at first difference, the variables manifest some levels of limitation and weakness. Correcting for this limitation requires the estimate of level and first-difference regression to be treated as a "system" in the presence of persistency (Blundell & Bond, 1998). To resolve the limitations of the first-difference estimator, it is required that a two-step system-GMM be applied.

According to Windmeijer (2005), Roodman (2009a) and Hauk & Wacziarg (2009), the two-step system GMM (Sys-GMM) provides better results than the first-difference GMM because it presents unbiased lower standard errors. In this study, therefore, we adopt the two-step Sys-GMM approach to investigate the link between sectoral compositions of growth and ED reduction. In order to avoid the problems of misspecification or over-identification of parameter challenges, which are likely to over-fit the endogenous variables[2] and weaken the informative power of the Hansen-J test (Roodman, 2009b), we follow the rule of thumb which stipulates that the number of instruments should be close to the number of countries (Roodman, 2009a) and the number of lags of endogenous variables limited to t-1 and t-2. Therefore, to check for the joint validity of the estimator and the instrument variable, the J-statistics test is employed.

3.2 Data Sources

The data for the study are annual time-series data spanning the period 1980 – 2019 for 41 African countries[3]. The period of 1980s -1990s captures the period during which most African economies witnessed a rise in ED stock and a fall in aggregate output growth as a result of political instability and wars. The period of the late 1990s through 2019 marks the era where most African countries started experiencing significant economic growth rates, political stability, and a declining ED profile as a result of the implementation of various domestic debt reduction reforms and other debt reduction initiatives put forward by creditor nations. Data for the different sectors (agriculture (LNAG), industry (LNINDUS), and services (LNSERV)) and current account balance were sourced from the UNCTAD statistics (2020). Data for ED stocks (% of GNI), government effectiveness (GOVEFF) and real interest rate were sourced from the World Development Indicators (WDI, 2020) published by the World Bank. Data for GOVEFF spanned from 1996 to 2018.

[2]Over fitting of endogenous variables occurs when the model is too complex. This gives rise to the wrong coefficients of the p-values (Roodman, 2009a).

[3] See Appendix 1 for a list of the countries examined.

4. Empirical Results

4.1 Descriptive Statistics

Table 5 provides the descriptive statistics analysis of the variables used in the regression analysis. From the table, it is shown that current account balance (CAB) recorded the highest mean, minimum, and maximum values in the series. Conversely, government effectiveness (GOVEFF) had the least average value, while ED stock (LNDEBT) had the least minimum value among the variables**.**

Table 5: Descriptive Statistics

	LNDEBT	LNAG	LNIDUS	LNSERV	RINTREST	GOVEFF	CAB	INF
Mean	1.737	3.047	3.123	3.427	12.829	-0.592	-421.366	33.941
Median	1.760	3.044	3.117	3.388	6.386	-0.611	-196.100	6.543
Maximum	3.140	5.056	5.146	5.488	572.936	1.049	365.020	237.130
Minimum	0.407	0.964	0.185	1.449	-53.444	-1.885	-272.370	-11.686
Std. Dev.	0.386	0.660	0.771	0.695	57.156	0.583	356.464	645.388
Skewness	-0.068	-0.065	0.169	0.461	8.702	0.357	2.023	35.334
Kurtosis	3.820	3.268	3.051	2.968	81.519	2.893	48.189	129.130
Jarque-Bera	43.401	5.926	7.790	56.674	33.100	20.466	13.500	98.000
Prob	0.000	0.052	0.020	0.000	0.000	0.000	0.000	0.000
Obs	1507	1599	1599	1599	1251	943	1574	1419.000

Note: All variables are expressed in logs except the real interest rate, government effectiveness, current account balance and inflation.

Source: Computed by the Authors.

