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THE EFFECTS OF PUBLIC SECTOR MANAGEMENT AND INSTITUTIONS ON ECONOMIC GROWTH IN SUB-SAHARAN AFRICA

BY

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DECLARATION

I, Peter Dadzie, hereby declare that this thesis titled "THE EFFECTS OF PUBLIC SECTOR MANAGEMENT AND INSTITUTIONS ON ECONOMIC GROWTH IN SUB-SAHARAN AFRICA" is my original work and that the same content has not been accepted for the award of the degree of Master of Philosophy at the University of Ghana. All ideas taken from the existing scholarly literature are duly cited and that this thesis benefited from the immense supervision of Dr. Emmanuel Codjoe and Prof. Festus Ebo Turkson at the Department of Economics, University of Ghana, Legon.

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ABSTRACT

Strong Public Sector Management and Institutions (PSMIs) are required for the sustained economic growth and development of countries. However, Sub-Saharan Africa's (SSA's) PSMI scores from the World Bank's Country Policy and Institutional Assessment (CPIA) are relatively weak. Equally weak are the scores of the indices of PSMI, which are Property Rights and Rule-Based Governance, Quality of Budgetary and Financial Management, Efficiency of Revenue Mobilisation, Quality of Public Administration, and Transparency, Accountability and Corruption in the public sector. The study set out to empirically examine the extent to which SSA's PSMI, and the indices of PSMI, influence its economic growth. The static panel estimation technique was employed for the empirical examination because it gives better results with data from thirty (30) SSA countries from 2005 to 2020. The empirical analyses revealed that PSMI positively influence SSA's economic growth at 1% significance level in line with the extant literature. The study further revealed that the Quality of Public Administration index exerts the greatest influence in absolute terms on economic growth in SSA. Again, Property Rights and Rule-Based Governance was found to exert the least influence in absolute terms on economic growth in SSA. However, among the five indices of PSMI, only the Efficiency of Revenue Mobilisation's index was found to correlate positively at 10% significance level with economic growth in SSA. The remaining four indices reported significant negative relationships with economic growth in SSA. The study recommends that SSA governments, development partners and civil society organisations should collaborate to build robust PSMI to achieve sustainable economic growth.

DEDICATION

I dedicate this thesis to Almighty God and to the memory of my late father, Mr. Samuel Dadzie, whose training and mentorship has guided me this far.

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I am deeply grateful to Almighty God for giving me the strength to successfully produce this work. I am also thankful to my supervisors, Dr. Emmanuel Codjoe and Prof. Festus Ebo Turkson for their immense contributions for the success of this thesis.

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LIST OF ABBREVIATIONS

AfDB	African Development Bank
CPI	Corruption Perception Index
CPIA	Country Policy and Institutional Assessment
CSOs	Civil Society Organisations
EBRD	European Bank for Reconstruction and Development
EFNA	Economic Freedom of North America
EFW	Economic Freedom of the World Index
ERM	Efficiency of Revenue Mobilisation
FDI	Foreign Direct Investment
FEM	Fixed Effects Model
GDP	Gross Domestic Product
GEM	Global Entrepreneurship Monitor
GMM	Generalised Method of Moments
IMF	International Monetary Fund
NIE	New Institutional Economic Theory
NPM	New Public Management
NRR	Non-Resource Rich
ODI	Overseas Development Institute
OIE	Old Institutional Economic Theory

OLS	Ordinary Least Squares
PMSI	Public Sector Management and Institutions
PRRG	Property Rights and Rule-Based Governance
PWT	Penn World Table
QBFM	Quality of Budgetary and Financial Management
QPA	Quality of Public Administration
REM	Random Effects Model
RR	Resource Rich
SAR	Spatial Autoregressive Model
SDG	Sustainable Development Goal
SEM	Spatial Error Model
SSA	Sub-Saharan Africa
TAC	Transparency, Accountability and Corruption in the Public Sector
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America
WGI	World Governance Indicators

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

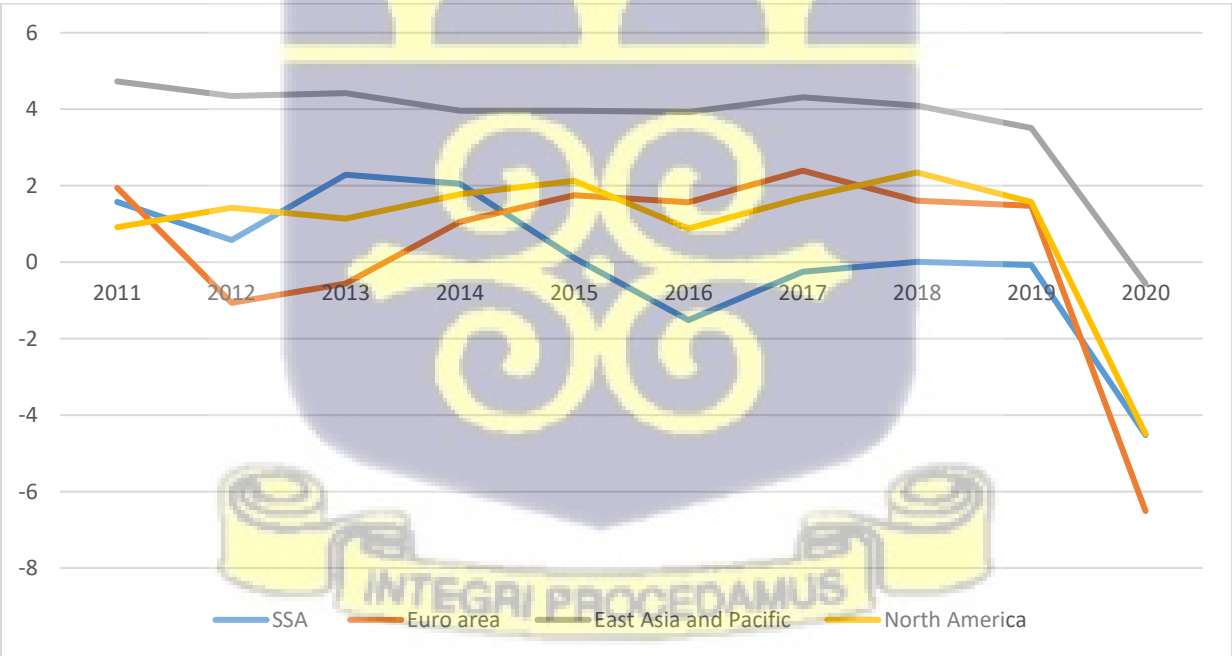
Arguments about the exact relationship between institutions and economic growth in both developed and developing countries continue to rage on in academia and the policy space (Chang, 2011). Empirical evidence supports the argument that strong and inclusive institutions lead to sustained growth and development, and the reverse lead to low growth and poverty (see Goldsmith, 1998; Moers, 1999; Acemoglu, Johnson and Robinson, 2001; Easterly et al., 2006; Acemoglu and Robinson, 2010; Siyakiya, 2017 and Arvin et al., 2021). The definition of institutions provided by North (1990) is that they are the rules of the game in a society or, more specifically, that they are the constraints imposed by humans on human interaction and that they stimulate economic growth. In fact, the contrary evidence supplied by Sachs (2003) and Glaeser et al. (2004) that geography and human capital respectively cause economic growth and not institutions do not change the general conclusion reached by many economists on how quality institutions contribute to economic growth.

For years, SSA has continued to be ranked as one of the world's poorest and most politically fragile regions (AfDB et al., 2007, Nwani and Osuji, 2020). In fact, the number of poor people in SSA grew more between 1981 and 2010, reaching a record high of 48% of her population in 2010, that is about 414 million people using the $1.25 per day threshold (World Bank, 2011). At the current poverty line per day of $1.90, the percentage of persons living in extreme poverty stood at 48.4% in 2019 (World Bank, 2020). The World Bank (2021) further revealed that the Corona Virus pandemic threw about 40 million people in SSA into extreme poverty in 2020 and 2021.

Between 2000 and 2009, SSA experienced a growth rate of 5.2%, and between 2010 and 2019, it experienced a growth rate of 3.5%. In those same periods, East Asia and the Pacific regions recorded growth rates of 9.1% and 7.3%, respectively. North America also recorded 2.3% and 2%, respectively, whereas the Euro Area recorded 1.4% in both periods, according to the author's computation using the World Bank's World Development Indicators (2021). In 2020, SSA recorded a growth rate of -2% compared to 1.4% in East Asia and Pacific, -3.8% in North America and -6.4% in the Euro Area. In per capita terms, SSA recorded a GDP per capita growth rate of 0.34% on average between 2011 and 2020 compared to 1% in the Euro Area, 1.20% in North America and 4.54% in East Asia and Pacific in the same period.

The GDP per capita growth rates from 2011 to 2020 in SSA, Euro area, North America and East Asia and Pacific are shown in the diagram below.

1.1.1 Figure 1: Growth rates of four regions between 2011 - 2020



Source: Author's computation using data from WDI, 2021.

Clearly, SSA's GDP per capita growth rates and poverty levels are relatively bad, and the

immediate question everybody asks is, what could be done to end extreme poverty and inequality in SSA? Butkiewicz and Yanikkaya (2006) and Chang (2011) argued that poor institutions are the root causes of the economic challenges of developing countries, including those in SSA. Aron (2000), however, stated categorically that majority of African countries are saddled with weak institutions which are responsible for their extreme poverty and underdevelopment.

Fosu and Gafa (2019) also confirmed that differences in the economic performances between Bostwana and Nigeria are due to the differences in the quality of institutions in those two countries. Specifically, they argued that Nigeria's weak political institutions and governance had intensified rent-seeking activities and hampered her growth and development, whereas the strong institutions in Botswana had led to the avoidance of resource curse and improved her growth. This is also in line with the conclusion reached by Acemoglu and Robinson (2010) and Hall et al. (2010) that institutional quality differences among countries in SSA are responsible for the differences in their economic growth and development.

Raphaeli et al. (1984) opined that public sector management encapsulates all facets of management in the government bureaucracy and parastatals and is an outcome of ancient, political, social, and economic forces. They argued that the outstanding management of Botswana's public sector partly explains her economic performance. From the empirical evidence enumerated above about Botswana, it is safe to say that strong PSMIs are responsible for Botswana's sustained economic growth and development. Megersa and Cassimon (2015) argued that countries with good PSMIs achieve sustained economic growth in the presence of high public debts, whereas those with weak PSMIs exhibit negative relationships between public debt and economic growth.

As indicated by Ivanyna and Salerno (2021), poor PSMIs promote rent-seeking activities, corruption, state capture, distort resource allocation, impairs public goods and services provision and undermines the business climate, which all together impede growth and increase inequality. Good PSMIs are thus a prerequisite for SSAs' overall sustained economic transformation.

Many lending and grants organisations including the IMF and the World Bank thus demand some conditionalities, including good PSMIs as prerequisites for loans or grants to countries. These are parts of efforts by the organisations to enhance accountability, transparency, rule of law and participation by their grant and loan-receiving countries. Megersa and Cassimon (2015) further argued that countries with strong PSMIs properly use aid and concessional lending for growth-generating activities. This study, therefore, empirically examines the exact effects of PSMI on SSA's economic growth.

1.2 Problem Statement

Good PSMIs are incredibly relevant for engineering sustained economic growth. Few studies have investigated variations in institutions across countries with PSMIs (see Knack et al., 2011; Dabla-Norris and Gunduz, 2014 and Megersa and Cassimon, 2015). The CPIA of the World Bank is a reliable source for PSMI as they use rigorous internal review processes to generate the data (IDA, 2004 and GTZ, 2008).

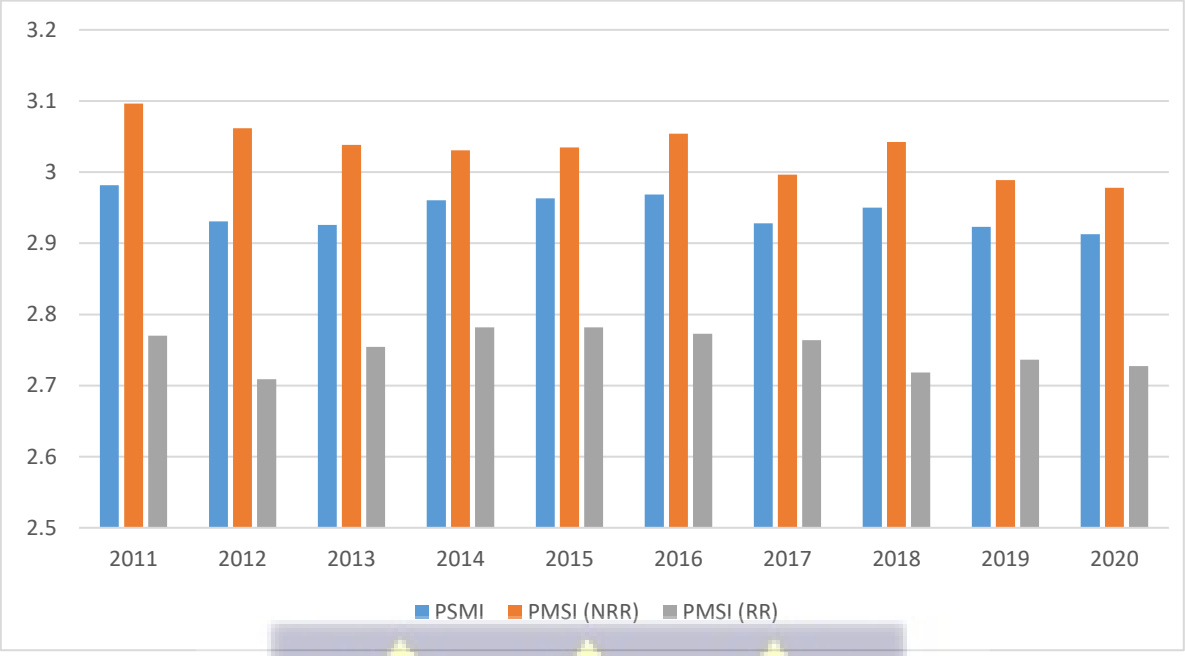
The CPIA assesses International Development Association's (IDA) eligible countries' policies and institutional qualities, and there are 39 eligible countries in SSA. The CPIA enables the World Bank to know the countries whose policies and institutions are good enough to engender sustained economic growth, efficient use of development resources and reduction in poverty

(World Bank, 2021). The rating is based on a scale of 1 to 6, where higher is better. The median threshold score for the CPIA is 3.5, below which a country is deemed to be weak, whereas countries above the threshold score are considered strong (IDA, 2004; Eifert and Gelb, 2007). A total of 16 indicators are included in the CPIA. They are further categorized into four areas, which are economic management, structural policies, social inclusion, and equity, and PSMI.

PSMI, which this study focuses on, refers to how laws, regulations, rules, policies, and procedures are effectively utilised to manage a country. PSMI is composed of property rights and rule-based governance, quality of budgetary and financial management, efficiency of revenue mobilisation, quality of public administration, and transparency, accountability, and corruption in the public sector (IDA, 2004). These indices are relevant for a country's sustained economic growth and development, and as indicated by Shleifer and Vishny (1993), unproductive governments and public sectors are able to use resources meant for high-value investments in education and health for less productive areas such as unnecessary infrastructural projects.

SSA's PSMI had continued to trend below 3 since 2005, recording 2.90 in 2019 and 2020. In fact, SSAs average PSMI score between 2005 and 2020 is 2.95, which is below the World Bank's median score of 3.5, indicating that the region's overall performance of her PSMI is weak (World Bank, 2021). This is almost the same as the ten-year average score of 2.94 between 2011 and 2020. In that same ten-year period, resource rich (RR) countries in SSA such as South Africa, Gabon, Sudan, Nigeria, etc. scored 2.75 on average. Conversely, non-resource rich countries (NRR) such as Swaziland, Mauritius, Seychelles, etc. in SSA scored 3.03 on average between 2011 and 2020 (World Bank, 2021). The figure below represents the performance of PSMI in SSA and its sub performances in NRR and RR countries. It is evident that PSMI performs better in NRR countries than that of RR countries.

1.2.1 Figure 2 – Performance of PSMI in SSA.

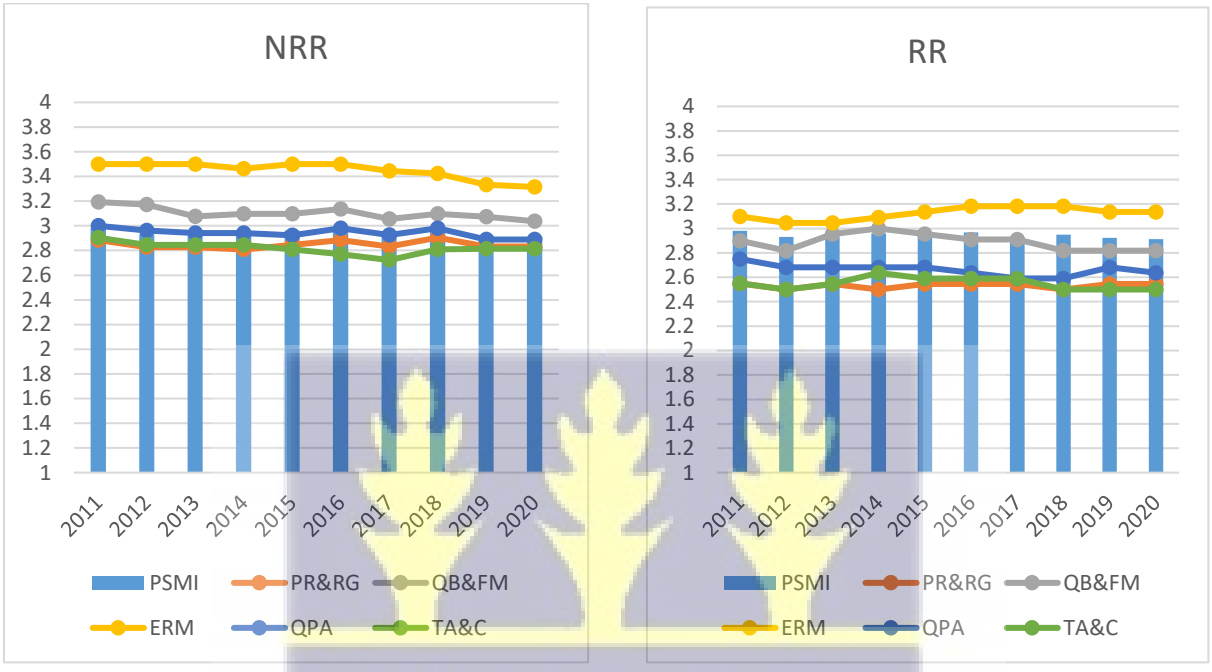


Source: Author's computation with data from WDI, 2021.

The indices of PSMI such as property rights and rule-based governance (PRRG), budgetary and financial management (QBFM), revenue mobilisation (ERM), public administration (QPA), and transparency, in the public sector (TAC) remained unchanged in 2020 from their scores in 2019, which were 2.8, 3.0, 3.3, 2.8 and 2.7 respectively. The indices performed poorly between 2011 and 2020 in both RR and NRR countries in SSA. In NRR countries in SSA, PR&RG, QB&FM, ERM, QPA and TA&C averaged 2.8, 3.1, 3.4, 2.9 and 2.8, respectively, between 2011 and 2020 (World Bank, 2021).

The figures below represent the overall PSMI in SSA and the performances of its indices in NRR and RR countries.

1.2.2 Figure 3 - Scores of the indices of PSMI in NRR and RR countries SSA



Source: Author's computation with data from WDI, 2021.

In RR countries in SSA, the average scores of the indices of PSMI between 2011 and 2020 were 2.5, 2.9, 3.1, 2.7 and 2.6 for PR&RG, QB&FM, ERM, QPA and TA&C respectively (World Bank, 2021). Sadly, none of the indices in both RR and NRR countries achieved the World Bank's median score of 3.5, indicating that the performances of the indices of PSMI in SSA are weak. Are these relatively poor performances of PSMI and its indices in SSA partly responsible for the region's low economic growth? Which of the indices of PSMI matter most for SSAs' sustained economic growth? This study will answer the above questions empirically and proffer

recommendations based on the findings to SSA governments, civil society organisations and interested persons.

