AKENTEN APPIAH MENKA UNIVERSITY SKILLS TRAINING AND ENTREPRENUERIAL DEVELOPMENT

EFFECT OF DEBT SERVICE AND REMITTANCE ON EDUCATION IN SUB-SAHARAN AFRICA

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THIS LONG ESSAY IS SUBMITTED TO THE SCHOOL OF BUSINESS, AKENTEN APPIAH MENKA UNIVERSITY OF SKILL TRAINING AND ENTREPRENEURIAL DEVELOPMENT IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION IN FINANCE

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DECLARATION

I do hereby declare that this project work was carried out independently by me. I take full responsibility for whatever has been reported here. Related work by others, which served as a source of information has been duly acknowledged by reference to the authors.

Signature …… Date ...…….

(SELINA SERWAA)

CERTIFICATION

I hereby certify that this long essay was supervised in accordance with guidelines on supervision laid down by Akenten Appiah-Menka University Skills Training and Entrepreneurial Development

Signature …… Date ...…….

(DR. KWAME ACHEAMPONG)

DEDICATION

I wish to dedicate this work to my fathers in the Lord, Pastor Obed Obeng-Addae, Apostle Ansah Asem Anthony for their prayers, invaluable guidance, support and encouragement throughout the preparation of this work.

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ABSTRACT

The study generally seeks to examine the effect of Debt Service and Remittance on Education in Sub-Saharan Africa current education expenditure. The studies used multicollinearity and multiply regression. The population of the study consists of ten year panel data from 2012 to 2021. The study sampled forty three countries from Sub-Sahara Africa. Data were collected from secondary source, particularly from World Bank database, United Nations Development Programme database, UNESCO Institute for Statistics Database and Human Development Reports. The data was collated using STATA version 14. The study revealed that external debt stock, represented by "Ext Debt," does not have a statistically significant effect on education expenditure in Sub-Saharan African countries. It was also identified that total debt stock, represented by "Total Debt," has a negative effect on education expenditure in Sub-Saharan African countries, and further showed that remittances, represented by "Ln Pers Remit" (natural logarithm of personal remittances), have a statistically significant positive effect on education expenditure in Sub-Saharan African countries. Based on the findings of the study, it is recommended given the positive impact of personal remittances on education expenditure, governments and policymakers in Sub-Saharan Africa should explore ways to harness and optimize remittance inflows for educational purposes. Initiatives such as remittance-backed education funds or partnerships with diaspora communities could be considered. It is prudent for governments to carefully manage their debt levels, considering the potential negative impact on education infrastructure. Governments should establish robust data collection and monitoring systems to track the utilization of funds allocated for education. This will ensure that funds, including remittances and debt-financed investments, are effectively channeled into improving educational access, quality, and infrastructure.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

It has been mentioned that in numerous nations external debt has sharply increased over the past few decades (Guiso & Sodini, 2013). In Europe, the US, developing economies, and the majority of industrialised economies, the external debt increased significantly (Sutherland & Hoeller, 2012). According to existing research, debt has a considerable impact on health outcomes in addition to socioeconomic factors such as wealth, income, and education (Berger, Collins & Cuesta, 2016). Debt accumulation can make it more difficult to acquire future funds for health-related investments and can lead to a vicious cycle in which a big amount of debt is both a result and a contributor to ill health (Jacoby, 2002).

Due to the estimated $93 billion annual infrastructure deficit in Sub-Saharan African countries, borrowing has become an essential source of deficit financing for these nations (Were, 2018). Internal borrowing is when money is borrowed from sources within a nation, but external borrowing is when money is borrowed from sources outside the nation (Ndubuisi, 2017). (World Bank, 2022). The World Bank (2022) defines external debt as debt owing to non-residents and repayable in products, services, or money. There are numerous reasons why nations take out loans. According to Fatas, Ghosh, Panizza, and Presbitero (2018), countries borrow money to fund extraordinarily large projects, giving financial markets a safe asset in the process. Borrowing enables countries to implement countercyclical fiscal policies, enhance citizens' quality of living, and withstand unforeseen shocks (Fatas, Ghosh, Panizza, & Presbitero, 2018). Numerous studies have discovered a positive connection between public debt and economic expansion (Thao, 2018; Fincke & Greiner, 2015).

A country's "debt service" is the portion of its national budget that is allocated to interest and principal payments on its debt, according to Fincke and Greiner (2015). The World Bank

defines the external debt stock as debt owed to non-residents that can be repaid in goods, services, or money (2022). Debt servicing stock includes payments to the International Monetary Fund, interest on long-term debt, and interest on short-term debt (Databank, 2022). The value of one currency stated in terms of a weighted average of many different foreign currencies split by a price deflator is the real effective exchange rate, according to the World Bank (2022). The cost of debt payment has an impact on investments made in the social and economic sectors, and consequently on the entire economy. It is feasible to break down economic production into its individual components, including private consumption, private investment, government spending, and net exports (Njuguna, 2008).

According to factors including economic growth, inflation, investment, consumption, and employment, macroeconomic performance has previously been evaluated (Kosimbei, 2009) to ascertain how effectively a nation is reaching its key policy objectives. Annual GDP growth and measures of macroeconomic stability are examples of indicators. Additionally, studies have shown that when inflation is low and stable, the debt to GDP ratio is controllable, and the currency rate is suitable, the private sector receives a significant signal. These elements clearly demonstrate how the government is committed to effectively managing the economy and how credible economic policy is.

Ekaette, Owan, and Agbo (2019) looked studied the relationship between Nigeria's external debt and its capacity to finance higher education using time series data from 1988 to 2018. An extensive positive association was found after a long-term review of Nigeria's external debt and its capacity to finance education. It was also demonstrated that Nigeria's ability to finance its educational system is mostly determined by the exchange rate rather than the country's stock of foreign debt or the interest paid on that debt. Furthermore, Tilak (1990), Fosu (2007), and

Fosu (2010) found that servicing external debt was a significant barrier to budgetary allocation to education using five-year panel data for 35 Sub-Saharan African nations from 1975 to 1994.

Using a panel of SAARC countries, Tasleem (2021) also discovered that paying off external debt had an impact on education and came to the same conclusions as Igudia (2020). For emerging nations with low levels of domestic savings, financial assistance is essential (Ihoya, 1999). Between the 1980s and 2005, several emerging nations started to worry about their ability to pay back their mounting debt. The High Income Poor Governments Strategy (HIPCS) is a representation of how challenging it has been for African governments to address the debt crisis (Awiti, 2015).

In this research, we concentrate on Africa's debt, which is further divided into three categories for private creditors. Sub-Saharan Africa is burdened with debt that is three times greater than the amount of the region's yearly exports. The region's combined health and education budgets are currently outstripped by debt servicing expenses. Africa's public debt was estimated to be US$235 billion in 1999. African nations owe a total of US$17 billion annually on average, which is equal to 3.8% of their GDP, 16% of their exports, and 35% of their investments in education.

Before the COVID-19 outbreak emerged, there was concern over the continent of Africa's mounting sovereign debt. The debt in Sub-Saharan Africa was 35 percent of GDP in 2010; by 2019, it had increased to 52 percent of GDP (IMF, 2021a). Greater countercyclical spending following the global financial crisis of 2008, lower revenue as a result of the 2014 commodities price shock, and increased infrastructure investment were some of the causes that contributed to the increase in debt (Onyekwena and Ekeruche, 2017). The rapid shift from concessional to

non-concessional lending is reflected in changes in the composition of creditors. Africa has moved its focus on debt repayment during the past ten years from multilateral organizations and the Paris Club to individual creditors and non-Paris Club nations like China. In contrast to conventional banks, new lenders like China and private creditors offer loans with fewer restrictions while still giving borrowers benefits like lower interest rates and longer repayment terms. China has been more adaptable than other nations thanks to its commercial and state-run loans to Africa. African countries issued about 125 Eurobonds worth a total of US$155 billion between 2003 and 2019. (AfDB, 2021a). Since the turn of the millennium, China has financed African nations a total of US$153 billion, according to CARI (2021). The higher interest rates and shorter maturities linked to these non-concessional sources have increased interest payments and refinancing risks. Governments have had to boost spending despite decreasing revenue to address the socioeconomic repercussions of the virus since the epidemic, which has made the debt position worse. According to the African Development Bank (AfDB), the continent would require between US$125 and US$154 billion by 2020, which will result in increased debt levels (estimated at 70% of GDP by 2020); now, seven countries1 are experiencing debt hardship (AfDB, 2021a).

1.2 Statement of the Problem

Ekaette, Owan, and Agbo (2019) used time series data from 1988-2018 to examine the relationship between Nigeria's external debt and education funding. Over time, studies showed a solid link between government debt and expenditures on school facilities and technology. Education spending in Nigeria was likewise demonstrated to be significantly more influenced by the exchange rate than either the total amount of external debt or the interest paid on that loan.

Adeola Peter (2019) argues that increased spending on debt service will leave less money for public investments like school renovations. According to UNESCO (2018), 26% of the underachievement of the country's public universities might be attributed to the cost of servicing foreign debt, which is an argument made by Ogunode (2020).

According to Ogunode and Adanna (2022), the cost of servicing foreign debt has cut into funding for higher education, particularly infrastructure, during the past decade. According to studies by Ogunode, Abubakar, and Jape (2021) and Tunde and Issa (2013), insufficient funding for infrastructure development can be traced back to issues including public debt repayment, corruption, population growth, inflation, a decline in national revenue, and poor financial planning. Underfunding public universities can have negative repercussions including inadequate facilities, a shortage of faculty, a decline in educational quality, a loss of talented faculty and students, a brain drain, and even strikes.

Capital projects, such as the construction of new buildings and the upgrading of existing ones, at several public institutions in Nigeria have been halted or cancelled due to the country's shrinking finances and significant debt servicing. According to Ogunode (2020), the infrastructure facilities that support the delivery of academic and non-academic services at educational institutions include libraries, labs, halls, offices, administrative buildings, residence halls, roads, water, electricity, the internet, and so on. When there is a sufficient amount of the necessary infrastructural facilities available, schools can function more smoothly, while when there is not enough, administration struggles to keep up.

According to Ogunode, Ndubuisi, and Jegede (2022), many capital projects at universities have been scrapped due to a shortage of finance. The rising cost of debt servicing, according to Adenikinju (2022), may prevent the financing of capital projects and reduce private sector investment. Since the international price of crude has fallen, the Nigerian government has had to rely on foreign and domestic borrowing to fund projects and reduce budget deficits, as argued

by Chukwuajah (2022). As a result, our debt load has ballooned to $38trn and we need to devote additional resources to debt payment while keeping our capital expenditures at roughly the same level. The rising cost of debt servicing in the United States has made it harder to secure funding for capital and other value-adding projects.

Staffing shortages are plaguing Nigeria's many public colleges due to the country's plummeting national GDP and heavy debt servicing. According to Oyekanmi (2022), in the first three months of that year, the Nigerian government paid out N668.69 billion to service domestic debt and $548.79 million to service overseas debt. This service is costing taxpayer-supported organizations like colleges a significant amount of money that could be better spent on infrastructure upgrades and employee training. It has come to light that no federally supported institution of higher education has been able to add to its teaching staff in the past three years.

The financing cost channel is another means through which public debt influences future educational attainment. Governments may reduce funding for social programs due to rising service costs (Tilak, 1990; Fosu, 2007; Fosu, 2010). Fosu (2007) examined whether servicing external debt has been a substantial constraint on fiscal allocation to education in 35 Sub-Saharan African nations using five-year panel data from 1975-1994. The findings indicate that the real cost of debt has little effect on investments in educational infrastructure or expenditures. It was also observed that debt servicing expenses had a major detrimental effect on education investment (Fosu, 2007). The study also revealed that the structural adjustment initiatives implemented by Sub-Saharan African nations throughout the time period aided in the rise in education spending during that time. Fosu (2007) claims that by rescheduling their debt, most countries have been able to escape the adverse effects of debt servicing.

Public spending on health and education were used as proxies for human capital development from 1960 to 2015 in an analysis of the effect of foreign debt payment on human capital development in Nigeria (Igudia, 2021). Ordinary Least Squares was used to conduct the

analysis of the data. Public expenditures on areas like healthcare and classroom supplies are mostly funded by borrowing from abroad, according to study by Igudia (Igudia, 2021).

1.3 Objectives of the Study

The study generally seeks to examine the effect of Debt Service and Remittance on Education in Sub-Saharan Africa. To accomplish this objective the study designed the following specific objectives.

1. To examine effect of internal debt stock on education expenditure in Sub-Saharan Africa countries
2. To examine effect of external debt stock on education expenditure in Sub-Saharan Africa countries.
3. To examine effect of total debt stock on educational infrastructural development in Sub-Saharan Africa countries
4. Effect of remittance on education expenditure in Sub-Saharan Africa countries

1.4 Hypotheses

The following guided the study.

1. H_0: Internal debt stock does not affect education expenditure in Sub-Saharan Africa countries significantly

   H_1: Internal debt stock affects education expenditure in Sub-Saharan Africa countries significantly

2. H_0: External debt stock does not affect education expenditure in Sub-Saharan Africa countries significantly.

H_1: External debt stock affects education expenditure in Sub-Saharan Africa countries significantly.

3. H_0: Total debt stock does not affect educational infrastructural development in Sub-Saharan Africa countries significantly

   H_1: Total debt stock affects educational infrastructural development in Sub-Saharan Africa countries significantly

4. H_0: Remittance does not affect education expenditure in Sub-Saharan Africa countries significantly

   H_1: Remittance affects education expenditure in Sub-Saharan Africa countries significantly

1.5 Research Questions

The study tested the following research questions.

1. What is the effect of internal debt stock on education expenditure in Sub-Saharan Africa countries?
2. What is the effect of external debt stock on education expenditure in Sub-Saharan Africa countries?
3. What is the effect of total debt stock on educational infrastructural development in Sub-Saharan Africa countries?
4. What is the effect of remittance on education expenditure in Sub-Saharan Africa countries significantly?

1.6 Significant of the Study

The main aim of the study is to examine the effect of Debt Service and Remittance on Education in Sub-Saharan Africa. The findings from the study such as knowing the effect of

internal debt on education expenditure, effect of external debt on education expenditure as well as effect of total on infrastructural development in the education sector in Sub-Saharan Africa countries. This will supports government in the region to make tailored policies that will help them to borrow meaningfully so as to ensure their debts do not their education which seeks to build human capacity for development and growth. It is also hoped that researchers and students will find the results of this study useful and serve as a guide to carry out further studies on the topic.

1.7 Scope of the Study

Contextually, the study sought to examine the effect of Debt Service and Remittance on Education in Sub-Saharan Africa. In view of that attention is given to the effect of internal debt on education expenditure, effect of external debt on education expenditure and effect of total on infrastructural development in the education sector in Sub-Saharan Africa countries. Data for study covers ten year period from 2011 to 2020 obtained from the World Bank Development indicator (2020) as well as sub-Sahara Africa government's expenditure on education. It also considered variables such as exchange rate and inflation rate as control variables.

1.8 Limitation of the Study

The study is envisaged to cover more than ten years, but limited to ten years as a result time and financial constraints. It would have also been better to have assessed the challenges sub-Sahara Africa countries encounter in funding education as a result of their total debt servicing experience. This was not possible due to the fact that it was not possible to issue questionnaire to all these countries and such challenges could not be obtained from available secondary data.

This limited the researcher to afore stated variables as indicated in specific objectives of the study. This can be a gap that other researchers could explore in future.

1.9 Organisation of the Study

This study is grouped into five chapters. The chapter one deals with the introduction part of study. The introduction covers the background of the study, problem statement, objectives of the study and research questions. It also takes into account significance of the study, scope of the study, limitation of the study as well as organisation of the study. Chapter two focuses on review of all related literatures. This consists of theoretical framework, empirical review and conceptual framework. Chapter three presents various approaches and methods the study employed to accomplish its objectives. This chapter deals with research design, study population, sampling procedure and sample size, data source, collection of data and data analysis. Chapter four presents the analysis and discuss of the data to be collected. The discussion considers demographic data on the respondents and various specific objectives of the study. Key findings of the study are summarised in chapter five. In addition, conclusions based on the outcomes of the study as well as recommendations for continuous improvement are also presented in chapter five.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The study sought to examine the effect of debt service and remittance on education of Sub-Sahara Africa. To accomplish this attention was given to the review of literature that relate to the study. It considered concepts, theories as well empirical literatures.

2.2 Conceptual Framework

2.2.1 Concept of Higher Education

The definition of tertiary education given by Ogunode and Mcbrown (2022) is "a system of higher education that fosters the development of teaching, research, and community service programs with the aim of contributing to the nation's economic, social, and technological advancement." The Federal Republic of Nigeria's national policy on education describes the tertiary education system in Nigeria as consisting of universities, inter-university centers like the Nigeria French Language Village and the Nigeria Arabic Language Village, the National Institute of Nigerian Languages, innovation enterprise institutions (IEIs), colleges of education, monotechnics, polytechnics, and other specialized institutions (2013).

According to Adeyemi (2001), a country's higher education system ought to house the majority of its research capacity and produce a sizable portion of the qualified people the economy requires. Higher education, in the words of Ogunode, Akinjobi, and Musa (2022), is "an structured educational system established for the worldwide community of people with the goals of carrying out teaching, research, and community service activities."

Ogunode (2020) placed a strong emphasis on the creation of a skilled work force when defining post-secondary education. A certificate is awarded upon successful completion of a higher education program. Higher education programs of study place equal emphasis on independent

study and class instruction. Higher education is the highest level of education and is crucial for the nation's social, economic, and political development (Ogunode, 2020).

Every country's leadership must develop educational policies that will guarantee that its children have the skills necessary to succeed in school and in the workforce, that they will reduce skill gaps in the labor market by increasing the supply of educated workers, that they will promote an environment that is supportive of learning, innovation, and scholarly pursuit, and that they will instill a love of learning in all of their citizens.

2.2.2 Concept of Administration

An organization's people and material resources are allocated and coordinated during administration in order to carry out its strategic plan and accomplish its objectives. Administration must manage and arrange existing resources in order to accomplish the institution's objectives. Any group must have management. Effective management is crucial to the institution's programs and services (Olatunde-Aiyedun, Ogunode, & Ohiosumua, 2021).

According to Diksha (2018), Ogunode and Atiga (2021), and Ogunode (2018), one of the main roles of administration is the integration and coordination of all the educational, physical, and human resources (2020a). It takes a lot of efficiency to operate a school well, and that efficiency must be supported by human empathy, understanding, knowledge, and skill. Construction equipment and school supplies make up the majority of the material resources. A school must manage its human resources, which include students, teachers, superiors, administrators, and parents. The various dimensions of educational theory and practice, such as the objectives of education, the curriculum, the mode of instruction, the function of the teacher, the rules and regulations, etc., are included as additional components. Through careful thought and thoughtful layout, all of these components have been combined to create a cohesive whole. Therefore, it is important to take into account the objectives and desires of a school's

administration. Some of the objectives of school administration are as follows, per Diksha (2018), Ogunode and Atiga (2021), and Ogunode (2020).:

a. First, to ensure that all students have access to a high-quality education that doesn't break the bank like many of today's private schools do. Instead, it refers to a high-quality education provided by appropriately qualified educators at an affordable price. This goal necessitates both the increase in enrollment and the enhancement of course content.
b. It is important to make sure that all of the available human, material, and financial resources are used to their full potential so that educational programs can fulfill their many goals.
c. Teachers are the most senior and experienced people in the classroom, and their contributions to the speeding up of the programs are greatly appreciated. They should be supported in developing novel strategies for teaching and taking part in educational service programs. As such, it's clear that school leadership should foster a culture where students are motivated to work hard, show loyalty, and care about their careers.
d. The fourth goal is to provide pupils with a solid foundation in democratic principles through well-planned educational programming.
e. As with other forms of administration, educational leadership strives to strengthen ties to the local neighborhood. That's why it needs public backing and cooperation to achieve its goals of increased enrollment, enhanced teaching quality, and streamlined, objective testing.
f. To plan extra-curricular activities that help students grow as individuals and improve instructors' effectiveness in the classroom.

g. As stated previously, the primary goal of administration is to get things done in a way that benefits society and the individuals involved.

h. 8. To get pupils ready for their future careers and roles in society.

i. Training students to adopt a scientific worldview and an objective perspective on life as a whole is goal number nine.

j. Providing pupils with a high-quality education relies on enhancing the quality of teaching in the classroom. The quality of instruction in classrooms can be improved by consistent monitoring and feedback for educators.