It was also observed that variability was highest for CAB and inflation (INF), while GOVEFF and agriculture (LNAG) appeared to be the least volatile among the variables. In Table 6, the correlation matrix is presented. From the table, it was observed that CAB and inflation (INF) were the highest, while GOVEFF and agriculture (LNAG) appeared to be the least volatile among all the pairs of variables. A moderate to high correlation exists among all the pairs of variables except between the share of industry in GDP (LNINDUS) and the real interest rate (RINTREST), ED stock and (LNDEBT), agriculture and CAB and inflation and CAB, where the correlation is weak. Also, the correlation analysis shows that while ED stock has a positive relationship with the real interest rate and inflation rate, CAB has a positive relationship with the inflation rate but a negative relationship with the real interest rate.

Table 6: Correlation Matrix

	LNDEBT	LNAG	LNIDUS	LNSERV	RINTREST	GOVEFF	CAB	INF
LNDEBT	1.000							
LNAG	-0.344*	1.000						
LNIDUS	-0.482*	0.761*	1.000					
LNSERV	-0.501*	0.824*	0.964*	1.000				
RINTREST	0.008	-0.026	0.001	0.022	1.000			
GOVEFF	-0.253*	-0.120*	0.248*	0.280*	-0.152*	1.000		
CAB	-0.058	-0.009	-0.026	-0.069**	-0.045	-0.123*	1.000	
INF	0.109*	0.071**	-0.056	-0.017	-0.118*	-0.047	0.008	1.000

*Note: *, ** significant at 1% and 10% respectively*

Source: Computed by the Authors.

The highest positive correlation lies between services (LNSERV) and industry, while the least falls between industry and agriculture. Similarly, industrial and service

sector shares in GDP have a positive correlation with all variables except current account balance and inflation rate, where the correlation is negative.

4.2 Discussion of main results

Table 7 below presents the GMM results of the estimation of equation (2). From the result, it is revealed that the coefficient of the dependent variable (ED stock) is positive and significant. A positive coefficient of the dependent variable implies weak fiscal convergence of the public debt stock between the low- and high-income countries. Over the years, while the debt/GDP ratios of smaller economies like Tunisia, Senegal, and Angola have risen above 75%, the debt ratios of higher economies like Nigeria, Botswana, South Africa, Ghana, Kenya, Egypt, and Morocco still hover between 10- 55% threshold. Similarly, this weak fiscal convergence in public debt stock could also be observed among countries in different monetary unions. Empirical studies show that while countries in the CFA franc area have attained an appreciable and significant level of fiscal convergence, especially in their tax revenue profiles (Ary Tanimoune & Plane, 2005; Sarr & Ndiaye, 2011), countries of the other regional economic communities (RECs) are still grappling with the challenges of attaining the desired fiscal convergence in all its ramifications.

Table 7: Sectoral Composition of Growth and External Debt Relationship. (GMM and Orthogonal Deviation Results)

Variable	**GMM Result**	**GMM Orthogonal Deviation**
LNDEBT(-1)	0.499*	0.865*
	(0.045)	(0.030)
LNAG	-0.143***	-0.013
	(0.084)	(0.105)
LNIDUS	-0.349*	-0.157**
	(0.087)	(0.078)
LNSERV	-0.145	0.101
	(0.118)	(0.115)
RINTREST	0.001	0.003*
	(0.001)	(0.001)
GOVEFF	0.038	-0.030
	(0.057)	(0.034)
CAB	0.000*	0.000*
	(0.000)	(0.000)
INF	0.000	-0.001
	(0.001)	(0.001)
Constant		
Mean dependent var	-0.018	0.090
S.E. of regression	0.114	0.108
J-statistic	20.149	21.390
Probability(J-statistic)	0.000	0.000
S.D. dependent var	0.109063	0.277
Sum squared residual	7.805663	7.036
Observation	613	613

*Note: All the variables are in log-form accept CAB, GOVEFF,RINTREST and INF. * p<0.01, ** p<0.05, *** p<0.10. Standard errors in parentheses. Dependent variable was lagged by one period (t-1). Dependent variable (lXDEBT) was lagged by one period (t-1).*

Source: Authors' estimations.