Studies with PSMIs either focused on the relationship between public debts and growth in the presence of PSMI (Megersa and Cassimon, 2015), the effects of PSMI on FDI or Stock Markets Development (Jumanne and Keong, 2017 and Emudainohwo, 2020), or the overall effects of the CPIA of the World Bank on economic growth (Tran et al., 2021). This study complements existing research by examining the effects of PSMI and its indices on economic growth in SSA with updated data and a static panel model.

1.3 Objectives of the study

In this research, the overarching objective is to examine the extent to which PSMI influence economic growth in SSA. Particularly, the study intends to;

1. Examine the effects of PSMI on economic growth in SSA.
2. Analyse the effects of the indices of PSMI on economic growth in SSA.

1.4 Research Questions

This research intends to answer the following questions:

1. To what extent does PSMI affect economic growth in SSA?
2. What are the effects of the indices of PSMI on economic growth in SSA?

1.5 Significance of the study

Interest on the relevance of institutions in the economic growth and development processes is on the ascendency. However, studies focusing exclusively on the effect of PSMIs on economic growth, particularly in SSA, are minimal. Thus, this study will add to the existing body of research and will be relevant for future studies. This research will also contribute to the

achievement of the SDG 16, which is peace, justice, and strong institutions, as it will guide policy decision-making and implementation by governments in SSA. Finally, the outcome of the research will be relevant to all other public policy makers advocating for better PSMIs in Africa.

1.6 Scope of the study

The study uses data from thirty (30) SSA countries from 2005 to 2020 to assess the effect of PSMI on economic growth in the sub-region. The study also examines the effects of the indices of PSMI, as listed above, on economic growth in the sub-region. Other control variables used in the study are trade openness, gross fixed capital formation (as a percent of GDP), human capital (with education as the proxy), foreign aid, and natural resource rents (as a percent of GDP).

1.7 Organisation of the Study

Five chapters make up this study. The first chapter is devoted to the introduction of the study. This section describes the study's background, the problem statement, objectives of the study, significance of the study, the scope of the study and the organisation of the study. Chapter two encompasses the review of the theoretical and empirical literature. Chapter three captures the study's methodology, and chapter four encapsulates the analyses of the empirical results. The summary of findings, conclusion and policy recommendations are presented in chapter five.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews related literature, both theoretical and empirical, and is divided into three sections. The sections are theoretical literature, empirical literature, and conclusion.

2.2 Theoretical literature

There are few theories that explain the relationship between PSMI and economic growth. However, this study reviewed five relevant theories: the New Institutional Economic (NIE) Theory, the New Public Management (NPM) Theory, the Property Rights Theory, the Transactions Cost Theory, and the Augmented Solow Growth Model. Below are the reviews of the theories.

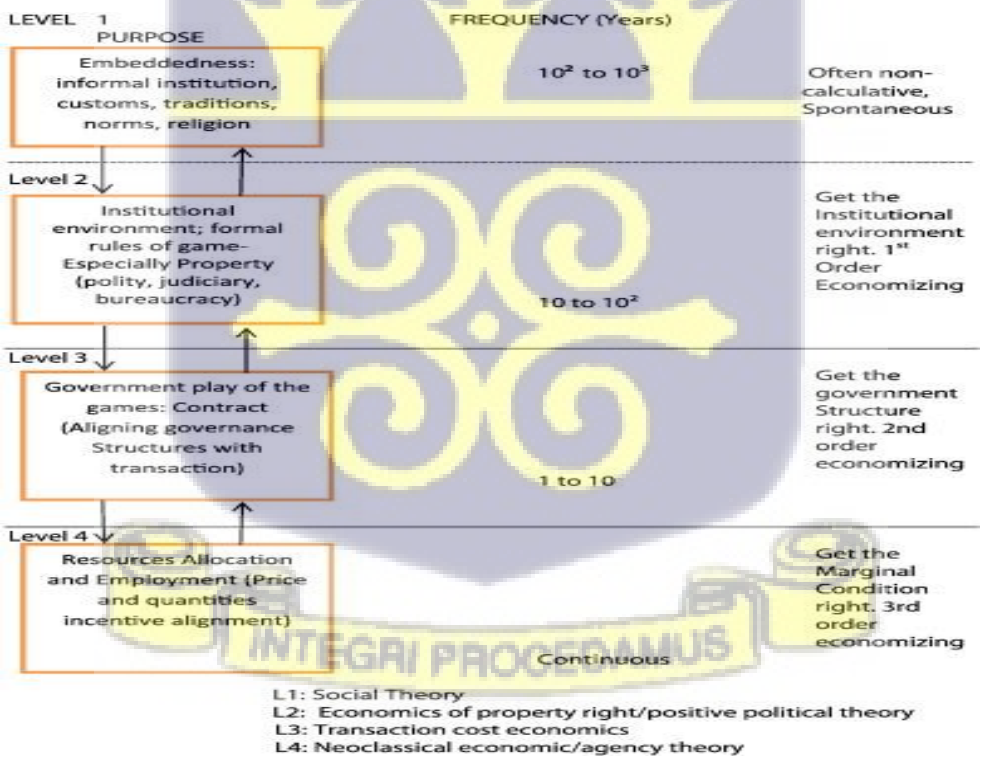
2.2.1 New Institutional Economic Theory

First, the New Institutional Economic (NIE) Theory emerges from neoclassical economics but extends it and proffers more solutions to real-world problems. This theory builds upon the Old Institutional Economic (OIE) Theory and corrects its deficiencies. Therefore, the NIE theory's scope encompasses economics, political science, anthropology, organisational theory, law, and sociology, (Abdul-Rahman et al., 2014). According to Harriss et al. (1995), the NIE theory's relevance hinges on three characteristics: first, it describes how to engineer sustained economic growth by reorganizing and changing institutions in an appropriate manner.

Second, it offers a solution to why firms exist as an administrative and financial organisation and elucidates the role of transaction costs in the neoclassical economic theory. Hence it is a significant improvement in the sphere of contemporary economics. Finally, it questions and

challenges the leading role of neoclassical theory to the free market. The theory gives a prominent position to ideas and ideologies and opens an interdisciplinary inquiry into the causes of sustained economic growth worldwide and how economies cope with market failures. Acemoglu et al. (2005) argued that inclusive political and economic institutions, which create a level playing field for all citizens, foster investment, innovation, and long-term economic growth. The authors noted that extractive political and economic institutions, which concentrate power and wealth in the hands of a few people, hinder sustained economic growth and development. Moreover, they observed that inclusive institutions create a virtuous cycle of sustainable development, whereas extractive institutions create a vicious cycle of poverty and underdevelopment. Finally, the authors concluded that extractive political and economic institutions in most African countries are partly responsible for their low growth.

Figure 2.1: The four levels of social analysis



Source: Williamson (2000).

Williamson (2000) proposes four levels of social analysis out of which the NIE theory emerges as shown on the diagram above. Social embeddedness is the first level which comprises morals, traditions, customs, and norms. He suggested that this level is spontaneous in origin based on his assumptions. The institutional environment makes up the second level and comprises formal rules including property rights, constitutions, and laws. This is succeeded by the third level, which contains the institutions of governance, such as a seamlessly operating legal system for the definition of contract laws and the enforcement of contracts. The final level is concerned with the operations of Neoclassical Economics. Williamson (2000) argued that the second, third, and fourth levels are the first-order economising, second-order economising, and the third-order economising, respectively. He further argued that levels two and three make up the NIE theory.

2.2.2 New Public Management (NPM) Theory

The NPM theory is a shift from the Traditional Public Administration (TPA) theory, and it advocates for transparency, decentralisation, flexibility, privatisation, de-bureaucratisation, minimum government, etc., to build an effective and efficient public administration (Chand et al., 2012). Christopher Hood (1991, 1994), the proponent of the NPM theory, regarded it as the doctrines of administration, particularly about specific ideas regarding what needs to be done in administration. The doctrines include but not limited to hands-on professional management in the public sector, immense stress on the control of output and public sector competition, disciplined and parsimonious of resources, performance measurements and well laid down standard, public sector disaggregation of units and styles of management practice (Hood, 1991).

Frederickson (1996) maintained that the NPM theory is linked to the following actionable phrases; revitalisation of the public service, organisational transformation, reinventing government, entrepreneurship, empowerment, lean and mean, re-engineering, paradigm shift,

downsizing, results over process, off-loading, earning rather than spending, contracting out, steering rather than rowing, total quality management, now rightsizing and empowering rather than serving. The NPM theory advocates for three E's, which are Efficiency, Effectiveness and Economy in the management of the public sector, and they are believed to be strengthened by ethical behaviour (Chand et al., 2012). Hood (1991) argued that the NPM theory could be described as 'a marriage of opposites', that is the integration of two completely different ideas. The partners in the marriage are the NIE and a 'number of sequential waves of business-type managerialism' in the public sector.

2.2.3 Property Rights Theory

North (1990) defines property rights as the rights people own to their labour, goods, and services. Smith (1776) initiated earlier discussions on the significance of property rights and the rule of law, a concept that was subsequently expanded upon by Coase (1960). Smith (1776) noted that clearly defined secure property rights are required to foster sustained economic growth. . According to the theory, there are three critical criteria for the effectiveness of property rights: universality, exclusivity, and transferability. Universality implies that scarce or abundant resources have clearly defined owners. Exclusivity means that they are the sole rights of individuals or organisations, and transferability means that resources can be allocated from the least to the best uses. However, North (1990) agreed that property rights are relevant for economic growth and challenged the three critical criteria for the efficiency of property rights. He argued that property rights must be adaptively efficient, well-specified, and properly enforced to engineer sustained economic growth and development.

Demsetz (1967) argued that property rights are critical to the success of a society because they allow people to be measured and circumspect in their day-to-day dealings with others. He noted

that property rights give the exclusive rights to people to either benefit or harm themselves and others. This feature of property rights leads to externalities, which are external benefits, external costs, and other pecuniary and nonpecuniary benefits to third parties that result from economic activities. Demsetz (1967) further argued that property rights are required to create better incentives to internalise externalities. According to his analysis, property rights ownership could be community ownership, private ownership, or state ownership. Among the three components of property rights ownership, community ownership poses the most significant challenge regarding the internalisation of externalities.

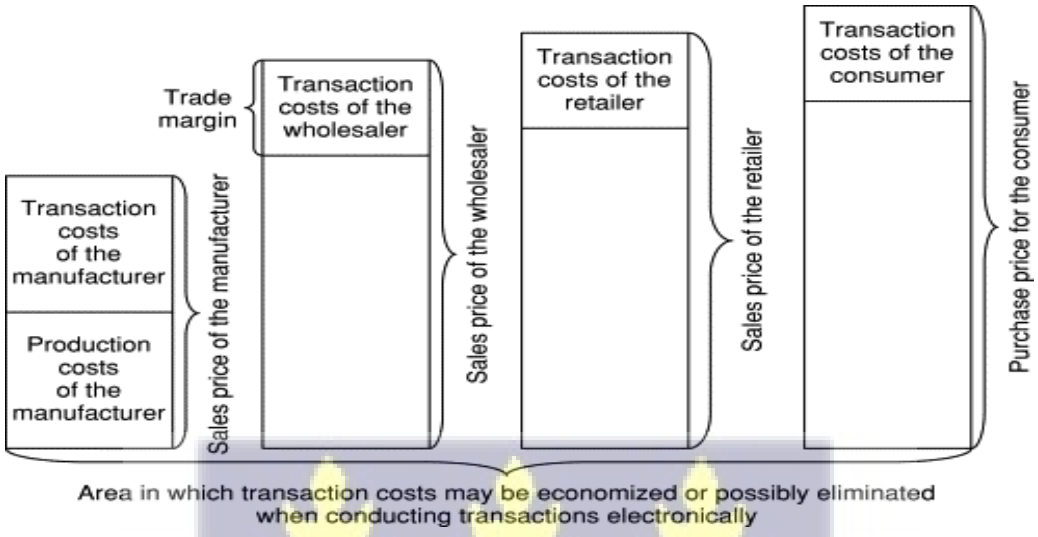
2.2.4 Transaction Cost Theory

Coase (1937) led the analysis of transaction costs with his ground-breaking research on the nature of the firm. He argued in his seminal work that institutions are extremely critical in the facilitation or the obstruction of transactions in the market. North (1992) defined transaction costs as the cost incurred in operating an economic system and argued that inclusive political and economic institutions that provide low transaction costs are critical to providing the efficient factors and product markets required for sustained economic growth. He reasoned further that quality institutions alongside technology lead to economic growth through the determination of the production and transaction costs.

The transaction costs of commodities are determined by the differences in selling and buying prices on a specific market, as defined by Stavins (1995). Transaction costs could also be in the form of the inputs or resources such as the buyer's or the seller's time. Transaction costs arise from transferring property rights from one person to another in a market economy. Wigand (2003) referred to transaction costs either as coordination costs or production costs, with coordination costs comprised of the costs of information processing that coordinates the work of people and machines. He further added that transaction costs could be viewed in economics

as the friction in physical systems where high friction hinders movement. In the same sense, no economic activity occurs at higher transaction costs. The various types of transaction costs are shown in figure three (3) below.

Figure 2.2: Hierarchy of Transaction costs from the manufacturer to the consumer.



Source: Wigand (2003)

The figure above implies that transaction costs reduce or approach zero when the adoption of information communication technology increases over time across the entire market hierarchy. From the diagram above, the types of transaction costs are the transaction costs of the manufacturer, the transaction cost of the wholesaler, the transaction costs of the retailer, and the transaction costs of the consumer. Williamson (1986), however, proposed the internalisation of high transaction costs within the hierarchy and the purchase of the commodities on the market when the transaction costs are low. In conclusion, Williamson (1986) proposed that the transaction costs theory produces the coordination costs of controlling, managing, and monitoring transactions.

2.2.5 Augmented Solow Growth Model

The Neoclassical Growth Model proposes physical capital, labour, and technology as the sole determinants of growth or output. Lewis (1978) noted that labour mobility, capital formation

and investment are essential for economic growth that the right regulatory environments are needed for labour to move freely and investment to flourish. North and Thomas (1973), however, argued that such factors do not cause growth and that quality institutions instead cause long-term growth. Tebaldi and Mohan (2008) augmented the Solow (1956) model to capture the impacts of institutions on economic growth. They averred that institutions are critical in determining the productivity of factors and the adoption of technology. Tebaldin and Elmslie (2008) further revealed that weak institutions prevent the use of existing technology, whereas Matthews (1986) argued that weak institutions reduce efficiency gains from current innovations. This implies that institutions influence the productivity of capital and labour and the efficiency of technology.

2.3 Empirical Literature

Several studies across the globe give credence to the fact that strong and inclusive political and economic institutions are prerequisites for the sustained economic growth of countries. For instance, according to the pioneering work of North (1990), institutions, whether formal or informal, have enormous effects on economies through costs of exchange and production. He argued that quality institutions reduce exchange and production costs, leading to sustained economic growth, and that poor institutions are to blame for the historical stagnation and contemporary underdevelopment of third-world economies.

Moers (1999) questioned the importance of institutions for growth in 25 structural adjusted economies in the Former Soviet Union, Eastern and Central Europe transition economies in Central and Eastern Europe and the Former Soviet Union, with a sample size spanning 1990 to 1995. The transition economies considered are those that fall within the ambit of the operations of the EBRD such as Armenia, Belarus, Estonia, Azerbaijan, Croatia, Bulgaria, Georgia, Albania, Hungary, Czech Republic, and others. Fifteen control variables were used including

rule of law, investment law, property rights and civil society, foreign direct investment, inflation, and war. In the transition countries considered, inflation and war exert greater effects on economic growth than institutions, according to the econometric analysis. However, after peace and macroeconomic stabilisation, institutions play a key role in growth.

On the basis of North's (1981) hypothetical framework, Siddiqui and Ahmed (2012) studied how institutions affect economic growth across the globe. The authors categorised thirty one indices of institutions extracted with principal component analysis into three indices such as institutional and policy rents, risk-reducing technologies and political rents. Other control variables the authors used are lagged GDP, savings, trade and education. With dataset on 84 countries spanning five years from 2002 to 2006 and the Generalised Method of Moments (GMM), their empirical investigations revealed that quality institutions are growth enhancing in the world. There was a statistically significant positive effect in the long run on economic growth for the institutional and policy rent indices, whereas the risk reducing technology and political rent indices did not exhibit any long run positive effect. Again, savings, trade and education showed a significant positive correlation with economic growth while the lagged GDP was growth-demeaning, which implies that countries with low per capita incomes grow faster to catch up with those with low per capita incomes.

Góes (2015) also investigated the institutions-growth nexus in the world with the Panel Structural Vector Autoregressive technique. Data on institutions and its five subcomponents used in the study such as regulation, international trade flexibility, stability of the monetary system, the legal systems reliability and government's size was extracted from the EFW of the Fraser Institute. The author also used the CPI of Transparency International in the analysis to ensure that the results are not spurious. With dataset covering 119 countries over a span of 10 years, the empirical analysis showed that exogenous shocks to the quality of institutions lead to

economic growth. Specifically, the author found that after 6 years, a 1% improvement in institutions generates a 1.7% growth in the GDP per capita. However, developing and developed countries had different dynamics where 2.6% and 0.4% were their respective peak statistically significant responses. Among the countries the author sampled for the study, he found that the gap in institutions between Burundi and Rwanda is 30% whereas it is 10% between Nicaragua and Costa Rica.

Megersa and Cassimon (2015) analysed the debt-growth connection in the presence of PSMI with a System GMM and data from the CPIA. Their empirical assessment revealed that the debt-growth relationship is negative in the presence of weak PSMI, and positive in the presence of strong PSMI. Their investigations further showed that countries with strong PSMI exhibited higher public debt sustainability thresholds. Finally, their empirical examination of the indices of PSMI showed that good PRRG, QBFM, QPA, and TAC have significant positive effect on economic growth in the developing countries under study. However, the revenue mobilisation index exhibited a negative relationship with the growth of the economies under consideration.

Further, Masuch et al. (2016) with help of pooled OLS regression with standard errors clustered across time found that quality institutions determine long-term growth in Europe. The authors used World Governance Indicators (WGI) as the proxy for institutional quality in their baseline model. Moreover, they used the following indicators in their robustness checks; Economic Complexity Index (ECI), Chinn-Ito Financial Openness Index (KAOPEN), Fraser Institute Economic Freedom (EFF) and the Heritage Foundation Economic Freedom (EFH). Other control variables the authors used are trade openness, labour force participation rate, government expenditures, the level of education and households' savings rate. With a sample size spanning 1995 to 2002 for all variables used in the research, their empirical analysis revealed that governments' debt levels over a threshold of 60-70% and the quality of institutions

below the European Union's average, lead to poor economic growth. The researchers also found that debt alone impacts GDP per capita adversely, and that strong institutions could alleviate the detrimental effects of high debt burdens and promote economic growth in Europe.

In a related study, Bosma et al. (2018) analysed the nexus amongst institutions, entrepreneurship, and growth in Europe with data drawn from the Penn World Table (PWT) and the Global Entrepreneurship Monitor (GEM). Other variables the researchers included in their System GMM, and 3SLS models are saving rate, human capital, entrepreneurial activity, and population growth. Using annual data from 2003 to 2014 on 25 countries in the European Union and employing some institutional variables to encapsulate the normative, regulatory, and cognitive dimensions of entrepreneurs' institutional environments, they found that sound institutions enhance economic growth in Europe through productive entrepreneurship.