Ogunode and Atiga (2021), Diksha (2018), and Ogunode claim that all forms of educational institutions fall under the umbrella of educational administration (2020). Both colleges and universities, as well as elementary and secondary schools, fall under this category. As noted by National Open University of Nigeria (2011), Diksha (2018), Ogunode and Atiga (2021), and Ogunode (2020), the rector, provost, and vice-chancellor serve as the chief executive and administrators at higher level of education (polytechnics, colleges of education, universities, and other equivalent institutions). Rectors, provosts, and vice chancellors use this strategy to successfully mobilise, harness, and utilise all the resources available to their specific higher education institutions in order to achieve the corporate goals of the system, which are primarily community service, research, and teaching. The ability of the chief executive or administrator to efficiently plan, organize, coordinate, direct, and control the institution's affairs and operations, as well as its people, material, and financial resources, in order to fulfill the institution's goals, is known as higher school administration. Universities, in particular, depend on effective administration, strategic planning, and adequate finance to meet their goals and objectives.

2.2.3 Concept of Debt Servicing

Debt servicing was described by Chinaemerem and Anayochukwu (2013) as the routine repayment of loans taken out by a nation from both local and foreign sources. A portion of the principal and interest on the loan are included in an installment. A nation or corporate entity should have those periodic financial flows for debt servicing. A nation is said to be unable to service its debt if it is unable to pay its debts in the absence of necessary resources. This variable is predicted to have a negative relationship with the provision for economic growth. This is due to the fact that less money would be available to support qualitative and quantitative economic growth the more money would be needed to pay off existing domestic and foreign loans.

Adesola (2009) defines debt servicing as the amount of money needed over a specific period of time to pay back a debt's principal and interest. It was further highlighted that debt servicing causes a sharp reduction in the standard of living, gross social and economic downgrading, high external dependency, currency depreciation, balance of payment imbalances, exchange rate depreciation, and growing inflationary rate.

2.2.4 External Debt

Audu (2004) in Olusegun, Oladipo & Omotayo (undated). The original loan's currency must be used to pay off any foreign debt. The World Bank, International Monetary Fund, African Development Bank, and International Bank for Reconstruction and Development are just a few examples of the international financial institutions and foreign commercial banks that provide it. The relationship between this variable and Nigeria's economic growth is expected to be positive. It is stated that the government will set aside more money for economic growth provisions the more external debt there is, but the contrary is also true (Butt, 2009).

2.2.5 Internal Debt

Internal debt, also known as domestic debt, refers to the portion of a nation's overall public debt that is owing to lenders domestically. An addition to external debt is internal debt. The funding sources for the internal debt are commercial banks and other financial organizations. With the help of the sale of bonds and treasury bills, the government borrows money from the populace. According to theory, this variable should influence economic growth in a favorable way. According to Choong, Evan, Venus, and Puah (2010), the quantity of domestic debt that the government borrows determines the amount of money that will be devoted to ensuring the citizens' economic progress. The opposite is also true.

2.3 Theoretical Framework

The study considered two key theories that relate to the study. These are Keynesian theory, Krugman Debt Overhang Theory and Dependency Theory.

2.3.1 Keynesian Theory

On the other hand, proponents of Keynesian theory contended that government borrowing and deficit spending could be used to boost the economy without jeopardizing the welfare of present and future generations (Salsman, 2017). Blanchard (2019) contends that a country's population will be more prosperous when its debt's interest rate is lower than its rate of real output growth. More specifically, external debt, which is an infusion of cash from the outside into the economy, is what the Keynesian theory of public debt to boost the economy along the course of economic growth and development pertains to.

Keynes believes fiscal policy to be the best method for promoting economic growth since it works in the public's best interest. When the government borrows money from the general public to pay for its expenses, according to Keynes, the general public's level of consumption is unaffected because no private individuals' disposable income is used. A multiplicative

increase in aggregate demand occurs when the government reinvests these monies in the economy, which increases output and employment. As a result, using public borrowing can be used to affect the macroeconomic performance of the economy (Choong et al., 2010). A public borrowing's effect on investment, on the other hand, is indirect. Debts have an adverse effect on economic growth because they lower the quantity of capital available for investment. Furthermore, public debt can have the effect of a hidden tax on a nation's resources and place a financial burden on future generations by reducing the amount of revenue that can be generated from a given level of private capital. This might therefore lead to an increase in long-term interest rates, a decline in capital accumulation, and a reduction in private investments necessary for productivity growth (Victo, Joseph, and Godoo, 2016).

The Keynesian theory of public debt serves as the theoretical underpinning of this study. This theory predicts that public debt should be positively correlated with and have an impact on expected years of education. Jeroen and Iaki (2019) predict that the number of years a child of school-entry age will spend in school will increase as external debt is introduced into the economy and education spending increases.

2.3.2 Krugman's Debt Overhang Theory

The situation in which a country's debt exceeds its capacity to pay it back in the future is described by Krugman's debt overhang hypothesis from 1988. There are several reasons why debt might build up, and these factors can have an impact on employment, economic stability, and growth. According to the hypothesis, predicted debt service will most likely rise when output levels rise if a country's debt burden is greater than its capacity for future payments by some margin. Onwe, as stated in Ekaette et al. (2019), claims that when a country's debt overhangs, existing foreign creditors effectively drain the proceeds from domestic investment,

discouraging both domestic and new foreign investors from participating. This lessens a nation's capacity to boost its economy, increasing its dependence on foreign debt (Yucel, 2009). The relevance of this theory to the current research is that a country's debt load has the capacity to affect its economic activities, including financing for education. This idea, it should be stressed, does not forbid borrowing from outside sources; rather, it suggests that a nation's debt burden becomes untenable if there are no institutions for repaying borrowed money. According to Ekaette et al. (1988), taking out a loan from a third party can be profitable if the money is put to constructive use and used to address macroeconomic problems.

According to classical theorists, government spending is ineffective, hence governments should maintain balanced budgets to avoid debt building from deficit budgets (Tsoulfidis, 2007). Future tax rises brought on by public debt accumulation will drive away domestic capital and have a net negative impact on the economy (Tsoulfidis, 2007). Mill noted that the impact of debt on interest rates as well as the cost of debt servicing in the future may cause interest rate expectations to rise (Aspromourgos, 2018). Furthermore, the expenses of debt servicing may be overly large and have a detrimental effect on citizens' overall wellbeing (Aspromourgos, 2018).

According to this view, government deficits have no lasting macroeconomic effects on the economy (Phillipe, Montfort, and Boileau, 2002). This is due to the fact that increasing public sector debt automatically increases the amount of taxes that must be paid in the future. As a result of anticipating future tax rises, rational economic agents will boost their current savings rate (Phillipe, Montfort, & Boileau, 2002). The theory states, in general, that an increase in government expenditure (by the issuance of additional external debt) or a decrease in taxes will result in a corresponding rise in private savings, which will have no impact on the real economy (Phillipe, Montfort, and Boileau, 2002).

2.3.3 The Dependency Theory

This theory postulates that resources move from a "periphery" of underdeveloped and underdeveloped nations to a "core" of wealthy states, enriching the latter at the expense of the farmer. Dependence theory holds that, contrary to what free market economists usually claim, the periphery nations are not poor because they are not fully or sufficiently connected into the global system, but rather because of the manner in which they are integrated. From this angle, the dominant school of thinking is that of the bourgeois professors (Ogunmuyiwa, 2011). They contend that their own domestic mistakes are the cause of less developed countries' ongoing dependence on more developed nations and their underdevelopment. They think that this problem can be attributed to their lack of close integration, capital dispersion, low level of technology, subpar institutional setup, subpar leadership, corruption, and mismanagement; they see the underdevelopment and dependence of third world nations as an internal rather than an external issue. This school of thinking contends that the issue can be resolved by third-world countries requesting foreign aid in the form of loans, investments, grants, etc. while allowing the multinational to carry on as usual (Nazifi, 2014). They are largely dependent on wealthy countries for everything, including technology, aid, technical support, culture, etc. Due to their reliance on Western industrialized nations and Breton Woods institutions, the majority of developing countries are vulnerable to their goods. The dependency theory (Villanueva & Mariano, 2006) offers a thorough explanation of the factors influencing the status of developing countries and their reliance on foreign aid for their economic development and progress.

2.4 Empirical Review

Empirical review concentrated on the effect of internal debt stock on education expenditure, effect of external debt stock on education expenditure and effect of total debt stock on education administration in sub-Sahara Africa.

2.4.1 Effect of External Debt Stock On Education Expenditure

In order to increase their populations' standard of life through education, nations might use the budgetary space provided by external debt to accelerate capital accumulation. Two factors can affect the anticipated number of years spent in education. Spending on education is one of them. As external debt increases, government spending increases (Fosu, 2007). External debt provides the money needed to invest in education, especially for Sub-Saharan African countries with high budget deficits. When nations increase their capital and ongoing education spending, it is believed that educational performance will improve (Charles, Sylvester, Stephen, and Emilia, 2016).

The relationship between governmental debt and education spending has been shown by a number of empirical research. The relationship between external debt and education spending was the subject of ground-breaking study by Tilak in 1990. The overall external debt of Sub-Saharan Africa surged tenfold between 1970 and the middle of the 1980s, according to the report. Government education spending only increased by a factor of three over the same period. External debt levels strongly affect public spending on education, according to Tilak's (1990) preliminary analysis using correlation coefficients (Tilak, 1990).

The purpose of this study is to fill a gap in the empirical literature about the relationship between external debt and anticipated years of schooling. Expected years of schooling, a crucial component in educating people to become aware, is the amount of time a child of school-entry age is expected to spend in school (Jeroen and Iaki, 2019; Human Progress, 2022).

The main goal of this study is to identify the association between external debt and anticipated years of schooling in Nigeria and Ghana from 1990 to 2019. The long-term impact of external debt on the anticipated number of years of education in Ghana and Nigeria will also be examined in this study. The causal relationship between foreign debt and anticipated years of

education will be looked into as well. This study is crucial because, although financing infrastructure improvements through borrowing is advantageous, the best outcomes will come from a concentrated effort to train the necessary employees. Numerous empirical studies have shown that a skilled workforce manages resources more effectively and helps the country's economy grow (Gitana and Agn, 2018; Yuriy, Halyna, Iryna, and Iveta, 2020). The theoretical underpinnings of the research, the literature review, the methodology, the discussion of the findings, and the conclusion and suggestions will be the main topics of the subsequent sections of this study.

In two South African provinces' public institutions, Boateng (2014) investigated the effect of public expenditure management on the results of primary education. The study included cross-sectional data from 175 public organizations, including 13 local education offices (Boateng, 2014). The misuse of education funding and poor education indicators are weakly correlated, according to the study (Boateng, 2014). However, there is a strong link between dropout rates and the amount of time it takes to provide funds to schools (Boateng, 2014). Ineffectiveness in the district and schools also significantly affects attrition rates (Boateng, 2014).

Using a panel data set and 95 developing nations from the years 2002 to 2015, Khemais (2018) examined the association between external debt and human development. For the time period under consideration, estimation findings using the Panel Smooth Threshold Regression (PSTR) model showed a non-linear association between external debt and human growth. External debt that is less than the ideal level of 41.7775 percent, as determined by Khemais (2018), has a favorable impact on human development, whereas external debt that is higher than this level has a negative impact. The variables included for this analysis are external debt, gross fixed capital formation, foreign direct investment, trade openness, and population growth rate.

Using time series data from 1988 to 2018, Ekaette, Owan, and Agbo (2019) examined Nigeria's foreign debt and financing for education. The acquired data was examined using the

Augmented Dickey-Fuller unit root test method, the Johansen co-integration for long run relationship analysis, the Vector Error Correction method, the Granger causality, and the Ordinary Least Squares method. The results showed that, in the long run, there was a substantial correlation between Nigeria's external debt and the funding of education. The study also showed that the currency rate has a considerable impact on education financing in Nigeria, although the stock and service of external debt have no discernible effects. In 2019, Ekaette, Owan, and Agbo According to the writers, external debt should be utilized to finance development projects like spending on education to overcome illiteracy in Nigeria.

Another way that public debt affects anticipated years of schooling is through the cost of financing. High service costs could limit government spending in the social sectors (Tilak, 1990; Fosu, 2007; Fosu, 2010; Fosu, 2007; Fosu, 2010). Fosu (2007) used five-year panel data from 1975 to 1994 to evaluate whether servicing external debt has been a substantial barrier to budgetary allocation to education for 35 Sub-Saharan African countries. The results showed that predicted debt payment has a considerable negative impact on education costs, but actual debt service had no impact on those costs (Fosu, 2007). The analysis also showed that the structural adjustment programs carried out by Sub-Saharan African countries during the time period had a favorable effect on the rise of education expenditure (Fosu, 2007). According to Fosu (2007), the majority of countries were able to escape the actual negative effects of debt payment through debt rescheduling.

(Igudia, 2021) investigated the impact of external debt servicing on human capital development in Nigeria from 1960 to 2015 using public spending on health and education as proxy for human capital development. The information was examined utilizing the Ordinary Least Squares method. According to Igudia's analysis (Igudia, 2021) external debt greatly increased government spending on health and education. The external debt servicing also had a detrimental effect on government spending on health and education.

According to Tilak (1990), large debt servicing expenses can cause the government to spend less on social sectors. In Tasleem (2021), which looked at how SAARC countries' foreign debt service affected education, the same finding was reached (Igudia, 2021). Data for SAARC countries were gathered from 1990 to 2016 and fixed effect model estimations were carried out (Tasleem, 2021). As it is easier to cut education spending than spending in other sectors, the data showed that the government repays debt and debt servicing costs by lowering education spending (Tasleem, 2021).

Empirical studies on the impact of public debt on education have primarily examined educational spending. However, there is actual evidence that suggests that raising school spending does not always result in better education (OECD, 2012; Emiliana & Chelsea, 2015). Investigating the link between external debt and anticipated years of education would help this study add to the body of empirical research.

2.4.2 Effect of Total Debt Stock On Educational Infrastructural Development

Ekaette, Owan, and Agbo (2019) conducted earlier research on the relationship between Nigeria's external debt and funding for education using time series data from 1988 to 2018. Over time, academics discovered a direct link between public debt and expenditures on the physical and technological infrastructure of schools. It has also been demonstrated that the exchange rate has a significantly greater effect on Nigeria's ability to fund education than either the total amount of external debt or the interest rate on that debt.

According to Adeola Peter (2019), high loan payment expenses will decrease the amount of money available for enhancing public institutions like schools. According to Ogunode (2020), the expense of servicing the nation's foreign debt prevents infrastructure development, which, per UNESCO (2018), is responsible for 26% of the public universities' underperformance.

According to Ogunode and Adanna (2022), servicing foreign debt during the preceding ten years has decreased funding for higher education, particularly for infrastructure. According to research by Ogunode, Abubakar, and Jape (2021) and Tunde and Issa, insufficient funding for infrastructure development has been attributed to reasons such public debt repayment, corruption, population growth, inflation, a decline in national revenue, and poor financial planning (2013). Underfunding public universities can have negative effects, including inadequate facilities, a shortage of academics, poor education, brain drain, and strike activity.

Many public colleges in Nigeria have halted or stopped capital projects, including the development of new facilities and the renovation of existing ones, due to the country's declining revenue and the burdensome debt servicing. According to Ogunode, infrastructure facilities include things like libraries, labs, halls, offices, administrative buildings, dormitories, roads, water, power, the internet, and other things that let educational institutions deliver both academic and non-academic services (2020). It will be simpler to manage educational institutions effectively if there is enough of the required infrastructure on hand, but it will be more difficult if there is not enough.

According to Ogunode, Ndubuisi, and Jegede (2022), many university-level capital projects have been shelved due to a shortage of finance. According to Adenikinju (2022), the rising cost of debt servicing could make it more difficult to finance capital projects and deter private sector investment. Chukwuajah (2022) believes that a decline in oil income as a result of a decline in the price of petroleum on the global market has led the Nigerian government to resort on borrowing on the domestic and international markets to fund its projects and close budget deficits throughout the years. Due to this, the debt profile has swiftly risen to $38 trillion, requiring more money for debt payment and almost the same amount for capital expenditures. The nation's increasing debt service payments make it more difficult to finance capital and other value-adding projects.

Nigeria's numerous public higher education institutions, particularly its universities, are experiencing a staffing problem as a result of the country's declining national revenue and hefty debt servicing. According to Oyekanmi (2022), in the first quarter of 2022, the Nigerian government paid $548.79 million in foreign debt payment and N668.69 billion in domestic debt service. At public institutions like universities, a large portion of the funds that could be used for infrastructure upgrades and training new employees are instead going toward this service. It has been reported that no government supported institution or university has been permitted to hire any new faculty members for the past three years.

The expense of sponsoring a student's education also has an impact on public debt. Because services are so expensive, governments can decide to reduce their spending on social programs (Tilak, 1990; Fosu, 2007; Fosu, 2010). Fosu (2007) examined whether servicing external debt has been a substantial barrier to fiscal allocation to education in 35 Sub-Saharan African nations using five-year panel data from 1975 to 1994. The findings demonstrate that the real cost of debt has little impact on infrastructure investments or educational spending. Costs associated with debt service were discovered to have a considerable negative influence on education spending (Fosu, 2007). More significantly, the study discovered that structural adjustment programs implemented by Sub-Saharan African nations over the time period influenced the growth of education spending. Fosu (2007) asserts that by rescheduling their debt, the majority of nations were able to avoid the detrimental effects of debt servicing.

Using state spending on health and education as proxies for human capital development from 1960 to 2015, the effect of external debt payment on human capital development in Nigeria was examined (Igudia, 2021). The Ordinary Least Squares approach was used to examine the data. Igudia's research (Igudia, 2021) indicates that a considerable portion of public spending on items like healthcare and school supplies is a result of borrowing from other countries.

2.4.3 Effect of Total Debt Stock on Education Administration

According to Ogunode, (2020) "non-academic staff" refers to individuals who work in institutions but do not instruct students or conduct research. Without the help of non-academic personnel, higher education cannot accomplish its objectives. Among the many advantages of attending a university, academic service is just one. Higher education institutions are run by a team of academic and non-academic staff members. For universities to succeed, they need a combination of academic and administrative staff (Ogunode, 2020). Non-academic staff work in the country's higher education institutions to provide services like security, libraries, administrative, maintenance, legal, medical, cleaning, planning, finances, and more. Any academic institution must have these support services in order to succeed. Because universities are not allowed to hire new faculty, there is a shortage of faculty. The National Institutions Commission (2021) has recommended that institutions be excluded from a Federal Government circular on new employment due to a critical lack of available faculty. 100,000 faculty members work in colleges, which have 2.1 million students. The NUC is responsible for overseeing over 200 colleges and universities that represent 48 federal, 54 state, and 99 private jurisdictions. There are 100,000 academic staff members and 170,000 non-teaching employees working for the National University System, which claims that there are 2.1 million students enrolled in the system. The system is beset by problems such as exorbitant maintenance costs, insufficient funding, a lack of electricity, and a shortage of personnel. Universities should be exempted from the Federal Government's circular on the embargo on new employment, according to the National University Commission (2022), if they are to compete with their peers around the world. This is because of their special characteristics.

Public universities are experiencing the effects of a drop in revenue and an increase in debt payment costs in other ways, such as through strike actions. The declining national revenue and high debt servicing costs of Nigeria have been blamed for the strike activity by several

unions in the country's higher education sector. The federal government has not been able to fulfill its obligations to various labor unions at public universities because of a lack of funding. The government's refusal to uphold and carry out agreements made with labor unions, according to Okebukola (2018) and Ogunode & Ahmed (2021), has led to strikes in public universities and colleges. Governments rely on tax revenue, according to Musa (2019), to cover the cost of essential services, maintain the public infrastructure, and pay other debts. Due to a large debt load, which Oyekanmi (2022) estimates to be N668.69 billion for domestic debt service and $548.79 million for external debt service in the first quarter of 2022, and falling oil prices, the federal government's revenue has been unstable for some time. Isiguzo and Arinze (2021) claim that Nigerian President Muhammadu Buhari has acknowledged that the federal government lacks the funding necessary to reenergize the nation's educational system. Additionally, the president claimed that the increase in competition for funding, especially in light of Nigeria's recent growth in the number of higher education institutions, was caused by the decline in oil revenue as a result of the global price collapse. Senator Chris Ngige, the minister of labor, was quoted in Inyang (2022) as saying that the drop in revenue and the price of oil prevented the federal government from having enough money to grant some of the Academic Staff Union of Universities' (ASUU) demands. The reasons for the strike actions by various union groups, according to Ogunode (2020) and Ogunode, Ugochukwu, and Jegede (2022), include poor implementation of the agreement, underfunding of the public universities, insufficient infrastructure facilities, poor implementation of the agreement reached with union groups, and poor working conditions.