Some of the reasons that accounted for this lack of fiscal convergence among RECs outside the CFA bloc could be as a result of high and persistent fiscal deficits, weak macroeconomic convergence programs, and fragile institutional frameworks (Qayyum & Haider, 2012; Qayyum et al., 2014), which have affected the management of most African countries' high ED profiles. Secondly, it could be a lack of political will and institutional capacity to implement the various forms of loan agreements which most of the African countries have signed into (Gammadigbe et al., 2018). The weak implementation of these loan agreements (especially the Maastricht Treaty and the Stability and Growth Pact (SGP) criteria) by countries outside the CFA monetary union has hindered revenue growth in these countries and consistently encouraged the accumulation of high public debt and fiscal deficits (Gammadigbe et al., 2018; Tapsoba et al., 2019). Although the African region has one of the world's lowest average debt-to-GDP ratios (less than 55% IMF threshold), this feat was not achieved by growth in domestic revenue but as a result of the two prominent debt relief initiatives (the Heavily Indebted Poor Country (HIPC) initiative and the Multilateral Debt Relief Initiative (MDRI)) of the IMF and Paris Club, which addressed over 40% of Africa's total public debt stock (IMF, 2017).

A look at the performances of the three main components of growth showed weak performance in all three sectors. From the results, it was revealed that the average income generated (as a percentage of GDP) for each of the three countries' productive sectors is weak and unable to provide the desired level of domestic revenue needed to support debt services and loan repayment of indebted countries. However, the results from the orthogonal deviation test present a better picture. The results show that among the three sectors, only services presented a positive and significant relationship with ED stock. The results of the two other sectors (agriculture and industry) are not surprising, as they reflect the levels of development and income- generating capacities of the two sectors over time. In the past three decades, the average level of sectoral share to GDP for these two sectors has remained one of the lowest when compared to other regions of similar classification (World Investment Report, UNCTAD, 2018).

The positive impact of the services sector implies that many African countries have started making concerted efforts in the development of the sector, especially in the areas of ICT, wholesale and retail trade, repair and services, hotel and restaurants, financial intermediation, real estate, renting, business activities, public administration, etc (Chukwu & Malikane, 2017). It could also be that the sector is utilising fewer imported inputs and has lower fixed costs, which creates a more elastic supply response within the domestic markets (Eichengreen & Gupta, 2013). The weak income-generating capacity of these two sectors has contributed to the high ED-to-gross national income (GNI) ratio of the African region. According to the World Bank report on international debt statistics (2021), the ED/GNI ratio of sub-Saharan African countries stood at about 43.7% in 2020, up from 23.4% in 2011. This figure is above the 36% acceptable threshold level to gauge a country's ability to service its ED stock (Hanna et al., 2012; Lee & Kim, 2016).

The result of the control variables (interest rate, inflation, government effectiveness and current account balances) showed that both the macroeconomic and institutional frameworks within the African region are inimical to income growth and ED sustenance. These findings are consistent with those of Qayyum & Haider (2012), Qayyum et al. (2014), Ramzan & Ahmed (2014) and Kim et al. (2017). These studies found that poor institutional frameworks and macroeconomic instability are key issues that affect growth and ED management of many HIPCs. Specifically, their findings revealed that while weak institutional structures affect the government's ability to carry out its regulatory functions in order to spur growth and development, a weak

macroeconomic environment encourages the accumulation of a high public debt stock. Studies have shown that high public debt structures lead to high charges of interest rates by creditors as safety nets to mitigate possible default in loan repayment plans and as a precondition for further financing of future budget deficits (Cerra et al., 2008).

Over time, most African countries have been faced with very high interest rates regimes as a result of increasing public debt stock, which in turn has crowded out domestic investments and stiffened the resources needed to meet debt service obligations (Agyapong & Bedjabeng, 2020; Olaoye, 2022). Apart from the issue of high interest rate structure facing most countries in Africa, the region is also faced with high price levels of both tradable and non-tradable commodities, which has also created negative shocks in both the commodity and product markets, eroded the purchasing power of the low-income class, and reduced the aggregate national income of countries.