In another study, Hall and Sobel (2008) uncovered that quality institutions enhance the economic growth of the United States of America through entrepreneurship and discovery. The control variables the authors used are the median age of the state population, state unemployment rate, and the percentage of state residents that are Hispanic, population density, state gross domestic product per capita, and percentage of state residents over 25 years with at least a bachelor's degree. The econometric methods they used for their empirical investigations are OLS, SAR of degree one and the SEM. With data from the Fraser Institute's EFNA index and the Kauffman Index of Entrepreneurial Activity, the authors argued that quality institutions serve as the means to transfer productive resources to their most valued use. That is, through institutions, research and development are translated into prolonged growth in the economy of USA.

Rodrik and Chen (1998) also found a similar result in East Asia. Their findings attributed East

Asia's economic performance to its institutional quality, initial income, and initial education levels. They further revealed that quality institutions are accountable for the economic performance of Japan, Taiwan and Singapore, and that poor institutions account for the abysmal performance of the economies Philippines and Indonesia. Their empirical analysis further revealed that the quality of institutions in East Asia decreases with ethno-linguistic fragmentation and increases with income. Moreover, initial education was found to correlate directly with Japan's growth and indirectly or negatively with Indonesia's growth.

In South Asia, Fernandez and Kraay (2005), using property rights institutions and contracting institutions as the focused variables to measure institutional quality found that property rights institutions enhance growth business performance in Bangladesh, India, Pakistan, and Sri Lanka. Their empirical analysis further revealed that contracting institutions have less influence on business performance and growth because firms are able to side-step shortcomings in formal contracting institutions by using informal methods such as being part of a business association.

Tran et al. (2021) explored the institutions-growth relationship in 48 Asian countries from 2005 to 2018. The authors used the CPIA data as a measure of institutional quality. Other control variables the authors used are government expenditure, domestic investment, inflation, labour force, trade openness and infrastructure. With the help of the feasible generalised least squares (FGLS) and the quantile regression methodology, their empirical analysis revealed that quality institutions are extremely required for the growth of the economies under consideration. The findings particularly revealed that institutions are more growth enhancing in Asian countries with lower incomes than those with higher incomes.

In Africa, Fayissa and Nsiah (2013) examined the relevance of good governance to Africa's economic growth with FEM, REM, quintile regression and Arellano-Bond models. Data from

1995 to 2004 on 39 African countries were used for the study. The author employed 6 indices of governance or institutions from the World Bank including government effectiveness, regulatory quality, voice and accountability, rule of law, political stability, and the control of corruption. Other control variables used include but not limited to gross fixed capital formation, human capital, trade openness, FDI, household consumption expenditure, foreign aid and crude oil production. The empirical examination revealed that good governance positively impacts growth in Africa, though the effect was found to be conditional to the distribution of GDP per capita considered in the study. Specifically, good governance was found to exert enormous influence on the growth of countries at the low and high ends of the income spectrums.

Epaphra and Kombe (2017) investigated the impacts of institutions on economic growth in Africa with FEM, REM and generalised GMM. With data on 48 countries from 1996 to 2016, the authors checked which of the indicators of institutions and governance such as regulatory quality, corruption, government effectiveness, rule of law, and voice and accountability exert more influence on Africa's growth. Other variables they used in their model are trade openness, FDI, gross fixed capital formation, inflation, and labour force. Their empirical investigations revealed that institutions are relevant for the growth of the African continent, and that improvements in Africa's institutional quality will engender sustained economic growth. The authors also found that absence of violence or terrorism and political stability have greater impacts on Africa's economic growth among the six indicators of institutions and governance. Finally, gross fixed capital formation, trade openness, FDI and population growth were found to exert great influence on Africa's economic growth whereas inflation and exchange rate were found to be irrelevant to Africa's growth.

Fosu (2019) analysed the nexus between institutions and the development of economies in Africa. The author underscored that improvements in Africa's economic institutions,

particularly economic freedom, began in the 1990s and heightened in the mid-1990s. The author again showed that political institutions such as the level of democracy, constraint on the executive branch of government and the index of electoral competitiveness improved during the latter part of the 1980s and the early part of the 1990s. This improvement, the author argued, led to the development of African economies in the said periods. The author concluded that quality institutions are required to engineer continuous development and reduction of poverties in African economies.

In SSA, limited research has been done to unravel the exact nexus between strong and inclusive institutions and economic growth. Among them, Osman et al. (2012) examined the effects of institutions on economic performance in 27 countries in SSA with data from 1984 to 2003. Policy variables used in the study are inflation and government size, and the control variables used are trade openness, foreign direct investment, credit provided by the banking sector, population growth and foreign aid. Using ethnic tensions and socioeconomic conditions, corruption, and government stability as the indicators for measuring institutional quality, they concluded that strong and inclusive institutions are more relevant to SSAs growth than the conventional variables of economic theory such as physical and human capital and technology. Their empirical investigations further revealed that credit provided by the banking sector has a significant negative effect on growth in SSA whereas the other policy and control variables were found to exert statistically insignificant effects on growth in SSA. This thus suggests that quality institutions matter for SSA's economic growth than other economic variables.

In another study, Kilishi et al. (2013), with the help of the Arellano and Bond first difference and the Blundell-Bond System GMM as the estimation strategies, and the World Governance Indicators as a measure of quality institutions, found that quality institutions matter for economic growth in SSA. With data from 36 countries in SSA from 1996 to 2010, the authors

concluded that rule of law and regulatory quality are the most important institutional indicators for growth of economies in SSA. Among the other explanatory variables the study used such as population growth, investment and human capital, the analysis revealed that both human capital and investment influence SSA's growth positively whereas population growth affect SSA's growth negatively.

Iheonu et al. (2017) explored the institutions-growth nexus in West Africa with data from 1996 to 2015. Data on the indicators of institutions such as control of corruption, rule of law, government effectiveness and regulatory quality was sourced from WGI. Other control variables the authors employed are gross fixed capital formation, labour force, trade openness, FDI and net official development assistance and foreign aid (AID) received and accessed their data from the WDI. Employing the FEM and the REM, and the panel two-stage least squares technique, their empirical investigations revealed that government effectiveness matter most for the economic growth of West Africa. They also found that gross fixed capital formation, labour force, FDI and AID have significant positive effects on the economic performance of West Africa, whereas trade openness was found to be insignificant.

Mensah et al. (2018) employed WGI's institutional quality indicators to study the effect of institutions on the external debt-growth nexus in SSA. Among the indicators used are Political Stability and Absence of Violence, Voice and Accountability, Regulatory Quality, Government Effectiveness, Control of Corruption, and Rule of Law. With data from 36 SSA countries and IV System GMM estimator, their empirical analysis revealed that SSA could only reap good benefits on external debts for their growth if they have good institutions. They argued that strong institutional mechanisms make provisions for the proper acquisition, disbursement, and repayment of external debts to engender sustained growth and development.

Finally, Wandeda et al. (2021) recently analysed the relationship between institutions and the growth of SSA economies with two-step system GMM and 2006 to 2018 as the sample size. Their findings also confirmed that quality institutions improve SSA's output. Their results again showed that the institutions-growth connection varies with the regional, local and income levels of SSA countries. They found that quality institutions exert more influence on economic growth in West Africa than in East and Central Africa. Moreover, low-income countries in SSA with good institutions exhibited good economic performance.

2.4 Conclusion

Theoretical and empirical literature reviewed above confirm that strong and inclusive institutions have robust effects on the sustained economic growth and development of countries. Much as arguments about which institutional quality indicator matters most for SSAs sustained growth are inconclusive, less importance has been attached to the PSMI indicator in the institutions-growth literature. This study digs deeper to uncover the exact effect of PSMI, and its indices, on economic growth in SSA with recent data and a static panel model technique.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

As evident in the related empirical literature reviewed, various methodologies and estimation strategies have been used to unravel the relationships among PSMI and economic growth. This chapter thus contains the exact methodology employed to answer the research questions, the description of the variables and the estimation strategy the study used. It comprises five sections, which are the introduction, theoretical framework and model specification, variable description and data sources, the econometric estimation strategies, and the diagnostic tests.

3.2 Model Specification

In accordance with the Augmented Solow Growth Model in the previous chapter, the following models are specified for the study. First, output follows the production function below.

$$Y(t) = f[A(I,t), K(I,t), L(I,t)] \quad \text{(i)}$$

Where Y represents output, A represents technology, K represents capital, L represents labour, I represents institutions, and t represents time. Interchanging I with PSMI, that is the institutional variable used in the study, equation (i) becomes;

$$Y(t) = f[A(PSMI,t), K(PSMI,t), L(PSMI,t)] \quad \text{(ii)}$$

PSMI is between zero and six, where zero represents weak PSMI, whereas six represents strong PSMI, (that is $0 \leq PSMI \leq 6$). Note that PSMI is interchanged with institutions in equation (i) because, it also represents governance according to (IDA (2004). However, Fosu (2022) argued that governance can be used interchangeably with institutions. Thus, it is justified that the I in equation (i) can be replaced with PSMI in equation (ii).

Having established that economic growth is a function of PSMI, the study proceeded to specify a static panel model for the empirical analysis.

$$Y_{it} = \gamma_{0i} + \alpha PSMI_{it} + \beta X_{it} + \varepsilon_{it} \quad \text{(iii)}$$

Where y_{it} represents the log difference of real GDP per capita, PSMI represents public sector management and institutions, and ε represents the stochastic error term which is assumed to be normally distributed with zero mean and constant variance [$\varepsilon_{it} \sim N(0,1)$]. X represents the vector of control variables which include Education as a proxy for human capital, Gross Fixed Capital Formation as a proxy for investment, trade openness, foreign aid, and natural resources.

From equation (iii), three models will be estimated for the first objective of the study, which is the examination of the effects of PSMI and other control variables on economic growth in Ghana. The first model involves the estimation of the entire PSMI data with the data of the control variables whereas the other two models involve the disaggregation of the PSMI data into strong and weak performers based on the World Banks median score of 3.5. Here, countries with PSMI scores above 3.5 are considered strong performers whereas those with scores below 3.5 are considered weak performers. The three models are specified below.

$$Y_{it} = \alpha_{0i} + \alpha_1 PSMI_{it} + \alpha_2 TO_{it} + \alpha_3 EDUC_{it} + \alpha_4 GFCF_{it} + \alpha_5 AID_{it} + \alpha_6 NR_{it} + \varepsilon_{it} \ldots\ldots (1)$$

$$Y_{it} = \beta_{0i} + \beta_1 PSMI\_ST_{it} + \beta_2 TO_{it} + \beta_3 EDU_{it} + \beta_4 GFCF_{it} + \beta_5 AID_{it} + \beta_6 NR_{it} + \varepsilon_{it} \ldots (2)$$

$$Y_{it} = \lambda_{0i} + \lambda_1 PSMI\_WK_{it} + \lambda_2 TO_{it} + \lambda_3 EDU_{it} + \lambda_4 GFCF_{it} + \lambda_5 AID_{it} + \lambda_6 NR_{it} + \varepsilon_{it} \ldots\ldots (3)$$

Note that $\alpha_1, \alpha_2, \ldots, \alpha_6$, $\beta_1, \beta_2, \ldots, \beta_6$ and $\lambda_1, \lambda_2, \ldots, \lambda_6$ are the unknown parameters to be estimated, and the εs are the stochastic error terms which are assumed to be normally distributed with zero means and constant variances, [$\varepsilon_{it} \sim N(0,1)$]. Again, α_0, β_0 and λ_0 represent the unobserved country-specific heterogeneities whereas t and i represent the time trend, and the number of countries, respectively.

Relating to the objective two of the study which focus on the analysis of the effects of the five indices of PSMI on economic growth, the study followed Megersa and Cassimon (2015) to replace PSMI in equation (iii) with the indices. Thus, five equations were generated from equation (3) with the five indices of PSMI. Note that the five indices of PSMI are Property Rights and Rule-Based Governance (PRRG), Quality of Budgetary and Financial Management (QBFM), Efficiency of Revenue Mobilisation (ERM), Quality of Public Administration (QPA) and Transparency, Accountability and Corruption in the Public Sector (TAC). The five equations are listed below.

$$Y_{it} = \psi_{0i} + \chi PRRG_{it} + \beta X_{it} + \mu_{it} \quad \ldots\ldots\ldots\ldots (4)$$

$$Y_{it} = \psi_{0i} + \delta QBFM_{it} + \beta X_{it} + \mu_{it} \quad \ldots\ldots\ldots\ldots (5)$$

$$Y_{it} = \psi_{0i} + \phi ERM_{it} + \beta X_{it} + \mu_{it} \quad \ldots\ldots\ldots\ldots (6)$$

$$Y_{it} = \psi_{0i} + \tau QPA_{it} + \beta X_{it} + \mu_{it} \quad \ldots\ldots\ldots\ldots (7)$$

$$Y_{it} = \psi_{0i} + \varphi TAC_{it} + \beta X_{it} + \mu_{it} \quad \ldots\ldots\ldots\ldots (8)$$

Where ψ_0 represents the unobserved country specific heterogeneity, X represents the vector of control variables as defined above, and μ is the error term and is assumed to normally distributed with zero mean and constant variance, that is $[\mu_{it} \sim N(0,1)]$. Finally, χ, δ, ϕ, τ, φ and β are the parameters to be estimated.

3.3 Variable Descriptions and Data Sources

The study used annual data on PSMI and their sub-indicators, sourced from the CPIA of the World Bank. The sub-indicators of PSMI as indicated above are PRRG, QBFM, ERM, QPA, and TAC. Again, annual data drawn from the World Development Indicators (WDI) on real GDP per capita, trade openness, gross fixed capital formation (as a percent of GDP), trade openness (as a percent of GDP), foreign aid and total natural resources were used. The data on human capital with education as the proxy was sourced from UNESCO's institute of statistics.

The data cover 16 years spanning 2005 to 2020 due to data availability and consistency across the sub-region.

3.3.1 Dependent Variable – Real GDP Per Capita

Real Gross Domestic Product (GDP) per capita is used to represent economic growth in this study following Osman et al. (2011), Fayissa and Nsiah (2013), Siddiqui and Ahmed (2013), Góes (2016), Arvin (2021) and a host of other researches. Real GDP per capita is the inflation-adjusted value of the total commodities produced in a country in a specific period of time divided by the country's population. How well an economy performs could best be determined by its Gross Domestic Product, (Samuelson and Nordhouse, 2009 and Callen, 2020). In both models in the study, real GDP per capita is used as the independent variable.

3.3.2 Independent Variables

PSMI is the main independent variable in the first objective of the study. The indices of PSMI which are PRRG, QBFM, ERM, QPA, and TAC as shown above are the main independent variables in the five models that address the second objective of the study. Other control variables used in the study are trade openness, gross fixed capital formation, human capital, foreign aid, and natural resources. Below are the detailed reviews of the independent variables.

3.3.2.1 Public Sector Management and Institutions (PSMI)

PSMI refers to how laws, regulations, rules, policies and procedures are effectively utilised to manage a country. Raphaeli et al. (1984) noted that public sector management encapsulates all facets of management in the government bureaucracy and parastatals and is a product of historical, political, social, and economic forces. The study adopted the World Bank's measure

of PSMI which is an index composed of PRRG, QBFM, ERM, QPA, and TAC as described above (World Bank, 2021).

Good PSMI enhance economic growth whereas the contrary leads to low growth and inequality. Megersa and Cassimon (2015) maintained that countries with good PSMI achieve sustained economic growth in the presence of high public debts. Ivanyna and Salerno (2021) also concluded that poor PSMI distort the distribution of resources, impairs the provision of public goods and services, and undermines the business climate while promoting corruption, rent-seeking activities, and state capture, all of which slow growth and induce and exacerbate inequality. Thus, the study expects PSMI and its indices to relate positively with economic growth in the first and second regressions respectively.

3.3.2.2 Human Capital

Human capital, represented in the study as education, is measured as the sum of upper secondary school enrolment and tertiary school enrolment divided by the number of people between the ages 15-64 in a country in accordance with Barro and Lee (2013). Human capital development through education increases the productivity of labour force and leads to the growth of economies (Mankiw et al., 1992). Moreover, human capital development makes the labour force in an economy more innovative and able to implement new technologies which altogether generates economic growth (Lucas, 1988; Romer, 1990 and Benhabib and Spiegel, 1994). Thus, it is expected that human capital will correlate positively with economic growth in this study. That is a (+) sign.

3.3.2.3 Gross Fixed Capital Formation (Investment)

Investment in physical capital is captured in this study as gross fixed capital formation (GFCF). GFCF comprises the acquisition of produced assets excluding disposals. GFCF also

encompasses purchases of used assets and the assets produced for use by the producers. Again, GFCF determines a country's share of investment in its GDP (Nawaz et al., 2014 and OECD 2017). The extant literature, both theoretical and empirical, recognises investment as hugely relevant to the economic growth of countries (Levine and Renelt, 1992; Solow 1956; Mankiw et al., 1992;Kukaj and Ahmeti, 2016 and De Long et al., 1992). The Overseas Development Institute (2016) singles out GFCF as extremely relevant for the generation of employment and economic growth. GFCF is expected to have a positive sign (+) in this study.

3.3.2.4 Trade Openness

Trade openness captures the degree of openness of the economies under consideration in the study. Exports plus imports over GDP equals trade openness according to Levine et al. (2000). Intuitively, trade openness is growth enhancing because it allows for easy transfer of technology and reduces wastages. This is confirmed by a lot of empirical studies (see Sachs and Warner,1995; Frankel and Romer, 1999; Berg and Krueger, 2003; Babula and Anderson, 2008; Brückner and Lederman, 2012; Keho, 2017 and Zaria, 2022). These empirical studies concluded that trade openness leads to the transfer of capital goods, technology, the spillover of knowledge and the improvements of human capital, which altogether generate long-run growth of economies, particularly for developing countries. Thus, it is expected that trade openness will have a positive relationship with economic growth in this study.

3.3.2.5 Foreign Aid

Foreign Aid is used in the study to represent all the official development assistance and foreign aid inflows to SSA from development partners and or bilateral and multilateral organisations. Foreign aid generates economic growth because it mostly targets the welfare of developing countries and specific growth-enhancing sectors like education, health, and infrastructure,

among others. Empirical studies in developing countries had however produced mixed results about the correlation between foreign aid and the growth of their economies. At one extreme, Fayissa and El-Kaissy (1999), Durbarry et al. (1998), Moreira (2005) and recent studies by Azam and Feng (2022), and Anyanwu and Wabekwa (2022) concluded that foreign aid generates economic growth. On the other extreme, Knack (2000), Kimura (2012) Abbas et al. (2022) concluded that foreign aid impacts economic growth negatively. The argument is that foreign aid negatively impacts governance in developing countries through heightened bureaucracy, corruption through procurement kickbacks and the destruction of rule of law. In between the two extremes, Mosley, et al. (1987), Boone (1996), and Jensen and Paldam (2003) concluded that foreign aid has no impact whatsoever on economic growth. Thus, the study expects foreign to correlate with economic growth either negatively or positively.

3.3.2.6 Natural Resources

Natural resources include all resources that exist in nature regardless of the actions of human beings on the planet. SSA harbours about thirty percent of the earth's mineral resources including oil, uranium ore, cobalt, diamonds, platinum and manganese. SSA also has vast arable lands and freshwater bodies and forests. Total natural resources rents as a percent of GDP is used to represent natural resources in the study. Gylfason et al. (1999), Brunnschweiler (2009) and Cavalcanti et al. (2011) argued that natural resources are growth-enhancing because they provide raw materials for the production of goods and services. Sachs and Warner (1995, 2001), Tiba and Frikha (2018) and Tiba (2019), however, argued that natural resources are growth-demeaning. The harmful effect of natural resources on economic growth known as the resource curse theory results because the exploration of the natural resources deteriorates the environment and thus destroys other income-generating activities. High demand for abundant resources also leads to currency appreciation and this impedes other sectors of the economy.

Alexeev and Chernyavskiy (2014) however found no correlation whatsoever between natural resources and the growth of economies. The study, therefore, expects natural resources to have either a positive or negative sign.