The Nigerian government's high debt servicing costs and decline in revenue are the direct cause of the public higher education system's underfunding, which impedes the implementation of the higher education system's various programs, including the community service program. Because they have such a positive effect on the surrounding communities, university

community service programs are highly regarded. The community service offered by the higher education institutions is well-known. According to Ogunode, Olugbenga, and Ezema (2022); Ogunode, Iyabode, and Olatunde-Aiyedun, community service ranks third among the most crucial courses offered at universities (2022). The community service initiative is the third most significant one that universities are pursuing, according to Ogunode and Audu (2022). A school or university's community service program is a well-organized effort to better the neighborhood. Through the implementation of community service programs, higher education institutions frequently take the initiative in community development. In order to support the community, higher education institutions frequently engage in community service. Ojelade, Aiyedun, and Aregebesola (2019) noted that community service programs are run in the vicinity of the institutions' physical locations so that the host community can benefit from the institutions.

Financial resources play a crucial role in the management and administration of higher education institutions, according to Ogunode and Audu (2022). Insufficient funding makes it impossible for higher education to run. Any plans or aspirations must be able to be realized, which means having enough money to pay for college. According to Ogunode, Yahaya, & Musa (2022) and Ogunode, Ugochukwu, & Iroegbu (2022), education funding is insufficient and significantly below the UNESCO-recommended level of 26%. Because of a lack of funding from the government, tertiary institutions are unable to carry out their community service initiatives as planned. As higher education is the government's main funding source, a reduction in funding for this sector will undoubtedly have an effect on how government programs like the community services program are implemented. Ogunode (2021) asserts that whether or not a program is implemented at a university depends on the budgetary support it receives.

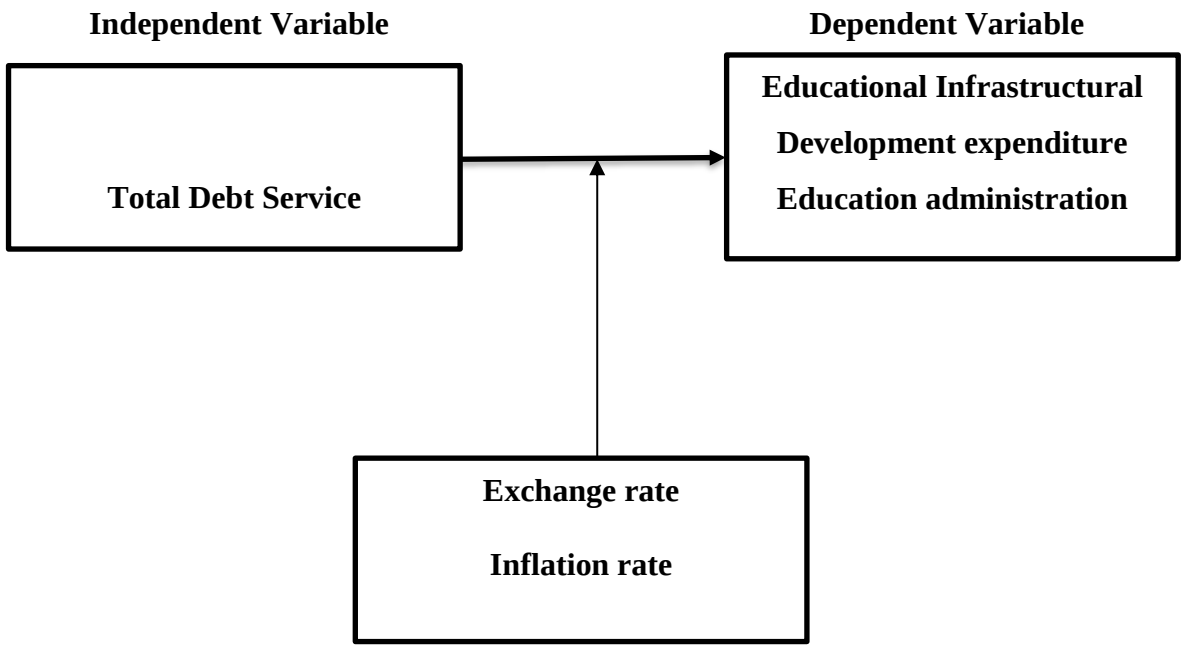
The ability of public universities to execute their research programs could be impacted by the service of government debt. Institutions of higher learning are frequently linked to research. Universities and colleges have three main objectives: educating students, conducting research, and giving back to the community (Ogunode, Jegede, Adah, Audu, & Ajape, 2021). The second-most significant academic activity, according to Ogunode and Abubakar (2020), is research. Civilizational advancement depends on research. Academic institutions serve as the main location for research that aims to address societal issues. It is expected that faculty members conduct research at universities. Their research abilities can be used as one indicator of their effectiveness. Universities' research programs are particularly affected by the criticism that higher education budgets are insufficient (Ogunode & Aiyedun, 2020; Ogunode, Ahmed, Gregory & Abubakar 2021). Any decrease in funding for higher education will have a knock-on effect throughout the entire system, affecting areas just as crucial to the nation's economic and technological advancement as research funding. Lack of funding is one factor in the slow advancement of research programs at Nigeria's public universities.

Nigeria's public higher education institutions' implementation of higher education programs has been below par as a result of recent declines in national revenue and excessive debt servicing. Numerous higher education initiatives intended to develop faculty and staff have been implemented ineffectively due to revenue shortfalls and the nation's enormous debt servicing burden. Nigeria's universities have been receiving less funding over the last ten years. Ohiare Udebu, Sarafadeen, and Abashi (2022) assert that the past few years have seen a decline in the country's revenue due to falling oil prices. Inadequate funding for Nigeria's universities is a problem that is exacerbated by this. The chronic revenue shortfall of the government, according to Ogunode & Onyekachi (2021), is another issue with Nigerian education funding. Nigeria's revenue has consistently fallen short of expectations over the last five years. In 2021, the federal government's projected revenue was N5.365 trillion, with an estimated N1.341

trillion in quarterly revenue, as stated in the updated 2020 Budget Framework. But as of the end of December 2020, the Federal Government's total inflow of revenue was only N3.418 trillion, falling short by N1.947 trillion (or 36.29 percent) of the annual budget projection for 2020. Ogunode, Ajape, and Jegede (2020) listed the following as obstacles to the successful implementation of policies governing higher education in Nigeria: a lack of funding, a lack of infrastructure, a lack of qualified professors, institutional corruption, a lack of political will, a security issue, political instability, a lack of clarity in the policies, strike actions, weak regulatory bodies, and political influence.

2.5 Conceptual Framework

The conceptual framework investigates how total debt stock affects the growth of the educational infrastructure. This was accomplished by using total debt as an independent variable and infrastructure development as a dependent variable in the study. Exchange rate and inflation rate were used as additional control variables.



Control variables

Figure 2.1: Conceptual Module

Source: Researcher's construct 2023

The cost of exchanging one currency for another is known as the exchange rate. It is the rate at which one currency will be converted into another, or the value of one nation's money in relation to another. The study makes the assumption that this variable should, in theory, have an impact on either the infrastructural development of the education sector in sub-Saharan Africa.

The provision for economic growth should be negatively impacted by the inflation rate. The government needs equipment or productive resources to support both qualitative and quantitative economic growth, so the higher the inflation rate, the more expensive these items will be. Investment in the development of infrastructure for the education sector would be discouraged or dissuaded.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the numerous strategies and tactics used to achieve the study's goal. The chapter addresses the following important topics. Research technique was defined by Leedy and Ormrod (2010) in agreement with Babbie and Mouton (2008) as the researcher's broad strategy to carrying out the research endeavour. According to Mouton (2001), research

methodology focuses on the nature of the research process as well as the tools and processes that will be applied. As a result, the chapter included the definitions, data sources, and description of the explanatory variables. It includes the target population, data collection methods, and research design.

3.2 Research Design

The steps taken by the researcher to carry out the study are detailed in a research design (Sekaran & Bougie, 2013; Kothari, 2011; Cooper & Schindler, 2014). A research design is generally referred to as a strategy that describes the structuring of the study and certifies that the objectives were met throughout, claim Saunders, Lewis, and Thornhill (2014). To ascertain the strength of correlations and/or effects between variables, the study employed a descriptive correlational research technique, which comprises gathering and evaluating data from study units at a certain point in time (Saunders et al., 2014; Mulwa, 2013). Descriptive research was used to gather data on current phenomenon status to define "what exists" related variables under study or existing conditions, according to Sekaran and Bougie (203), Kothari (2013), and Mugenda and Mugenda. The features of a population are also accurately and methodically described (Sekaran & Bougie, 2013). A research design is the overall strategy for addressing the questions of the study and resolving any potential issues (Polit & Beck, 2004). Research plans are created to satisfy a study's particular specifications.

It was also suggested that choosing a strong research design be influenced by a general factor, specifically if the design does the best it can to generate reliable responses to the research question. Instead of all of these, the study used a descriptive cross-sectional survey because it was done simultaneously across a few chosen universal banks. This makes it possible for the researcher to apply the results to a wider population. The study used a quantitative approach. The approach used to generate the data had an impact on the methodology selection.

3.3 Population of the Study

A population is defined as an absolute category of people, events, or things that adhere to a specified description and exhibit comparable behaviour (Cooper & Schindler, 2013). The population of the study consists of ten year panel data from 2012 to 2021. It also considers all the countries within the sub-Sahara Africa.

3.4 Source of Data and Data Collection

This study's data came from one secondary source. The information was gathered from databases maintained by the World Bank, the UNDP, the UNESCO Institute for Statistics, and the Human Development Reports, which covered the period from 2012 to 2021.

Data collection, according to Burns and Grove (2010), is the systematic gathering of relevant information on the sub-problems within a research field using predetermined criteria such as interviews, participant observations, focus groups, case studies, and narratives. Information was gathered on each sub-Saharan African nation's overall debt servicing stock, exchange rate, and inflation rate.

The external debt stock (2022), as defined by the World Bank, is the total amount owed to nonresidents and repayable in goods, services, or cash. Debt servicing stock is the total of principal repayments and interest payments made in goods, services, or money on long-term debt, interest payments made on short-term debt, and IMF repayments (Databank, 2022). According to the World Bank (2022), the real effective exchange rate is the ratio of one currency to a weighted average of several other foreign currencies divided by a price deflator. According to research by (Ekaette, Owan, and Agbo 2019), real effective exchange rate is one of the independent factors because of its impact on the stock of external debt and the payment of external debt (Blessy, 2019). Loan repayment becomes more expensive for a currency that

is losing value due to external debt by raising the amount that must be repaid in domestic terms (Blessy, 2019).

3.5 Reliability and Validity

Validity and reliability are two essential factors to take into account when evaluating an instrument. When conducting the survey, the objectives of the study, the target population, and the available resources should all be taken into account to improve the validity and reliability of the findings (Liamputtong, 2019). An instrument is said to have high dependability when it can be counted on to deliver accurate measurements of a constant value (Vitiello, Whittaker, Mulcahy, Kinzie & Helferstay, 2019; Gerlach, Arslan, Schultze, Reinchard & Penke, 2019).

The researcher checked the accuracy and value of the data collected for the study. Data dependability was determined using the Cronbach alpha method.

By proving a logical connection between the items in the instruments and the study's objectives, the face and content validity of the instruments will be proven.

This will be done to make sure that the study objectives are sufficiently and completely covered by the items of the instruments. Several of the questionnaire's questions will be changed based on the suggestions and amendments made by the experts. Instrument validation basically aims to find any potential flaws, ambiguities, or issues with the tool (Oluwatayo, 2012). As a result, the researcher will be able to make the required modifications before to data collection. The researcher will investigate further pertinent literature and use the information to support the design of the instrument. There will be some scientific validation used for the scales' items.

3.6 Data Analysis

This section presented the methodology that was useful for testing the examined variables and for data analysis. The researcher will organise the data using the excel tool to help

operationalize the study variables. The data will be collated using STATA version 14 since it features a point-and-click user interface and a command syntax that make analysis incredibly simple. The creation of data plots, graphs, and conclusions is also made simpler by STATA software.

3.7 Model Specification

The study is guided by the following models. Thus, this study has employed a balanced panel data of Sub-Sahara Africa over a period from 2012 to 2021.

3.7.1 Model for the Effect of Internal Debt Stock on Education Expenditure in Sub-Saharan Africa Countries:

The study employed a multiple linear regression model, using education expenditure as the dependent variable and internal debt stock, GDP, and population size as independent variables. The model could be formulated as follows:

Education Expenditure = β_0 + β_1Internal Debt Stock + β_2GDP + β_3Population Size + β_4 Remittance + ε

Where:

β_0 is the intercept

β_1 is the coefficient for internal debt stock

β_2 is the coefficient for GDP

β_3 is the coefficient for population size

β_4 is the Remittance

ε is the error term

This model would allow us to estimate the relationship between internal debt stock and education expenditure while controlling for the effects of GDP and population size.

3.7.2 Model for the Effect of External Debt Stock on Education Expenditure in Sub-Saharan Africa Countries:

A similar multiple linear regression models were used to explore the effect of external debt stock on education expenditure in Sub-Saharan Africa. The model could be formulated as follows:

Education Expenditure = β_0 + β_1External Debt Stock + β_2GDP + β_3Population Size + β_4 Remittance + ε

Where:

β_0 is the intercept

β_1 is the coefficient for external debt stock

β_2 is the coefficient for GDP

β_3 is the coefficient for population size

β_4 is the Remittance

ε is the error term

This model would allow us to estimate the relationship between external debt stock and education expenditure while controlling for the effects of GDP and population size.

3.7.3 Model for the Effect of Total Debt Stock on Educational Infrastructural Development in Sub-Saharan Africa Countries:

Again, study employed a linear regression model using a continuous measure of progress in educational infrastructural development as the dependent variable and total debt stock, GDP, population size, and political stability as independent variables. The model could be formulated as follows:

Educational Infrastructural Development = $\beta_0 + \beta_1$Total Debt Stock + β_2GDP + β_3Population Size + β_4Political Stability + ε

Where:

β_0 is the intercept

β_1 is the coefficient for total debt stock

β_2 is the coefficient for GDP

β_3 is the coefficient for population size

β_4 is the coefficient for political stability

ε is the error term

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1 Introduction

Examining the impact of debt service and remittance on current education spending in Sub-Saharan Africa was the study's main goal. Data are analysed in accordance with the study's specific objectives using descriptive statistics. The analysis and discussion of the data are presented in this chapter.

4.2 Summary Statistics of the Variables

Table 4.1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
PersRemit	394	9.09e+08	3.19e+09	0	2.43e+10
Agric	408	20.00487	12.38501	1.055657	60.61109
CO^2	352	.9289822	1.474521	.0307149	9.522969
Exports	378	29.24941	17.12622	.4357652	99.99395
FDI	396	1.02e+09	2.95e+09	-7.40e+09	3.14e+10

GDPg	430	3.502564	4.214073	-20.59877	20.71577
Imports	378	37.4919	18.14364	.3488656	117.1538
Industry	418	24.27594	11.09077	4.555926	77.3115
Inflation	430	9.337116	37.55496	-2019275	558.56
Popng	430	2.480529	.7782809	.0022912	4.394053
Revenue	219	19.22116	7.611698	7.104627	39.47071
Electricity	396	47.30006	25.62743	6.5	100
CO^2Dam	395	3.67e+08	7.83e+08	3752166	5.64e+09
NatResDep	387	.8374956	1.443259	0	9.895505
BankLiqRes	394	23.18704	16.96323	2.916577	125.0811
LnFinCOnExpo	358	23.28156	1.349046	20.61141	26.93313

Source: Field Data, 2023

External Debt Stocks (% of GNI) (Ext Debt):

The variable Ext Debt has a mean of 41.46% of GNI, with a notable variation, ranging from 4.95% to 170.70% across the 352 observations. The study confirmed the findings of the study conducted by Fosu (2007).

Total Debt Service (% of exports of goods, services, and primary income) (Total Debt):

The variable Total Debt exhibits an average debt service of 9.38% of exports, with a standard deviation of 8.44, indicating significant variability in debt service levels across the 323 observations as depicted in table 4.1. The findings of the study settled with Charles, Sylvester, Stephen, and Emilia (2016).

Personal Remittances, Received (current US$) (Per Remit):

The variable Per Remit represents personal remittances received, with a wide range from zero to approximately 24.3 billion USD, and a mean of approximately 909 million USD across the 394 observations. Evidences confirmed that the results of this current study support the assert by Gitana and Agnė (2018); Yuriy, Halyna, Iryna and Iveta (2020).

Government Expenditure on Education, Total (% of GDP) (Education):

The variable Education represents government expenditure on education as a percentage of GDP. The mean expenditure on education is 4.13% of GDP, with variations across the 351 observations.

Agriculture, Forestry, and Fishing, Value Added (% of GDP) (Agric):

The variable Agric represents the value added by agriculture, forestry, and fishing as a percentage of GDP. On average, agriculture contributes 20.00% to GDP across the 408 observations, with notable variation.

CO2 Emissions (Metric Tons per Capita) (CO2_Em):

The variable CO2_Em measures carbon dioxide emissions per capita. On average, each person is responsible for emitting approximately 0.93 metric tons of CO2 per year across the 352 observations.

Exports of Goods and Services (% of GDP) (Exports):

The variable Exports represent the percentage of GDP attributed to exports of goods and services. On average, exports account for 29.25% of GDP across the 378 observations. According to the findings which agreed with the assertion export of goods and services have positive effect on primary education in public schools (Boateng, 2014).

Foreign Direct Investment, Net Inflows (BoP, Current US$) (FDI):

The variable FDI represents net inflows of foreign direct investment in current US dollars. The average net FDI inflow is approximately 1.02 billion USD across the 396 observations.

GDP Growth (Annual %) (GDPs):

The variable GDPs represents the annual percentage growth rate of GDP. On average, GDP growth is 3.50% per year across the 430 observations, with significant variation.

Imports of Goods and Services (% of GDP) (Imports):

The variable Imports represent the percentage of GDP attributed to imports of goods and services. On average, imports account for 37.49% of GDP across the 378 observations.

Industry (Including Construction), Value Added (% of GDP) (Industry):

The variable Industry represents the value added by industry, including construction, as a percentage of GDP. On average, industry contributes 24.28% to GDP across the 418 observations.

Inflation, GDP Deflator (Annual %) (Inflation):

The variable Inflation measures the annual percentage change in the GDP deflator, reflecting inflation or deflation. On average, inflation is approximately 9.34% per year across the 430 observations, with significant variability. The outcomes of the study settled with the findings of Ekaette, Owan, and Agbo (2019) in their study conducted on inflation, external debt and GDP on financing of education in Nigeria.

Population Growth (Annual %) (Popping):

The variable Popping represents the annual percentage growth rate of the population. On average, the population grows by approximately 2.48% per year across the 430 observations, with variations. Evidence gathered confirmed the results obtained by Khemais (2018) in their study.

Revenue, Excluding Grants (% of GDP) (Revenue):

The variable Revenue represents government revenue, excluding grants, as a percentage of GDP. On average, government revenue is 19.22% of GDP across the 219 observations.

Adjusted Savings: Carbon Dioxide Damage (Current US$) (CO2Dam):

The variable CO2Dam represents the adjusted savings related to carbon dioxide damage in current US dollars. On average, the damage-related savings amount to approximately 367 million USD across the 395 observations.

Adjusted Savings: Natural Resources Depletion (% of GNI) (NatResDep):

The variable NatResDep represents adjusted savings related to natural resources depletion as a percentage of Gross National Income (GNI). On average, natural resources depletion accounts for 0.84% of GNI across the 387 observations.