4.3 Robustness check

To validate the consistency of our estimators and results, we subjected the GMM results to a sensitivity test by conducting the GMM Orthogonal Deviation Test and estimating pooled ordinary least squares (POLS) and Two-stage Least Square (TSLS) following Bond (2002) and Wang & Lee (2022). According to Bond (2002), if in dynamic panel estimation, the value of the result of the lagged dependent coefficient falls within the range of the POLS and TSLS, then the dynamic panel result is robust and appropriate. This is because while the estimate of the TSLS model leads to a downward bias of the lagged dependent variable, the POLS leads to an upward bias. From the result in Table 8, it was observed that the GMM result of the lagged dependent coefficient (LNDEBT (-1)) fell within the range of the other two estimators, thus suggesting that the GMM estimation result is of good fit. However, the orthogonal deviation test presented better results when compared to the original results of the GMM. Similarly, the results from TSLS and POLS estimations also presented an interesting outcome, which suggests that among the three sectors, only services presented a positive and significant relationship with ED stock.

Table 8: Sectoral Composition of Growth and External Debt Relationship.
(GMM, TSLS, POLS Results)

Variable	**TSLS Result**	**GMM Result**	**POLS (Fixed Effects) Result**
LNDEBT(-1)	0.964*	0.499*	0.931*
	(0.008)	(0.045)	(0.013)
LNAG	-0.040**	-0.143***	-0.028
	(0.017)	(0.084)	(0.017)
LNIDUS	-0.090*	-0.349*	-0.065*
	(0.022)	(0.087)	(0.023)
LNSERV	0.128*	-0.145	0.071**
	(0.029)	(0.118)	(0.033)
RINTREST	0.000	0.001	0.000
	(0.000)	(0.001)	(0.000)
GOVEFF	-0.008	0.038	0.022
	(0.011)	(0.057)	(0.012)
CAB	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)
INF	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)
Constant			0.143*
			(0.041)
Mean dependent var	1.579	-0.018	1.579
S.E. of regression	0.110	0.114	0.109

Variable	TSLS Result	GMM Result	POLS (Fixed Effects) Result
J-statistic		20.149	
Probability (J-statistic)	0.000	0.000	
S.D. dependent var	0.398	0.109063	0.398
Sum squared residual	7.749	7.805663	7.606
R^2	0.925		0.926
Adjusted R^2	0.924		0.925
F-Stat	28.336		999.236
Prob(F-Stat)			0.000
DW			1.810
Observation	649	613	649

*Note: All the variables are in log-form accept CAB, GOVEFF, RINTREST and INF. * p<0.01, ** p<0.05, *** p<0.10. Standard errors in parentheses. Dependent variable was lagged by one period (t-1). * p<0.01, ** p<0.05, *** p<0.10. Standard errors are in parentheses. Dependent variable (lXDEBT) was lagged by one period (t-1).*

Source: Authors' estimations.

To further show the clarity of our results, this study disaggregated the entire dataset by income level according to the World Bank (2022) income classification and the three sectors into subsectors. The essence of disaggregating the datasets by income level and sectors into subsectors was to (i) mainly ascertain the performances of the sectors within these income groups in the provision of quality funds to support ED stock reduction; and (ii) identify which of the sub-sectors that contributes higher resources for each country for the purpose of ED management. The results of the disaggregated dataset by income level are presented in Table 9. From the results, it was observed that out of the three sectors, only the services sector presented a positive and significant relationship with ED stock in the low-income group of the region.

Among the other groups, although the service sectors presented a positive sign, they are not significant. The implication of the result suggests that countries classified in the low-income categories have started to invest more resources in the development of subsectors like ICT, wholesale and retail trade, repair and services, hotel and restaurants, financial intermediation; real estate, renting and business activities, public administration, etc. than countries in the other income groups. An interesting feature of the results in Table 9 was the performance of the industrial sector *(LINDUS)* for low- and low-middle income countries. Although the a priori expectation in terms of direction was not met, the magnitude was significant. This result implies that among the two income groups, the industrial sector has huge potential to provide the much-needed domestic resource to finance the fiscal imbalance among countries in the income groups. However, due to limited investments in the sector, the anticipated gains have yet to be achieved. Another interesting feature of the result was the outcome of the government effectiveness (*GOVEFF*) variable.