3.4 Estimation Strategy

The study used the static panel estimation technique to examine the effects of PSMI on economic growth in SSA with data from 2005 to 2020. The estimable models under section 3.1 are panel in nature and therefore will be estimated with the conventional static panel estimation techniques such as the pooled OLS regression, the REM and the FEM techniques. The pooled OLS estimation is however not suitable for the panel models specified under section 3.1. This is because they do not qualify for the basic assumptions of OLS models which are linearity, exogeneity, non-autocorrelation, non-multicollinearity, and non-stochastic independent variables. This implies that the results produced by OLS will be biased and inconsistent. Therefore, FEM and the REM estimators are the suitable estimators for this study. However, the study will perform the OLS estimation to ascertain its appropriateness with the empirical data. Below are the detailed discussions of the pooled OLS, the REM, and the FEM estimators.

3.4.1 Pooled OLS Regression Model

The Pooled OLS model is used to combine all identical data and estimated in one regression without taking into consideration the time-series or the cross-section properties of the data used (Gujarati and Porter, 2003). That is the pooled regression model ignores any individual-specific heterogeneity in the data. Any individuality or uniqueness in the data is subsumed in the disturbance term in the model. Robertoson and Symons (2000) argued that this has the tendency of rendering the estimated coefficients biased and inconsistent because it becomes highly likely

for the disturbance term to be correlated with some of the independent variables included in the model.

Specified below is a simple pooled regression model following Wooldridge (2015, p. 459 - 460).

$y_{it} = \beta_0 + \delta_t d2_t + \beta_1 x_{it} + v_{it}$ ..... (a)

Here, y is the dependent variable (in this case this per capita GDP growth rate), β_0 is the intercept when t = 2005, β_1 is the coefficient, x represents the independent variable of interest which is PMSI, and v is the composite error term. The cross-sectional unit is denoted by i whereas t represents the time period. Finally, $d2_t$ is a dummy variable that helps to test the stability of the pooled regression model over time. As a dummy variable, t = 2005 is the base period. It implies that the intercept will be $\beta_0 + \delta_0$ when t is either 2006, 2007, …, or 2020. The pooled regression model will be appropriate if the time dummies are jointly equal to zero.

Note that from equation (a) above, $v_{it} = a_i + u_{it}$ ..... (b)

Where a_i is the unobserved country-specific effect or individual heterogeneity whereas u_{it} is the idiosyncratic error term or the time-varying error term. The u_{it} represents all the unobserved factors that affect y_{it} and change over time. The pooled regression model will only produce unbiased and consistent estimates if and only if v_{it} is uncorrelated with x_{it}, that is when both a_i and u_{it} are uncorrelated with any of the independent variables.

3.4.2 Fixed Effects Model (FEM)

The FEM eliminates the individual heterogeneity with a first difference or deviations from the mean transformation. The FE model does this by assuming that the time-invariant individual

heterogeneity correlates with the explanatory variables. Below is a simple FEM following Wooldridge (2015).

$y_{it} = a_i + \beta_1 x_{it} + u_{it}$…….…….. (c)

Equation (c) is then transformed with the deviations of the varying variables from their means, also known as the within transformation.

That is $\overline{y}_i = a_i + \beta_1 \overline{x}_i + \overline{u}_i$ ……. (d)

From equation (d), $\overline{y}_i = T^{-1}\sum_{t=1}^{T}$ yit , $\overline{x} = T^{-1}\sum_{t=1}^{T}$ xit and $\overline{u} = T^{-1}\sum_{t=1}^{T} uit$

Subtracting equation (d) from equation (c) at each t gives;

$y_{it} - \overline{y}_{it} = (a_i - a_i) + \beta_1(x_{it} - \overline{x}_{it}) + (u_{it} - \overline{u}_{it})$

This is then written simply as $\ddot{y}_{it} = \beta_1 \ddot{x}_{it} + \ddot{u}_{it}$…… (e)

Where $\ddot{y}_{it} = y_{it} - \overline{y}_{it}$, $\ddot{x}_{it} = x_{it} - \overline{x}_{it}$ and $\ddot{u}_{it} = u_{it} - \overline{u}_{it}$ are the time-demeaned data on y, x and u. The country-specific heterogeneity, a_i, disappears from equation (e). Thus, equation (e) could be estimated with a pooled OLS because a pooled OLS estimation on time-demeaned variables becomes an FEM.

3.4.3 Random Effects Model (REM)

The REM captures all the individual heterogeneities in the intercept term and treats them as random rather than fixed. Unlike the FEM, the REM assumes that the individual heterogeneities are uncorrelated with the explanatory variables in all time periods.

That is $Cov(x_{itj}, a_i) = 0$, for all t or t = 2005, 2006, ..., 2020.

Specified below is an RE model following Gujarati and Porter (2003, p. 602).

$y_{it} = \beta_{0i} + \beta_1 x_{it} + u_{it}$ …….. (f)

Note that $\beta_{0i} = \beta_0 + \varepsilon_i$, where a_i is equal to ε_i because the individual heterogeneities are treated as random not fixed. Thus, equation (f) could be written as;

$y_{it} = \beta_0 + \beta_1 x_{it} + \varepsilon_i + u_{it}$ …….. (g)

Let $v_{it} = \varepsilon_i + u_{it}$

It implies $y_{it} = \beta_{0i} + \beta_1 x_{it} + v_{it}$ …… (h)

Where v_{it} is the composite error term. RE is preferred in this study because it allows for time invariant variables like education that is constant over time. As noted by Danbolt (2004), RE estimation caters for time effects, the uniqueness of the variables, and the country-specific heterogeneities

However, the study used Breusch and Pagan's (1980) Lagrange Multiplier (LM) test and the Hausman (1978) test to make an informed choice among the pooled OLS, REM and FEM estimations. The LM test by Breusch and Pagan (1980) was first carried out to untangle the distinction between the pooled OLS and the REM, that is, whether country-specific heterogeneities exist at all in the variables under study. The null hypothesis for the LM test is that there is no country-specific heterogeneity or the pooled OLS regression is suitable whereas the alternate hypothesis is that the REM is suitable. That is;

H_0: No country-specific heterogeneity (or the pooled OLS regression is appropriate)

H_1: There is country-specific heterogeneity (or the RE estimator is appropriate)

The LM test's statistic is given as;

$$LM = \frac{NT}{2(T-1)}\left[\frac{\sum_{i=1}^{N}(\sum_{t=1}^{T}\hat{e}it)^2}{\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{e}it^2} - 1\right] \text{..... (i)}$$

The LM static follows a Chi-square distribution with one (1) degree of freedom. Here, the p-value of the LM test's statistic is compared with five percent (5%) level of significance, where the null hypothesis is rejected when the p-value is less than 5%.

Again, the Hausman (1978) test was performed after the LM test proved that the pooled OLS regression is not appropriate. This allowed for a well-informed determination between the REM and FEM estimators. The Hausman (1978) test basically checks whether the country-specific heterogeneities are correlated with the explanatory variables. Thus, the null hypothesis of the test is that the country-specific heterogeneities are not correlated, whereas the alternate hypothesis is that they are correlated. The test's statistic follows a Chi-square distribution and is given as;

$$H = (\hat{\beta}_{FEM} - \hat{\beta}_{REM})'V^{-1}(\hat{\beta}_{FEM} - \hat{\beta}_{REM}), \text{ where } V = var(\hat{\beta}_{FEM}) - var(\hat{\beta}_{REM}) \quad \ldots\ldots\ldots\ldots\ldots (j)$$

The computed test statistic's p-value is compared with 5% significance level, and the null hypothesis is rejected in favour of the alternate hypothesis if the p-value is less than 5%When the null hypothesis is rejected, it means the FEM is appropriate for the estimation over the REM.

3.5 Justification of the Estimation Strategy

The estimation technique used results from the data adopted for the empirical analysis. A cross-country study of this nature requires the use of a panel estimation technique to account for the time and country-specific heterogeneities. The preference for a panel estimation technique over a time series or a cross-section technique stems from the fact that the panel estimation technique offers more efficiency because the panel data used have more sample variability and degrees of freedom. The panel estimation technique also controls for omitted variables and unobservable bias common with time series and cross-section models and therefore prevents heteroskedasticity and multicollinearity (Gujarati, 2003 and Hsiao, 2007). Finally, the panel estimation technique makes it possible to easily analyse the complex behavioural models and prevents endogeneity by controlling for measurement errors, specific country effects and reverse causality (Sequeira, 2008 & Nunes 2008). The study, therefore, adopted a static panel data analysis based on the reasons enumerated above.

3.6 Diagnostic Test

Three common issues in econometric analysis that this study dealt with to generate unbiased and consistent estimates are autocorrelation, heteroscedasticity and panel unit root. First, autocorrelation, also known as serial correlation, will occur when the idiosyncratic error terms or the time-varying error terms correlate with each other for all the explanatory variables and the country-specific heterogeneity. That is when $cov(u_{it}, u_{is}|X_i, a_i) \neq 0$ for all $t \neq s$. The presence of unobserved variables that are often captured in the error term causes panel data models to have cross-sectional dependencies in the errors (De Hoyos and Sarafidis, 2006). The study used Friedman's test of cross-sectional independence and Pesaran's test of cross-sectional independence to test for the presence or otherwise of cross-sectional dependencies in the panel data. The study again used the Wooldridge test for autocorrelation in panel data to check for the presence or otherwise of autocorrelation in the data. The null hypothesis of $cov(u_{it}, u_{is}|X_i, a_i) = 0$ was tested against the alternate hypothesis of $cov(u_{it}, u_{is}|X_i, a_i) \neq 0$ for all $t \neq s$ and a decision was made by comparing the test's p-value to 5% significance level.

Again, heteroscedasticity will occur when the variance of the idiosyncratic error term conditioned on all the explanatory variables and the country-specific heterogeneity is not constant. That is when $var(u_{it}|X_i, a_i) = \sigma_i^2$ for all $t = 2005, \ldots, 2020$. The study employed the Breusch Pagan test to detect the presence or absence of heteroscedasticity in the data. In both cases of autocorrelation and heteroscedasticity, the study applied robust standard errors to make the estimates unbiased and consistent.

Finally, the study applied panel stationarity test to check for the presence or otherwise of unit root in all the variables. This test revealed the order of integration of all the variables used and thus helped to prevent biases from nonstationary series. Whenever two consecutive time periods

have a constant mean and variance, and the value of the covariance between the two periods depends on the distance between them rather than on the actual time upon which the covariance is calculated, the series is said to be stationary (Gujarti, 2003). The study employed the Levin-Lin-Chu unit-root test and the Im-Pesaran-Shin unit-root test to check for the presence or otherwise of stationary series in the variables.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results and the detailed discussions of the findings of the study. The chapter is divided into six sections which are the introduction, the descriptive statistics and correlation matrix of the data used, the panel unit root tests, presentation of the estimated regression results from the various estimation techniques espoused in the previous chapter, the discussions of the findings, and the conclusion.

4.2 Descriptive Statistics and Correlation Matrix

The descriptive statistics and the correlation matrix of the variables used in the study are presented in this subsection for the 30 countries in SSA and the time period of 2005 to 2022 under consideration. Under the descriptive statistics, the mean, standard deviation, the minimum, and the maximum values of the variables used in the study are presented in Table 4.1.

The mean of the real Gross Domestic Product (GDP) per capita from Table 4.1 is US$982.33 with a standard deviation of US$538.78 and the minimum and maximum values of US$270.67 and US$2688.27. The mean value for the real GDP per capita reveal that the average income in SSA is very low because it places SSA in the low-income economies' threshold of US$1,046 – US$4,095 according to the World Bank's (2021) classification. PSMI averaged 3.0 approximately with a standard deviation of 0.457, minimum value of 1.6 and maximum value of 3.9. The average score of 3.0 compared to the World Bank's median score of 3.5 means that SSA's PSMI is weak.

Table 4.1 Descriptive Statistics

Variable	Observations	Mean	Std. Deviation	Minimum	Maximum
Real Gross Domestic Product per capita	480	982.3344	538.7807	270.6577	2688.267
Public sector management and institutions	480	2.994167	0.4572398	1.6	3.9
Education	320	3.57415	2.74847	0.2043	14.98064
Gross Fixed Capital Formation	480	21.62949	8.46901	-8.389265	52.41832
Trade Openness	480	56.45509	29.52319	-2.503376	172.91
Foreign Aid	456	20.43444	1.018832	17.06278	23.19804
Natural Resources	480	9.912764	7.403748	0.0403251	38.8119
Property Rights	480	2.8229	0.5760	1	4
Budgetary Management	480	3.1354	0.5952	1.5	4.5
Revenue Mobilisation	480	3.4083	0.5015	2.5	4.5
Public Administration	480	2.9125	0.4832	1	4
Transparency	480	2.7365	0.5921	1	4

Source: Author's computation using Stata 15.

PSMI's standard deviation of 0.457 implies that majority of the countries in SSA are weak performers as far as their PSMIs' are concerned. Education reported a mean value of 0.04, a standard deviation of 0.03 and minimum and maximum values of 0.002 and 0.15 respectively. According to UNESCO's Institute for Statistics (UIS) (2022), 60% of young people in SSA between the ages of 15 and 17 are not in school. Again, 57.5% of youths in SSA of upper secondary school going age are out of school compared to 27% in Central Asia, 21% in Eastern and South-Eastern Asia, 23% in Latin America and the Caribbean, and 7% in Europe and North America according to the 2019 factsheet of UIS. Finally, about 58% of all youths in SSA are out of school (UNESCO, 2019).

Gross Fixed Capital Formation (GFCF) recorded a mean value of 21.63, a standard deviation of 8.47, a minimum value of -8.39 and a maximum of 52.42. It is argued that for SSA to eradicate poverty or reduce it to the least minimum possible, there should be an investment or a GFCG of 25% of the GDP of the subregion (Akobeng, 2017). The mean value of GFCF of 21.63% is below the 25% threshold implying that SSA is not making enough investment to boost its economic growth. In fact, only six out of the thirty countries under study meet the 25% threshold and they are Chad, Ethiopia, Mauritania, Niger, Tanzania, and Zambia with average gross fixed capital formation between 2005-2020 of 25.27%, 35.83%, 36.43%, 27%, 34.47% and 31% respectively. However, the above six countries are still underdeveloped, implying that GFCF alone is not enough to generate sustainable development. The standard deviation of 8.47 means that majority of the countries under study in SSA generate less investments or GFCF far below the subregion's average and the threshold required to boost growth and reduce poverty. SSA's minimum value of -8.39 represents the disposing off of fixed assets in some countries in the subregion through sale or capital transfers. This is not surprising because about 80% of

businesses in Africa collapse after their establishment rendering their fixed assets redundant, and most times sold to defray costs (Faminu, 2022).

Trade openness had a standard deviation of 29.53, a mean value of 56.45%, and minimum and maximum values of -2.50 and 172.91 respectively. Trade openness's average value of 56.45% means that SSA is open to trade with the rest of the world. Foreign Aid (FA) reported a mean value of US$1.14 billion, a standard deviation of US$1.09 billion, a minimum value of US$257 million and a maximum value of US$11.90 billion. Natural resources rents as a percent of Gross Domestic Product (GDP) averaged 9.91% within a range of 0.04% and 38.81% with a standard deviation of 7.40%. The figures indicate that, though SSA is home to more about 30% of the world's natural resources according to the United Nations (2022), their contribution to the subregion's growth is abhorring compared to other continents. Izvorski, Coulibaly, Doumbia and (2018) argued that SSA's low natural resource wealth despite its abundance is because the resources beneath the soil such as oil, metals and natural gas are less explored, whereas the topsoil resources bear inadequate yields.

Property rights and rule-based governance (PRRG) averaged 2.82 within a range of 1 and 4 with a standard deviation of 0.58. The average score of 2.82 is below the World Bank's threshold of 3.5 indicating that SSA's PRRG is weak. Sadly, many of the 30 countries in SSA under study have far minimal scores for their property rights as exhibited by the standard deviation. The quality of budgetary and financial management index also had a mean value of 3.14, a standard deviation of 0.595, and minimum and maximum values of 1.5 and 4.5 respectively. The mean value is slightly below the World Bank's median score of 3.5 indicating that budgetary and financial management in SSA is somehow good though not the best. The revenue mobilisation index followed in the same way with a mean value of 3.41 which is

slightly below the World Bank's median score. Public administration (EPA), and transparency, accountability and corruption in the public sector (TAC) are also weak as their mean values of 2.9 and 2.7 respectively are below the World Bank's median score of 3.5. Their standard deviations of 0.48 and 0.59 further confirm that most of the SSA countries considered in the study are having weak public administration and transparency in their public sectors.

The correlation matrix of the variables in the first objective of the study is presented in Appendix II A. It is observed that only Trade as a percent of GDP and Total Natural Resources Rents as a percent of GDP have significant negative relationships with real GDP per capita at 5% and 1% respectively. PSMI and GFCF as a percent of GDP correlate positively with real GDP per capital at 5% whereas Education, and Official Development Assistance and Foreign Aid received have significant positive relationship with real GDP per capita at 1%. Again, among the regressors, education correlates negatively with GFCF as a percent of GDP and trade openness as a percent of GDP, albeit both are insignificant at 1% and 5%. The correlation between education and QBFM is also negative, but it is significant at 5%. Moreover, education correlates positively with Foreign Aid, Total Natural Resources Rents as a percent of GDP, PRRG, ERM, QPA, TAC. However, only the correlations with Foreign Aid and ERM are significant at 5% with the rest being insignificant.

Furthermore, GFCF as a percent of GDP correlates positively and with trade openness as a percent of GDP, Foreign Aid, both at 5 percent, and Total Natural Resources Rents as a percent of GDP at 10% significance level. It however correlates negatively and significantly with all the indices of PSMI at 1% significance level. Trade openness correlates positively and significantly with Total Natural Resources Rents as a percent of GDP at 5% significance level.

Again, it correlates negatively and significantly with Foreign Aid and all the indices of PSMI except TAC at 1% significance level. Trade openness' correlation with TAC is also negative but significant at 5% significance level. Foreign Aid correlates positively with Total Natural Resources Rents as a Percent of GDP and negatively with PRRG, but both are insignificant. Foreign Aid, however, correlates negatively and significantly with the rest of the indices of PSMI at 1% significance level. Finally, Total Natural Resources Rents as a percent of GDP correlates positively with QBFM and TAC, and negatively with PRRG, but all of them are insignificant. The correlation between Total Natural Resources Rents as a percent of GDP and ERM is positive whereas it is negative with QPA with both being significant at 5% significance level.

Moving on, it can be seen from Appendix II B that QBFMhas a negative correlation with real GDP per capita, albeit insignificant at all levels of significance. The remaining variables such as PRRG, ERM, QPA, and TAC correlate positively with real GDP per capita and among each other. Again, except the PRRG index whose correlation with real GDP per capita is significant at 5% and QPAwhose correlation with real GDP per capita is insignificant at all levels of significance, the correlations among the remaining variables are all significant at 1%. The absolute values of all the correlation coefficients are less than 0.8 indicating the absence of multicollinearity among the variables. Therefore, the variables are good for the empirical estimation.

4.3 Panel Unit Root Test

The study used the Im, Pesaran and Shin (IPS, 2003) test and the Levin-Lin-Chu panel stationarity test (Levin et al., 2002) to test the presence or otherwise of unit roots in the variables to generate efficient and robust estimates. It is evident from table 4.2 that real GDP per capita

and PSMI are non-stationary at levels with the Im, Pesaran and Shin (IPS, 2003) test. However, both are stationary at 1% at their first difference with the Im, Pesaran and Shin (IPS, 2003) test.

From the table, GFCF as a percent of GDP, Trade as a percent of GDP, Foreign Aid, and Natural Rents as a percent of GDP are all stationary at levels at 5% with the Im, Pesaran and Shin (IPS, 2003) test. They are all stationary at first difference at 1% with the same test. The Im, Pesaran and Shin (IPS, 2003), however failed to present the statistics of Education because data on education is not balanced. Under the Levin-Lin-Chu panel stationarity test (Levin et al., 2002), all the variables except PSMI are stationary at both levels and first difference at 1% significance level. PSMI is stationary at levels and first difference at 5% and 1% respectively using the Levin-Lin-Chu panel stationarity test (Levin et al., 2002). This implies that the variables are very good for the empirical estimation.