Bank Liquid Reserves to Bank Assets Ratio (%) (BankLiqRes):

The variable BankLiqRes represents the ratio of bank liquid reserves to bank assets, expressed as a percentage. On average, this ratio is 23.19% across the 394 observations.

Final Consumption Expenditure (Constant 2015 US$) (FinConsExp):

The variable Fin Cons Exp represents final consumption expenditure in constant 2015 US dollars. On average, final consumption expenditure amounts to approximately 34.6 billion USD across the 358 observations, with significant variability.

4.2.1 Correlation

The correlation results provide insights into the relationships between various variables in the dataset. Correlation coefficients range from -1 to 1, with positive values indicating a positive relationship, negative values indicating a negative relationship, and values close to zero indicating a weak or no relationship. This section highlights the strong correlations (both positive and negative) between variables. Strong correlations among independent variables can have several implications both in terms of interpretation of the results and the robustness of the model. Some of these implications are multicollinearity and loss of variable importance in the model.

Table 4.2: Correlation Results

Variable	ExtDebt	Total Debt	LnPers~t	Education	Agric	CO^2_Em	Exports	LnFDI	GDPg
ExtDebt	1.0000								
Total Debt	0.4578	1.0000							
LnPersRemit	-0.1585	-0.0959	1.0000						
Education	0.2902	0.1238	0.0002	1.0000					
Agric	-0.2872	-0.3874	0.3892	-0.3460	1.0000				
CO^2_Em	0.2219	0.3138	-0.5448	0.3178	-0.7657	1.0000			
Exports	0.3071	0.0216	-0.5867	0.3346	-0.5128	0.7144	1.0000		
LnFDI	0.1496	0.1726	0.1449	0.0077	0.0152	-0.1558	-0.1368	1.0000	
GDPg	-0.1719	-0.0138	0.2127	-0.0395	0.2055	-0.2716	-0.2544	0.0349	1.0000
Imports	0.6618	0.1144	-0.3032	0.5598	-0.1668	0.2812	0.6330	0.0599	-0.1607
Industry	-0.2455	-0.1112	-0.3367	0.0217	-0.4515	0.4680	0.3968	0.1940	-0.0939
Inflation	0.0323	-0.0861	0.2985	0.0453	0.0875	-0.1617	-0.1075	0.3222	0.0392
Popng	-05193	-0.4790	0.1441	-0.3759	0.5233	0.5533	-0.3991	0.2101	0.2163
Revenue	0.3738	0.1354	-0.4489	0.6481	-0.5643	0.6004	0.6114	-0.0686	-0.1992
TDebt Svc	0.4578	1.0000	-0.0959	0.1238	-0.3874	0.3138	0.0216	0.1726	-0.0138
Electricity	0.2802	0.4036	-0.1967	0.1659	-0.6723	0.7166	0.5352	-0.0717	-0.1399
LnCO^2Dam	-0.2086	0.2373	0.2749	0.1259	-0.2007	0.0618	-0.2041	0.5656	0.1017
NatResDep	-0.2940	-0.3457	0.2651	0.0737	0.4943	-0.2504	0.0474	-0.1646	0.0832
BankLiqRes	0.2605	-0.0910	-0.0042	-0.0369	-0.2195	0.0113	0.1362	0.2961	-0.2419
LnFinCOnExp	-0.2311	0.2591	0.3550	-0.0693	0.0027	-0.1758	-0.4625	0.6130	0.2054

Source: Field Data, 2023

Variable	Imports	Industry	Inflation	Popng	Revenue	TDebtSvc	Electricity	$LnCO^2Dam$	NatResDep
Imports	1.0000								
Industry	-0.1707	1.0000							
Inflation	0.0074	-0.0096	1.0000						
Popng	-04366	0.3292	-0.0733	1.0000					
Revenue	0.5693	0.3516	-0.1774	-0.2858	1.0000				
TDebt Svc	0.1144	-1.1112	-0.0861	-0.4790	0.1354	1.0000			
Electricity	0.1680	0.2318	-0.0645	-0.6241	0.3809	0.4036	1.0000		
$LnCO^2Dam$	-0.3469	0.3936	0.2408	0.1746	-0.1097	0.2373	0.0885	1.0000	
NatResDep	0.0838	-0.0842	0.1319	0.1644	-0.1952	-0.3457	-0.2369	-0.0755	1.0000
BankLiqRes	0.0853	0.3264	0.3928	0.0907	0.1247	-0.0910	0.0007	0.1504	-0.2065
LnFinCOnExp	-0.4781	0.1848	0.2497	0.2494	-0.3164	0.2591	-0.0710	0.9040	-0.1419

Source: Field Data, 2023

Variable	BankLiqRes	LnFinCOnExp
BankLiqRes	1.0000	
LnFinCOnExp	0.0444	1.0000

Source: Field Data, 2023

4.2.2 Imports and Revenue

Imports of goods and services (% of GDP) (Imports) have a strong positive correlation with government revenue, excluding grants (% of GDP) (Revenue). This suggests that as a country's imports increase, its government revenue tends to increase as well. (Correlation coefficient: 0.5693)

4.2.3 Exports and Industry

Exports of goods and services (% of GDP) (Exports) show a strong positive correlation with the value added by industry (including construction) (% of GDP) (Industry). This indicates that countries with a larger industrial sector tend to have higher exports. (Correlation coefficient: 0.3968)

4.2.4 Co2 Emissions and Electricity Access

CO2 emissions (metric tons per capita) (CO2_Em) are strongly positively correlated with access to electricity (% of population) (Electricity). This suggests that countries with higher CO2 emissions often have better access to electricity. (Correlation coefficient: 0.7166)

Population Growth and Imports

Population growth (annual %) (Popng) has a strong negative correlation with imports of goods and services (% of GDP) (Imports). This implies that countries with higher population growth tend to have lower levels of imports relative to their GDP. (Correlation coefficient: -0.4366)

CO2 Emissions and Agriculture

CO2 emissions (metric tons per capita) (CO2_Em) are strongly negatively correlated with the value added by agriculture, forestry, and fishing (% of GDP) (Agric). This indicates that countries with higher CO2 emissions tend to have a smaller agricultural sector relative to their GDP. (Correlation coefficient: -0.7657)

Final Consumption Expenditure and CO2 Emissions

Final consumption expenditure (constant 2015 US$) (FinConsExp) exhibits a strong negative correlation with CO2 emissions (metric tons per capita) (CO2_Em). This suggests that countries with higher consumption expenditure often have lower per capita CO2 emissions. (Correlation coefficient: -0.4625)

External Debt and Total Debt Service

External debt stocks (% of GNI) (Ext Debt) and total debt service (% of exports of goods, services, and primary income) (Total Debt) are positively correlated, which is expected since higher external debt levels often lead to higher debt service obligations. (Correlation coefficient: 0.4578)

Government Expenditure on Education and GDP Growth

Government expenditure on education, total (% of GDP) (Education) has a positive correlation with GDP growth (annual %) (GDPs). This suggests that countries with higher education expenditure levels tend to experience higher GDP growth rates. (Correlation coefficient: 0.2127)

Bank Liquid Reserves and Revenue

Bank liquid reserves to bank assets ratio (%) (BankLiqRes) shows a positive correlation with government revenue, excluding grants (% of GDP) (Revenue). This implies that countries with higher bank liquid reserves relative to their assets tend to have higher government revenues. (Correlation coefficient: 0.2961)

4.3 Diagnostics

4.3.1 Variance Inflation Factor (VIF)

Table 4.3: VIF Results 1

Variable	VIF	1/VIF
LnFinCOnExp	16.06	0.062263
LnCO2Dam	12.36	0.080938
Industry	11.79	0.084850
Imports	11.16	0.089568
Popng	10.73	0.093188
CO2 Em	8.27	0.120917
Exports	7.96	0.125638
Agric	6.87	0.145622
LnFDI	4.28	0.233889
ExtDebt	3.97	0.251871
FDI	3.43	0.291950
Revenue	3.36	0.297492
Electricity	3.32	0.301527
NatResDep	2.73	0.366856
TDebtSvc	2.40	0.417322
BankLiqRes	2.39	0.417704
Inflation	1.95	0.512965
GDPg	1.29	0.773636
Mean VIF	6.35	

Source: Field Data, 2023

According to Kim (2019), multicollinearity is present when VIF is higher than 5. From the VIF results above (6.35), there is multicollinearity among the variables. Based on the correlation results from earlier, the researcher decided to drop the environmental variables due to its low theoretical importance in the model. The new VIF results (excluding LnCO2Dam and CO2_Em) is as follows:

Table 4.4: VIF Results 2

Variable	VIF	1/VIF
Imports	10.26	0.097427
Industry	8.29	0.120688
Popng	7.94	0.125912
Exports	7.68	0.130199
Agric	6.43	0.155638
ExtDebt	4.09	0.244748
LnFDI	4.07	0.245643
LnFinCOnExp	3.69	0.271181
Revenue	3.42	0.292685
FDI	3.30	0.303228
Electricity	3.25	0.307517
TDebtSvc	2.46	0.407017
NatResDep	2.14	0.468316
BankLiqRes	2.09	0.477513
Inflation	1.81	0.551776
GDPg	1.24	0.806874
Mean VIF	4.51	

Source: Field Data, 2023

The new VIF results (excluding LnCO2Dam and CO2_Em) are as follows:

The new mean VIF is 4.51 which is acceptable for the model. Although some individual variables exhibit VIFs greater than 5, the researcher considers these variables as theoretically important to the model.

Table 4.5: VIF Fitness of Model 1: External Debt as Main Independent Variable

Education	Coef.	Std. Err.	t	p> |t|	[95% Conf. Interval]
ExtDebt	-0.0035996	0.0045119	-0.80	0.427	-0.125523 0.005353
Agric	-0.137908	0.167338	-0.82	0.412	-0.469942 0.194127
CO2 Em	-0.3016632	0.1813818	-1.66	0.099	-0.661564 0.582377
Exports	-0.368849	0.161151	-2.29	0.024	-0.688607 0.0049092
FDI	- 8.56E-11	8.12e-11	1.05	0.294	-7.55e-11 2.47e-10
LnFDI	-0.2218648	0.1099279	-2.02	0.046	-0.4399855 -0.0037441
GDPg	0.339371	0.295662	1.15	0.254	-0.247287 -0.0926028
Imports	0.0408394	0.014086	2.90	0.005	0.0128896 0.0687892
Industry	0.0128444	0.0267193	0.48	0.632	-0.0401724 0.0658613
Inflation	0.0023476	0.0108856	0.22	0.830	-0.0192517 0.039478
Popng	-0.8154072	0.2559298	-3.19	0.002	-1.323227 -0.307587
Revenue	0.1372314	0.0193878	7.08	0.000	0.0987617 0.1757011
TDebtSvc	-0.046759	0.0123139	-2.00	0.048	-0.0491093 -0.0002425
Electricity	-0.0107873	0.0047053	-2.29	0.024	-0.0201241 -0.0014505
$LnCo_2Dam$	1.064024	0.2350737	4.53	0.000	0.5975863 1.530461
NatResDep	0.0682792	.0645344	1.06	0.293	-0.059771 0.1963295
BankLiqRes	-0.0152653	0.0077895	-1.96	0.053	-0.0307213 0.0001907
LnFinCOnExp	-0.4542314	0.2766321	-1.64	0.104	-1.003129 0.0946667
_cons	-0.8647048	3.040512	-0.28	0.777	-6.897745.16833

Source: Field Data, 2023

Source	SS	df	MS	Number of obs = 118
Model	166.351469	18	9.24174828	F (18, 99) = 18.97
Residual	48.2429228	99	0.48730225	Prob > F = 0.0000
				R-squared = 0.7752
Total	214.594392	117	1.8341401	Adj R-squared = 0.7343
				Root MSE = 0.69807

The Ordinary Least Squares model overall demonstrates a strong fit, as indicated by several key statistics.

The F-statistic, with a value of 18.97, is highly significant ($p < 0.0001$), indicating that the model as a whole is statistically significant. This suggests that at least one of the independent variables has a significant effect on the dependent variable.

The R-squared value of 0.7752 signifies that approximately 77.52% of the variance in the dependent variable is explained by the independent variables included in the model. In other words, the model accounts for a substantial portion of the variation in the dependent variable.

The adjusted R-squared, which takes into account the number of predictors in the model, is 0.7343. This adjusted value helps prevent overfitting and provides a more reliable measure of the model's goodness of fit.

The root mean square error (RMSE) is 0.69807, indicating that the average prediction error of the model is relatively low. This suggests that the model's predictions are generally close to the actual values of the dependent variable.

In essence, the OLS regression model shows a strong overall fit (as indicated by the low p-value for the F-statistic) and explains a significant portion of the variance in the dependent

variable (as indicated by the high R-squared value). The Root MSE suggests that the average prediction error is relatively low.

Panel Regression

The panel regression analyses present the Hausman test results; based on which either the fixed or random effect results would be chosen and presented for analyses.

Model 1: External Debt as main independent variable

TABLE 4.6: HAUSMAN TEST: MODEL 1

Education	Coef.	Std. Err.	t	p> | t |	[95% Conf.	Interval]
ExtDebt	-0.0035996	0.0045119	-0.80	0.427	-0.125523	0.005353
Agric	-0.137908	0.167338	-0.82	0.412	-0.469942	0.194127
CO2 Em	-0.3016632	0.1813818	-1.66	0.099	-0.661564	0.582377
Exports	-0.368849	0.161151	-2.29	0.024	-0.688607	0.0049092
FDI	- 8.56E-11	8.12e-11	1.05	0.294	-7.55e-11	2.47e-10
LnFDI	-0.2218648	0.1099279	-2.02	0.046	-0.4399855	-0.0037441
GDPg	0.339371	0.295662	1.15	0.254	-0.247287	-0.0926028
Imports	0.0408394	0.014086	2.90	0.005	0.0128896	0.0687892
Industry	0.0128444	0.0267193	0.48	0.632	-0.0401724	0.0658613
Inflation	0.0023476	0.0108856	0.22	0.830	-0.0192517	0.039478
Popng	-0.8154072	0.2559298	-3.19	0.002	-1.323227	-0.307587
Revenue	0.1372314	0.0193878	7.08	0.000	0.0987617	0.1757011
TDebtSvc	-0.046759	0.0123139	-2.00	0.048	-0.0491093	-0.0002425
Electricity	-0.0107873	0.0047053	-2.29	0.024	-0.0201241	-0.0014505
$LnCo_2Dam$	1.064024	0.2350737	4.53	0.000	0.5975863	1.530461
NatResDep	0.0682792	0645344	1.06	0.293	-0.059771	0.1963295
BankLiqRes	-0.0152653	0.0077895	-1.96	0.053	-0.0307213	0.0001907
LnFinCOnExp	-0.4542314	0.2766321	-1.64	0.104	-1.003129	0.0946667
_cons	-0.8647048	3.040512	-0.28	0.777	-6.89774	5.16833

Source: Field Data, 2023

The Hausman test p-value of 0.1056 is greater than 5%, hence insignificant. The Random effect results are considered best for the model.

Table 4.7: Hausman Test: Model 1

_____ Coefficients _____

	(b) sqrt(diag(V_b_v_B)) fixed	(B) random	(b – B) difference	S. E
ExtDebt	-.0096221	-.0074734	-.0021487	.0036231
LnPersRemit	.1552769	.1882998	-.033023	.0228486
Agric	-.057394	-.0488685	-.0085254	.0176446
Exports	-.0097878	-.0267837	.0169959	.0057001
LnFDI	-.1924254	-.2287197	.0362943	.0223653
GDPg	-.0036096	-.0066249	.0003152	.0070128
Imports	.0173002	.0344691	-.017169	.00504
Industry	-.0491673	-.0074131	-.0417542	.0192992
Inflation	-.0084921	-.0079015	-.0005906	-
Popng	-.5926141	-.447194	-.1454201	.4485538
Revenue	.0743217	.1000028	-.0256865	.0118715
TDebtSvc	.0138975	.0123151	.0015832	.015107
Electricity	-.0229786	-.0100789	-.0128996	.0079439
NatResDep	.2377435	.1729139	.0648296	.0501906
BankLiqRes	-.0019889	-.0037176	.0017287	.0026732
LnFinCOnExp	2.123412	.4012344	1.722177	.7205116

b. Consistent under Ho and Ha; obtained xtreg

B. *Inconsistent under Ha. Efficient under Ho; obtained form xtreg

Test; Ho; difference in coefficients not systematic

chi2(16) *(b.B)’ {(v_b.v_B)*(.1)} (b.B)

*23.31

*prob>chi2*0.1056

(v_b.v_B is not positive indefinite)

The model showed a reasonable degree of fit to the data. The within R-squared value, which explains the variance in the dependent variable attributable to the random effects and the independent variables, was 0.3362. This indicates that approximately 33.62% of the variance in the dependent variable can be attributed to the random effects and the independent variables. The between R-squared value, which represents differences between the countries themselves, was notably higher at 0.7371. This suggests that around 73.71% of the variance in the dependent variable is due to differences between the groups (countries). The overall R-squared value, combining both within and between effects, was 0.6523.

The Wald chi-square statistic, which tests the overall significance of the random-effects GLS model, yielded a value of 93.50 with a p-value of 0.0000. This low p-value indicates that the random-effects model is statistically significant.

The coefficient estimate for "Ext Debt" was -0.0074734 with a standard error of 0.0045493. This coefficient represents the estimated change in education expenditure for a one-unit increase in external debt stock. The negative coefficient for "Ext Debt" suggests that, on average, an increase in external debt stock is associated with a decrease in education expenditure. However, it is important to note that the p-value (0.100) is slightly above the significance level of 0.05, indicating that the relationship between external debt and education expenditure may not be statistically significant.

The coefficient estimates for the other independent variables also provide insights into their impact on the dependent variable (Education). Each coefficient is associated with a standard error, z-score, p-value, and confidence interval.

Notably, the LnPersRemit variable had a positive coefficient of 0.1883, suggesting that an increase in personal remittances received is associated with higher education expenditure.

Conversely, variables such as GDP growth (GDPs) and Industry had coefficients with p-values greater than 0.05, indicating that they may not be statistically significant predictors of education expenditure in this model.