Table 9: Disaggregated Result by Income Level (TSLS and POLS). Dependent Variable: ED (lEXDEBT)

Variables	**Low-Income**		**Low-Middle Income**		**Upper-Middle Income**	
	TSLS Result	**POLS Result (Fixed Effects)**	**TSLS Result**	**POLS Result (Fixed Effects)**	**TSLS Result**	**POLS Result (Fixed Effects)**
LNDEBT(-1)	0.676**	1.088*	0.836*	0.850*	0.901*	0.794*
	(0.274)	(0.255)	(0.049)	(0.025)	(0.044)	(0.120)
LNAG	-0.277	-51.258	-0.700	1.856	-4.489	-9.530
	(4.520)	(26.319)	(4.507)	(1.446)	(2.903)	(5.729)
LNIDUS	-14.967*	-4.017	-8.259**	-0.794	-0.634	-3.168
	(4.632)	(50.450)	(3.932)	(1.478)	(2.494)	(8.290)
LNSERV	15.063*	65.921	8.181	-1.119	4.111	8.321
	(4.049)	(63.364)	(5.615)	(2.390)	(3.754)	(7.031)
RINTREST	0.281	0.576	0.310*	0.312*	0.351*	0.280
	(0.419)	(0.954)	(0.127)	(0.119)	(0.166)	(0.264)
GOVEFF	-5.405	-56.567	19.079**	8.025**	-6.632	-11.741
	(12.278)	(39.344)	(7.737)	(3.382)	(7.291)	(10.93)
CAB	-2.726	-1.813	0.133	-0.002	-0.882	-1.348
	(2.232)	(4.601)	(1.014)	(0.842)	(1.259)	(1.456)
INF	0.597	2.870*	0.115	0.002	-0.067	-0.235
	(0.428)	(1.087)	(0.309)	(0.230)	(0.538)	(0.730)
Constant		-275.17		10.463**		34.288
		(177.39)		(4.808)		(28.368)
R-squared	0.865	0.965	0.963	0.957	0.957	0.960
Adjus R-squared	0.786	0.868	0.954	0.953	0.949	0.948
S.E. of reg	16.099	12.668	10.900	11.086	7.332	7.451
Sum sqresid	3110.066	802.379	9622.781	11428.640	2150.605	1998.712
Log likelihood		-65.297	-376.624			-157.606
F-statistic		9.893	106.900	256.521		78.293
Prob(F-statistic)		0.010	0.000	0.000	0.000	0.000
DW	0.695	3.620	1.691	1.386	1.733	1.634
Observation	20	20	102	102	48	48
Instrument rank	10.000		22		10.000	
Prob(J-statistic)	0.002		0.000		0.000	

*Note: All the variables are in log-form accept: CAB, GOVEFF, RINTREST and INF. * p<0.01, ** p<0.05, *** p<0.10. Standard errors in parentheses. Dependent variable was lagged by one period (t-1). Dependent variable (lXDEBT) was lagged by one period (t-1).*

Source: Authors' estimations.

From the result, it was revealed that among the three income groups, only countries in the low-middle income group have, to some extent, put in structures that have strengthened domestic institutions to support the implementation of government policies, administration, and control. The result in this section is quite revealing, as it has been able to shed more light on our earlier results.

Tables 10 and 11 present the results of the disaggregated sectors. However, in the course of our estimating the disaggregated sectors, it was discovered that the data for industrial sector subsectors (manufacture, mining, and construction) were highly correlated with one another, which affected their joint estimation. In a bid to overcome the high correlation challenges, we estimated each variable of the three subsectors separately in combination with other explanatory variables. While the services and industrial sectors were disaggregated, agriculture could not be disaggregated for lack of data. The study estimated the results using the GMM and TSLS only.