Table 4.2: Stationarity Test

Variable	IPS 2003		Levin-Lin-Chu	
	Levels [I(0)]	1st Difference [I(1)]	Levels [I(0)]	1st Difference [I(1)]
Ln(Real GDP per capita)	1.3097	-3.1021***	-4.6826***	-2.6688***
Public sector management and institutions	1.7271	-6.2143***	-1.7660**	-7.5221***
Education	-	-	-5.4920***	-3.0185***
Gross fixed capital formation as a percent of GDP	-2.2785**	-8.1160***	-4.7437***	-10.5210***
Trade openness as a GDP	-1.7928**	-7.4759***	-3.6656***	-8.3336***
Ln(Foreign Aid)	-1.8722**	-9.5741***	-4.2038***	-12.0886***
Natural Resources Rents as a percent of GDP	-1.7017**	-10.0109***	-2.5963***	-9.3557***

Source: Author's Computation with Stata 15.0. *Note that ***, **, and * represent 1%, 5% and 10% levels of significance respectively.*

4.4 Presentation of the Results

The various models estimated to answer the objectives of the study are presented in this section. The models and their various diagnostic tests for the first objective of the study are first presented below. The Pooled OLS regression without the time effects and with the time (year) effects for model (1) are first presented in Appendix III A and Appendix III B. These presentations are captured in the Appendix because they were estimated as part of the diagnostic tests to select the best estimation technique for the models under the first objective of the study. Then, the study tested the significance or otherwise of the time effects in the model. The test for the time effects in the Pooled OLS regression was done with the null hypothesis that the coefficients for all years are jointly equal to zero (that is there is no time effects in the model) against the alternate hypothesis that the coefficients of all years are not jointly equal to zero (that is there is time effects in the model). The p-value of the testparm statistic for model (1) is 1.000 which is greater than 0.05. Therefore, the coefficients of all the years are jointly equal to zero indicating that there are no time effects in panel data used for the empirical estimations.

Again, the Breusch Pagan LM test was conducted to determine the appropriateness of the Pooled OLS regression with the null hypothesis of no country-specific heterogeneity (that is the Pooled OLS regression is appropriate) against the alternate hypothesis of the presence of country-specific heterogeneity (that is the REM and or the FEM is appropriate). The results from the Breusch Pagan LM test are presented in Table 4.3 below.

Table 4.3: Breusch Pagan Lagrangian Multiplier Test for model (1) (objective one)

lnrgdppc[countryname,t] = Xb + u[countryname] + e[countryname,t]

Estimated results	Var	sd = sqrt(Var)
lnrgdppc	0.2843688	0.5332624
e	0.0115395	0.1074219
u	0.2773804	0.5266692

Var(u) = 0

chibar2(01) = 3003.83

Prob > chibar2 = 0.0000

Source: Author's computation with Stata 15.0

As shown in Table 4.3 above, the p-value of the Breusch Pagan LM test is 0.0000 which is less than 1%. Therefore, the null hypothesis is rejected in favour of the alternate hypothesis that the REM/FEM are appropriate for the model (1) of the first objective of the study. Further checks revealed that there are no time effects in all the other models in the study and that the REM and the FEM are better than the Pooled OLS model in the study. The section then proceeded with the presentation of the undiagnosed results from the FEM (check Appendix V) and the REM (check Appendix VI), and then the Hausman test (Table 4.4) to choose between the REM and FEM.

The results from the Hausman test for the model (1) of the study is presented in Tables 4.4. The test was conducted with the null hypothesis that there is no correlation between the regressors and the country-specific effects, and the alternate hypothesis that the regressors correlate with the country-specific effects.

Table 4.4 Hausman Test for objective one

Ho: difference in coefficients not systematic		
chi2(6)	=	(b-B)'[(V_b-V_B)^(-1)](b-B)
	=	1.67
Prob>chi2	=	0.9474

Source: Author's computation using Stata 15.0

It can be seen from table 4.4 that the p-value of the Hausman test is 0.9474, which is greater than 0.05. Thus, the null hypothesis is accepted implying that the REM is the appropriate estimation technique for the model (1) of the first objective of the study. The study proceeded to conduct further diagnostic tests on the REM to ensure that the final results presented are efficient and robust. The presence or otherwise of serial correlation and cross-sectional

dependence were tested with the Wooldridge test for autocorrelation in panel data and the Pesaran's test of cross-sectional independence respectively. The study also tested for heteroskedasticity with the Breusch-Pagan/Cook-Weisberg test for the random effects model in objective one. The Wooldridge test for autocorrelation in panel data was conducted with the null hypothesis that there is no first-order autocorrelation and the alternate hypothesis that there is first-order autocorrelation in the panel data. The p-value of the tests was 0.0000, which is less than 1%. Therefore, the null hypothesis is rejected meaning that there is first-order serial correlation in the random effects estimation technique for the model (1) of the study.

Again, the Pesaran's test of cross-sectional independence presented a p-values of 0.0000 indicating the presence of cross-sectional dependence in the panel data of the model (1) of the study. This is further confirmed by the Friedman's test of cross-sectional independence which also had a p-value of 0.0000. Finally, for the tests of the presence or otherwise of heteroskedasticity, the null hypothesis of constant variance was tested against the alternate hypothesis of non-constant variance. The p-value of the test is 0.0014 which is less than 1% indicating the acceptance of the alternate hypothesis that there is heteroskedasticity in the panel data in the model (1) of the study. The issues enumerated above for model (1) were also the same for the model (2) and model (3) where the countries' data for PSMI were disaggregated into strong and weak performers, respectively, based on the World Bank's median score of 3.5 The study then estimated the panel corrected standard errors with correction for first order serial correlation to address the above econometric challenges in the models (1), (2) and (3) for the first objective of the study the results of whichare presented in Table 4.5 below.

Table 4.5: Results from the Panel Corrected Standard Errors corrected for first order serial correlation for objective one.

Variable	Model (1)	Model (2)	Model (3)
lnRGDPPC			
PSMI	0.0855***		
	(0.0303)		
PSMI_ST		0.0009	
		(0.0138)	
PSMI_WK			-0.0164
			(0.0172)
EDUC	0.0073***	0.0072***	0.0072***
	(0.0021)	(0.0021)	(0.0021)
GFCF_GDP	0.0011*	0.0012*	0.0012*
	(0.0006)	(0.0006)	(0.0006)
TO_GDP	0.0002	0.0002	0.0002
	(0.0005)	(0.0005)	(0.0005)
lnFA	0.0056	0.0094	0.0084
	(0.0135)	(0.0130)	(0.0130)
NR_GDP	-0.0021	-0.0025*	-0.0024*
	(0.0014)	(0.0014)	(0.0014)
CONS	6.3269***	6.5084***	6.5419
	(0.2834)	(0.2671)	(0.2643)

*Source: Author's Computation with Stata 15.0. Note that ***, ** and * represent 1%, 5% and 10% significance levels respectively.*

Presentation of the results from the five models under objective two.

The study proceeded to present the findings of the models of the second objective and their various diagnostic tests. Having established initially that the Pooled OLS model is not suitable for the panel data and that there are no time (year) effects, the study presented the results from the REM and the FEM. The undiagnosed results from the Random Effects and the Fixed Effects estimations for models (4), (5), (6), (7) and (8) are presented in Appendix VI, VII, VIII, IX and X respectively. These results were presented under the Appendix to enable the study present only final best results for the analysis in this section. The diagnostic tests on the models are presented below.

Model (4): Property Rights and Rule Based Governance with the Control Variables

Regarding model (4), the study first conducted the Hausman test to choose between the Fixed Effects estimation and the Random Effects estimation. The test was conducted with the null hypothesis that the Random Effects estimation is better against the alternate hypothesis that the Fixed Effects estimation is better. The results from the Hausman test are presented in Table 4.6.1 below.

Table 4.6.1 Hausman Test for Model (4)

Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 2.01

Prob>chi2 = 0.9186

Source: Author's computation using Stata 15.0

The p-value of the Hausman test from Table 4.6.1 is 0.9186, which is greater than 0.05. Therefore, the study accepts the null hypothesis that the Random Effects estimation is appropriate for Model (4). The study used the Friedman's test of cross-sectional independence and the Pesaran's test of cross sectional independence to check for the presence or otherwise of cross-sectional dependence in the model. Both tests reported a p-value of 0.0000 indicating that there is cross-sectional dependence in Model (4). The study further used the Wooldridge test for autocorrelation in panel data to test the null hypothesis that there is no first order serial correlation in model (4) against the alternate hypothesis that there is presence of first-serial correlation in the model. The p-value from the test is 0.0000 rejecting the null hypothesis in favour of the alternate hypothesis that there is first-order serial correlation in Model (4). The study, thus, performed the Driscoll-Kraay standard errors to address all the econometric challenges listed above and the results are presented in Table 4.7 below as Model (4).

Model (5): Quality of Budgetary and Financial Management with the Control Variables.

Again, with model (5), a choice was made between the Random Effects Estimation and the Fixed Effects estimation with the help of the Hausman test. The test was done with the null hypothesis that difference in the coefficients are not systematic and the alternate hypothesis that the differences in the coefficients are systematic. Presented in Table 4.6.2 are the results from the Hausman test.

Table 4.6.2 Hausman Test for Model (5)

Ho: difference in coefficients not systematic		
chi2(6)	=	(b-B)'[(V_b-V_B)^(-1)](b-B)
	=	3.35
Prob>chi2 =		0.7642

Source: Author's computation using Stata 15.0

It could be seen from Table 4.6.2 that the p-value of the Hausman test is 0.7642, which is greater than 0.05. Therefore, the study accepts the null hypothesis that the difference in the coefficients is systematic, that is the Random Effects estimation is appropriate for model (5) in the study. The study used the Friedman's test of cross sectional independence and the Pesaran's test of cross sectional independence to check for the presence or otherwise of cross-sectional dependence in the model. Both tests had a p-value of 0.0000 confirming the presence of cross-sectional dependence in Model (5). The study again used the Wooldridge test for serial correlation in panel data to test the null hypothesis that there is no first order serial correlation in model (5) against the alternate hypothesis that there is the presence of first-serial correlation in the model. The test reported a p-value of 0.0000 indicating that there is first-order serial correlation in Model (5). The study, therefore, performed the Driscoll-Kraay standard errors to address all the econometric challenges listed above and the results are presented in Table 4.7 below as Model (5).

Model (6): Efficiency of Revenue Mobilisation with the Control Variables.

Relating to the model (6) of the study, the Hausman test was performed after the Fixed Effects and the Random Effects estimations to make proper choice between them. The Hausman test was performed with the null hypothesis that the country-specific heterogeneities are ucorrelated with the explanatory variables against the alternate hypothesis that they are correlated. The outcome of the test is presented in Table 4.6.3 below.

Table 4.6.3 Hausman Test for Model (6)

Ho: difference in coefficients not systematic		
chi2(6)	=	(b-B)'[(V_b-V_B)^(-1)](b-B)
	=	1.31
Prob>chi2	=	0.9711

Source: Author's computation using Stata 15.0

The p-value from the Hausman test as shown on Table 4.6.3 is 0.9711. The p-value is greater than 0.05 significance level, thus the null hypothesis is accepted with the conclusion that the country-specific heterogeneities are not correlated with the explanatory variables. Thus, the Random Effects estimation is chosen over the Fixed Effects estimation for the model (6) of the study. Regarding the test for the cross-sectional independence in model (6), the p-value from both the Friedman's test of cross sectional independence and the Pesaran's test of cross sectional independence is 0.0000. This confirms the presence of cross sectional dependence in the model (6) of the study. The test for the presence or otherwise of serial correlation in model (6) with the Wooldridge test for serial correlation in panel data also reported a p-value of 0.0000 indicating the presence of first-order serial correlation in model (6). To address the above

econometric issues in model (6), the study performed the Driscoll-Kraay standard errors and the results are presented in Table 4.7.

Model (7): Quality of Public Administration with the Control Variables.

Under model (7) of the study, the Fixed Effects and Random effects estimations were first conducted, and one was chosen with the Hausman test. Again, the null hypothesis for the test as noted above is that the Random Effects estimation is appropriate for model (7) against the alternate hypothesis that the Fixed Effects estimation is appropriate for model (7). The results from the Hausman test are presented in Table 4.6.4 below.

Table 4.6.7 Hausman Test for Model (7)

Ho: difference in coefficients not systematic		
chi2(6)	=	(b-B)'[(V_b-V_B)^(-1)](b-B)
	=	13.25
Prob>chi2	=	0.0392

Source: Author's computation using Stata 15.0

Based on the p-value of 0.0392 presented by the Hausman test, the null hypothesis is rejected because the p-value is less than the 0.05 significance level. Thus, the conclusion is that the Fixed Effects estimation is appropriate for model (7). The study proceeded to use the Friedman's test of cross sectional independence and the Pesaran's test of cross sectional independence to check for the presence or otherwise of cross-sectional dependence in the model. Both tests reported a p-value of 0.0000 confirming the presence of cross-sectional dependence in Model (7). The study again used the Wooldridge test for serial correlation in panel data to test the null

hypothesis that there is no first order serial correlation in model (7) against the alternate hypothesis that there is the presence of first-serial correlation in the model. The test reported a p-value of 0.0000 indicating that there is a first-order serial correlation in Model (7). The study finally used the Modified Wald test for groupwise heteroskedasticity.

in fixed effect regression model to check for the presence or otherwise of heteroskedasticity in model (7) and the test reported a p-value of 0.000. This shows that there is heteroskedasticity in model (7). The study concluded on model (7) by performing the Driscoll-Kraay standard errors to address all the challenges identified above and the results are presented in Table 4.7 below.

Model (8): Transparency, Accountability and Corruption in the Public Sector with the Control Variables.

Concerning the last model for the study, the Hausman test was performed after the Fixed Effects and the Random Effects Estimations had been conducted to make an informed choice between them. The Hausman test was performed with the null hypothesis that the Random Effects estimation is better for model (8) against the alternate hypothesis that the Fixed Effects estimation is better suited for the model. As shown on Table 4.6.5 below, the p-value of the Hausman test is 0.6433, which is greater than the 0.05 significance level. Thus, the null hypothesis is accepted with the conclusion that the Random Effects estimation is better suited for the model (8) of the study.

Table 4.6.5 Hausman Test for Model (8)

Ho: difference in coefficients not systematic
chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 4.25
Prob>chi2 = 0.6433

Source: Author's computation using Stata 15.0

Moreover, the study used the Friedman's test of cross sectional independence and the Pesaran's test of cross sectional independence to test for the presence or otherwise of cross-sectional dependence in the model. Both tests reported a p-value of 0.0000 confirming the presence of cross-sectional dependence in Model (8). The study again used the Wooldridge test for serial correlation in panel data to test the null hypothesis that there is no first order serial correlation in model (8) against the alternate hypothesis that there is the presence of first-serial correlation in the model. The test presented a p-value of 0.0000 meaning that there is a first-order serial correlation in Model (8). The study finally performed the Driscoll-Kraay standard errors to cater for all the issues listed above and the results are presented in Table 4.7 below as Model (8).

Table 4.7: Final Results from the Estimations of Models (4), (5), (6), (7) and (8).

Variable	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
lnRGDPPC					
EDUC	0.0275***	0.0247***	0.0280***	0.0269***	0.0265***
	(0.0080)	(0.0067)	(0.0079)	(0.0072)	(0.0074)
GFCF_GDP	0.0073	0.0053	0.0084*	0.0058	0.0058***
	(0.0044)	(0.0047)	(0.0046)	(0.0045)	(0.0050)
TO_GDP	0.0002	-0.0002	0.0009	-0.0008	0.0001
	(0.0007)	(0.0004)	(0.0007)	(0.0007)	(0.0006)
lnFA	0.0462***	-0.0173***	0.0577***	0.0201	0.0326**
	(0.0141)	(0.0040)	(0.0126)	(0.0145)	(0.0114)
NR_GDP	-0.0181***	-0.0173***	-0.0192***	-0.0188***	-0.0176**
	(0.0040)	(0.0040)	(0.0039)	(0.0035)	(0.0032)
Property_Rights	-0.0707*				
	(0.0389)				
Budgetary_Mgt		-0.1585***			
		(0.0373)			
Revenue_Mobil			0.0834*		
			(0.0426)		
Public_Adm				-0.2804***	
				(0.0829)	
Transparency					-0.1708***
					(0.0468)
CONS	5.9280***	6.4378***	5.1506***	7.1736	6.5103***
	(0.2690)	(0.1692)	(0.2233)	(0.4939)	(0.3192)

*Source: Author's Computation with Stata 15.0. Note that ***, ** and * represent 1%, 5% and 10% significance levels respectively. The values in the parenthesis are the standard errors.*

4.5 Discussion of Findings

The findings of the study are discussed in this section. Consistent with a priori expectations, the empirical investigations revealed that PSMI correlates positively with real GDP per capita. Specifically, when PSMI increases by 1 score, real GDP per capita will grow by 8.55%, and this is statistically significant at 1% significance level. This outcome is in line with the extant theorical and empirical literature that good governance systems or strong and inclusive institutions are prerequisites for sustained growth of countries (Acemoglu and Robinson, 2010; Siyakiya, 2017; Fosu, 2019 and Arvin et al., 2021). Governance in SSA has significantly improved since the 1990s with good governance reforms in some parts of the subregion such as Ghana, Cote d'Ivoire and Kenya. The reforms include but not limited to the writing and promulgation of democratic constitutions that reduce or prevent corruption and promote transparency and accountability (Mbaku, 2020). These reforms together with those that promote property rights may have created the enabling environment for businesses and individuals to use their resources efficiently and/or invest in productive ventures.

When the countries' PSMIs' were disaggregated into strong (PSMI_ST) and weak (PSMI_WK) performers using the World Bank's median score of 3.5, PSMI_ST exhibited positive relationship whereas PSMI_WK exhibited negative relationship with real GDP per capita. This is again another confirmation that strong PSMIs lead to the growth of economies whereas weak PSMIs are inimical to the growth of economies. However, both are not statistically significant at all significance levels. Again, the results from the empirical estimation of the sub-indicators of PSMI on real GDP per capita revealed that the Quality of Public Administration (QPA) index exerts the highest influence in absolute terms on economic growth among the sub-indicators in SSA. That is, when the QPA improves by 1 unit score, real GDP per capita decreases by 28.04%, and it is statistically significant at 1% significance level. This confirms the

ineffectiveness of public administration in SSA which adversely affects the subregion's sustained economic growth. It is worrying to note that the index of Public Administration recorded a weak average score of 2.86 between 2005 and 2020 (that is the period under study) which is below the World Bank's median score of 3.5. In fact, none of the years from 2005 to 2020 scored 3, as far as public administration is concerned in SSA. As noted by the World Bank (1997), effective public administration is a prerequisite for sustained social and economic development and that it is next to impossible to develop without it. Public Administration in SSA is ineffective because too much power is concentrated in the hands of politicians who mostly do not pay critical attention to the relevant demands and needs of the citizenry (Ayee, 2008).

Property Rights and Rule Based Governance (PRRG) exerts the least influence on real GDP per capita in absolute terms in the study because a 1 unit increase in it leads to a 7.07% decrease in real GDP per capita. The negative relationship between PRRG and real GDP per capita in the study is statistically significant at 10% significance level. The negative relationship is because impediments to land ownership continue to persist in SSA and this adversely affects wealth generation and economic growth in the sub region (Koch, 2020). Again, inadequate guarantee for secured property rights in SSA disincentivises capital inflows and foreign direct investments in Africa and this does not auger well for the sub-region's economic growth and development (Coulibaly et al., 2018). In between the two extremes are Quality of Budgetary and Financial Management (QBFM), Efficiency of Revenue Mobilisation (ERM) and Transparency, Accountability and Corruption in the public sector (TAC).