Table 4.8: Random Effect Results; Model 1

Education	Coef.	Std. Err	z	p>/z/	[95% conf .	interval]
ExtDebt	-.0074734	.0045493	-1.64	0.100	-.0163898	.001443
LnPersRemit	.1882998	.0673767	2.79	0.005	.056244	.3203557
Agric	-.0488685	.0187407	-2.61	0.009	-.0855997	-.0121374
Exports	-.0267837	.0167119	-1.60	0.109	-.0595384	.005971
LnFDI	-.2287197	.0761355	-3.00	0.003	-.3779425	-.0774968
GDPg	-.0066249	.01833	-0.36	0.718	-.042551	.293013
Imports	.0344691	.0121776	2.83	0.005	.0106014	.0583369
Industry	-.007131	.0271224	-0.27	0.785	-.060572	.0457458
Inflation	-.0079015	.0087331	-0.90	0.366	-.0250181	.009215
Popng	-.447194	.2990245	-1.50	0.135	-1.03327	.1388832
Revenue	.1000082	.0226791	4.41	0.000	.055558	.1444584
TDebtSvc	.0123151	.0103829	1.19	0.236	-.0080349	.0326652
Electricity	-.0100789	.0068718	-1.47	0.142	-.0245475	.0033896
NatResDep	.1729139	.0721632	2.40	0.017	.0314767	.3143511
BankLiqRes	-.0037176	.0071496	-0.52	0.603	-.0177305	.0102952
LnFinconExp	.4012344	.1875844	2.14	0.032	.0335757	.7688931
_cons	-3.767051	4.164784	-0.90	0.366	-11.92988	4.395776

Random effects GLS re-progression
Group variables; country
R.sq;
Within *0.3362
between *0.7371
overall *0.6523
corr(u_i.x)*0(assumed)

Table 4.9: Random Effect Results: Model 2

	_____coefficients _____			
	(b)	(B)	(b.B)	sqrt (diag(v_b.V_B))
	Fixed	Random	Difference	S.E.
TotalDebt	.0129637	.0081249	.0048388	.0018802
LnPersRemit	.1433006	.0177378	-.0340774	.230696
Agric	-.0526181	-.0512264	-.0013917	.0180127
Exports	-.0087687	-.0259676	.017199	.0057206
LnFDI	-.1708447	-.2194224	.0485776	.0158249
GDPg	.0083118	.0019807	.0063311	.-
Imports	.014429	.0326089	-.0181799	.0056662
Industry	-.0581035	-.0050934	-.0530101	.019172
Inflation	-.0071537	-.0064679	-.0006858	
Popng	-.631115	-.3732353	-.2578797	-4604882
Revenue	.0671062	.0965884	-.0294822	.0120669
Electricity	-.243084	-.0113911	-.0129173	0.0081787
NatResDep	.2263156	.187468	.0395688	.0526833
BankLiqRes	-.008002	-.0088326	0.0008306	0.0014478
LnFinCOnExp	1.741611	.3881633	1.353424	.6920393

b. *Consistent under Ho and Ha; obtained xtreg
B. *Inconsistent under Ha. Efficient under Ho; obtained form xtreg
Test; Ho; difference in coefficients not systematic
chi2(15) *(b.B)' {(v_b.v_B)*(.1)} (b.B)
*.2.25 chi2<0**>model fitted on these

Table 4.10: Hausman Test is Negative, the OLS Results Would be a Fit for the Model

Education	Coef.	Std. Err.	t	p>/t/	[95% Conf.	interval]
TotalDebt	-.0205725	.0117708	-1.75	0.083	-.0439019	-.0027569
LnPersRemit	.238796	.0734533	3.25	0.002	.093214	.384378
Agric	-.0378242	0.171119	-2.21	0.029	-.0717394	-.003909
Exports	-.0240202	.0176323	-1.36	0.176	-.0589669	.0109365
LnFDI	-.2898932	0.0974237	-2.98	0.004	-.4829838	-.0968025
GDPg	-.0034893	.0215774	-0.16	0.872	-.046255	.0392764
Imports	.0546906	.0118347	4.62	0.000	.0312346	.0781467
Industry	.0168074	.0236679	0.71	0.479	-.0301215	0.0637362
Inflation	.0037941	0.11466	0.33	0.741	-.0189312	.0265194
Popng	-.3542528	.2294704	-1.54	0.126	-.8090557	.10055
Revenue	.1296133	.0206489	6.28	0.000	.0886878	.1705388
TDebtSvc	0	(omitted)				
Electricity	-.01393	.0052623	-2.65	0.000	-.0243596	-.0035003
NatResDep	.1199349	.0649463	1.85	0.067	-.0087469	.2486167
BankLiqRes	-.0126778	.0072296	-1.75	0.082	-.0270067	.0016511
LnFinCOnExp	.6737891	.1438765	4.68	0.000	.3886307	.9589476
_cons	-11.99053	2.921194	-4.10	0.000	-177824	-6.200619

Note: TDebtSvc omitted because of colinearity

Source	SS	df	MS
Model	180.677626	15	12.0451751
Residual	64.293391	109	.589847624
Total	244.971017	134	1.79557272

Number of obs	*	125
F(15.109)	*	20.42
Prob>F	*	0.0000
R-squared	*	0.7375
Adj squared	*	0.7014
Root MSE	*	0.76802

In this model, R-squared is 0.7375, indicating that approximately 73.75% of the variance in education expenditure is explained by the independent variables included in the model. This suggests that the model has a relatively good fit. The F-statistic is 20.42, and the associated p-value (Prob > F) is 0.000, indicating that the model as a whole is statistically significant.

The coefficient estimate for "Total Debt" is -0.0205725 with a standard error of 0.0117708. The t-statistic for "Total Debt" is -1.75, and the associated p-value is 0.083, which is slightly above the conventional significance level of 0.05. This suggests that the relationship between total debt and education expenditure may not be statistically significant at the 0.05 significance level.

The coefficient estimate for "LnPersRemit" is 0.238796 with a standard error of 0.0734533. The t-statistic for "LnPersRemit" is 3.25, and the associated p-value is 0.002, indicating a statistically significant positive relationship. A one-unit increase in the natural logarithm of personal remittances received is associated with an increase in education expenditure.

The coefficient estimate for "Imports" is 0.0546906 with a standard error of 0.0118347. The t-statistic for "Imports" is 4.62, and the associated p-value is 0.000, indicating a statistically significant positive relationship. An increase in imports as a percentage of GDP is associated with higher education expenditure.

The coefficient estimate for "Revenue" is 0.1296133 with a standard error of 0.0206489. The t-statistic for "Revenue" is 6.28, and the associated p-value is 0.000, indicating a statistically significant positive relationship. Higher government revenue as a percentage of GDP is associated with increased education expenditure.

The coefficient estimate for "LnFinCOnExp" is 0.6737891 with a standard error of 0.1438765. The t-statistic for "LnFinCOnExp" is 4.68, and the associated p-value is 0.000, indicating a statistically significant positive relationship. An increase in final consumption expenditure (constant 2015 US$) is associated with higher education expenditure.

The coefficient estimate for "Electricity" is -0.01393 with a standard error of 0.0052623. The t-statistic for "Electricity" is -2.65, and the associated p-value is 0.009, indicating a statistically significant negative relationship. A higher percentage of the population with access to electricity is associated with lower education expenditure.

The coefficient estimate for "NatResDep" is 0.1199349 with a standard error of 0.0649263. The t-statistic for "NatResDep" is 1.85, and the associated p-value is 0.067, which is slightly above 0.05. This suggests that the relationship between natural resources depletion and education expenditure may not be statistically significant at the 0.05 significance level.

The coefficient estimate for "BankLiqRes" is -0.0126778 with a standard error of 0.0072296. The t-statistic for "BankLiqRes" is -1.75, and the associated p-value is 0.082, which is slightly above 0.05. This suggests that the relationship between bank liquid reserves and education expenditure may not be statistically significant at the 0.05 significance level.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study results mainly centered analysing how Debt Service and Remittance affects Education in Sub-Saharan Africa. Specifically, to examine effect of internal debt stock on education expenditure in Sub-Saharan Africa countries, examine effect of external debt stock on education expenditure in Sub-Saharan Africa countries as well as examine effect of total debt stock on educational infrastructural development in Sub-Saharan Africa countries.

5.2 Summary of Findings

Objective I: To examine the effect of external debt stock on education expenditure in Sub-Saharan Africa countries.

The analysis indicates that external debt stock, represented by "Ext Debt," does not have a statistically significant effect on education expenditure in Sub-Saharan African countries. The coefficient estimate for external debt stock is -0.0074734, with a standard error of 0.0045493. The t-statistic (-1.64) is associated with a p-value of 0.100, which is greater than the common significance level of 0.05. Therefore, there is insufficient evidence to suggest that changes in external debt stock significantly impact education expenditure in the region.

Objective II: To examine the effect of total debt stock on educational infrastructural development in Sub-Saharan Africa countries.

The analysis reveals that total debt stock, represented by "Total Debt," has a negative effect on education expenditure in Sub-Saharan African countries. The coefficient estimate for total debt stock is -0.0205725, with a standard error of 0.0117708. While the relationship is negative, the statistical significance is marginally below the standard significance level. The t-statistic (-1.75) is associated with a p-value of 0.083. Although it does not reach conventional

significance, this suggests a potential trend that higher total debt stock might be associated with reduced investment in educational infrastructure.

Objective III: To examine the effect of remittances on education expenditure in Sub-Saharan Africa countries.

The analysis shows that remittances, as measured by "LnPersRemit" (natural logarithm of personal remittances), have a statistically significant beneficial impact on education expenditure in nations in Sub-Saharan Africa. Remittances have a coefficient estimate of 0.238796 and a standard error of 0.0734533. The p-value of 0.002 for the t-statistic (3.25) is very significant. According to this finding, rising personal remittances are positively correlated with higher education spending in the area.

In conclusion, the study shows that while overall debt stock may have a negative impact on the development of educational infrastructure, this effect is statistically insignificant and does not significantly affect education expenditure. Personal remittances, however, have a statistically significant beneficial impact on education spending, indicating that higher remittance inflows help to improve education investment in Sub-Saharan African nations.

5.3 Conclusions

External Debt and Education Expenditure: The analysis did not find significant evidence to support a direct relationship between external debt stock (Ext Debt) and education expenditure in Sub-Saharan African countries. This suggests that changes in external debt levels alone may not be a significant driver of educational investment in the region.

Total Debt and Educational Infrastructure: While the relationship was marginally below the conventional significance level, there is an indication that total debt stock (Total Debt) might have a negative effect on educational infrastructural development in Sub-Saharan Africa. This

implies that higher total debt levels could potentially hinder investments in educational infrastructure, but further research is needed to confirm this trend.

Remittances and Education Expenditure: Personal remittances (LnPersRemit) were found to have a statistically significant positive impact on education expenditure in Sub-Saharan African countries. This suggests that higher inflows of personal remittances contribute to increased investment in education in the region, highlighting the role of diaspora support in education funding.

5.4 Recommendations

The study made the following policy recommendations in order to ensure effective debt servicing that does not affects the education of the region.

Diversify Funding Sources: Given the positive impact of personal remittances on education expenditure, governments and policymakers in Sub-Saharan Africa should explore ways to harness and optimize remittance inflows for educational purposes. Initiatives such as remittance-backed education funds or partnerships with diaspora communities could be considered.

Debt Management: While the relationship between total debt and education expenditure was not statistically significant, it is prudent for governments to carefully manage their debt levels, considering the potential negative impact on education infrastructure. Striking a balance between debt financing for infrastructure development and maintaining a sustainable education budget is essential.

Further Research: More in-depth research is recommended to better understand the dynamics between debt (both external and total), education expenditure, and educational outcomes in Sub-Saharan Africa. This could involve qualitative studies, case analyses, and examining the impact on specific aspects of education, such as access, quality, and inclusivity.

Data Monitoring: Governments should establish robust data collection and monitoring systems to track the utilization of funds allocated for education. This will ensure that funds, including remittances and debt-financed investments, are effectively channeled into improving educational access, quality, and infrastructure.

Collaborative Efforts: Collaboration with international organizations, development partners, and civil society groups can play a significant role in supporting education initiatives. Governments should seek partnerships and funding opportunities to bolster education development efforts.

In conclusion, while the relationship between debt and education expenditure is complex and context-specific, this study underscores the positive role of personal remittances in supporting education in Sub-Saharan Africa. It also highlights the importance of prudent debt management and the need for further research to inform evidence-based policies that promote education in the region.

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Appendix

CountryName	Country	Year	ExtDebt	TotalDebt	PersRemit	LnPersRemit	Education	Agric	CO2_Em	Exports	FDI	LnFDI	GDP
Angola	1001	2012	31.332089	8.2107	40348853.99	17.513074	3.0819085	6.069629	0.95069588	55.940136	-1464627991		
Angola	1001	2013	34.755041	8.16256	36637411.34	17.41658	4.4389495	6.5074932	1.0362985	50.747085	-7120017424		
Angola	1001	2014	33.943604	12.9757	30971119.27	17.248566	3.1229176	7.5470567	1.0997911	44.695029	3657514667	22.020049	
Angola	1001	2015	44.660331	24.4092	11114711.6	16.22378	3.4868958	9.1225343	1.1350440	29.754598	1002821516	23.028668	
Angola	1001	2016	60.330974	38.2657	3988048.38	15.198813	2.7549364	9.8311688	1.0318113	28.124485	-1795176194		
Angola	1001	2017	51.628710	25.5216	1418195.84	14.164896	2.4668789	10.016996	0.8133007	29.004102	-7397295409		
Angola	1001	2018	67.595207	26.403	1579247.15	14.272459	2.0447013	8.6077418	0.7776749	40.836288	-6456076413		1.31
Angola	1001	2019	78.687973	32.4364	3445473.468	15.052572	1.9274573	7.8826247	0.7921370	40.790751	-4098478748		
Angola	1001	2020	125.88270	39.2613	8053050.894	15.901562	2.4152002	9.1101074		37.911273	-1866468113		
Angola	1001	2021						9.0163035		37.872346			

Benin	1002	2012	15.1082889	2.98684	207763555.2	19.151911	3.56202006	25.7689758	0.45635565	23.8967369	281548556.3	19.4558155	4.81
Benin	1002	2013	16.0539561	3.1812	248800533.7	19.332162	3.32751012	25.2754046	0.46778508	27.5705653	360343380.3	19.7025608	7.19
Benin	1002	2014	15.4394269	2.49504	304659173.4	19.534704	3.16178989	25.618453	0.50452817	31.4308411	405737369.1	19.8212166	6.35
Benin	1002	2015	19.217847	2.75957	214449579.5	19.183585	3.17298007	26.3920851	0.52099282	24.7204512	149755663.3	18.8245156	1.77
Benin	1002	2016	19.2695536	2.98886	221726215	19.216954	2.89910007	27.7536355	0.61993701	27.6067881	131790853.8	18.6967268	3.33
Benin	1002	2017	22.246219	3.03114	195776833.9	19.092486	3.53558993	28.4890165	0.61475453	27.2055948	200902719.3	19.1183314	5.67
Benin	1002	2018	25.4214853	5.85223	198742396	19.10752	2.93161988	28.0647739	0.64605812	27.2742306	194073683.2	19.0837485	6.69
Benin	1002	2019	27.2157547	13.8775	216993145.2	19.195376	2.96519995	26.8758016	0.61858375	29.6305272	218207871.7	19.2009587	6.86
Benin	1002	2020	33.8984749		204623916.5	19.136684	3.00366211	27.109175		19.8724704	174019952.1	18.9746805	3.84
Benin	1002	2021											6.60
Botswana	1003	2012	17.8358252	0.88501	18103143.92	16.711596		2.69526989	1.67193666	49.2507438	146084155.2	18.7996934	4.45
Botswana	1003	2013	16.7584835	2.1516	36004335.94	17.39915		2.29859284	2.62781385	61.5226397	67136806.16	18.022243	11.3
Botswana	1003	2014	15.8636502	0.66566	46123119.08	17.646825		1.79813518	3.34670889	60.5602991	515184471	20.0600356	4.14
Botswana	1003	2015	16.1498183	3.3368	30045619.57	17.218227	7.80650854	1.94090121	3.27719497	52.9031723	378554181.5	19.7518698	5.71

Botswana	1003	2016	13.93057 06	1.99653	24622501.68	17.019171	7.974824 91	1.975876 15	3.069551 08	54.61135 08	142522598.3	18.77501 11	7.03
Botswana	1003	2017	10.69186 93	2.45953	38956561.47	17.477958	7.299754 14	1.843897 08	3.324148 43	42.96473 61	260575129.4	19.37840 18	4.00
Botswana	1003	2018	10.49998 66	2.37922	44309897.4	17.606719	6.721307 28	2.055350 72	3.243026 91	44.53578 69	285955061.9	19.47134 52	3.98
Botswana	1003	2019	9.466339 71	3.02762	59360104.14	17.899133	6.914368 63	2.088654 79	3.147107 07	37.15431 09	93607130.03	18.35461 71	3.34
Botswana	1003	2020	10.58309 31	3.7912	35615908.37	17.388303	8.739999 77	2.130881 38		31.35372 09	31807196.16	17.27520 31	8.72
Botswana	1003	2021											11.3
Burkina Faso	1004	2012	21.14297 58	2.1543	209980744.4	19.162526	3.603159 9	23.75600 5	0.177415 69	26.59808 54	329281976	19.61242 5	6.45
Burkina Faso	1004	2013	20.16819 63	2.50067	308469520.2	19.547134	4.083439 83	23.64109 28	0.183332 66	27.07698 55	490403410.5	20.01073 89	5.79
Burkina Faso	1004	2014	19.52933 08	2.98355	396308040.7	19.797702	4.053299 9	23.69377 28	0.180825 36	26.93200 42	357296974.3	19.69407 79	4.32
Burkina Faso	1004	2015	23.69310 31	4.09944	384985616.4	19.768717	3.670089 96	22.63307 52	0.204300 07	26.10764 55	231901703.7	19.26182 41	3.92
Burkina Faso	1004	2016	23.35557 64	3.69615	397373892.5	19.800388		21.71471 78	0.198430 26	25.91596 48	390622353.4	19.78325 18	5.95
Burkina Faso	1004	2017	23.32391 98	3.61691	416839243.1	19.848211	5.628469 94	20.58558 72	0.222474 21	26.45238 56	2572690.322	14.76046 27	6.20
Burkina Faso	1004	2018	21.56069 44	3.2077	455650092.2	19.937236	5.488609 79	20.99747 33	0.236438 15	28.07890 61	268414907.9	19.40804 45	6.60

Burkina Faso	1004	2019	24.05579 76	3.52976	467251841 .7	19.962379	5.696845 05	18.37610 29	0.246046 25	27.61611 21	162970140 .3	18.90907 76	5.68
Burkina Faso	1004	2020	26.97166 56		524608104 .8	20.078162	5.519075 87	18.39807 89			-98777856		1.93
Burkina Faso	1004	2021											6.90
Burundi	1006	2012	28.67962 39	8.91255	46433649. 09	17.653535	6.167860 03	35.42003 26	0.040017 34	9.696095 32	604919.65 15	13.31285 09	4.44
Burundi	1006	2013	27.86346 12	13.7588	48639473. 9	17.699946	5.995359 9	38.3674	0.040879 21	9.095256 07	116727136 .5	18.57534 96	4.92
Burundi	1006	2014	25.57126 77	13.8641	56262591. 43	17.84554	6.784520 15	34.95819 23	0.038601 01	8.696021 19	81747197. 23	18.21914 21	4.24
Burundi	1006	2015	20.17508 54	13.9185	51041087. 26	17.748141	6.370540 14	30.68469 73	0.039369 95	6.417273 57	49622865. 77	17.71996 23	3.90
Burundi	1006	2016	22.06327 8	16.0191	31276058. 24	17.258363	4.691999 91	31.54433 61	0.041952 7	6.384522 19	55420.356 66	10.92270 23	0.60
Burundi	1006	2017	22.11426 8	9.55401	33725358. 65	17.333761	4.762020 11	28.54664 7	0.048951 65	6.026574 33	316473.44 94	12.66499 46	0.50
Burundi	1006	2018	21.87757 19	9.93248	48328631. 78	17.693535	5.07865	29.01190 05	0.061742 87	5.685654 31	983747.12 5	13.79912 42	1.60
Burundi	1006	2019	22.51518 71		48328631. 78	17.693535	5.346684 46	28.84439	0.062442 67	5.172036 84	1044957.4 15	13.85948 67	1.81
Burundi	1006	2020	21.91571 27		45630633. 6	17.63609	5.040983 68	28.62494 56		4.549322 7	8473943.2 01	15.95250 65	0.32
Burundi	1006	2021						28.66021 87		5.000293 84			1.
Cabo Verde	1005	2012	74.88956 75	4.53407	176969700 .3	18.991489		8.446544 47	1.049004 28	40.43180 43	128009964 .8	18.66761 87	1.08

Cabo Verde	1005	2013	83.58175 09	4.57621	175918335 .4	18.98553	5.001440 05	8.279068 07	0.996599 82	40.49244 28	89297444	18.30748 34	0.80
Cabo Verde	1005	2014	87.74453 84	4.77824	196981864 .6	19.098622	4.963870 05	8.015767 5	0.964736 94	40.36113 97	180589795 .4	19.01173 87	0.61
Cabo Verde	1005	2015	100.8091 78	6.22653	200903517 .8	19.118335	5.266910 08	8.737394 76	0.952852 84	44.90744 23	96071472. 84	18.38060 3	1.00
Cabo Verde	1005	2016	96.76819 35	5.90719	211373829 .2	19.169139	5.288790 23	7.995741 1	1.035508 55	44.22968 9	126312006 .1	18.65426 56	4.70
Cabo Verde	1005	2017	104.8412 75	6.14104	216552202	19.193342	5.181749 82	6.738689 9	1.097676 41	45.92281 3	111711633 .7	18.53143 14	3.70
Cabo Verde	1005	2018	92.06717 9	5.6076	234507467	19.272998	5.368846 89	5.291984 29	1.121810 22	48.95264 44	102763598 .2	18.44794 17	4.53
Cabo Verde	1005	2019	93.93082 03	5.91426	241314283 .9	19.301611	4.733459 95	4.632906 04	1.181955 68	50.64929 2	89833935. 68	18.31347 34	5.66
Cabo Verde	1005	2020	124.5555 32		245800363 .1	19.32003	7.584795	4.864050 18		24.85098 2	50177018. 58	17.73106 77	14.7
Cabo Verde	1005	2021						4.409768 72		24.61632 55			6.95
Cameroon	1007	2012	13.08634 37	3.12678	210407729 .6	19.164558	2.603060 01	16.65724 02	0.320219 44	23.87672 38	527363935 .6	20.08340 14	4.62
Cameroon	1007	2013	15.63919 38	3.34545	244128552	19.313205	2.655479 91	16.72366 12	0.341980 23	23.63910 87	547404749 .8	20.12069 9	4.99
Cameroon	1007	2014	15.97249 9	6.05475	283337565 .9	19.46215	2.583960 06	16.82583 82	0.363726 9	23.60997 55	725854540 .9	20.40286 02	5.71
Cameroon	1007	2015	22.99067 75	7.35707	241706990	19.303237	2.657919 88	17.20941 59	0.363115 44	20.98914 96	694336734 .9	20.35846 76	5.66
Cameroon	1007	2016	23.72589 61	13.3925	268951584 .7	19.410042	2.562340 02	17.19266 24	0.379494 76	18.94997 88	663893595 .2	20.31363 24	4.53