We also conducted the orthogonality test on the GMM results to ascertain their robustness. From the results, it was observed that only the *"lOTHERS",* a subsector of the services sector, is the main driver of the overall performance of the sector. The significant impact of the subsector suggests that most African countries have started to intensify efforts in the development of smaller communities, social and personal-based services, improved quality of employed private households, and growth in extra-territorial organizations. The subsectors of the industrial and agricultural sectors presented a weak and insignificant relationship with ED. The reason behind this outcome is not far-fetched. For more than three decades, agriculture and industry have remained underdeveloped. For instance, while agricultural practices in most countries are still in their rudimentary stages, commodity productions are in their primary states with little or no value addition. Similarly, while most countries' industrial sectors are gradually gaining ground, they still suffer from poor infrastructure (electricity and good road networks), weak regulatory and industrial/trade policy frameworks, a weak macroeconomic environment, poor quality products, and an underdeveloped market. All these factors have stifled the growth and development of the sector.

Table 10: Disaggregated Sectoral Composition of Growth and External Debt Relationship. (GMM and Orthogonal Deviation Test Results). Dependent Variable: ED *(lEXDEBT)*

Variable	**GMM Result (First Differences)**						**GMM Orthogonal Deviation Test**					
	(1)		**(2)**		**(3)**		**(4)**		**(5)**			**(6)**
lMANUF	-0.308*	***lMINING***	-0.314*	***lCONSTR***	-0.128*	***lMANUF***	-0.154**	***lMINING***	-0.171**	lCONSTR		-0.017
	(0.488)		(0.079		(0.049)		(0.078)		(0.070)			(0.040)
lXDEBT(-1)	6.516*		0.504*		0.515*		0.870*		0.866*			0.878
	(2.250)		(0.045)		(0.047)		(0.031)		(0.029)			*(0.029)
lAGRIC	-0.716		-0.158***		-0.178**		-0.011		-0.013			-0.040
	(0.549)		(0.088)		(0.084)		(0.096)		(0.103)			(0.096)
lTRANSP	0.371		-0.112		-0.165*		-0.024		-0.008			-0.019
	(0.488)		(0.072)		(0.064)		(0.102)		(0.098)			(0.100)
lWHR	0.816		0.040		-0.029		0.048		0.038			0.000
	(0.557)		(0.098)		(0.086)		(0.082)		(0.077)			(0.070)
lOTHERS	2.372**		-0.092		-0.101		0.056		0.080			0.021
	(1.303)		(0.101)		(0.095)		(0.165)		(0.160)			(0.164)
CAB	0.000*		0.000*		0.000*		0.000*		0.000*			0.000*
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)			(0.000)
GOVEFF	0.327		0.038		0.051		-0.013		-0.027			-0.017
	(0.353)		(0.059)		(0.055)		(0.033)		(0.032)			(0.032)
RINTREST	0.015**		0.001		0.002*		0.003*		0.003*			0.003*
	(0.006)		(0.001)		(0.001)		(0.001)		(0.001)			(0.001)
INF	-0.008***		0.000		0.000		-0.001		-0.001			-0.001
	(0.005)		(0.001)		(0.001)		(0.001)		(0.001)			(0.001)
M. depvar	-0.018		-0.018		-0.018		0.09		0.09			0.09
S.E. of regress	0.746		0.114		0.116		0.108		0.108			0.109
J-statistic	21.433		20.282		20.525		21.433		21.543			21.607
F-Statistics	0.000		0.000		0.000		0.000		0.000			0
S.D. depvar	0.109		0.109		0.109		0.277		0.277			0.277
Sum sqresid	335.933		7.831		8.074		7.059		6.98			7.1

Variable	GMM Result (First Differences)			GMM Orthogonal Deviation Test		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Instrument rank	10	11	11	11	11	11
Obs	613	613	613	613	613	613