The index of Budgetary and Financial Management (QBFM) has a negative relationship with real GDP per capita and is statistically significant at 1% in the study. Specifically, when QBFM improves by 1 unit score, real GDP per capita declines by 15.85%, all other things remaining

the same. The high debt levels in SSA countries are a testament that the subregion's Budgetary and Financial Management is not good enough, which accounts for its bad effect on real GDP per capita in the subregion. Public debts to GDP in SSA had risen sharply to a peak of 63.1% in 2020 after the debt reliefs granted thirty SSA countries which saw a decline in their median public debts to GDP from around 85% in the 2000s to 34% in 2011 (Heitzig et al., 2021 and Atingi-Ego et al., 2021). The debt reliefs were granted under the heavily indebted poor countries (HIPCs) initiative and the multilateral debt relief initiative (MDRI). Again, the Efficiency of Revenue Mobilisation's index reported a positive relationship with real GDP per capita at 1% significance level. It is the only index among the five indices of PSMI that is positively correlated with real GDP per capita in the study. Specifically, when Revenue Mobilisation improves by 1 score, economies in SSA growths by 8.34%. This is not surprising because efficient revenue mobilisations enable the government to have access to sufficient funds to finance critical public goods and other development needs to generate sustained economic growth. Revenue mobilisation in SSA has significantly improved over the years, with tax revenues to GDP increasing from 11 percent in the early 2000s to 15 percent in 2019 before the Corona Virus pandemic (Coulibaly and Gandhi, 2018 and Aslam et al., 2022). As noted by Gaspar et al. (2016), a tax-to-GDP ratio of 15 percent accelerates economic growth and development and therefore the Revenue Mobilisation's influence on real GDP per capita in the study is justified.

Moreover, TAC has a negative relationship with real GDP per capita in the study and is statistically significant at 1% significance level. Specifically, a 1 score increase in the index of TAC leads to a 17.08% decrease in real GDP per capita, all other things being equal. This is a confirmation that lack of transparency and accountability, and the high levels of corruption in SSA are detrimental to the subregion's economic growth. The average score of the index of

TAC in the public sector in SSA for the period under study is 2.7 which is far below the World Bank's median score of 3.5. The lack of transparency, accountability and anti-corruption in SSA leads to the misuse of state funds for private purposes and the investment of state resources in less productive sectors of the economy. Finally, lack of transparency, accountability and anti-corruption discourage official development assistance for investments in growth-enhancing sectors of the economy. (Makina and Mago, 2015). As noted by Sumanjeet (2015), transparency, accountability and anti-corruption are required to generate sustained economic growth and development.

Among the five variables the study controlled for such as human capital proxied with education, GFCF as a percent of GDP, trade openness, foreign aid, and total natural resources rents as percent of GDP, only two were significant in Model (1), the main model for the first objective of the study. The two significant control variables are education and GFCF as a percent of GDP. Education exhibits a positive relationship with real GDP per capita in the study at 1% significance level. Specifically, when education increases by 10%, real GDP per capital will grow by 0.073%, all other things being equal. This reflects a positive relationship between education and the growth of SSA economies implying that improvements in human capital through upper secondary and tertiary education engender creativity, innovation, and increments in productivity which ultimately leads to economic growth. This is in line with the recent conclusions drawn by Akinlo and Oyeleke (2020) and Sajoh (2021) that improvements in human capital leads to the growth of economies in SSA.

Again, the positive relationship between GFCF as a percent of GDP and growth is significant at 10% significance level. The empirical results show that all other things being equal, a 10% increase in GFCF as a percent of GDP will lead to an economic growth of 0.011% in SSA. Increments in the GFCF as a percent of GDP empower industries to produce more goods and

services. Industries become more operationally efficient in the presence of more fixed capital, and this generates economic growth. This result is consistent with the finding of Adams (2009) that investment leads to economic growth in SSA. Trade, foreign aid, and total natural resources rents were found to be insignificant in the study. Trade and foreign aid reported positive relationships with real GDP per capita whereas total natural resources rents reported a negative relationship with real GDP per capita.

4.6 Conclusion

The previous sections in this chapter have shown the econometric processes the study used to answer the research questions in chapter one. It is evident from the analysis that PSMI positively influence the growth of SSA economies. The analysis again revealed that the QPA and PRRG indices exert the greatest and the least influences respectively in absolute terms on economic growth in SSA.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Introduction

The summary of the main findings of the study and conclusion, policy recommendations and limitations are presented in this chapter.

5.2 Summary of findings and conclusion

Reasons for SSA's underdevelopment continue to dominate empirical studies. Among some of the reasons given are unfavourable geography, poor economic structures, extractive political and economic institutions or poor governance, and high and unsustainable public debts, among others. This study investigated the effect of PSMI on economic growth in SSA. The study further explored the effects of the indices of PSMI on economic growth with the view to unravelling the indices that exert the greatest and the least influence on economic growth in SSA. The study used a balanced panel data on real GDP per capita on thirty (30) countries in SSA from 2005 to 2020 to empirically answer the research questions of the study.

The study first examined the effects of PSMI and other control variables such as Education as a proxy for human capital (Edu), gross fixed capital formation as percent of GDP (as a proxy for investment), trade openness, foreign aid and total natural resource rents as a percent of GDP on real GDP per capita in SSA. The first estimation was done using the Random Effects estimation in accordance with the results of the Hausman test. Thereafter, the Panel Corrected Standard Errors (PCSE) corrected for first-order serial correlation was used to address the econometric issues in the model such as cross-sectional dependence, first-order serial correlation and heteroskedasticity. The study then disaggregated the countries into strong and weak PSMI performers using the World Bank's median score of 3.5. The study proceeded to

investigate the effects of property rights, budgetary and financial management, revenue mobilisation, public administration, and transparency, accountability and corruption in the public sector on economic growth in SSA with five models which are Models (7), (8), (9), (10) and (11). Four out of the five models which are Models (7), (8), (9) and (11) were estimated with the Random Effects estimation technique as it was selected by the Hausman tests. The Hausman test, however, chose the Fixed Effects technique for the estimation of Model (10). The Driscoll-Kraay Standard Errors was finally used to address the presence of cross-sectional dependence, serial correlation and heteroskedasticity in all the models.

The study concluded that, improvement in PSMI by 1 score generates an 8.55% growth in the economies of SSA. Again, the study found that Public Administration exerts the greatest influence whereas Property Rights exerts the less influence, both in absolute terms, on the growth of SSA's economies. Specifically, improvements in Public Administration and Property Rights by 1 score leads to a decline in real GDP per capita by 28.04% and 7.07% respectively. Using the World Bank's median score of 3.5, the study concluded that PSMI_ST correlates positively with economic growth whereas PSMI_WK correlates negatively with economic growth, though both were not statistically significant at all levels of significance. The study finally concluded that increments in upper secondary and tertiary educational attainments and gross fixed capital formation lead to economic growth in SSA in line with a priori expectations and economic theory.

5.3 Policy Recommendations

In accordance with the findings of the study, the underlisted recommendations are made. First, it is recommended that SSA governments, bilateral and multilateral development partners, civil society organisations and key stakeholders should collaborate to build effective and robust PSMI for the sub-region. This can be done by doing a comprehensive stakeholder mapping to

identify all the relevant stakeholders, establishing clearly defined metrics for accountability for public institutions, and the stakeholders engaging regularly to share knowledge about how best to improve SSA's PSMI. SSA governments are entreated to increase their transparency and accountability to their citizens, development partners and all relevant organisations by making all government financial information easily accessible on open data platforms They are also entreated to improve their revenue collection and management mechanisms and institute efficient property rights to attract enough local and foreign investments for the subregions sustained economic growth and development.

Second, SSA governments should embark on credible and irreversible reforms that will minimise or eliminate corruption at all levels of their states. This will help SSA governments to avoid the misappropriation of state resources and mobilise enough funds to invest in critical public goods and services for the growth of the sub-region. Modern innovative technology should be employed to eliminate middlemen, streamline administrative processes, improve public sector delivery, and eliminate corruption. Finally, as found by the study that education and gross fixed capital formation are sine qua nons for SSAs economic growth, the necessary investments should be made by the governments of SSA and their development partners to improve the physical and human capital of the subregion. Investments in the education sector should focus on aligning the curricula with the current and future job market and development needs of the country. Small and medium-sized enterprises should be provided with targeted support, including access to markets and credit, as well as regular training, to empower them to enhance their productivity.

5.4 Limitations of the study

The study failed to determine whether the effects of PSMI on real GDP per capita in SSA are unidirectional or bidirectional. Future studies should explore the possibility of bidirectional causality between PSMI and economic growth in SSA.

Finally, the baseline models are static panel models. Future studies should employ more advanced models such as dynamic panel models, dynamic heterogeneous panel models, among others.

APPENDIX

Appendix I: List of the 30 countries in SSA used in the study by region.

West Africa	East Africa	Central Africa	South Africa
Mauritania	Comoros	Burundi	Lesotho
Cote d'Ivoire	Ethiopia	Central African Republic	Mozambique
Cameroon	Kenya	Chad	Zambia
Benin	Madagascar	Congo, Democratic Republic	Zimbabwe
Gambia	Uganda	Rwanda	
Ghana	Tanzania		
Nigeria	Sudan		
Mali			
Sierra Leone			
Niger			
Guinea			
Senegal			
Burkina Faso			
Togo			

Source: World Bank's International Development Association eligible countries in SSA

APPENDIX II A: Correlation Matrix for variables in the first objective.

```
. pwcorr lnrgdppc psmi edu gfcf_gdp to_gdp lnfa nr_gdp , sig
```

	lnrgdppc	psmi	edu	gfcf_gdp	to_gdp	lnfa	nr_gdp
lnrgdppc	1.0000						
psmi	0.0996 0.0291	1.0000					
edu	0.5145 0.0000	-0.1751 0.0017	1.0000				
gfcf_gdp	0.1416 0.0019	0.1991 0.0000	-0.0261 0.6416	1.0000			
to_gdp	-0.0237 0.6051	0.0128 0.7797	-0.0191 0.7339	0.1383 0.0024	1.0000		
lnfa	0.0930 0.0472	0.3079 0.0000	0.1355 0.0165	0.1974 0.0000	-0.3307 0.0000	1.0000	
nr_gdp	-0.2259 0.0000	-0.3810 0.0000	0.0179 0.7498	0.0868 0.0574	0.1048 0.0217	0.0993 0.0340	1.0000

Appendix II B: Correlation Matrix for the variables in the second objective.

```
. pwcorr lnrgdppc ed gfcf_gdp to_gdp fa nr_gdp  prrg qbfm erm qpa tac, sig

             | lnrgdppc       ed gfcf_gdp   to_gdp       fa   nr_gdp     prrg
-------------+------------------------------------------------------------------
    lnrgdppc |   1.0000
             |
             |
          ed |   0.5145   1.0000
             |   0.0000
             |
    gfcf_gdp |   0.1416  -0.0261   1.0000
             |   0.0019   0.6416
             |
      to_gdp |  -0.0237  -0.0191   0.1383   1.0000
             |   0.6051   0.7339   0.0024
             |
          fa |   0.1231   0.1109   0.2073  -0.3365   1.0000
             |   0.0085   0.0501   0.0000   0.0000
             |
      nr_gdp |  -0.2259   0.0179   0.0868   0.1048   0.0720   1.0000
             |   0.0000   0.7498   0.0574   0.0217   0.1245
             |
        prrg |  -0.0816   0.1026  -0.0740  -0.2639  -0.0433  -0.0338   1.0000
             |   0.0740   0.0667   0.1053   0.0000   0.3564   0.4599
             |
        qbfm |  -0.2398  -0.1291  -0.2540  -0.2044  -0.1691   0.0174   0.5861
             |   0.0000   0.0208   0.0000   0.0000   0.0003   0.7045   0.0000
             |
         erm |  -0.0157   0.1114  -0.2618  -0.1941  -0.1508   0.1015   0.5092
             |   0.7316   0.0465   0.0000   0.0000   0.0012   0.0262   0.0000
             |
         qpa |  -0.2503   0.0273  -0.1918  -0.2291  -0.1335  -0.0950   0.7280
             |   0.0000   0.6260   0.0000   0.0000   0.0043   0.0375   0.0000
             |
         tac |  -0.2331   0.0596  -0.1915  -0.0921  -0.2258   0.0010   0.6969
             |   0.0000   0.2877   0.0000   0.0437   0.0000   0.9833   0.0000

             |      qbfm       erm       qpa       tac
-------------+------------------------------------
        qbfm |   1.0000
             |
             |
         erm |   0.5330   1.0000
             |   0.0000
             |
         qpa |   0.7291   0.5269   1.0000
             |   0.0000   0.0000
             |
         tac |   0.6110   0.4616   0.6618   1.0000
             |   0.0000   0.0000   0.0000
```

Appendix III A: Pooled OLS regression with no time effects for Model (1).

```
reg lnrgdppc psmi huca gfcf_gdp to_gdp lnfa_gdp nr_gdp
```

Source	SS	df	MS		
Model	19.7417699	6	3.29029499	Number of obs	= 480
Residual	116.470884	473	.246238654	F(6, 473)	= 13.36
				Prob > F	= 0.0000
Total	136.212653	479	.284368796	R-squared	= 0.1449
				Adj R-squared	= 0.1341
				Root MSE	= .49622

lnrgdppc	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
psmi	-.0830944	.0600201	-1.38	0.167	-.2010333	.0348446
huca	.0272794	.0049843	5.47	0.000	.0174854	.0370735
gfcf_gdp	.0079645	.0028553	2.79	0.005	.0023538	.0135751
to_gdp	.0008402	.0008638	0.97	0.331	-.0008572	.0025377
lnfa_gdp	.0670469	.0267628	2.51	0.013	.0144582	.1196356
nr_gdp	-.0205988	.0035388	-5.82	0.000	-.0275525	-.0136452
_cons	5.524665	.5112275	10.81	0.000	4.520107	6.529223

APPENDIX III B: Pooled OLS Regression with time effects for Model (1).

```
. reg lnrgdppc psmi huca gfcf_gdp to_gdp lnfa_gdp nr_gdp i.year
      Source |       SS           df       MS      Number of obs   =       480
-------------+----------------------------------   F(21, 458)      =      3.77
       Model |  20.0667933        21  .955561584   Prob > F        =    0.0000
    Residual |   116.14586       458  .253593581   R-squared       =    0.1473
-------------+----------------------------------   Adj R-squared   =    0.1082
       Total |  136.212653       479  .284368796   Root MSE        =     .50358
------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        psmi |  -.0794443   .0619718    -1.28   0.201    -.2012286    .0423401
        huca |   .0271024   .0051285     5.28   0.000     .0170242    .0371806
    gfcf_gdp |   .0077278   .0029926     2.58   0.010     .0018469    .0136087
      to_gdp |   .0007909    .000883     0.90   0.371    -.0009443    .0025262
    lnfa_gdp |    .063535   .0278349     2.28   0.023     .0088351    .1182349
      nr_gdp |  -.0202511   .0037925    -5.34   0.000     -.027704   -.0127982
        year |
        2006 |   .0036552   .1301329     0.03   0.978    -.2520765    .2593868
        2007 |   .0252223   .1303147     0.19   0.847    -.2308665    .2813112
        2008 |   .0349642   .1306035     0.27   0.789    -.2216921    .2916205
        2009 |  -.0244195   .1310661    -0.19   0.852    -.2819849     .233146
        2010 |    -.00397   .1316496    -0.03   0.976    -.2626821    .2547421
        2011 |   .0405867   .1316503     0.31   0.758    -.2181268    .2993002
        2012 |   .0433416    .131983     0.33   0.743    -.2160257    .3027089
        2013 |   .0055613   .1328703     0.04   0.967    -.2555496    .2666723
        2014 |   .0203898   .1329019     0.15   0.878    -.2407833    .2815629
        2015 |   .0041642   .1331704     0.03   0.975    -.2575365    .2658649
        2016 |   .0375995   .1326327     0.28   0.777    -.2230445    .2982436
        2017 |   .0613561   .1326324     0.46   0.644    -.1992873    .3219996
        2018 |   .0498404   .1334327     0.37   0.709    -.2123759    .3120567
        2019 |   .0369822   .1347391     0.27   0.784    -.2278012    .3017656
        2020 |   .0799182   .1329277     0.60   0.548    -.1813056    .3411421
       _cons |   5.564615   .5261929    10.58   0.000     4.530563    6.598667
```

Appendix IV A: Fixed Effects regression for Model (1).

```
Fixed-effects (within) regression               Number of obs      =       480
Group variable: countryname                     Number of groups   =        30

R-sq:                                           Obs per group:
     within  = 0.3009                                         min =        16
     between = 0.0682                                         avg =      16.0
     overall = 0.0794                                         max =        16

                                                F(6,444)           =     31.85
corr(u_i, Xb)  = 0.0574                         Prob > F           =    0.0000

------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        psmi |   .1043436   .0291059     3.58   0.000     .0471411    .1615461
        huca |   .0047624   .0014978     3.18   0.002     .0018188     .007706
    gfcf_gdp |    .006729   .0009132     7.37   0.000     .0049343    .0085237
      to_gdp |   .0004461   .0005155     0.87   0.387    -.0005671    .0014592
    lnfa_gdp |   .0373821   .0142796     2.62   0.009     .0093181    .0654461
      nr_gdp |  -.0075224   .0013578    -5.54   0.000    -.0101909   -.0048539
       _cons |   5.560294   .2788314    19.94   0.000     5.012301    6.108287
-------------+----------------------------------------------------------------
     sigma_u |  .50995648
     sigma_e |  .10742186
         rho |  .95751228   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(29, 444) = 332.73                     Prob > F = 0.0000
```

Appendix IV (B): Random Effects regression for Model (1).

```
. xtreg lnrgdppc psmi huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, re

Random-effects GLS regression                   Number of obs      =       480
Group variable: countryname                     Number of groups   =        30

R-sq:                                           Obs per group:
     within  = 0.3009                                         min =        16
     between = 0.0697                                         avg =      16.0
     overall = 0.0806                                         max =        16

                                                Wald chi2(6)       =    193.73
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

lnrgdppc	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
psmi	.1022362	.0288576	3.54	0.000	.0456763	.1587961
huca	.0048795	.0014925	3.27	0.001	.0019544	.0078047
gfcf_gdp	.0067329	.0009094	7.40	0.000	.0049506	.0085152
to_gdp	.0004398	.0005085	0.86	0.387	-.0005569	.0014365
lnfa_gdp	.0374183	.0141195	2.65	0.008	.0097446	.065092
nr_gdp	-.0076022	.0013494	-5.63	0.000	-.0102469	-.0049575
_cons	5.566553	.2920606	19.06	0.000	4.994125	6.138981
sigma_u	.52666916					
sigma_e	.10742186					
rho	.96006001	(fraction of variance due to u_i)				

Appendix V (A): Estimation with Strong PSMI – Model (2)

```
. xtpcse lnrgdppc psmi_st huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, corr(ar1)
(note: estimates of rho outside [-1,1] bounded to be in the range [-1,1])

Prais-Winsten regression, correlated panels corrected standard errors (PCSEs)

Group variable:    countryname                  Number of obs      =       480
Time variable:     year                         Number of groups   =        30
Panels:            correlated (balanced)        Obs per group:
Autocorrelation:   common AR(1)                                min =        16
                                                               avg =        16
                                                               max =        16
Estimated covariances      =       465         R-squared          =    0.9759
Estimated autocorrelations =         1         Wald chi2(6)       =     22.96
Estimated coefficients     =         7         Prob > chi2        =    0.0008
```

lnrgdppc	Panel-corrected Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
psmi_st	.000903	.0138481	0.07	0.948	-.0262388	.0280448
huca	.0071702	.0021183	3.38	0.001	.0030184	.0113219
gfcf_gdp	.0012025	.0006198	1.94	0.052	-.0000123	.0024172
to_gdp	.0001892	.0004982	0.38	0.704	-.0007872	.0011656
lnfa_gdp	.0093557	.0130038	0.72	0.472	-.0161314	.0348427
nr_gdp	-.0024657	.0013866	-1.78	0.075	-.0051834	.000252
_cons	6.508384	.2671178	24.37	0.000	5.984842	7.031925
rho	.9381529					

Appendix V (B): Estimation with Weak PSMI - Model (3)