Cameroon	1007	2017	28.42549 27	10.6895	316800671.4	19.573783	3.059629 92	16.69294 18	0.373279 08	18.35109 86	814458940.9	20.51803 46	3.54
Cameroon	1007	2018	27.84787 94	14.1354	333554498.4	19.625317	3.030960 08	16.49880 07	0.380310 16	18.73625 35	765092012.8	20.45550 67	3.95
Cameroon	1007	2019	33.09325 13	14.3504	355550645.8	19.689178	3.080876 59	16.80228 36	0.364424 92	19.85009 07	102477923 8	20.74774 3	3.47
Cameroon	1007	2020	34.72909 01	19.7843	334097288.5	19.626943	3.166161 3	17.38179 05		15.03506 91	675186993.7	20.33050 02	0.49
Cameroon	1007	2021						17.24972 3		17.76674 03			3.48
Chad	1008	2012	19.44514 31		0		2.206150 05		0.145485 86	38.46805 42	579793037.4	20.17818 18	8.88
Chad	1008	2013	23.54369 23		0		2.850709 92		0.165652 67	33.56559 17	520200751.3	20.06972 54	5.70
Chad	1008	2014	27.92567 24		0		2.599999 9		0.165403 43	34.16136 29	-675545915		6.89
Chad	1008	2015	26.42585 76		0		2.400000 1		0.169371 77	30.00176 09	559642022.5	20.14280 79	2.76
Chad	1008	2016	28.92848 35		0		2.299999 95		0.151768 43	26.29503 68	244682121	19.31547 05	6.25
Chad	1008	2017	31.65195 14		0		2.454819 92		0.143173 36	33.87296 25	363381636.4	19.71096 42	2.98
Chad	1008	2018	29.27886 11		0		2.25948		0.141493 65	36.19068 24	460890507.7	19.94867 11	2.37
Chad	1008	2019	29.73886 91		0		2.372459 89		0.141093 41	36.74225 34	566638948	20.15523 29	3.24
Chad	1008	2020	36.73315 85		0		2.908510 45			26.71614 9	557692503.3	20.13931 83	1.60

		2021								38.75012			1.19
Chad	1008									73			
		2012			72030040.74	18.092594		3.274933 54	4.506229 08	33.84559 05	313682324 03	24.16906 15	6.15
Chile	1009												
		2013			71108144.91	18.079712	4.529429 91	3.473375 33	4.723555 08	32.08746 36	222104409 93	23.82382 83	3.30
Chile	1009												
		2014			60612706.42	17.920015	4.730949 88	3.946620 63	4.311060 94	33.00390 3	235580418 68	23.88273 31	1.79
Chile	1009												
		2015			58992215.84	17.892916	4.875309 94	3.709404 28	4.576124 12	29.19107 95	208791393 89	23.76201 64	2.15
Chile	1009												
		2016			64551112.66	17.982968	5.342010 02	4.199089 37	4.749830 08	27.92315 81	123286242 78	23.23518 96	1.75
Chile	1009												
		2017			66541753.59	18.01334	5.419660 09	4.280971 61	4.714019 98	28.33137 68	612782099 3	22.53610 51	1.35
Chile	1009												
		2018			69856849.79	18.061959	5.433169 84	3.927435 92	4.624338 35	28.52904 47	775964736 5	22.77220 27	3.99
Chile	1009												
		2019			69372771.36	18.055005		3.983967 23	4.821118 3	27.83413 16	125866077 04	23.25589 92	0.77
Chile	1009												
		2020			70926721.44	18.077158		4.084313 24		31.53353 45	852799451 7	22.86662 01	5.97
Chile	1009												
		2021						3.284870 41		31.89080 3			11.6
Chile	1009												
		2012	24.88091				2.747839 93	30.17296 34	0.221035 69	8.945869 24	10375197. 46	16.15492 87	3.16
Comoros	1010			13.1987	110203511	18.517839							
		2013	13.21442				2.382760 05	30.78986 26	0.256233 55	9.048387 21	4231644.4 17	15.25810 12	4.46
Comoros	1010		53	0.54159	0								
		2014	12.31461		159817450			30.01153 36	0.223863 89	9.676472 18	4684558.6 75	15.35978 23	2.10
Comoros	1010		87	0.59187	.3	18.889543	2.74473						

Comoros	1010	2015	13.46171	7.24707	131866003.3	18.697297	2.54505992	30.59862	0.244393	10.13619	4936699.51	15.41220	1.14
Comoros	1010	2016	17.67513	5.54649	116745529.7	18.575507		31.36847	0.276521	10.67289	3569823.73	15.08802	3.32
Comoros	1010	2017	17.22430	2.98082	131598332.3	18.695265		31.89888	0.344026	11.90131	3919473.025	15.18146	3.81
Comoros	1010	2018	20.66780	3.88711	172620209.6	18.966604		33.72015	0.360437	12.90902	5672348.129	15.55111	3.64
Comoros	1010	2019	22.68917	2.89098	168546815.8	18.942724		35.62009	0.376076	12.77346	4300803.966	15.27431	1.76
Comoros	1010	2020	24.53634	10.4432	227340368.5	19.241959		35.78286		5.627251	3873524.392	15.16967	0.29
Comoros	1010	2021						36.40212		6.609135			2.34
Congo, Dem. Rep.	1011	2012	20.26612	3.0837	855853174.6	20.567609		20.44106	0.041002	30.80300	289160780	21.78507	7.08
Congo, Dem. Rep.	1011	2013	20.53148	3.32655	100135824	20.724623	2.06221008	19.31666	0.055494	36.44586	169758583	21.25247	8.48
Congo, Dem. Rep.	1011	2014	16.67795	3.22302	756410387.6	20.444095	1.95142996	18.56251	0.069678	36.83218	149957215	21.12844	9.47
Congo, Dem. Rep.	1011	2015	15.16778	3.74273	116656821	20.877332	2.17043996	18.37038	0.042363	27.58332	116572001	20.87660	6.91
Congo, Dem. Rep.	1011	2016	13.81624	4.02298	593480274.8	20.201515	2.11869001	18.59975	0.030714	32.78786	932374669	20.65324	2.39
Congo, Dem. Rep.	1011	2017	13.76046	3.39294	107629491	20.79679	1.45494998	19.70269	0.035012	30.69015	104797948	20.77012	3.72
Congo, Dem. Rep.	1011	2018	10.80509	2.32975	182270617	21.323588		18.88734	0.037112	33.80735	140756358	21.06512	5.82

Congo, Dem. Rep.	1011	2019	11.47395 06	7.19586	207631792 8	21.453862		19.43498 87	0.036985 59	25.75623 87	135099422 6	21.02410 66	4.38
Congo, Dem. Rep.	1011	2020	12.93574 5	2.30941	110906759 5	20.826785	2.450000 05	20.88341 89		28.60458 74	149808480 8	21.12745 33	1.73
Congo, Dem. Rep.	1011	2021					2.700000 05	19.43382 85		40.12576 34			5.71
Cote d'Ivoire	1012	2012	36.80848 48	5.40939	367086167	19.721107	3.434469 94	16.37514 99	0.373134 53	34.98249 04	330255520 .7	19.61537 72	7.62
Cote d'Ivoire	1012	2013	33.00299 17	7.98415	384778636 .2	19.768179	3.458600 04	15.34290 19	0.393435 08	29.16040 27	407592122 .1	19.82577 75	10.7
Cote d'Ivoire	1012	2014	28.46042 05	7.14586	387214302 .3	19.774489	3.314169 88	15.24175 55	0.406222 76	28.15695 88	439356961 .2	19.90082 28	9.37
Cote d'Ivoire	1012	2015	25.41485 38	6.35865	336382061 .9	19.633758	3.494159 94	18.36220 73	0.422368 81	27.35560 79	494408755 .8	20.01887 32	7.19
Cote d'Ivoire	1012	2016	24.43541 27	12.9731	342435061 .1	19.651593	3.972320 08	19.74037 04	0.402556 79	24.59506 75	577871524 .2	20.17486 21	7.17
Cote d'Ivoire	1012	2017	26.87034 1	17.0951	307645127 .9	19.544457	3.803479 91	18.73748 67	0.432123 22	24.92012 19	975014998 .8	20.69796 34	7.35
Cote d'Ivoire	1012	2018	28.99984 65	12.3171	332046730	19.620786	3.239939 93	20.54857 04	0.406474 44	22.64068 27	620330654 .4	20.24576 32	6.89
Cote d'Ivoire	1012	2019	34.78049 78	21.1858	328290412 .1	19.609409	3.716381 55	20.67122 11	0.421129 52	23.77627 76	848881139 .4	20.55942 97	6.23
Cote d'Ivoire	1012	2020	42.15920 75		329147636 .2	19.612017	3.443016 05	21.38539 19		21.55155 52	712915894 .5	20.38487 4	1.95
Cote d'Ivoire	1012	2021								26.00982 17			7.02
Equatorial Guinea	1014	2012			0			1.055657 09	9.522968 78	71.90499 18	985256411 .5	20.70841 25	8.31

Equatorial Guinea	1014	2013		0	1.19199068	8.5283333	67.653316	582948701.9	20.1836098	4.13
Equatorial Guinea	1014	2014		0	1.29424877	7.0481958	65.963286	167875182.6	18.9387313	0.41
Equatorial Guinea	1014	2015		0	1.88839088	5.6222323	56.658473	233325072.8	19.2679432	9.11
Equatorial Guinea	1014	2016		0	2.33223921	5.4806648	51.412829	53998812.9	17.8044726	8.81
Equatorial Guinea	1014	2017		0	2.31546304	4.5958505	58.863105	304827249.5	19.5352558	5.66
Equatorial Guinea	1014	2018		0	2.25797968	4.9122741	59.614534	396077780	19.7971212	6.23
Equatorial Guinea	1014	2019		0	2.43787851	3.9454803	51.130748	452287112.1	19.9298277	5.48
Equatorial Guinea	1014	2020			2.91312465		43.486735	529894746.1	20.088189	4.24
Equatorial Guinea	1014	2021			2.63047392		55.473249			0.94
Eritrea	1013	2012	37.3424807	0		0.1907631		41357999.9	17.5377764	
Eritrea	1013	2013		0		0.1950355		43859000	17.5964905	
Eritrea	1013	2014		0		0.1962898		46511000	17.6551994	

Eritrea	1013	2015			0				0.19444671		49323000	17.7139011	
Eritrea	1013	2016			0				0.19546533		52305000	17.7726025	
Eritrea	1013	2017			0				0.21096466		55468000	17.8313168	
Eritrea	1013	2018			0				0.24617724		61015000	17.9266303	
Eritrea	1013	2019			0				0.25163585		67116000	18.021933	
Eritrea	1013	2020									73828000	18.1172486	
Eritrea	1013	2021											
Eswatini	1015	2012	10.6154405	2.38171	88545679.84	18.299029		10.2033356	0.63004675	36.6930205	26480002.33	17.0919004	5.39
Eswatini	1015	2013	10.2787515	1.86707	75120413.21	18.134603		10.1158105	0.69007207	40.5349666	81790158.4	18.2196675	3.86
Eswatini	1015	2014	9.77566986	1.68689	95824457.55	18.378029	7.07059002	9.23424884	0.68491775	43.8544194	25782635.17	17.0652118	0.92
Eswatini	1015	2015	9.78815046	1.75529	95771402.34	18.377475	5.35575008	9.3543114	0.69743974	43.1068658	31498094.37	17.2654376	2.22
Eswatini	1015	2016	13.8314622	2.2488	98421043.99	18.404765	5.41466999	8.95986292	0.75404354	44.059035	26852077.65	17.1058538	1.06
Eswatini	1015	2017	15.916514	2.31507	144415393.6	18.788204	6.13809013	8.42776197	0.79124614	43.5131079	57647593.4		2.02
Eswatini	1015	2018	11.7677158	2.26705	125737322.1	18.649706	5.67916012	8.52688465	0.8008632	40.430219	31130826.66	17.2537091	2.38
Eswatini	1015	2019	15.590904	2.58399	118702081.8	18.592127	5.64554977	8.598221	0.83614005	45.9463234	127970922	18.6673136	2.60

Eswatini	1015	2020	21.4332567	3.29488	112495380.4	18.538423	5.34233999	8.3636055		44.8870553	44069562.36	17.6012799	1.85
Eswatini	1015	2021					4.99529791	8.9303987					7.42
Ethiopia	1016	2012	24.2139228	7.1342	624360669.9	20.252239	5.56678009	44.3309428	0.09145126	13.7672982	278562822.2	19.4451542	8.64
Ethiopia	1016	2013	26.4700749	10.7036	833031317	20.540582	4.49854994	41.2395055	0.10567611	12.4840736	134387602	21.0188238	10.5
Ethiopia	1016	2014	30.5535498	11.8701	1796377787	21.309038	4.60201979	38.5204497	0.12579737	11.6416199	1855052154	21.3411786	10.2
Ethiopia	1016	2015	31.7802881	18.2926	1086986751	20.806675	4.73791981	36.0569754	0.12783203	9.3633136	2626517918	21.6889248	10.3
Ethiopia	1016	2016	31.5933238	20.935	772235946.6	20.464801	5.06151009	34.6988796	0.14449324	7.8120805	414293749	22.1446709	9.43
Ethiopia	1016	2017	32.195262	22.2355	393379170	19.790285	5.64951992	33.7792807	0.14868431	7.6293686	4017159565	22.1138409	9.56
Ethiopia	1016	2018	33.1883489	21.4918	436325463.1	19.893899	5.06867981	31.2188008	0.15784017	8.3726758	3360419369	21.9353316	6.81
Ethiopia	1016	2019	29.7669173	28.2884	479624165.3	19.988513		33.6333291	0.16381343	7.9399761	2548743427	21.6588663	8.36
Ethiopia	1016	2020	28.3614578	25.8484	404088319.9	19.817144		35.5582693		7.1272009	2395799881	21.5969883	6.05
Ethiopia	1016	2021						37.5738333		7.5928382			5.63
Gabon	1018	2012	21.0488238	4.16574	22586458.56	16.932861	3.01340008	3.3536978	3.2005906	60.950341	677327365.5	20.3336653	5.25
Gabon	1018	2013	30.4236887	12.0337	16527000.61	16.620506	3.02971005	3.3290806	3.1864849	57.357405	324032442.4	19.5963542	5.63

Gabon	1018	2014	26.9913514	6.10646	29467150.85	17.198787	2.66667008	3.62120477	3.16381616	44.5208924	126310904	20.956842	4.31
Gabon	1018	2015	38.816938	8.56899	18458042.25	16.731011	2.99166393	4.31162904	3.14218376	46.0320085	41707702.33	17.5461964	3.87
Gabon	1018	2016	41.2532718		18458042.25	16.731011	2.66205835	4.97313691	3.19739909	44.0353473	124366016 0	20.9413246	2.09
Gabon	1018	2017	46.4710326		18458042.25	16.731011	3.32681179	5.26576484	2.58134877	50.226754	131402933 0	20.9963641	0.47
Gabon	1018	2018	43.2325651		18458042.25	16.731011	2.93345881	5.4359528	2.41592048	54.2990765	137907081 6	21.0446758	0.83
Gabon	1018	2019	46.4113558		18458042.25	16.731011	2.73232412	5.55443087	2.41648401	51.4310732	155313687 5	21.1635425	3.92
Gabon	1018	2020	52.5111376		17734957.67	16.691048	3.18160939	6.65899101		47.7301166	171651150 6	21.2635599	1.83
Gabon	1018	2021						6.31303761		53.2020795			1.50
Gambia, The	1017	2012	39.0995319	9.44778	106349453.1	18.482241	2.6375699	27.39357 15	0.24146729	19.8416822	41183457.77	17.5335472	5.24
Gambia, The	1017	2013	40.9716747	11.1171	109829222	18.514437	1.81839001	26.22212 25	0.2240659	18.9791644	68340322.38	18.0400105	2.87
Gambia, The	1017	2014	43.6663907	18.3045	137771209.4	18.741105	2.2309401	22.45883 92	0.25691229	21.8368954	23014092.04	16.9516173	1.40
Gambia, The	1017	2015	39.7539313	18.7964	154062367.7	18.852868	2.16002989	22.20888 6	0.25409182	19.5963332	71976051.7	18.091844	4.05
Gambia, The	1017	2016	36.1823373	22.3589	145678794.7	18.796915	2.02443004	21.86137 94	0.24661095	15.9115118	69830172.21	18.0615767	1.94
Gambia, The	1017	2017	44.7555908	15.8314	160167345.3	18.89173	2.45919442	21.00189 47	0.24391347	16.7894554	64338516.04	17.979669	4.82

Gambia, The	1017	2018	41.89900 68	12.6605	212034736 .1	19.172261	2.365439 89	19.87159 62	0.241218 34	21.72642 95	81805006. 6	18.21984 9	7.23
Gambia, The	1017	2019	39.97871 5	12.7843	275825107 .5	19.435278	2.788928 03	20.00404 59	0.247050 72	18.84139 8	71083305. 87	18.07936 31	6.22
Gambia, The	1017	2020	42.22116 11	17.8253	416418880 .7	19.847202	2.763717 17	20.97683 02		8.163815 23	189576190 .8	19.06030 16	0.20
Gambia, The	1017	2021						19.69990 52		9.618674 91			5.62
Ghana	1019	2012	30.61314 64	2.98921	215549500 0	21.491286	7.919139 86	22.13115 47	0.561999 71	40.35921 82	329452000 0	21.91552 63	9.29
Ghana	1019	2013	26.38697 77	4.28367	186399000 0	21.345985	4.576469 9	20.36984 25	0.587425 25	25.44078 34	322700000 0	21.89481 88	7.31
Ghana	1019	2014	34.35397 02	5.2499	200783148 0	21.420321	4.399789 81	19.58377 29	0.554280 56	28.23190 18	336338944 4	21.93621 51	2.85
Ghana	1019	2015	41.88817 59	6.25282	498244236 2	22.329186	4.434050 08	19.98265 07	0.566623 03	33.83170 5	319232053 1	21.88401 39	2.12
Ghana	1019	2016	39.02517 65	9.52485	297993420 4	21.815167	4.394529 82	20.84429 31	0.564217 04	31.19323 95	348533336 9	21.97182 95	3.37
Ghana	1019	2017	38.67697 2	10.0543	353641000 0	21.986378	3.533629 89	19.56170 97	0.584105 26	33.87687 44	325499000 0	21.90345 5	8.12
Ghana	1019	2018	36.05680 29	11.7052	352056662 3	21.981888	3.886130 09	18.13655 06	0.627538 3	33.45489 59	298903500 0	21.81821 64	6.20
Ghana	1019	2019	40.80563 94	9.80023	405369472 9	22.122895		17.32323 54	0.658823 54	37.44959 94	387983147 0	22.07905 76	6.50
Ghana	1019	2020	44.25625 45	12.0412	429195680 1	22.180009		18.85378 27		20.72104 61	187578295 3	21.35229 2	0.51
Ghana	1019	2021						19.70877 54		29.90761 97			5.35
Guinea	1020	2012	17.76885 57	5.99847	66300000	18.0097	1.833709 96	16.83167 32	0.232819 43	33.13739 16	605560000	20.22166 42	5.91