*Note: Disaggregated sectoral variables are defined as follows: "lMANUF" (manufacturing); "lAGRIC" (agriculture); "lMINING" (mining); "lCONSTR" (construction); "lTRANSP" (Transport & Communication); "lWHR" (Warehouse, Hotel & Retails); "lOTHERS" (as classified by the international standard industrial classification (ISIC. Rev 4)). All the variables are in log-form accept: CAB, GOVEFF,RINTREST and INF. * p<0.01, ** p<0.05, *** p<0.10. Standard errors in parentheses. Dependent variable was lagged by one period (t-1). * p<0.01, ** p<0.05, *** p<0.10. Standard errors are in parentheses. Dependent variable (lXDEBT) was lagged by one period (t-1).*

Source: Authors' estimations.

Table 11: Disaggregated Sectoral Composition of Growth and ED Relationship (GMM and Two-Stage Least Square Results). Dependent variable: ED (*lEXDEBT*)

Variable	GMM Result (First Differences)						Two-Stage Least Square Result					
	(1)		**(2)**		**(3)**		**(4)**		**(5)**		**(6)**	
lMANUF	-0.308	***lMINING***	-0.314*	***lCONSTR***	-0.128*	***lMANUF***	-0.026	***lMINING***	-0.058*	***lCONSTR***	-0.051*	
	(0.488)		(0.079)		(0.049)		(0.020)		(0.021)		(0.019)	
lXDEBT(-1)	6.516*		0.504*		0.515*		0.963*		0.965*		0.955*	
	(2.250)		(0.045)		(0.047)		(0.009)		(0.009)		(0.009)	
lAGRIC	-0.716		-0.158***		-0.178**		-0.004		-0.026		-0.004	
	(0.549)		(0.088)		(0.084)		(0.016)		(0.018)		(0.016)	
lTRANSP	0.371		-0.112		-0.165*		-0.064*		-0.052**		-0.046**	
	(0.488)		(0.072)		(0.064)		(0.022)		(0.023)		(0.023)	
lWHR	0.816		0.040		-0.029		0.053**		0.059**		0.047***	
	(0.557)		(0.098)		(0.086)		(0.027)		(0.026)		(0.026)	
lOTHERS	2.372**		-0.092		-0.101		0.043***		0.079*		0.055**	
	(1.303)		(0.101)		(0.095)		(0.027)		(0.030)		(0.026)	
CAB	0.000*		0.000*		0.000*		0.000*		0.000*		0.000*	
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	

Variable	GMM Result (First Differences)			Two-Stage Least Square Result		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
GOVEFF	0.327	0.038	0.051	0.005	-0.006	0.006
	(0.353)	(0.059)	(0.055)	(0.011)	(0.012)	(0.011)
RINTREST	0.015**	0.001	0.002*	0.000***	0.000	0.000
	(0.006)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
INF	-0.008***	0.000	0.000	-0.001	-0.001	-0.001
	(0.005)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
R-squared				0.924	0.924	0.924
Adj R-square				0.923	0.923	0.923
Mean depvar	-0.018	-0.018	-0.018	1.579	1.579	1.579
S.E. of regre	0.746	0.114	0.116	0.111	0.11	0.11
J-statistic	21.433	20.282	20.525			
F-Statistics	0.000	0.000	0	0	0	0
S.D. depvar	0.109	0.109	0.109	0.398	0.398	0.398
Sum sqresid	335.933	7.831	8.074	7.839	7.767	7.769
SSR				7.839	7.767	7.769
Inst rank	10	11	11	12	12	12
Obs	613	613	613	649	649	649
DW				1.8	1.812	1.802

*Note: Disaggregated sectoral variables are defined as follows: "lMANUF" (manufacturing); "lAGRIC" (agriculture); "lMINING" (mining); "lCONSTR" (construction); "lTRANSP" (Transport & Communication); "lWHR" (Warehouse, Hotel & Retails); "lOTHERS" (as classified by the international standard industrial classification (ISIC. Rev 4)). All the variables are in log-form accept: CAB, GOVEFF,RINTREST and INF. * p<0.01, ** p<0.05, *** p<0.10. Standard errors are in parentheses. Dependent variable (lXDEBT) was lagged by one period (t-1)*

Source: Authors' estimations.