```
. xtpcse lnrgdppc psmi_wk huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, corr(ar1)
(note: estimates of rho outside [-1,1] bounded to be in the range [-1,1])

Prais-Winsten regression, correlated panels corrected standard errors (PCSEs)

Group variable:    countryname                 Number of obs      =       480
Time variable:     year                        Number of groups   =        30
Panels:            correlated (balanced)       Obs per group:
Autocorrelation:   common AR(1)                              min =        16
                                                             avg =        16
                                                             max =        16
Estimated covariances      =       465         R-squared          =    0.9760
Estimated autocorrelations =         1         Wald chi2(6)       =     23.27
Estimated coefficients     =         7         Prob > chi2        =    0.0007

------------------------------------------------------------------------------
             |         Panel-corrected
    lnrgdppc |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     psmi_wk |  -.0163771   .0172331    -0.95   0.342    -.0501533    .0173992
        huca |    .007194   .0021126     3.41   0.001     .0030534    .0113345
    gfcf_gdp |   .0012046   .0006191     1.95   0.052    -8.69e-06    .0024179
      to_gdp |   .0001759   .0004946     0.36   0.722    -.0007934    .0011452
    lnfa_gdp |   .0084064   .0129675     0.65   0.517    -.0170093    .0338222
      nr_gdp |  -.0024296   .0014043    -1.73   0.084     -.005182    .0003229
       _cons |   6.541865    .264311    24.75   0.000     6.023825    7.059905
-------------+----------------------------------------------------------------
         rho |     .93786
------------------------------------------------------------------------------
```

Appendix VI (A): Fixed effects regression for Model (4)

```
. xtreg lnrgdppc prrg huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, fe

Fixed-effects (within) regression               Number of obs      =       480
Group variable: countryname                     Number of groups   =        30

R-sq:                                           Obs per group:
     within  = 0.3016                                         min =        16
     between = 0.0696                                         avg =      16.0
     overall = 0.0782                                         max =        16

                                                F(6,444)           =     31.96
corr(u_i, Xb)  = 0.0820                         Prob > F           =    0.0000

------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        prrg |   .0746946   .0204537     3.65   0.000     .0344965    .1148927
        huca |   .0063541    .001532     4.15   0.000     .0033432     .009365
    gfcf_gdp |   .0070209   .0009101     7.71   0.000     .0052323    .0088096
      to_gdp |   .0001572   .0005154     0.31   0.760    -.0008556    .0011701
    lnfa_gdp |   .0443569   .0138846     3.19   0.001     .0170692    .0716446
      nr_gdp |   -.008185   .0013337    -6.14   0.000    -.0108062   -.0055638
       _cons |   5.530782   .2791721    19.81   0.000     4.982119    6.079445
-------------+----------------------------------------------------------------
     sigma_u |  .51121836
     sigma_e |  .10736496
         rho |  .95775581   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(29, 444) = 332.36                     Prob > F = 0.0000
```

Appendix VI (B): Random Effects regression for Model (4)

```
. xtreg lnrgdppc prrg huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, re

Random-effects GLS regression                   Number of obs     =       480
Group variable: countryname                     Number of groups  =        30

R-sq:                                           Obs per group:
     within  = 0.3016                                         min =        16
     between = 0.0719                                         avg =      16.0
     overall = 0.0798                                         max =        16

                                                Wald chi2(6)      =    194.17
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =    0.0000

------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        prrg |   .0728198   .0202773     3.59   0.000      .033077    .1125626
        huca |   .0064162   .0015261     4.20   0.000     .0034252    .0094072
    gfcf_gdp |   .0070128   .0009066     7.74   0.000     .0052358    .0087897
      to_gdp |   .0001776   .0005085     0.35   0.727     -.000819    .0011743
    lnfa_gdp |   .0443878   .0137276     3.23   0.001     .0174821    .0712934
      nr_gdp |  -.0082855   .0013245    -6.26   0.000    -.0108814   -.0056896
       _cons |   5.535267   .2924296    18.93   0.000     4.962116    6.108419
-------------+----------------------------------------------------------------
     sigma_u |  .52521815
     sigma_e |  .10736496
         rho |  .95988872   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix VII (A): Fixed Effects Estimation for Model (5).

```
. xtreg lnrgdppc qbfm huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, fe

Fixed-effects (within) regression               Number of obs     =       480
Group variable: countryname                     Number of groups  =        30

R-sq:                                           Obs per group:
     within  = 0.2923                                         min =        16
     between = 0.0690                                         avg =      16.0
     overall = 0.0743                                         max =        16

                                                F(6,444)          =     30.57
corr(u_i, Xb)  = 0.0934                         Prob > F          =    0.0000

------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        qbfm |   .0419802   .0155222     2.70   0.007     .0114741    .0724862
        huca |   .0051021   .0015037     3.39   0.001     .0021468    .0080575
    gfcf_gdp |    .007064   .0009166     7.71   0.000     .0052625    .0088654
      to_gdp |   .0003847    .000518     0.74   0.458    -.0006333    .0014027
    lnfa_gdp |   .0487214   .0138845     3.51   0.000     .0214338     .076009
      nr_gdp |  -.0082942   .0013419    -6.18   0.000    -.0109313    -.005657
       _cons |   5.512013   .2824736    19.51   0.000     4.956862    6.067164
-------------+----------------------------------------------------------------
     sigma_u |  .51271382
     sigma_e |  .10807886
         rho |  .95745488   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(29, 444) = 319.01                     Prob > F = 0.0000
```

Appendix VII (B): Random Effects Estimation for Model (5).

```
. xtreg lnrgdppc qbfm huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, re

Random-effects GLS regression                   Number of obs     =       480
Group variable: countryname                     Number of groups  =        30

R-sq:                                           Obs per group:
     within  = 0.2923                                         min =        16
     between = 0.0722                                         avg =      16.0
     overall = 0.0767                                         max =        16

                                                Wald chi2(6)      =    185.43
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =    0.0000

------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        qbfm |   .0399559   .0154537     2.59   0.010     .0096672    .0702446
        huca |   .0052116   .0014998     3.47   0.001     .0022721    .0081512
    gfcf_gdp |   .0070587   .0009136     7.73   0.000     .0052681    .0088494
      to_gdp |   .0003884   .0005115     0.76   0.448    -.0006141    .0013908
    lnfa_gdp |   .0486394   .0137345     3.54   0.000     .0217202    .0755586
      nr_gdp |  -.0083915   .0013332    -6.29   0.000    -.0110046   -.0057784
       _cons |   5.520563   .2954493    18.69   0.000     4.941493    6.099633
-------------+----------------------------------------------------------------
     sigma_u |   .5214332
     sigma_e |  .10807886
         rho |  .95880773   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix VIII (A): Fixed Effects Estimation for Model (6).

```
Fixed-effects (within) regression               Number of obs     =       480
Group variable: countryname                     Number of groups  =        30

R-sq:                                           Obs per group:
     within  = 0.3059                                         min =        16
     between = 0.1027                                         avg =      16.0
     overall = 0.1019                                         max =        16

                                                F(6,444)          =     32.61
corr(u_i, Xb)  = 0.1326                         Prob > F          =    0.0000

------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         erm |   .0940058   .0234087     4.02   0.000     .0480002    .1400113
        huca |   .0055651   .0014935     3.73   0.000     .0026298    .0085004
    gfcf_gdp |   .0070058   .0009073     7.72   0.000     .0052227    .0087889
      to_gdp |   .0000611   .0005158     0.12   0.906    -.0009526    .0010748
    lnfa_gdp |    .053173   .0137418     3.87   0.000      .026166    .0801801
      nr_gdp |  -.0083375   .0013279    -6.28   0.000    -.0109472   -.0057277
       _cons |   5.250704   .2914677    18.01   0.000     4.677877    5.823532
-------------+----------------------------------------------------------------
     sigma_u |   .50715517
     sigma_e |   .10703886
         rho |   .95735442   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(29, 444) = 334.45                     Prob > F = 0.0000
```

Appendix VIII (B): Random Effects Estimation for Model (6).

```
. xtreg lnrgdppc erm huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, re

Random-effects GLS regression                   Number of obs      =       480
Group variable: countryname                     Number of groups   =        30

R-sq:                                           Obs per group:
     within  = 0.3059                                         min =        16
     between = 0.1049                                         avg =      16.0
     overall = 0.1033                                         max =        16

                                                Wald chi2(6)       =    198.75
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         erm |   .0932245   .0231977     4.02   0.000     .0477578    .1386911
        huca |   .0056619   .0014877     3.81   0.000      .002746    .0085777
    gfcf_gdp |   .0070041   .0009032     7.75   0.000     .0052338    .0087744
      to_gdp |   .0000828   .0005085     0.16   0.871    -.0009138    .0010795
    lnfa_gdp |   .0528217   .0135822     3.89   0.000      .026201    .0794424
      nr_gdp |  -.0084396   .0013179    -6.40   0.000    -.0110226   -.0058565
       _cons |   5.260067   .3038238    17.31   0.000     4.664583    5.85555
-------------+----------------------------------------------------------------
     sigma_u |  .52736089
     sigma_e |  .10703886
         rho |  .96043291   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix IX (A): Fixed Effects Estimation for Model (7)

```
. //Estimating with quality of public administration//
. xtreg lnrgdppc qpa huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, fe

Fixed-effects (within) regression               Number of obs      =       480
Group variable: countryname                     Number of groups   =        30

R-sq:                                           Obs per group:
     within  = 0.2886                                         min =        16
     between = 0.0621                                         avg =      16.0
     overall = 0.0699                                         max =        16

                                                F(6,444)           =     30.03
corr(u_i, Xb)  = 0.0796                         Prob > F           =    0.0000

------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         qpa |   .0500792   .0224401     2.23   0.026     .0059773    .0941812
        huca |   .0055645   .0015212     3.66   0.000     .0025749    .0085541
    gfcf_gdp |   .0071494   .0009216     7.76   0.000     .0053381    .0089607
      to_gdp |  -.0000196   .0005386    -0.04   0.971    -.0010782     .001039
    lnfa_gdp |   .0462023   .0140522     3.29   0.001     .0185851    .0738194
      nr_gdp |  -.0078837   .0013686    -5.76   0.000    -.0105735    -.005194
       _cons |    5.56475   .2816216    19.76   0.000     5.011274    6.118227
-------------+----------------------------------------------------------------
     sigma_u |  .51328641
     sigma_e |  .10835942
         rho |  .95733443   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(29, 444) = 305.70                     Prob > F = 0.0000
```

Appendix IX (B): Randoms Effects Estimation for Model (7)

```
. xtreg lnrgdppc qpa huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, re

Random-effects GLS regression                   Number of obs     =       480
Group variable: countryname                     Number of groups  =        30

R-sq:                                           Obs per group:
     within  = 0.2886                                         min =        16
     between = 0.0675                                         avg =      16.0
     overall = 0.0740                                         max =        16

                                                Wald chi2(6)      =    181.22
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =    0.0000

------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         qpa |   .0457558   .0223031     2.05   0.040     .0020426    .0894691
        huca |   .0056376   .0015208     3.71   0.000     .0026568    .0086183
    gfcf_gdp |   .0071282   .0009209     7.74   0.000     .0053233    .0089331
      to_gdp |   .0000262   .0005316     0.05   0.961    -.0010156     .001068
    lnfa_gdp |   .0463884   .0139239     3.33   0.001      .019098    .0736787
      nr_gdp |  -.0080396   .0013621    -5.90   0.000    -.0107093   -.0053699
       _cons |   5.572723   .2938603    18.96   0.000     4.996767    6.148679
-------------+----------------------------------------------------------------
     sigma_u |  .49777665
     sigma_e |  .10835942
         rho |  .95475643   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix X (A): Fixed Effects Estimation for Model (8)

```
. xtreg lnrgdppc tac huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, fe

Fixed-effects (within) regression               Number of obs     =       480
Group variable: countryname                     Number of groups  =        30

R-sq:                                           Obs per group:
     within  = 0.2853                                         min =        16
     between = 0.0810                                         avg =      16.0
     overall = 0.0838                                         max =        16

                                                F(6,444)          =     29.53
corr(u_i, Xb)  = 0.1086                         Prob > F          =    0.0000

------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         tac |   .0313657   .0185416     1.69   0.091    -.0050745    .0678059
        huca |   .0055798   .0015362     3.63   0.000     .0025605     .008599
    gfcf_gdp |   .0070963   .0009232     7.69   0.000     .0052819    .0089108
      to_gdp |   .0002386   .0005213     0.46   0.647    -.0007858    .0012631
    lnfa_gdp |   .0475884   .0140624     3.38   0.001     .0199513    .0752255
      nr_gdp |  -.0082273   .0013542    -6.08   0.000    -.0108887   -.0055659
       _cons |   5.586356   .2819076    19.82   0.000     5.032317    6.140395
-------------+----------------------------------------------------------------
     sigma_u |  .51063979
     sigma_e |  .10861601
         rho |  .95671466   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(29, 444) = 313.30                     Prob > F = 0.0000
```

Appendix X (B): Random Effects Estimation for Model (8)

```
. xtreg lnrgdppc tac huca gfcf_gdp to_gdp lnfa_gdp nr_gdp, re

Random-effects GLS regression                   Number of obs     =        480
Group variable: countryname                     Number of groups  =         30

R-sq:                                           Obs per group:
     within  = 0.2852                                         min =         16
     between = 0.0845                                         avg =       16.0
     overall = 0.0865                                         max =         16

                                                Wald chi2(6)      =     179.29
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000

------------------------------------------------------------------------------
    lnrgdppc |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         tac |   .0287481   .0184209     1.56   0.119    -.0073561    .0648524
        huca |   .0056484   .0015324     3.69   0.000      .002645    .0086518
    gfcf_gdp |   .0070832   .0009206     7.69   0.000     .0052788    .0088876
      to_gdp |   .0002527   .0005147     0.49   0.623     -.000756    .0012615
    lnfa_gdp |   .0476812   .0139074     3.43   0.001     .0204232    .0749392
      nr_gdp |  -.0083402   .0013459    -6.20   0.000     -.010978   -.0057023
       _cons |   5.592013   .2945316    18.99   0.000     5.014741    6.169284
-------------+----------------------------------------------------------------
     sigma_u |  .51416342
     sigma_e |  .10861601
         rho |  .95728065   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix XI: List of Abbreviations in the appendices above.

lnrgdppc	Natural Log of Real GDP Per Capita
psmi	Public Sector Management and Institutions
edu/ed	Education
gfcf_gdp	Gross Fixed Capital Formation as a percent of GDP
to_gdp	Trade Openness
lnfa	Natural Log of Foreign Aid
nr_gdp	Natural Resource Rents as a percent of GDP
prrg	Property Rights and Rule-Based Governance

qbfm	Quality of Budgetary and Financial Management
erm	Efficiency of Revenue Mobilisation
qpa	Quality of Public Administration
tac	Transparency, Accountability and Corruption in the public sector
psmi_st	Strong PSMI
psmi_wk	Weak PSMI
huca	Human Capital which is used interchangeability with Education.

REFERENCES

1. Abbas, K., Abbas, M., & Abbassi, F. A. (2022). An Empirical Investigation into the Contribution of Foreign Aid to Economic Growth in Developing Countries: Exploring the Role of Democracy. *Journal of Economic Impact*, *4*(2), 32-38.
2. Abdul-Rahman, A., Latif, R. A., Muda, R., & Abdullah, M. A. (2014). Failure and potential of profit-loss sharing contracts: A perspective of New Institutional, Economic (NIE) Theory. *Pacific-Basin Finance Journal*, *28*, 136-151.
3. Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). Institutions as a fundamental cause of long-run growth. Handbook of economic growth, 1, 385-472.
4. Acemoglu, D., & Robinson, J. (2010). The role of institutions in growth and development. Review of Economics and Institutions, 1 (2), 1-33.
5. Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *American economic review*, *91*(5), 1369-1401.
6. Acemoglu, Daron; Robinson, James. 2008. The Role of Institutions in Growth and Development. Commission on Growth and Development Working Paper;No. 10. World Bank, Washington, DC. © World Bank.
7. Adams, S. (2009). Foreign direct investment, domestic investment, and economic growth in Sub-Saharan Africa. *Journal of policy modeling*, *31*(6), 939-949.
8. Agbloyor, E. K., Gyeke-Dako, A., Kuipo, R., & Abor, J. Y. (2016). Foreign direct investment and economic growth in SSA: The role of institutions. *Thunderbird International Business Review*, *58*(5), 479-497.
9. Akinlo, T., & Oyeleke, O. J. (2020). Human capital formation and economic growth in Sub-Saharan African countries: an empirical investigation. *The Indian Economic Journal*, *68*(2), 249-268.

10. Alexeev, M., & Chernyavskiy, A. (2014). Natural resources and economic growth in Russia's regions. *Higher School of Economics Research Paper No. WP BRP, 55*.

11. Anderson, D. (1990). Investment and economic growth. *World Development, 18*(8), 1057–1079. https://doi.org/10.1016/0305-750X(90)90088-F

12. Anderson, L., & Babula, R. (2008). Openness and long-run economic progress. Journal of International Economics and Commerce, 1-20.

13. Anyanwu, S., & Wabekwa, B. (2022). Impact of Foreign Aid on Economic Growth in the West African Monetary Zone using Non-linear Autoregressive Distributed Lag.

14. Arvin, M. B., Pradhan, R. P., & Nair, M. S. (2021). Are there links between institutional quality, government expenditure, tax revenue and economic growth? Evidence from low-income and lower middle-income countries. *Economic Analysis and Policy, 70*, 468–489. https://doi.org/10.1016/j.eap.2021.03.011

15. Aslam, A., Delepierre, S., Gupta, R., & Rawlings, H. (2022). *Revenue Mobilization in Sub-Saharan Africa during the Pandemic, IMF COVID-19 Special Series. Box 1*, 1–11.

16. Atingi-Ego, M., Timuno, S., & Makuve, T. (2021). Public Debt Accumulation in SSA: A Looming Debt Crisis. *Journal of African Economies, 30*(Supplement_1), i103–i139. https://doi.org/10.1093/jae/ejab023

17. Ayee, J. R. A. (2005). Public Sector Management in Africa. *Economic Research Working Paper Series, 82*(2), 60 72.

18. Azam, M., & Feng, Y. (2022). Does foreign aid stimulate economic growth in developing countries? Further evidence in both aggregate and disaggregated samples. Quality & Quantity, 56(2), 533-556.

19. Becker, G. S. (2009). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago press.

20. Benhabib, J., & Spiegel, M. M. (1994). The role of human capital in economic development evidence from aggregate cross-country data. Journal of Monetary economics, 34(2), 143-173.

21. Berg, A., & Krueger, A. O. (2003, February). Trade, growth, and poverty: A selective survey. In Annual World Bank Conference on Development Economics (pp. 47-91). Washington DC, USA: World Bank.

22. Besley, T., & Dray, S. (2021). Institutions, Trust and Responsiveness: Patterns of Government and Private Action During the COVID-19 Pandemic. *LSE Public Policy Review*, *1*(4).

23. Boone, P. (1996). Politics and the Effectiveness of Foreign Aid. European Economic Review, 40(2), 289–329.

24. Bosma, N., Sanders, M., & Stam, E. (2018). Institutions, entrepreneurship, and economic growth in Europe. *Small Business Economics*, *51*(2), 483-499.

25. Breusch, T. S., & Pagan, A. R. (1980). The Lagrange multiplier test and its applications to model specification in econometrics. The review of economic studies, 47(1), 239-253.

26. Brückner, M., & Lederman, D. (2012). Trade causes growth in sub-Saharan Africa. World Bank Policy Research Working Paper, (6007).

27. Brunnschweiler, Christa, 2009. "Oil and Growth in Transition Countries," CER-ETH, OxCarre Research Paper 29.

28. Callen, T. (2020, February 24). *Gross Domestic Product (GDP): An Economy's All - Back to Basics: GDP Definition*. Finance & Development. https://www.imf.org/external/pubs/ft/fandd/basics/gdp.htm

29. Cavalcanti, T. V. D. V., Mohaddes, K., & Raissi, M. (2011). Growth, development and natural resources: New evidence using a heterogeneous panel analysis. *The Quarterly Review of Economics and Finance*, *51*(4), 305-318.

30. Chand, P., Chakrabarty, B., & Roy, A. (2012). *Public Administration in a Globalizing World: Theories and Practices*. Sage Publications.

31. Chang, H. J. (2011). Institutions and economic development: theory, policy and history. *Journal of institutional economics*, *7*(4), 473-498.

32. Coase, R. H. "The Journal of LAW c." *Journal of Law and Economics* 3 (1960): 1-44.

33. Coase, R. H. (1937). The nature of the firm. *economica*, *4*(16), 386-405.

34. Coulibaly, B. S., & Gandhi, D. (2018). *Mobilization of tax revenues in Africa State of play and policy options*. http://www.un.org/esa/ffd/overview/monterrey-conference.html

35. Coulibaly, S. S., Gakpa, L. L., & Soumaré, I. (2018). The role of property rights in the relationship between capital flows and economic growth in SSA: do natural resources endowment and country income level matter?. *African Development Review*, *30*(1), 112-130.

36. De Hoyos, R. E., & Sarafidis, V. (2006). Testing for cross-sectional dependence in panel-data models. The stata journal, 6(4), 482-496.

37. De Long, J. B., Summers, L. H., & Abel, A. B. (1992). Equipment investment and economic growth: how strong is the nexus?. Brookings Papers on Economic Activity, 1992(2), 157-211.

38. Demsetz, H. (1967). Towards a theory of property rights, American Economic Journal, 347–359. *Ownership, control and the firm*, *57*(2), 347-359.

39. Durbarry, R., Gemmell, N., & Greenaway, D. (1998). New evidence on the impact of foreign aid on economic growth (No. 98/8). CREDIT Research paper.

40. Easterly, W., Ritzen, J., & Woolcock, M. (2006). Social cohesion, institutions, and growth. *Center for Global Development Working Paper*, (94).

41. Emudainohwo, O.B., 2020. IFRS and stock exchange development in sub-Saharan Africa: a logistic model. Innovations, 17(3), pp.397-407.

42. Epaphra, M., & Kombe, A. H. (2017). *Institutions and economic growth in Africa : Evidence from panel estimation*.

43. Fapohunda, O. J. (1976). The case of Nigeria. Intereconomics, 11(2), 38–42. https://doi.org/10.1007/BF02929363

44. Fayissa, B., & Nsiah, C. (2013). The impact of governance on economic growth in Africa. *The Journal of Developing Areas*, 91-108.

45. Fernandez, A. M., & Kraay, A. (2005). Property rights institutions, contracting institutions, and growth in South Asia: Macro and Micro Evidence. *The World Bank. Background paper prepared for the SAARC Business Leaders' Conclave: South Asia Regional Integration and Growth, New Delhi, November*, 17-18.

46. Frankel, J., Romer, D., 1999. Does trade cause growth? American Economic Review 89 (3), 379–399

47. Frederickson, H. G. (1996). Comparing the reinventing government movement with the new public administration. *Public administration review*, 263-270.

48. Gaspar, V., Jaramillo, L., & Wingender, M. P. (2016). *Tax Capacity and Growth: Is There a Tipping Point?*. International Monetary Fund.

49. Geopolitics - Sub-Saharan Africa | World101. (n.d.). Retrieved October 5, 2022, from https://world101.cfr.org/rotw/africa/geopolitics#african-union-provides-imperfect-forum-for-regional-cooperation

50. Glaeser, E. L., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2004). Do institutions cause growth?. *Journal of economic Growth*, *9*(3), 271-303.

51. Glewwe, P., Maiga, E., & Zheng, H. (2014). The contribution of education to economic growth: A review of the evidence, with special attention and an application to Sub-Saharan Africa. *World Development*, *59*, 379-393.

52. Góes, C. (2016). Institutions and growth: A GMM / IV Panel VAR approach. *Economics Letters*, *138*, 85–91. https://doi.org/10.1016/j.econlet.2015.11.024

53. Goldsmith, A. A. (1998). *Institutions and economic growth in Africa*. United States Agency for International Development, Division of Strategic Analysis, Office of Sustainable Development, Bureau for Africa.

54. Gujarati, D. (2003). Basic Econometrics. 4th ed. New York: McGraw Hill, pp. 638-640.

55. Gujarati, D. N., & Porter, D. C. (2003). Basic econometrics (ed.). *Singapore: McGrew Hill Book Co*.

56. Gylfason, T., Herbertsson, T. T., & Zoega, G. (1999). A mixed blessing: natural resources and economic growth. Macroeconomic dynamics, 3(2), 204-225.

57. Hall, J. C., & Sobel, R. S. (2008). Institutions, entrepreneurship, and regional differences in economic growth. *Southern Journal of Entrepreneurship*, *1*(1).

58. Harriss, J., Hunter, J., & Lewis, C. (1995). *The new institutional economics and third world development*. Psychology Press.

59. Hausman, J. A. (1978). Specification tests in econometrics. Econometrica: Journal of the econometric society, 1251-1271.

60. Heitzig, C., Ordu, A. U., & Senbet, L. (2021). Sub-Saharan Africa's debt problem: Mapping the pandemic's effect and the way forward. *Africa Growth Initiative, October*, 1–29.

61. Hodgson, G. M. (2006). What are institutions?. *Journal of economic issues*, *40*(1), 1-25.

62. Hood, C. (1991). A public management for all seasons?. *Public administration*, *69*(1), 3-19.

63. Hsiao, C. (2007). Rejoinder on: Panel data analysis-advantages and challenges. *Test*, *16*(1), 56–57. https://doi.org/10.1007/s11749-007-0055-9

64. IDA (2004, September). IDA'S Performance-Based Allocation System: IDA Rating Disclosure and Fine-tuning the Governance Factor. International Development Association. https://documents1.worldbank.org/curated/en/766251468762005853/text/30128.txt

65. Iheonu, C., Ihedimma, G., & Onwuanaku, C. (2017). Institutional quality and economic performance in West Africa.

66. International Monetary Fund (2021, October) Regional Economic Outlook, Sub-Saharan Africa. IMF eLibrary. https://tinyurl.com/2p99p3u2

67. Ivanyna, M., & Salerno, A. (2021). Governance for Inclusive growth.

68. Ivanyna, M., & Salerno, A. (2021). Governance for Inclusive growth.

69. Jensen, P.S., Paldam, M. (2003), "Can the New Aid-Growth Models Be Replicated?," Working Paper No. 2003–17, Institute for Economics: Aarhus.

70. Jumanne, B.B. and Keong, C.C., 2017. Foreign direct investment and public sector management and institutions: the Acquaintances in Sub-Saharan Africa (SSA) low-income economies. African Journal of Economic Review, 5(2), pp.14-33.

71. Keho, Y. (2017). The impact of trade openness on economic growth: The case of Cote d'Ivoire. *Cogent Economics & Finance*, *5*(1), 1332820.

72. Kilishi, A. A., Mobolaji, H. I., Yaru, M. A., & Yakubu, A. T. (2013). Institutions and economic performance in sub-Saharan Africa: a dynamic panel data analysis. *Journal of African Development*, *15*(2), 91-119.

73. Kimura, H., Mori, Y., & Sawada, Y. (2012). Aid proliferation and economic growth: A cross-country analysis. World Development, 40(1), 1-10.

74. Knack, S. (2000). Aid Dependence and the Quality of overnice: A Cross-Country Empirical Analysis. World Bank Policy Research Paper.

75. Knack, S., Rogers, F. H., & Eubank, N. (2011). Aid quality and donor rankings. *World Development*, *39*(11), 1907-1917.

76. Koch, T. (2020, December 17). *Property rights, data, and prosperity in Africa - Atlantic Council*. https://www.atlanticcouncil.org/blogs/geotech-cues/property-rights-data-and-prosperity-in-africa/

77. Kukaj, H., & Ahmeti, F. (2016). Assessing the Value of the Enterprise: Methods and Instruments. International Journal of Economics, Commerce and Management, 4(7).

78. Lewis, W. Arthur. "1978. The Evolution of the International Economic Order."

79. Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. The American economic review, 942-963.

80. Levine, R., Loayza, N., and Beck, T. (2000) Financial Intermediation and Growth: Causality and Causes. Journal of Monetary Economics, 46(1), pp. 31–77.

81. Lucas Jr, R. E. (1988). On the mechanics of economic development. Journal of monetary economics, 22(1), 3-42.

82. Makina, C., & Mago, D. (2015). Public financial accountability: a pre-requisite to the management of development assistance in Mozambique beyond 2015. Africa's Public Service Delivery & Performance Review, 4(4), 554-571.

83. Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. The quarterly journal of economics, 107(2), 407-437.

84. Masuch, K., Moshammer, E., & Pierluigi, B. (2016). Institutions and growth in Europe. *CEPS Working Document*, (421).

85. Matthews, R. C. (1986). The economics of institutions and the sources of growth. The Economic Journal, 96(384), 903-918.

86. Matthews, R. C. (1986). The economics of institutions and the sources of growth. *The Economic Journal*, *96*(384), 903-918.

87. Mbaku, J. M. (2020). Good and inclusive governance is imperative for Africa's future. *Foresight Africa - Top Priorities for the Continent 2020-2030*, 23–33. https://www.brookings.edu/wp-content/uploads/2020/01/ForesightAfrica2020_Chapter2_20200110.pdf

88. Megersa, K. (2017). *Government finances and financial shocks in developing economies*. University of Antwerp.

89. Megersa, K., & Cassimon, D. (2015). Public Debt, Economic Growth, and Public Sector Management in Developing Countries: Is There a Link? *Public Administration and Development*, *35*(5), 329–346. https://doi.org/10.1002/pad.1733

90. Mensah, L., Bokpin, G., & Boachie-Yiadom, E. (2018). External debts, institutions and growth in SSA. *Journal of African Business*, *19*(4), 475-490.

91. Moers, L. (1999). *How important are institutions for growth in transition countries?* (No. 99-004/2). Tinbergen Institute Discussion Paper.

92. Moreira, S. B. (2005). Evaluating the impact of foreign aid on economic growth: A cross-country study. Journal of Economic Development, 30(2), 25-48.

93. Mosley, P. Hudson, J., Horrell, S. (1987), Aid, the Public Sector and the Market in Less Developed Countries, Economic Journal, 97(387), 616–641.

94. Mwai, P. (2022, February 2). Are military takeovers on the rise in Africa? BBC News. https://www.bbc.com/news/world-africa-46783600

95. Nawaz, S., Iqbal, N., & Khan, M. A. (2014). The impact of institutional quality on economic growth: Panel evidence. The Pakistan Development Review, 15-31.

96. North Douglass, C. (1990). Institutions, institutional change and economic performance. *Journal of Women s Health*.

97. North, D. C., & North, D. C. (1992). *Transaction costs, institutions, and economic performance* (pp. 13-15). San Francisco, CA: Ics Press.

98. North, D. C., & Thomas, R. P. (1973). *The rise of the western world: A new economic history*. Cambridge University Press.

99. OECD. (2017). Gross fixed capital formation : Year on year growth rates | How's Life? 2017: Measuring Well-being | OECD iLibrary. https://www.oecd-ilibrary.org/economics/how-s-life-2017/gross-fixed-capital-formation_how_life-2017-table230-en

100. Osman, R. H., Alexiou, C., & Tsaliki, P. (2011). The role of institutions in economic development: Evidence from 27 Sub-Saharan African countries. *International Journal of Social Economics*, *39*(1), 142–160. https://doi.org/10.1108/03068291211188910

101. Osman, R. H., Alexiou, C., & Tsaliki, P. (2012). The role of institutions in economic development: Evidence from 27 Sub-Saharan African countries. *International journal of social Economics*.

102. Our work in Africa | UNEP - UN Environment Programme. (n.d.). Retrieved October 5, 2022, from https://www.unep.org/regions/africa/our-work-africa

103. Overseas Development Institute. (2016). What are the links between power, economic growth and job creation. Development Impact Evaluation, 1-30.

104. Raphaeli, N., Roumani, J., & MacKellar, A. (1984). Public sector management in Botswana: Lessons in pragmatism. The World Bank.

105. Robertson, D., & Symons, J. (2000). Factor residuals in SUR regressions: estimating panels allowing for cross sectional correlation (No. 473). Centre for Economic Performance, London School of Economics and Political Science.

106. Robinson, J. A., & Acemoglu, D. (2012). *Why nations fail: The origins of power, prosperity and poverty* (pp. 45-47). London: Profile.

107. Rodirk, D., & Subramanian, A. (2003). The primacy of institutions:(and what this does and does not mean). *Finance & development*, *40*(002).

108. Rodrik, D., & Chen, T. J. (1998). TFPG controversies, institutions and economic performance in East Asia. In *The Institutional Foundations of East Asian Economic Development* (pp. 79-105). Palgrave Macmillan, London.

109. Romer, P. M. (1990). Endogenous technological change. Journal of political Economy, 98(5, Part 2), S71-S102.

110. Sachs, J. D. (2003). Institutions don't rule: direct effects of geography on per capita income.

111. Sachs, J. D., & Warner, A. (1995). Natural resource abundance and economic growth.

112. Sachs, J. D., & Warner, A. M. (2001). The curse of natural resources. European economic review, 45(4-6), 827-838.

113. SAJOH, A. A. (2021). THE EFFECT OF HUMAN CAPITAL ON ECONOMIC GROWTH IN SOME SUB SAHARA AFRICAN COUNTRIES (SSA). *American Journal of Economics*, *5*(1), 1-24.

114. Samuelson, P., & Nordhouse, V. (2009). Economics: a textbook.

115. Seydou, M. (2021) Corruption, mistrust, and praise? Assessing governments' management of the COVID-19 pandemic in West Africa. (Dispatch No. 43). Afrobarometer.https://afrobarometer.org/sites/default/files/publications/Dispatches/ad4

39-covid_responses_earn_praise_highlight_challenges_for_w_african_govts-afrobarometer-8april21.pdf

116. Siddiqui, D. A., & Ahmed, Q. M. (2013). The effect of institutions on economic growth: A global analysis based on GMM dynamic panel estimation. *Structural Change and Economic Dynamics*, *24*(1), 18–33. https://doi.org/10.1016/j.strueco.2012.12.001

117. Siddiqui, D. A., & Ahmed, Q. M. (2013). The effect of institutions on economic growth: A global analysis based on GMM dynamic panel estimation. Structural Change and Economic Dynamics, 24, 18-33.

118. Siyakiya, P. (2017). The impact of institutional quality on economic performance: An empirical study of European union 28 and prospective member countries. *World journal of applied Economics*, *3*(2), 3-24.

119. Solow, Robert M. "A contribution to the theory of economic growth." *The quarterly journal of economics* 70.1 (1956): 65-94.

120. Solow, Robert M. "A contribution to the theory of economic growth." *The quarterly journal of economics* 70.1 (1956): 65-94.

121. Stavins, R. N. (1995). Transaction costs and tradeable permits. *Journal of environmental economics and management*, *29*(2), 133-148.

122. Sumanjeet. (2015). Institutions, transparency, and economic growth. Emerging Economy Studies, 1(2), 188-210.

123. Smith, A. (1776). An inquiry into the nature and causes of the wealth of nations: Volume One. London: printed for W. Strahan; and T. Cadell, 1776.

124. Tebaldi, E., & Elmslie, B. (2008). Institutions, Innovation And Economic Growth. Journal of Economic Development, 33(2), 27–53. https://ideas.repec.org/a/jed/journl/v33y2008i2p27-53.html

125. Tebaldi, E., & Mohan, R. (2008). Institutions-augmented Solow model and club convergence.

126. Tiba, S. (2019). Modeling the nexus between resources abundance and economic growth: An overview from the PSTR model. Resources policy, 64, 101503.

127. Wandeda, D. O., Masai, W., & Nyandemo, S. M. (2021). Institutional quality and economic growth: evidence from Sub-Saharan Africa countries. *African Journal of Economic Review*, *9*(4), 106-125.

128. Wigand, R. T. (2003). Electronic Commerce. *Encyclopedia of International Media and Communications*, 489–503. https://doi.org/10.1016/B0-12-387670-2/00077-7

129. Williamson, O. (1986). Transaction-cost economics: The governance of contractual relations. In J. Barney & W. Ouchi (Eds.), *Organizational economics* (pp. 98–129). San Francisco: Jossey-Bass.

130. Williamson, O. E. (2000). The new institutional economics: taking stock, looking ahead. *Journal of economic literature*, *38*(3), 595-61

131. Wooldridge, J. M. (2015). *Introductory econometrics: A modern approach*. Cengage learning.

132. World Bank (2020, March 31) Governance and Institutions Emergency Measures for State Continuity during COVID-19 Pandemic. Governance Global Practice. https://thedocs.worldbank.org/en/doc/333281587038822754-0090022020/original/GovernanceandInstitutionsduringCOVID.pdf

133. World Bank (2021, June 25). How will the role of government change after the pandemic? World Bank Blogs. https://blogs.worldbank.org/governance/how-will-role-government-change-after-pandemic

134. World Bank (2021, March 31). Amid Recession, Sub-Saharan Africa Poised for Recovery.https://www.worldbank.org/en/news/press-release/2021/03/31/amid-recession-sub-saharan-africa-poised-for-recovery

135. World Bank (2021, November). Assessing Africa's Policies and Institutions. Open Knowledge Repository. https://openknowledge.worldbank.org/handle/10986/36885

136. World Bank (2021, October 6). Climate Change Adaptation and Economic Transformation in Sub-Saharan Africa. Africa's Pulse. https://www.worldbank.org/en/region/afr/publication/africas-pulse

137. Zaria, Y. B. (2022). Causal analysis of trade openness, government expenditures and economic growth in Nigeria (1980-2020): Recalling economic policy corrective actions.

138. Barro, R. J., & Lee, J. W. (2013). A new data set of educational attainment in the world, 1950–2010. Journal of development economics, 104, 184-198.

139. Faminu, G. (2022, July 27). 80% of businesses in Africa fail within five years of establishment - report - Businessday NG. https://businessday.ng/uncategorized/article/80-of-businesses-in-africa-fail-within-five-years-of-establishment-report/

140. Akobeng, E. (2017). Gross capital formation, institutions and poverty in Sub-Saharan Africa. Journal of Economic Policy Reform, 20(2), 136-164.

141. Izvorski, I., Coulibaly, S., & Doumbia, D. (2018). Reinvigorating Growth in Resource-Rich Sub-Saharan Africa. Reinvigorating Growth in Resource-Rich Sub-Saharan Africa. https://doi.org/10.1596/30399

142. Our work in Africa | UNEP - UN Environment Programme. (n.d.). Retrieved November 27, 2022, from https://www.unep.org/regions/africa/our-work-africa

143. Siddiqui, D. A., & Ahmed, Q. M. (2013). The effect of institutions on economic growth: A global analysis based on GMM dynamic panel estimation. *Structural Change and Economic Dynamics*, *24*(1), 18–33. https://doi.org/10.1016/j.strueco.2012.12.001

144. World Bank (1997). World Development Report, 1997: the state in a changing world. Washington, DC.: The World Bank.

145. Ayee, J.R.A. (2005). 'Public Sector Management in Africa', African Development Bank Economic Research Working Paper, vol. 82 (November): 1–56.