Guinea	1020	2013	21.01072	1.95813	93010000	18.348218	2.63421011	17.5452721	0.20013182	26.4706206	190000	12.1547794	3.94
Guinea	1020	2014	21.64173	2.40733	121425853.2	18.614814	2.42281008	17.5238164	0.20087939	26.6885101	-73758603.7		3.69
Guinea	1020	2015	23.54476	4.06666	130582308.4	18.687514	2.51713991	18.4782421	0.22218148	21.4968704	53272458.42	17.79093	3.82
Guinea	1020	2016	26.25574	2.31068	52170780.86	17.770033	2.54450011	17.5899467	0.24023647	29.3715113	161844726 0	21.20473 3	10.8
Guinea	1020	2017	23.24680	1.74048	44660000	17.614589	2.32033992	20.5284725	0.27677609	44.6602985	577590000	20.17437 48	10.3
Guinea	1020	2018	22.61720	2.77456	28430000	17.162955	2.38432002	22.3259309	0.30207119	40.2070955	352760000	19.68129 85	6.35
Guinea	1020	2019	23.33691	2.76427	158130000	18.878928	1.84836996	26.4272767	0.30928854	30.1190304	44400000	17.60875	5.61
Guinea	1020	2020	29.11689	1.5161	22530000	16.930358	2.19947004	25.7366306		58.8090591	176350000	18.98798 12	4.63
Guinea	1020	2021						25.5001752		53.3521767			3.1
Guinea-Bissau	1021	2012	27.95237	3.99228	45635184.42	17.63619	2.00106001	46.892498	0.15576508	15.4752133	6624917.193	15.70634 84	1.71
Guinea-Bissau	1021	2013	27.19501	1.1892	63787684.42	17.971071	2.13248992	44.135611	0.15167519	18.2571916	19639703.8	16.79306 38	3.25
Guinea-Bissau	1021	2014	26.67172	1.42615	92419676.5	18.34185	2.20000005	41.1323466	0.15953365	20.2074001	28852727.69	17.17771 51	0.96
Guinea-Bissau	1021	2015	31.72079	1.4027	84952814	18.257607	2.29999995	46.7881253	0.16117826	27.5430439	18575499.45	16.73735 4	6.13
Guinea-Bissau	1021	2016	26.75061	2.78319	56431260	17.848534	2.29999995	46.348359	0.17391948	26.5081143	14221700	16.47027 95	6.26

Guinea-Bissau	1021	2017	31.41505 08	2.57574	105179557.5	18.47118	2.200000 05	49.15780 78	0.169570 7	27.77397 26	15691197.95	16.56861 05	5.91
Guinea-Bissau	1021	2018	35.82403 81	2.60795	127983532.8	18.667412	2.137870 07	30.72370 34	0.170730 04	25.27609 5	20563818.22	16.83904 37	1.28
Guinea-Bissau	1021	2019	41.57894 07	3.55874	151185244.9	18.834016	2.947819 95	30.39657 95	0.171792 96	20.28794 97	71658680.34	18.08742 49	4.49
Guinea-Bissau	1021	2020	55.34350 07		174938409.2	18.979945	2.708427 67	30.86324 48		14.38704 39	20989721.61	16.85954 34	
Guinea-Bissau	1021	2021											3.80
Kenya	1022	2012	23.52785 92	4.63754	121102143 9	20.91473	4.931210 04	18.82972 59	0.273997 5	19.86494 77	138017366 2	21.04547 52	4.56
Kenya	1022	2013	25.23263 46	4.72707	130427723 1	20.988915	4.837210 18	18.61655 16	0.309754 06	17.79218 06	111882500 0	20.83554 49	3.79
Kenya	1022	2014	27.87758 67	11.36	144084625 0	21.088496	4.717299 94	18.34783 93	0.324410 69	16.47280 45	820937598 .4	20.52595 77	5.02
Kenya	1022	2015	31.27088 54	8.32796	156926785 0	21.173875	4.743500 23	19.46961 48	0.359452 72	15.12873 39	619724465	20.24478 55	4.96
Kenya	1022	2016	28.50399 89	11.1603	174463917 5	21.279814	4.895180 23	20.03451 64	0.389590 3	13.24974 48	469533310 .7	19.96724 98	4.21
Kenya	1022	2017	33.44161 68	14.6074	196227310 6	21.397369	4.963089 94	20.89363 74	0.377928 44	12.73665 99	134608534 5	21.02046 65	3.83
Kenya	1022	2018	34.59236 8	23.7172	272036606 1	21.724032	5.107619 76	20.31491 04	0.340321 56	12.54197 53	767761506 .7	20.45898 97	5.64
Kenya	1022	2019	35.31354 9	38.3758	283819221 5	21.766433	4.974390 03	20.86116 38	0.423783 9	11.42799 67	469940266 .8	19.96811 62	5.11
Kenya	1022	2020	38.45294 6	27.8412	310793225 3	21.857223	5.079969 88	22.62100 89		9.639532 69	426305189 .4	19.87066 61	0.25
Kenya	1022	2021					4.799036 03	22.42824 55		10.56913 51			7.51

Liberia	1023	2012	19.2577734	1.17284	546822359.4	20.119635	1.77711999	46.7127296	0.22970929		2309981241	21.5605052	7.99
Liberia	1023	2013	18.457331	0.93712	412747709.3	19.838347	1.69078004	39.5299619	0.21655533		1998675366	21.4157505	8.68
Liberia	1023	2014	23.5589488	2.39826	512000267.6	20.053836	2.20005012	36.499083	0.2798481		501870828.6	20.03385	0.70
Liberia	1023	2015	28.4739024	8.71763	654424479.5	20.299267	2.17083001	34.4037545	0.2817387		232679832.5	19.26517	0.01
Liberia	1023	2016	30.5588831	3.04266	580127751.4	20.178759	2.14812994	35.9187135	0.3074065		311699760.3	19.55755	1.55
Liberia	1023	2017	36.3439823	3.35252	403475872.7	19.815627	2.66330004	35.9426159	0.2722161		247842983	19.328306	2.45
Liberia	1023	2018	38.9649189	4.41027	459924732.1	19.946573	2.50391006	35.4966999	0.2344895		129129754.8	18.67632	1.15
Liberia	1023	2019	43.7108183	7.11688	346244091.6	19.662655	2.27039003	36.4371513	0.2389943		86681700.46	18.27775	2.46
Liberia	1023	2020	52.121129	11.0044	333398262.7	19.624848	2.30928993	41.0519657			86960000	18.28095	2.98
Liberia	1023	2021					2.69217944	37.2056597					4.0
Madagascar	1025	2012	26.584124	2.49032	330495619.9	19.616104	2.34067011	28.0006124	0.1226135	21.780692	814789934.7	20.518440	3.01
Madagascar	1025	2013	24.3800113	2.31461	357754330.9	19.695357	1.77693999	26.493034	0.1276062	23.272161	565848886	20.153837	2.30
Madagascar	1025	2014	24.2268182	2.77464	344438244	19.657425	2.38123012	25.8453829	0.127597	28.281912	372872463.3	19.736747	3.33

Madagascar	1025	2015	27.46082 61	4.41953	326844541.4	19.604995	2.210119 96	25.74335 43	0.135346 59	28.39064 61	328059305.6	19.60870 5	3.13
Madagascar	1025	2016	26.03005 42	3.59423	299204626.1	19.516638	2.687190 06	25.13345 44	0.127739 73	29.09256 94	540842779.8	20.10863 92	3.99
Madagascar	1025	2017	26.38819 48	3.15352	342776977.9	19.652591	2.701374 29	24.55013 78	0.135703 19	30.90263 09	464856589.6	19.95723 95	3.93
Madagascar	1025	2018	27.85718 38	2.68312	425502225.7	19.868781	2.8441	24.22980 4	0.127559 21	31.87333 59	612036371.4	20.23230 23	3.20
Madagascar	1025	2019	29.90057 56	2.84404	407676204.2	19.825984	2.994858 74	22.81512 49	0.152766 26	28.24965 72	474311425.4	19.97737 47	
Madagascar	1025	2020	38.45754 3	4.71693	495356527.4	20.020788	3.095706 22	24.79931 65		21.48459 66	358467141.4	19.69734 76	-7.1
Madagascar	1025	2021								22.46506 01			4.4
Malawi	1024	2012	22.58993 43	2.05547	28303298.99	17.158489		28.28892 62	0.061704 3		-8885976.22		1.88
Malawi	1024	2013	29.23940 14	3.15321	34132322.31	17.345755	5.416170 12	28.67364 22	0.061871 47		451362406.6	19.92778 11	
Malawi	1024	2014	28.30786 39	4.11378	38487169.24	17.465835	4.839839 94	28.70269 88	0.052180 69		598086538.1	20.20924 6	5.70
Malawi	1024	2015	27.97139 93	5.53042	41493977.04	17.541059	5.608660 22	27.48122 39	0.055537 96		287746689.2	19.47759 11	
Malawi	1024	2016	34.14109 35	6.37694	39053133.13	17.480434	4.748569 97	25.92704 34	0.065096 4		115700000	18.56651 12	2.48
Malawi	1024	2017	24.72659	6.71494	78880384.23	18.183443	4.031330 11	22.92623 86	0.067345 05		90200000	18.31754	4.00
Malawi	1024	2018	23.70052 51	7.18468	181067327.5	19.014379	3.322959 9	21.62943 58	0.076061 49		77012306	18.15947 58	4.39
Malawi	1024	2019	22.60023 11	7.46879	280913154.6	19.453556	3.711319 92	23.00254 03	0.077836 68		55227831.63	17.82697 76	5.44

Malawi	1024	2020	24.7856586	9.18831	231650864.5	19.260742	2.90761995	22.6552061			45238934.1	17.6274686	0.79
Malawi	1024	2021						22.7301499					2.75
Mali	1026	2012	25.4522122	1.74698	827417012	20.533819	3.47949004	38.1141025	0.19462445	27.85634	397842480.3	19.8015667	0.83
Mali	1026	2013	26.7786802	3.1155	894763366.2	20.61207	3.28465009	36.7528163	0.19574642	24.9405403	307940910.8	19.5454185	2.29
Mali	1026	2014	24.6316941	2.98604	921490603.7	20.641503	3.64819002	37.4567677	0.19959594	22.555487	144214831.2	18.7868146	7.08
Mali	1026	2015	28.759908	3.25972	816930232.7	20.521064	3.80152011	37.7232569	0.20930373	24.0437085	275525536	19.4341909	6.17
Mali	1026	2016	27.7015841	3.51626	827242532.9	20.533608	3.09477997	37.403703	0.25994342	23.442913	356476591.9	19.6917791	5.85
Mali	1026	2017	28.7830807	4.02406	885444663.1	20.601601	3.78976989	37.4324396	0.27981239	22.2140939	560747464.4	20.1447812	5.30
Mali	1026	2018	27.9658267	4.41403	1022573592	20.745588	3.90556502	37.6124432	0.28672136	24.5223744	467295391.1	19.9624721	4.74
Mali	1026	2019	30.6190001		971700936.1	20.694559	3.48410225	37.3077973	0.29657102	25.7052911	859091549.2	20.5713861	4.75
Mali	1026	2020	36.3064805		997137083.8	20.720399	3.76343131	36.188045		30.6566301	536851812.9	20.1012327	1.23
Mali	1026	2021						36.0003231		29.5810562			3.06
Mauritania	1027	2012	65.4348001	5.18583	0		2.15821004	16.0859608	0.73653299	48.2613552	138609885.1	21.0497591	4.47
Mauritania	1027	2013	64.3326926	5.78566	0		2.29354	16.2826011	0.678455	45.5485992	112600476.0	20.8419416	4.15

Mauritania	1027	2014	71.4691722	10.8697	0			18.814206	0.737745	37.392007	502589833.8	20.03528	4.27
Mauritania	1027	2015	83.4089141	14.1529	0			20.629754	0.879815	30.195148	501726765.7	20.03356	5.37
Mauritania	1027	2016	80.8650426	15.0234	0		1.944059	21.739169	0.782989	33.925140		19.41812	1.26
Mauritania	1027	2017	78.1961642	15.7224	77170265.83	18.161525		22.718747	0.814928	34.505675	588217194.8	20.19260	6.27
Mauritania	1027	2018	71.4261062	17.4078	60391856.66	17.916365		23.330663	0.838005	34.276267	772890477.2	20.46564	4.52
Mauritania	1027	2019	68.9009384	14.07	64458913.64	17.981539	1.824370	21.676947	0.872793	39.184759	-883561116		5.75
Mauritania	1027	2020	73.1316508	9.93179	168665175.6	18.943426	1.881160	20.187921		39.775021	927916265.8	20.64845	1.76
Mauritania	1027	2021											2.29
Mauritius	1028	2012	88.6380341	40.9413	861942.5999	13.666944	3.418200	3.657270	2.970024	53.792163	589018302.8	20.19396	3.49
Mauritius	1028	2013	95.0653961	20.3213	552880.1027	13.222896	3.615789	3.375429	3.034990	48.417417	293369157.1	19.49694	3.36
Mauritius	1028	2014	92.6403728	43.2592	327038003.8	19.605587	4.916950	3.259178	3.132598	48.846109	455562151.8	19.93704	3.74
Mauritius	1028	2015	81.4012731	32.8681	223577781.4	19.22527	4.886670	3.153993	3.136372	47.862247	216455188.3	19.19289	3.55
Mauritius	1028	2016	79.0953881	12.8246	194066629.1	19.083712	5.013599	3.187929	3.197535	44.250342	378764432.3	19.75242	3.83
Mauritius	1028	2017	108.745623	17.0027	250243134.9	19.337944	5.023129	3.095793	3.297451	42.451782	479995890.3	19.98928	3.81

Mauritius	1028	2018	101.466518	22.5421	244621262.5	19.315222	4.83458996	2.78458866	3.2640404	40.9634373	460511368.2	19.9478481	3.75
Mauritius	1028	2019	115.043019	20.8495	318511666.2	19.57917	4.71929979	2.89791954	3.29459101	38.4703384	444077760.9	19.9115102	3.01
Mauritius	1028	2020	155.663848	26.2783	284728298.4	19.467046	4.60817003	3.40631684		29.9636198	224668082.8	19.2301347	14.8
Mauritius	1028	2021						3.75548375		30.4853336			4.04
Mozambique	1029	2012	43.8450413	9.94139	174107424.2	18.975183	5.67216015	24.9145111	0.1480105	28.8839773	5635092659	22.4522794	7.25
Mozambique	1029	2013	75.4893285	10.6396	152410998.7	18.842091	6.11533022	23.5039507	0.1643141	26.743936	6697422432	22.6249886	6.96
Mozambique	1029	2014	75.8717122	15.713	155464965.9	18.861931	6.8763299	23.9349347	0.1848795	31.2840396	4998799334	22.3324636	7.39
Mozambique	1029	2015	90.1038684	13.7624	142879136.5	18.77751	6.01082993	22.9161876	0.2041261	31.0781714	3868353885	22.0760949	6.72
Mozambique	1029	2016	121.66001	12.5078	93372689.55	18.352109	5.86503983	22.8545745	0.2615888	33.5453172	3128149929	21.8637076	3.82
Mozambique	1029	2017	123.360594	8.12436	257936772.5	19.368225	5.50555992	25.0436812	0.2516666	38.5790511	2319071971	21.5644329	3.74
Mozambique	1029	2018	128.373105	8.77841	296070198.9	19.506107	5.45218992	24.5676729	0.2356250	44.8700029	1678061192	21.2409049	3.44
Mozambique	1029	2019	133.280456	14.7606	299567589.2	19.517851	6.0844202	24.2114333	0.2469864	32.2683615	3379329136	21.940943	2.31
Mozambique	1029	2020	154.405191	33.9887	348813813.3	19.670049	6.26058865	25.5774211		29.8668658	3187942207	21.8826415	1.23
Mozambique	1029	2021											2.22
Namibia	1030	2012			80114673.13	18.19897		8.0544752	1.6083638	40.058338	1041555413	20.763981	5.06

Namibia	1030	2013			64103034.95	17.976002	8.60933208	7.8214649	1.69688372	37.5019849	777073646.4	20.4710457	5.61
Namibia	1030	2014			80721935.11	18.206521	9.57785416	8.13893575	1.73746585	39.0170852	445582247.9	19.9148924	6.09
Namibia	1030	2015			46673693.35	17.658691	9.85076809	6.6504268	1.81433237	35.3708484	838879062.7	20.5475771	4.26
Namibia	1030	2016			66479264.7	18.012401	10.6387959	6.7201164	1.75145168	35.0094674	358727049.6	19.6980723	0.03
Namibia	1030	2017			48292447.47	17.692786	9.70867252	7.6761562	1.7772243	33.6208046	280476975	19.4520022	1.02
Namibia	1030	2018			53670691.33	17.798378	8.88112259	7.7682971	1.72772945	35.8825652	234372724.5	19.2724232	1.05
Namibia	1030	2019			65593517.23	17.998987	8.92702675	7.0832566	1.69170543	36.3616472	-176478262		0.92
Namibia	1030	2020			64026883.05	17.974814	9.44689655	9.1860098		33.4767178	-159342886		7.86
Namibia	1030	2021					9.64049149	9.3969554		31.9413202			2.43
Niger	1031	2012	18.3098994	2.47642	151834370	18.838301	3.18682003	33.680993	0.10620836	16.1005771	841227436.9	20.5503726	10.5
Niger	1031	2013	18.6649574	4.07026	145912239.1	18.798516	3.6895299	32.235010	0.10646182	16.9790336	719338470.5	20.3938426	5.31
Niger	1031	2014	17.6665825	6.17108	219080292	19.204949	5.10368013	33.429042	0.11174531	15.9458629	822967023.3	20.5284267	6.64
Niger	1031	2015	21.9648291	6.17865	171586253	18.960597	4.48669004	32.416995	0.10549122	14.26837	529476871.1	20.0874	4.39

Niger	1031	2016	23.5610496	8.32442	176370907.3	18.9881	2.95843005	35.2629582	0.10149701	12.1833389	301332480.6	19.5237248	5.74
Niger	1031	2017	26.336306	8.59965	264041277.6	19.391616	2.57818007	35.8168772	0.08841615	13.2943709	338710710.1	19.6406569	5.00
Niger	1031	2018	23.8489603	7.86859	296677560	19.508156	3.45727992	37.6616625	0.08688744	11.8352699	466042273	19.9597869	7.21
Niger	1031	2019	26.7726877	9.21078	308661888.8	19.547757	3.52752876	36.9148824	0.09223225	11.4217334	717147639.4	20.3907923	5.94
Niger	1031	2020	34.8935434		520943729.8	20.071153	3.83761263	38.3847253		10.2875991	360653574.6	19.7034284	3.58
Niger	1031	2021						36.3718567		10.0786616			1.35
Nigeria	1032	2012	4.9508164	1.3442	205428844	23.74578		21.8599586	0.57011708	31.5465877	706990842	22.6791134	4.23
Nigeria	1032	2013	5.0637524	0.49417	207970739	23.758078		20.7586228	0.62951988	18.0499066	556285798	22.4393778	6.67
Nigeria	1032	2014	5.4176640	5.27231	209990848	23.767745		19.9902548	0.65094553	18.4351261	469382863	22.2695144	6.30
Nigeria	1032	2015	6.8383456	3.20515	206260469	23.749821		20.6318935	0.59490735	10.6663096	306416890	21.8430422	2.65
Nigeria	1032	2016	9.0207549	6.27743	196979380	23.70378		20.9831097	0.59598761	9.2181097	345325840	21.9625841	1.61
Nigeria	1032	2017	12.568160	6.74529	220370168	23.815989		20.8465714	0.56844006	13.171562	241297491	21.6041262	0.80
Nigeria	1032	2018	14.306501	7.88436	243110224	23.914196		21.2037737	0.56102196	15.496892	775247400	20.4686928	1.92
Nigeria	1032	2019	13.853298	7.10206	238092814	23.893341		21.9062959	0.57363621	14.220968	230509981	21.5583898	2.20
Nigeria	1032	2020	16.942847	13.3601	172075473	23.568614		24.1433059			238527766	21.5925814	1.79

Nigeria	1032	2021						23.3570588					3.64
Papua New Guinea	1033	2012	73.8807935	7.05083	14254412.22	16.472577		19.2739508	0.640806	96	28796707.52	17.17577 16	4.65
Papua New Guinea	1033	2013	110.58291	19.6812	14280890.13	16.474433		19.2600194	0.672796	45	26804026.04	17.10406 27	3.82
Papua New Guinea	1033	2014	89.5642188	12.8367	10474115.13	16.164418		17.6919443	0.741185	07	29436963.91	17.19776 17	13.5
Papua New Guinea	1033	2015	95.5869892	12.7451	3944547.935	15.187845		17.4569302	0.802933	31	213710099.4	19.18013 1	6.57
Papua New Guinea	1033	2016	93.7556365	39.8727	2694279.502	14.806641		17.8663404	0.926041	65	19180492.96	16.76940 43	5.48
Papua New Guinea	1033	2017	77.256473	27.1045	4262316.573	15.265323	1.96493006	17.6495689	0.901868	44	161470622.8	18.89983 38	3.53
Papua New Guinea	1033	2018	75.4442354	26.1493	3670805.657	15.115922	1.87483001	16.9738355	0.878423	81	113464353 8	20.84958 44	0.27
Papua New Guinea	1033	2019	79.0672182	20.1025	3000000	14.914123		16.9761434	0.863707	51	335176756.7	19.63016 86	4.48
Papua New Guinea	1033	2020	73.655845	14.1498	2000000	14.508658					111767602.9	18.53193 23	
Papua New Guinea	1033	2021											
Rwanda	1034	2012	24.0411997	7.54224	182402478.1	19.021726	4.42352009	24.7780423	0.071092	28	12.00069 37	269615550.4	19.41250 76	8.64
Rwanda	1034	2013	30.1226217	8.3151	170199422.5	18.952481	4.74491978	24.9324161	0.074919	96	13.49942 06	233763793.6	19.26982 17	4.71
Rwanda	1034	2014	36.1367608	12.6046	183593635.9	19.028235	4.19878006	24.7003361	0.077591	92	13.87574 42	313997162.8	19.56489 45	6.16

Rwanda	1034	2015	41.2090671	12.645	159199957	18.885672	3.64915991	23.99261065	0.08619882	13.2385106	162083821	18.9036242	8.85
Rwanda	1034	2016	51.0961952	14.5635	172516841	18.966005	3.43672991	25.16484 07	0.09941014	15.4296017	279747327.6	19.4493974	5.97
Rwanda	1034	2017	56.6423112	12.7069	215292394.8	19.187508	3.12646008	26.34545 56	0.09932427	20.5283853	274025990.7	19.4287335	3.97
Rwanda	1034	2018	61.1356251	12.7531	260511615.6	19.378158	3.07375002	24.61187 12	0.10486126	21.0980867	366192315.5	19.7186692	8.57
Rwanda	1034	2019	65.0973574	14.3138	260710294.7	19.37892	3.23707414	23.54579 7	0.10533037	21.8106397	263172335.2	19.3883196	9.46
Rwanda	1034	2020	81.1446683	14.6191	280069130.5	19.450547	3.33054972	26.63087 49		19.307046	99915133.32	18.4198317	3.35
Rwanda	1034	2021					3.82156157	24.06210 5		19.0641467			10.8
Sao Tome and Principe	1038	2012	82.7273057	33.4366	6358889.79	15.665364	6.33950996	11.50249 48	0.63696295		22471527.03	16.9277596	3.14
Sao Tome and Principe	1038	2013	71.3953937	10.9582	26566722.92	17.09517	5.93969011	12.03395 97	0.62475269		12162344.82	16.3138552	4.81
Sao Tome and Principe	1038	2014	64.6463305	13.8655	26827848.81	17.104951	3.74905992	11.37588 67	0.61309884		26489982.13	17.0922772	6.54
Sao Tome and Principe	1038	2015	76.7259742	2.85674	19980196.89	16.810252	3.86459994	11.94616 95	0.60168772		27924059.14	17.1449992	3.91
Sao Tome and Principe	1038	2016	71.6660335	2.55437	18044840.56	16.70837	5.17303991	11.39767 89	0.63969765		23331087.12	16.9652972	4.16

Sao Tome and Principe	1038	2017	71.95373 14	4.05795	18192067.23	16.716496	5.036369 8	10.87890 25	0.676047 64		34208489.03	17.34798 44	3.84
Sao Tome and Principe	1038	2018	61.25862 92	4.72744	17776130.48	16.693367	5.235109 81	11.11538 31	0.663406 5		23698321.49	16.98091 48	2.94
Sao Tome and Principe	1038	2019	59.08157 59	11.6967	11114429.37	16.223755	5.921549 8	12.28981 2	0.697518 72		24191799.51	17.00152 43	2.21
Sao Tome and Principe	1038	2020	61.91362 76	4.27311	8620359.248	15.969637	5.011384 01	13.99179 7			47112184.77	17.66804 22	3.08
Sao Tome and Principe	1038	2021						14.94635 41					
Senegal	1037	2012	34.41884 31	7.6785	157622506 9	21.178299	4.776989 94	14.09769 24	0.555887 58	22.47437 44	276159533	19.43648 93	4.00
Senegal	1037	2013	34.17762 58	8.88823	177789728 4	21.298697	5.686560 15	13.72488 04	0.581174 79	22.34974 23	311366768.8	19.55648 21	2.41
Senegal	1037	2014	34.14311 82	9.04798	193162479 3	21.381627	5.720210 08	13.36876 51	0.604596 61	21.77829 67	403098056.4	19.81469 04	6.22
Senegal	1037	2015	39.12085 63	8.76988	175775446 2	21.287303	5.456379 89	14.28257 67	0.637241 95	22.67719 45	409166125.8	19.82963 18	6.36
Senegal	1037	2016	40.63473 49	9.5795	198058147 0	21.406656	5.113090 04	14.41402 04	0.675625 48	21.56085 81	472409799.8	19.97335 74	6.36
Senegal	1037	2017	48.11622 25	14.3529	214891138 5	21.488227	4.624969 96	14.98203 38	0.635564 9	21.93008 31	588292998	20.19273 57	7.39
Senegal	1037	2018	56.32112 84	15.1842	242753190 6	21.610141	4.858220 1	14.98824 78	0.642096 14	22.94889 49	847841574.8	20.55820 44	6.20
Senegal	1037	2019	66.83346 95		252220566 5	21.6484	5.348875 05	14.89957 31	0.651679 18	24.98793 28	106546282 0	20.78667 51	4.61

Senegal	1037	2020	71.69028 09		2561899542	21.664015	5.497858 05	16.21585 47		20.66971 78	1845663881	21.33610 49	1.32
Senegal	1037	2021						15.32368 03		22.31529 25			6.06
Seychelles	1036	2012			17669070.06	16.687326	2.613929 99	2.044812 86	4.869596 81	99.32936 01	613208776.3	20.23421 6	1.26
Seychelles	1036	2013			12874328.25	16.370746	3.608129 98	2.667339 01	4.669312 46	90.81130 47	57289065.62	17.86362 03	6.01
Seychelles	1036	2014			15075955.04	16.528612	4.083680 15	2.330459 36	5.144539 66	98.95971 73	108355443.1	18.50092 75	4.50
Seychelles	1036	2015			18424230.93	16.729177	4.222899 91	2.269725 5	5.459274 78	91.12849 75	105893597.2	18.47794 53	5.63
Seychelles	1036	2016			22087023.35	16.910501	4.421020 03	2.234425 78	6.126091 69	89.83399 25	40854189.7	17.52551 99	5.35
Seychelles	1036	2017			21661247.93	16.891035	3.677289 96	2.747987 09	6.051563 32	99.99394 61	124465535.7	18.63953 94	4.51
Seychelles	1036	2018			22713694.64	16.938479	4.498839 86	2.605116 22	5.994088 42	94.91760 72	307664653.8	19.54452 1	3.19
Seychelles	1036	2019			23648219.31	16.978798	3.914589 88	2.647322 64	6.248399 63	91.37599 85	253880560.1	19.35237 45	3.08
Seychelles	1036	2020			9979686.567	16.116062	5.150725 36	2.472223 54		76.62947 38	175110126.1	18.98092 56	7.72
Seychelles	1036	2021						2.243015 76		85.83452 72			1.84
Sierra Leone	1035	2012	34.02848 88	1.66809	64534081.21	17.982704	2.872040 03	50.59211 66	0.128117 54	32.90532 71	722447405.1	20.39815 52	15.1
Sierra Leone	1035	2013	28.60404 24	1.555	69660699.5	18.059147	2.379810 09	47.98330 9	0.151515 7	28.62675 71	429664580.1	19.87851 54	20.7
Sierra Leone	1035	2014	29.27269 44	2.3308	62430104.57	17.949558	2.66292	51.79252 87	0.163884 12	30.76003 94	375089628.5	19.74267 56	4.55

Sierra Leone	1035	2015	37.44016 54	6.58221	48163694.6	17.690116	3.057290 08	58.65189 37	0.126883 93	19.36254 45	252435829.4	19.34666 76	20.5	
Sierra Leone	1035	2016	49.65261 56	5.07743	58230465.76	17.879919	3.060230 02	58.20874 13	0.126895 83	24.91409 33	138509469.3	18.74644 93	6.05	
Sierra Leone	1035	2017	48.24373 07	7.72671	63556890.5	17.967446	4.660960 2	60.61109 04	0.125527 03	26.19289 51	413724476.1	19.84071 08	4.19	
Sierra Leone	1035	2018	46.19393 62	8.20076	73207824.62	18.108813	6.989630 22	58.93440 96	0.112416 11	17.46729 93	250446053.5	19.33875 41	3.46	
Sierra Leone	1035	2019	46.03625 45	8.89865	68081022.81	18.036209	7.447010 04	58.15447 24	0.115189 57	18.24693 61	301485441.3	19.52423 23	5.25	
Sierra Leone	1035	2020	53.03307 41		177031971.5	18.991841	8.809550 29	59.48739 59		15.09107	135110809.8	18.72160 58	1.96	
Sierra Leone	1035	2021											3.05	
Sudan	1039	2012	61.28331 7	7.12909	595843243.8	20.205488		33.77462 42	0.436539 09	12.07008 77	231146074 0	21.56114 55	17.0	
Sudan	1039	2013	55.93693 26	4.90856	619508803.4	20.244437		29.60763 65	0.410546 3	11.68602	168788417 9	21.24674 16	1.95	
Sudan	1039	2014	44.83108 28	4.31042	506556821.9	20.043147		32.62427 08	0.424460 12	0.670014 77	125128088 9	20.94743 36	4.66	
Sudan	1039	2015	42.32564 75	10.6505	151392010.5	18.835383		31.55645 13	0.480940 39	0.730366 82	172837340 3	21.27044 66	1.91	
Sudan	1039	2016	50.50224 52	6.33692	153411466.3	18.848634		22.97758 14	0.530272 53	0.712992 21	106376753 5	20.78508 27	3.46	
Sudan	1039	2017	54.75483 58	4.0172	212936009.9	19.176502		21.23054 03	0.513556 82	0.664361 8	106529848 1	20.78652 09	0.70	
Sudan	1039	2018	73.85099 81	4.19894	425214350.6	19.868104		21.99347 32	0.499024 79	0.611168 06	113578716 4	20.85059 18	2.68	

Sudan	1039	2019	90.74247 63	3.75873	522317287 .8	20.073786		20.16401 53	0.481626 77	0.630574 15	825354992 .3	20.53132 41	2.17
Sudan	1039	2020	115.5929 92	2.88593	495355092 .5	20.020785		20.35627 52		0.435765 18	716939710 .6	20.39050 23	3.62
Sudan	1039	2021						6.357092 13		2.251364 4			0.11
Tanzania	1042	2012	30.80921 17	1.91116	390138888 .1	19.782013	3.470930 1	26.55092 65	0.209763 31	22.37207 07	179964613 7	21.31085 59	4.50
Tanzania	1042	2013	31.09218 77	2.88529	381930784 .2	19.76075	3.357959 99	26.79086 79	0.222964 15	19.01220 4	208726131 0	21.45911 87	6.78
Tanzania	1042	2014	33.00316 02	3.51247	389484432	19.780334	3.384880 07	25.80257 74	0.214369 08	18.06920 94	141608806 5	21.07116 4	6.73
Tanzania	1042	2015	39.03914 46	5.60208	387768413	19.775919	4.19487	26.74588 57	0.227066 83	17.10491 14	150602489 6	21.13273 95	6.16
Tanzania	1042	2016	39.93875 71	8.59072	402531458 .3	19.813284	4.101970 2	27.44414 26	0.211124 64	16.34997 47	864040000	20.57712 96	6.86
Tanzania	1042	2017	41.10489 89	10.1161	402634721 .8	19.81354	4.430510 04	28.74208 61	0.216427 47	15.14027 77	937700000	20.65894 06	6.78
Tanzania	1042	2018	39.76395 48	12.1203	412910078	19.83874	3.696439 98	27.86859 95	0.213092 99	14.73914 34	971576866	20.69443 09	5.44
Tanzania	1042	2019	39.03159 3	12.5573	433499813 .4	19.887402	3.596836 33	26.54641 52	0.214634 96	16.00786 39	121723525 2	20.91984 79	5.79
Tanzania	1042	2020	41.25045 12	14.6012	326160727 .8	19.602901	3.225153 45	26.73711 13		14.29548 77	684887679 .4	20.34476 54	1.99
Tanzania	1042	2021					3.297790 29	25.88565 33		14.33087 71			4.27
Togo	1040	2012	19.31935 39	1.1609	344740603	19.658303	4.719200 13	42.52391 81	0.330685 54	45.20536 1	121511565 .6	18.61552	6.54
Togo	1040	2013	21.29350 24	2.28144	397472016 .4	19.800635	4.423649 79	37.51484 19	0.251627 64	46.47602 4	183599249	19.02826 59	6.11

Togo	1040	2014	22.1252994	2.85176	427861354.6	19.87431	4.78455019	25.6848698	0.22275157	39.7162731	54020342.35	17.8048712	5.92
Togo	1040	2015	25.3927268	3.2629	363741802.8	19.711955	5.10860014	24.374003	0.24989206	35.8463567	257860036.5	19.3679275	5.74
Togo	1040	2016	20.0225093	4.86354	367166876.4	19.721327	3.68649006	20.7579834	0.30626027	26.9067158	-46308331.6		5.55
Togo	1040	2017	25.7134988	5.76252	403610143	19.81596	3.76052999	20.6386085	0.26888438	25.2702383	88558699.5	18.2991762	4.34
Togo	1040	2018	24.1123784	5.96126	450814504.6	19.926567	4.04394007	20.4404884	0.29280924	23.9434753	-180972715		4.97
Togo	1040	2019	27.7536965	5.96474	507962802	20.045919	4.0691433	19.7552068	0.29323121	23.061582	345697547	19.6610748	5.45
Togo	1040	2020	33.5439815		650385610.2	20.293076	3.99124622	18.7766483		22.6936446	-59206820		1.75
Togo	1040	2021						19.2784379		23.3167602			5.26
Uganda	1041	2012	14.1274625	1.35791	913264190.7	20.632536	1.79746997	26.932672	0.10937911	15.4917288	120538848	20.9100677	3.83
Uganda	1041	2013	30.2751021	1.74841	940664379.3	20.662097	1.87114	26.0431878	0.10337722	16.5130357	1096000000	20.814933	3.58
Uganda	1041	2014	27.1497288	4.18326	887611309.4	20.604044	1.91472006	24.8632563	0.11134733	14.9482109	1058564540	20.7801796	5.10
Uganda	1041	2015	30.1352154	1.99111	902157540.5	20.6203	2.32152009	23.537813	0.12347795	12.8773253	737652140.2	20.4189829	5.18
Uganda	1041	2016	35.1533883	17.3741	1146050427	20.859587	2.1378901	22.660328	0.12484497	12.4271644	625704361.9	20.2543886	4.78
Uganda	1041	2017	38.8819899	3.65712	1165739411	20.876621	2.25363994	23.458835	0.12558729	16.6611294	802704141	20.5034968	3.13

Uganda	1041	2018	38.48400 35	8.6354	1338053925	21.014482	2.13052011	23.25029 35	0.13714329	15.08705 31	105535335 3	20.77714 15	6.30
Uganda	1041	2019	40.56995 96	4.71373	1424508663	21.077093	1.52999997	22.94550 88	0.13237079	17.10905 8	127388558 6	20.96533 76	6.43
Uganda	1041	2020	46.53501 29	12.1076	1061902500	20.783328	2.58627582	23.92903 37		15.41479 85	873792834 .6	20.58835 39	2.95
Uganda	1041	2021					2.66505313	23.79854 85		15.68592 97			3.37
Zambia	1044	2012	22.82177 65	2.18837	72864000	18.104105	4.19999981	9.321639 54	0.27860069	40.08291 1	173150000 0	21.27225 39	7.59
Zambia	1044	2013	23.40160 67	2.75048	53980262. 06	17.804129	4.30000019	8.226523 18	0.28405757	40.48271 67	209980000 0	21.46510 79	5.05
Zambia	1044	2014	34.56992 4	3.59741	58300302. 43	17.881118	5.19999981	6.779597 85	0.30454955	38.82228 99	150780000 0	21.13391 75	4.69
Zambia	1044	2015	56.52103 36	6.62635	47046538. 13	17.666648	4.62433004	4.980836 56	0.31235496	37.13852 58	158266666 7	21.18237 7	2.92
Zambia	1044	2016	74.93685 89	9.90298	38464441	17.465245	3.74792004	6.228471 99	0.32511484	35.32467 57	662813935 .4	20.31200 49	3.77
Zambia	1044	2017	92.83179 04	9.16791	93644095. 26	18.355012	3.72964001	4.024271 19	0.40406778	34.99285 78	110751980 5	20.82538 89	3.50
Zambia	1044	2018	90.81824 47	12.8159	106965625 .9	18.488018	4.73974991	3.341123 99	0.44548913	37.95740 45	408438491 .7	19.82785 19	4.03
Zambia	1044	2019	121.0537 73	31.3701	98259120. 81	18.403119	4.46517992	2.860774 94	0.38071705	34.63619 26	547967909 .6	20.12172 73	1.44
Zambia	1044	2020	170.6992 03	47.2408	134864831 .7	18.719784	3.70240283	2.977086 35		46.79016 54	- 172752813		2.78
Zambia	1044	2021						2.964328 21		54.59707 54			3.57
Zimbabwe	1043	2012	52.82095 83	17.2104	211357966 8	21.471649	6.07020998	8.044517 53	0.91573494	25.16325 37	349850000	19.67301 5	16.6

Zimbabwe	1043	2013	44.764123	14.0516	1890271473	21.359986	5.99597979	7.14447945	0.91982412	21.98775 86	373050000	19.73722 3	1.98	
Zimbabwe	1043	2014	43.625083 8	12.6629	1903970852	21.367207	6.13835001	8.74530423	0.88910413	20.93014 59	472800000	19.97418 3	2.37	
Zimbabwe	1043	2015	49.218797 9	16.7016	2046579806	21.439436	5.81278992	8.28424699	0.89976999	19.16017 58	399200000	19.80497 31	1.77	
Zimbabwe	1043	2016	56.888351 4	30.4677	1856034931	21.341708	5.47262001	7.87398582	0.78544084	19.94353 16	343013813 .4	19.65328 13	0.75	
Zimbabwe	1043	2017	72.415633	15.405	1729883817	21.27132	5.81877995	8.34096887	0.72629707	19.65890 48	307187738 .8	19.54296 96	4.70	
Zimbabwe	1043	2018	70.859018 1	11.6879	1427703019	21.079333	3.86611009	10.52095 5	0.85741127	28.04975 71	717865322 .2	20.39179 25	4.82	
Zimbabwe	1043	2019	64.797379 7	30.0535	1417011953	21.071816		10.14365 71	0.80297852	31.25104 04	249500000	19.33496 95	6.14	
Zimbabwe	1043	2020	73.02174	18.6063	1832039381	21.328696		7.60710062		37.20223 49	150360000	18.82854 3	6.24	
Zimbabwe	1043	2021											5.84	