5. Conclusion and Policy Inferences

This study examines the impact of the composition of growth on the level of ED in selected African countries. One of the challenges Africa is facing is fiscal imbalance owing to the structure of its domestic productive base, which provides the region with inadequate resources for further growth. In a bid to correct this imbalance, many countries have resorted to the 'traditional' debt relief packages and imposed high taxes and interest rates to finance domestic economic activities. However, these approaches have been found to be inadequate in providing the needed resources for growth (see Aiyagari & McGrattan, 1998). The act of targeting specific sectors has proven to be an alternative to the fiscal challenges facing many economies. This study therefore examines the impact of growth in the productive sectors on ED to ascertain the sectors that have a higher capacity to impact the level of ED.

The study relies on the neoclassical perfect capital mobility assumptions and the three-sector economy model to show how growth in the productive sectors can impact ED. From the results, it is interesting to note that one of the reasons why the African continent is constantly faced with fiscal imbalances is as a result of lack of adequate information that encourages investment in the productive sectors with little resource capacity, a weak macroeconomic environment, and poor institutional quality. Rather than the much-touted agricultural sector being the main driver of economic growth in Africa, it is observed that the services sector is solely responsible for the increase in revenue in many African countries. However, from a policy point of view, much attention and resources are still being channeled into the agricultural sector with little attention to the industrial and service sectors, which have been the engines of growth in most advanced economies.

In trying to identify the sub-sectors of services that are responsible for this growth drive, the study notes that the "others" (as classified by the international standard industrial classification (ISIC. Rev 4)) have more capacity to drive the levels of ED even after controlling for institutional and macroeconomic factors. Therefore, for the levels of ED in the African region to be reduced, the continent's policymakers need to channel more resources towards the three sectors, but with greater attention to the services sector. The idea of resorting to 'traditional' debt relief packages and imposing high taxes and interest rates for financing domestic economic activities, debt servicing, and loan repayments might be counterproductive for Africa's growth and development. Secondly, Africa's heads of government should, as a matter of urgency, develop well-tailored domestic resource mobilization instruments and create an environment to mitigate private investment risks for sustained long-term growth and employment creation within the sectors. When this is achieved, it will not only help to improve sectoral productivity but will also attract more local and foreign direct investments into the different productive sectors.

Thirdly, countries should strive to adopt credible medium-term fiscal frameworks to ensure that sufficient resources are available to meet debt service obligations and broader spending needs. This can be achieved through formulating and implementing sustainable fiscal and monetary policy frameworks that supports government economic programs, as well as strengthening of domestic institutions and agencies of government responsible for the enforcement of local contracts and ease of doing business. Currently, many African countries' macroeconomic structures are very weak and unable to drive quality growth. Improving the macroeconomic environment would stimulate growth in

all the productive sectors of the economies, thus increasing the availability of domestic revenues to finance critical infrastructure and ensure debt sustainability.

Acknowledgements

The authors would like to thank the Editor-in-Chief and anonymous reviewers for their time and suggestions, which were most helpful in improving the quality of this article.

The authors declare that they have no potential conflicting interests with respect to the research, authorship, and/or publication of this manuscript.

The authors received no financial support for the research, authorship, and/or publication of this manuscript.

The views expressed in this article are those of the authors and not the official position of their institutions.

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Appendix 1

The following countries were examined: Algeria, Benin, Botswana, Burkina Faso, Burundi, Côte d'Ivoire, Cameroon, Central Africa Republic, Congo, Congo DR, Egypt, Ethiopia, Eswatini, Gabon, Gambia, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Papua NG, Rwanda, Senegal, Sierra Leone, Seychelles, South Africa, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe.