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TOPIC:

INSTITUTIONS AND ECONOMIC GROWTH: EVIDENCE FROM SUB-SAHARAN AFRICA

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ABSTRACT

To provide the fundamental cause (s) of the growth problems of sub-Saharan African countries, this dissertation uses a panel of 39 sub-Saharan African countries from 2005-2009 to estimate the effect of institutions, geography, investment, population, gender equality and openness to foreign trade on economic performance. The results from the Arellano-Bond dynamic panel data estimator - two-step system generalised method of moments (GMM) provide robust findings as compared to results from ordinary least squares and least squares dummy variable estimation since the former is able to account for potential problems like autocorrelation or heteroskedasticity within panels, endogenous regressors, attenuation bias and the like whereas the latter estimators do not. For a given level of initial per capita GDP and these variables, output per worker is enhanced by higher level of transparency, accountability and corruption control in the public sector. Thus after controlling for the effect of these variables, sub-Saharan African countries are poor not necessarily because of low investment level, high population, gender inequality, geography or being more or less opened to international trade, but because of worse institutions. On a whole, this thesis provides robust evidence on the effect of institutions in the public sector on income per capitain the sub-region.

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I dedicate this thesis to my first child, Gerard SarfoAdusei and also to my lovely wife, Jennifer AnokyewaaAppiah for her love, support, advice, and words of encouragement she has shown to me. I also dedicate this thesis to my entire family for their love and care. Finally, I dedicate this dissertation to all my friends in Ghana and in the United Kingdom.

DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of the Kwame Nkrumah University of Science and Technology. The work is original except where indicated by special reference in the text and no part of the thesis has been submitted for any other degree.

Any views expressed in the thesis are those of the author and in no way represent those of the Kwame Nkrumah University of Science and Technology.

The thesis has not been presented to any other university for examination either in Ghana or Overseas.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Africais often described as the poorest part of the world despite the fact that it is also the continent that is well endowed with the world's natural resources. The abundance of natural resources in Africa is expected to boost growth but rather the continent has turned out to be a "natural resource-cursed" region.As emphasised by Ndulu and O'Connell (2008),the most commonly feature of growth experience in Africa after 1960 is the divergence of African incomes from incomes in other developing economies.However they noted that the divergence is not exclusively an African phenomenon (for example, consider Haiti or North Korea), and there are dramatic exceptions within the region.Notwithstanding some improvement in economic growth rates, poverty is still prevalent and in many parts of the continent enormously dire.

As compared to the rest of the world, Africa lags behind in terms of economic and social progress. The crucial challenge facing African economies is to reduce poverty through higher levels of economic growth. Basu, Calamitsis and Ghura (2000) argued that long-term, broad-based economic growth is necessary for Africa to increase incomes and reach its potential to become a significant trade and investment partner in the world economy.

Although Africa has historically had the slowest growth in the world, its performance is improving significantly, offering hope for the future. According to the United Nations (UN), Africa is currently enjoying robust economic growth and is exporting more food than ever through world trade and corporate investment alongside productivity improvement. A report by the International Monetary Fund(IMF) showed that, African countries have continued to sustainthe growth momentum of the 1990s, recording an overall real GDP growth rate of

5.8% in 2007. More than 30 sub-Saharan African (SSA)countries according to the IMF, recorded higher economic growth rates in 2007 than 2006; but these growth rates must be sustained and accelerated in order to have a significant impact on poverty and increase living standards. Overall, however, progress has remained relatively slow and hence reform efforts will need to be strengthened to accelerate growth and reduce poverty in SSA (Basu et. al., 2000).

Nevertheless, Basuet. al.(2000) stressed that the economic and social condition in SSA remains fragile and vulnerable to domestic and external shocks, and the region has a long way to go to make up for the ground lost over the past two decades. SSA countries therefore face major challenges. Key constraints to growth in the sub-region include inappropriate economic policies, poor human capital development, and low levels of private investment. There is the need to raise economic growth and reduce poverty. It is also essential for SSA countries to promote rule of law, political stability and reduce corruption and bureaucracy drastically to promote investment. As emphasised by Chang (2010) SSA's growth failure can also be attributed to ethnic diversity, poor institutions, "bad" culture and whatnot. Economic growth rates are still not high enough to make a real dent in the pervasive poverty and enable these countries to catch up with other developing nations. Public and private investment remains subdued, limiting efforts to diversify economic structures and boost growth. There is the need for governments in SSA countries to increase the quality and quantity of basic health care, education and other high-priority services which are consistent with economic development.

In line with this disappointing trend, a number of countries including Liberia, Sierra Leone and Rwanda have only recently emerged from civil wars that have severely set back their development efforts while, sadly, new armed and fuel conflicts have erupted in other parts of

the continent exacerbating poverty (Basu et. al., 2000). They noted that these conflicts and other adverse factors, particularly poor weather conditions and deterioration in the terms of trade, have led to some loss in economic momentum in the region over the past years.

Policies during the 1980's and 1990's in most SSA countries focussed on Structural Adjustment Programmes. These programmes were a combination of macroeconomic stabilization measures to restore domestic and external equilibrium, and structural changes in policies and institutions designed to make the economy more efficient and flexible, thereby increasing growth. For instance, between 1986 and 1991, the Structural Adjustment Programme was initiated in Ghana following some major problems that the Economic Recovery Programme brought to light. This programme was aimed at promoting growth and development after the economic decadence prior to 1983 (Aryeetey, Harrigan, and Machiko, 2000). Despite the fact that many SSA countries implemented Structural Adjustment Programmes, several others experienced economic disturbances because of war. Basuet. al.(2000) stated that what is needed is a sustained and substantial increase in real per capita GDP growth rates in these countries, coupled with significant improvements in social conditions.

Higher oil revenues and increased debt relief for most countries have been used to make progress toward reducing poverty in the sub-region.Most SSA countries after independence have given importance to public spending on health care, education and other economic and social services. Work byBasuet. al.(2000) emphasised that, these countries are moving from a more dictatorship form of governance to a more open and participatory forms of government that encourages the cooperation between the state and the civil society. They noted that to enhance economic efficiency, these countries have successfully reduced domestic and external financial imbalances that hinder growth.

This dissertation therefore presents a thorough investigation of both theoretical and empirical evidence on the many ways institutions in the public sector may matter for growth and development in SSA.

1.2 Statement of Problem

According to the UN as cited in Makwana (2007), many countries in SSA are not on track to achieve the internationally agreed target for halving extreme poverty by 2015. The concern is therefore the increasing slow rate by which the number of people living in extreme poverty is reducing. The dire failure according to the UN is not surprising given the inability of the World Trade Organisation to negotiate development-friendly trade rules and the financial burdens imposed on many African countries by the IMF and the World Bank.

The US State Department's 2010 report on human rights showed that corruption in Ghana permeates the public sector, regardless of the regulations in place to check it. The report cited the police and judicial officials for corruption, arguing that some judicial officials accept bribes to expedite or postpone cases whereas the police set-up barriers to extort money from motorists. As an evidence of judicial corruption, on August 30 2011, the Judicial Council in Ghana dismissed two magistrates, a female from the Juvenile Court in Accra and a male based at Berekum in the BrongAhafo region, for taken bribes from parties in cases they were presiding over following investigations into complaints by the parties in the respective cases. Similarly, in 2011, the president of Ghana accused custom officers for putting up structures within two years in office with monies he suspected to have been acquired illegally.

The fact still remains that most SSA countries have passed through series of political coups and revolution after independence. Corruption, mismanagement and unequal distribution of income in favour of the rich in most cases have been the main justification for this political unrest. However evidence of this “disease” still pertains even after the overthrow of the

sitting government through coups. Individuals who feel cheated always support revolution and coup d'états thereby allowing the country to pass through series of political instability. Series of political unrest in SSA has made the sub-region less attractive for private investment (both domestic and foreign investment, since most people lose their property during coups and revolution). Political instability together with corruption, mismanagement etc. has exacerbated the poverty situation in the sub-region thereby delaying growth.

In light of the persistence and prevalence of extreme poverty,many philosophers and social scientists have provided several theories to explain why Africa in general and SSA countries in particular have failed to grow up to expectation and reduce poverty. Whilesome scholars (e.g.,Bloom and Sachs, 1998; Diamond, 1997; Marshall, 1890;Montesquieu, 1748) have provided geographical reasons, others (e.g.,Acemoglu, 2005; Easterly and Levine, 1997) have provided culturereasons and institutional reasons (e.g.,Acemoglu, Johnson and Robinson, 2005) to explain the growth failure of Africa. A critical look at these theories will be dealt with in the next chapter.

Nonetheless the neoclassical growth model and the endogenous growth model or the new growth theory presents production functions that focus largely on steady states and rate of convergence between rich and poor countries (Abu-Qarn et al, 2007; Bernanke et al, 2001; Islam, 1995; Knight et al, 1993; Mankiw, Romer and Weil, 1992;Romer 2006; Temple 1995; Temple et al, 2007). Cross-country growth regressions based on these models largely ignore the importance of institutions, which is the main focus of this dissertation. No importance is given to the role played by institutions in determining economic growth and development of countries.

1.3 Objective of the Thesis

Based on the statement of problem outlined above, the objectives of this research include the following:

- To investigate the fundamental constraints to growth and poverty reduction in SSA.
- To provide answers towards poverty-reducing economic development.

1.4 Research Questions

The research seeks to answer the following questions:

- Why are SSA countries lagging behind the rest of the world in terms of economic growth and development?
- Why are SSA countries poor than other regions of the world?

1.5 Hypothesis

The research hypothesises that;

a) **H_0**: Controlling for the effect of 'economic growth variables', better institutions do not matter for growth in SSA.
b) **H_1:** Controlling for the effect of 'economic growth variables', better institutions matter for growth in SSA.
c) **H_0**: Controlling for the effect of institutions, 'economic growth variables' do not matter for growth in SSA.
d) **H_1:** Controlling for the effect of institutions, 'economic growth variables' matter for growth in SSA.

1.6 Significance ofthe Thesis

- The thesis will provide governments and policy makers on the many ways to promote economic progress.
- Theresults from the research will have strong policy implications.

1.7 Structure of the Thesis

The rest of this thesis is organised as follows. Chapter two looks at the theoretical and empirical reviews on why SSA countries have failed to grow. The theoretical review looks at the existing theories on why SSA countries have failed to grow up to expectations and the empirical review evaluates some of the existing empirical works on growth failure in SSA countries. The methodology adopted in bringing this thesis into light is presented in chapter three. This chapter will consider the sources of the data to be examined and the strategy used in obtaining the main results of the thesis. To investigate further, the growth model to be estimated is likewise dealt with under this chapter. The penultimate chapter, chapter four, will present the main results of this research. Chapter five will be the last chapter and will conclude the findings of the thesis along with possible recommendations for future research.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Theoretical Review

Lagging economic development in SSA has been attributed to many causes. This section of the thesis examines some possible theoretical causes that have been identified by some economists, social scientists and philosophers.

2.1.1 Economic Factors

Economic theory presents a number of factors that are likely to affect output per worker in an economy. This section of the thesis explains why SSA countries are poorer than other parts of the world based on economic reasons. Some of the factors to be considered are the theory of marginal propensity to consume, openness to trade, terms of trade and inflation.

According to economic theory, the marginal propensity to consume for the poor is higher than that of the rich. The analogy here is that the marginal propensity to consume in SSA is higher than that of their rich counterparts. People desire to consume a higher proportion of any increase in income relative to the proportion of additional income saved. Individuals therefore prefer earlier rather than later consumption and this reduces average saving rates and hence investment and in the process, a fall in output growth.

Nonetheless some economists argue that macroeconomic policies matters for growth.Openness to international trade is often believed to enhance a country's welfare, particularly developing countries. As argued by Agénor and Montel (2008), a standard measure of openness to trade is the share of trade in GDP; the sum of shares of exports and imports in GDP. By this measure, SSA economies are substantially more open to trade in goods and services than the rest of the world.

However SSA countries exports are mainly primary products whereas their imports are predominantly finished goods. They depend on the ratio of primary products prices and prices of finished goods. These primary products do not command high prices relative to finished goods on the world market as technical progress in manufacturing has tended to reduce demand for raw materials, (Dunn et. al., 2004). Agénor et al. (2008) explained that developing countries including SSA countries typically face exogenous terms of trade, that is, these countries have little control over the prices of the products they export and import. The end result is trade deficit and this affect economic progress. This however counters the arguments that openness to international trade by SSA economies promotes economic progress.

According to Dunn and Mutti (2004), demand for primary products tended not to be income elastic. They argued that beverages and foods markets have been threatened by Engel's law, which states that the income elasticity of demand for such products is less than one. Poor people spend a high proportion of their incomes on food, but this percentage steadily falls as incomes rise. According to them, this suggests that markets for beverages and food items do not expand as quickly as the world economy unless the income distribution shifts to lower income groups.

Moreover low level of inflation rate is associated with lower cost of borrowing and vice versa, ceteris paribus. The fall in interest rate encourages investors to borrow and invest and in the transition period leads to higher economic growth. Thus empirically, inflation and growth are correlated negatively. Interestingly most countries in the sub-region have failed to achieve low levels of inflation over the years to trigger off investment leading to economic progress.

There are two important schools of economic thought that attempt to explain the causes of inflation. According to the neo-classical economists whom Keynes confusingly labelled as 'classicals', inflation is caused by irresponsible governments creating too much money. According to the classical economists, the quantity theory of money shows how nominal value of aggregate income is determined. The quantity theory of money as expressed by Fisher's equation of exchange is MV=PY; where 'M' is money supply, 'P' is price level, 'Y' is aggregate output and 'V' is velocity of money, thus the average number of times money is spent in buying the total amount of goods and services. They noted that 'V' is fairly constant in the short-run. Since they believed that prices and wagesare flexible, the level of output (Y) produced during normal times would remain at full employment level suggesting that 'Y' is also constant in the short-run. This therefore implies that changes in money supply directly affect changes in the piece level and hence if M doubles, since 'V' and 'Y' are constant, 'P' also doubles. Thus according to the 'classicals', the quantity theory of money provides an explanation of movements in the price level.

However Keynes rejected the quantity theory of money as a theory to explain inflation. He believed that inflation is caused by excess demand over supply. An increase in aggregate demand in a situation of near full employment will result in excess demand in many individual markets, causing prices to rise. The increase in aggregate demand will result in an increase in demand for factors of production leading to a rise their prices. Thus these two price increase resulted from an increase in aggregate demand.

2.1.2 Non-Economic Factors

This section distinguishes four set of theories that tries to explain why SSA countries are poorer than the rest of the world. The first emphasises the importance of geography which influences economic outcomes by shaping economic incentives. The second looks at the

importance of culture and the third looks at institutions in shaping economic performances. The last theory focuses on 'luck' and argues that societies that are poor are just unlucky.

The idea that geography affects economic growth has a long history and has been advocated recently by Bloom and Sachs (1998), Sachs (2000), and others. These scholars have identified numerous geographical disadvantages to economic progress of countries in SSA.While some have argued that the natural environment in SSA nations encourages the spread of manydiseases, others believe that the climatic condition in the sub-region is less favourable to agriculture.Similarly whiles Collier and O'Connell (2008) argue that being landlocked may impact negatively on economic growth, Acemoglu and co-authors (2001) found that being a landlocked country is an insignificant determinant of economic performance.

According to Acemoglu et al. (2005) and Acemoglu (2001), the *geography hypothesis*emphasises the fact that the role of "nature" on the physical, geographical and ecological environment determine the pattern of economic growth. The idea is that poverty and sluggish growth in SSA is a direct consequence of geography. In their 1998 paper, Bloom and Sachs as cited in Romer (2006), emphasised that average incomes are much lower closer to the equator. They showed that countries within 39 degrees of the equator have lower incomes as compared to countries at more than 39 degrees of the equator. In Acemoglu et al. (2005), to understanding cross-country differences ineconomic performance, this hypothesis emphasises that differences in geography, climate and ecology determine both the preferences and the opportunity set of individual economic agents in different societies. They however noted three different versions of this hypothesis, each emphasizing a different mechanism of how geography affects growth.

First, they emphasised that climate may be a pertinent determinant of work effort, incentives, or even productivity. As cited in Acemoglu et al. (2005) and Acemoglu (2001), this argument dates back at least to the famous French philosopher, Montesquieu, 1748. He believed that climate was among the main determinant of the fate of countries. In particular, he was convinced that heat shaped human attitudes and work effort by making people lazy and hence unproductive and through this affected both economic and social outcomes. In his classic 1748 book 'The Spirit of the Laws', Montesquieu documented that in warm countries, people are unproductive describing them as 'old men' and 'timorous' whiles in cold countries, people are productive and hence 'vigorous', 'brave' and 'like young men'.

Espousing the idea of Montesquieu (1748) in explaining the effect of climate on growth, one of the founders of modern economics, Alfred Marshall,documented in his famous 1890 book, 'Principles of Economics' that the climate affected work effort which in one way or the other depends on race qualities.

Whereas the first version appears to be naïve and raw, the second version of the geography hypothesisAcemoglu et al. (2005) noted is that geography may determine the technology available to a society, especially in agriculture.This version seems more appropriate relative to the first version. As emphasised by Acemoglu (2001), geographic factors that can impact the growth process include soil quality, which can affect agricultural productivity and natural resources, which directly contribute to the wealth of a country and may facilitate industrialization by providingresources like coal and iron[1].

Myrdal (1968) as cited in Acemoglu et al (2005)provides evidence of how geography may influence growth via agriculture, arguing that the effect of climate on humans, animals and

[1]Acemoglu (2001) noted that geography-based explanations can easily be integrated into the Solow model. In terms of the production function of the Solow model, poor soil quality and unfavourable climatic conditions may represent a low level of A, thus, "inefficient technology", Acemoglu (2001).

the quality of soil and vegetation should be taken into consideration if one is studying the growth problems of developing countries.More recently, economists, such asJeffrey D. Sachs has been an influential advocate of the importance of geography in agricultural productivity, stating in his 2001 paper,'Tropical Underdevelopment' that agricultural technologies were less productive in the tropical-zone than in the temperate-zone at the start of modern growth.

It should however be noted that this version fails to recognise the importance of industrialisation in shaping economic progress. While the previous version of the geography hypothesis highlights low agricultural productivity (a result of 'unfavourable geography') as a reason for explaining the growth failures of countries, Acemoglu (2001) claim that the problem is not with unfavourable agricultural productivity. He argued that modern economic growth came with industry and it is the nations that have failed to industrialise that are poor today. He went on and explained further that low agricultural productivity, if anything, should create a comparative advantage in industry, and thus encourage those countries with the 'unfavourable geography' to start investing in industry before others. One can however counter this view and argue that investing in agriculture productivity can be a precondition for industrialisation. Nonetheless this seems not to work in SSA countries who have failed to industrialise even though the sub-region has achieved a certain level of agricultural productivity. According to these prominent figures, SSA countries are poor because the climatic condition in the sub-region serves as a deterrent to work-effort and incentives to invest which directly results in slow growth.

In addition Acemoglu et al. (2005)emphasised that the third version of the geography hypothesis, especially popular over the past decade, relates poverty in many areas of the world especially SSA to their "disease burden". This according to Acemoglu (2001) suggests that disease environment can affect productivity and incentives to accumulate physical and

human capital by affecting the health of the people. For instance, Bloom and Sachs (1998)as cited in Acemoglu et al. (2005) argued for a direct effect of climate on economic performance. They claimed that the prevalence of malaria, a disease which kills millions of children every year in SSA, reduces the annual growth rate of SSA economies by more than 1.3 percent a year. This according to them is a large effect, implying that had malaria been exterminated in 1950, income per capita in SSA would be double what it is today. Similarly Sachs (2000) espoused this view and noted that the cost imposed on individuals from the tropics by infectious disease is higher relative to the cost on people from temperate regions. The cost of this infectious disease is poor health which makes individuals less productive and translates into slow growth.

If on the other hand other diseases are included, the effect would even be larger. According to a report by the World Health Organisation as cited in Acemoglu (2001), in SSA, Asia and other areas of extreme poverty, poor health has a negative effect on growth and improving access to health care could save millions of individuals and reduce poverty thereby promoting economic development.

This version of the geography hypothesis seems more reasonable than the previous ones discussed since economic theory shows that unhealthy individuals are less productive and less able to learn than healthy ones. As emphasised by Acemoglu (2001, p. 134), extreme poverty in poor nations makes the cost of diseases much heavier in these countries.

It should however be emphasised that one should be careful in explaining the 'disease burden' as a causal effect since economic development or growth can enable a country to eradicate these diseases. Acemoglu (2001) espoused this view and argued that the failure of many poor countries to develop economically has resulted in unhealthy environments in those countries.

While the geography theories emphasises the role of "nature" in shaping the economic progress of countries, an alternative is to focus on the role of culture in influencing economic development. Acemoglu et al. (2005) discussed the role of culture in determining economic performance. They noted that different societies, races or ethnic groups have diverse cultures, because of different shared experiences or different religions. They argued that culture is viewed as a key determinant of the values, preferences and beliefs of individuals in societies and these differences play a key role in shaping economic performance. Easterly and Levine (1997) for example argue that countries with larger ethnic diversity have lower social infrastructure. As emphasised by Acemoglu (2001), culture may affect the degree of cooperation among individuals which together with trust are often imperative foundations for productive activities in societies.

Moreover Eijk (2010) noted that one possible constraint to economic development in SSA which is almost neglected in formal literature is the prevailing work ethics in SSA. The work ethic according to him is a crucial component of human behaviour and relates to the process of disciplining to labour. SSA countries are facing many ethical challenges that seriously compromise the development of the sub-region. Poor work ethics has contributed to wasteful inefficiencies. Some of these challenges or bad habits include poor customer services, lateness to work[2], diversion of business resources for private gain, underperformance especially in the public sector, lack of urgency in retorting to queries, among others. All these are constraints to the economic development and tend to aggravate the growth problems of the sub-region. In addition, primitive cultures and negative cultural beliefs are still being held unto in many parts of the sub-region. Although a number of countries in SSA are promoting the involvement of women in various aspects of national development, the fact still remains

[2]Most of these individuals prefer to work less but expect greater results.

that a number of tribes in the sub-region still adhere to limiting the role of women in national development and this reduces average productivity.

Nonetheless one of the factors affecting cross-country income differences and economic success that is highlighted by Acemoglu (2001) is the "luck" hypothesis. The 'luck' hypothesis according to him,proposes that e.g., SSA countries are poor because they are just 'unlucky' in achieving economic success. This therefore implies that even though these countries are trying hard enough in achieving economic growth, economic performances are still not appreciable because of 'bad luck'. Policies that promote growth in other developing countries seem not to work in the sub-region.

An alternative theory to explain why SSA countries are poor is the theory of institutions. A major problem is how to define what institutions are. North (1990) as cited in Acemoglu et al. (2005) and Acemoglu (2001) proposedthat institutions are man-made constraints that affect human interaction and the process of economic development.

Whilethe geography, culture and the luck theories are *social choices*,the institution hypothesis according to Acemoglu et al. (2005) is based on the notion that it is the way that human beings themselves decide to organise their societies that determines whether or not they prosper.Thus for instance whereas geography and luck are out of the control of human beings, institutions are not. Whiles some institutionsencourage incentive to innovate, take risks and invest, others do not. The institution hypothesis therefore emphasises the role of rule of law, property right enforcement, checks against government power among others in shaping economic incentives. Thus Acemoglu et al. (2005) and Acemoglu (2001) all claimed that institutions play a vital role in the economic performances of countries.

Countries are economically prosperous when they have 'good' economic institutions and it is these institutions that are the causeof prosperity, Acemoglu et al. (2005). Without good institutions, individuals will have less incentive to invest in human and physical capital. Institutions tend to be poor in most parts of SSA and this supresses the economic growth we all expect in the sub-region. One would therefore wonder why individuals in a country would support bad or poor institutions that retard economic progress. According to the 'social conflict view' bad institutions arise because individuals with political power benefit from bad institutions. Groups with political power who want to amass wealth in the future would not prefer to set-up good institutions that enforce property right protection and rule of law since setting-up good institutions reduces their future gains. This is particularly the case of SSA countries.

However it is tempting for one to argue that 'good' institutions causes prosperity. It should be noted that there could be reverse causality where prosperity or growth may lead to 'good' institutions. Thus a country would prefer to set-up better institutions that enforce property right protection if that country is prosperous. There could also be the problem of omitted variable bias where omitted factors maycorrelate with institutions and or growth.[3] Estimating such a relationship between growth and institutions by Ordinary Least Squares could lead to the problem of endogeneity resulting in biased regression coefficients.

2.1.3 The Link between Growth and Transparency, Accountability and Corruption

Acemoglu, Johnson and Robinson (2001, 2005) argued that malfunctions in government institutions present a severe obstacle to investment and innovation. Lack of transparency in the public sector may mean that government projects, decisions or actions may not be known to the public and as such public officials cannot be held accountable for misuse of resource,

[3]Acemoglu (2001) noted that European settler mortality rates may correlate with initial institutions and hence current institutions and through this affect economic performances.

financial impropriety, abuse of office and whatnot. This would therefore lead to poor economic and social infrastructure provided and this may slow down the process of investment and innovations, thereby lowering economic growth.

Corruption indirectly impedes growth through its adverse effects on investment in physical capital, human capital and political instability. Lack of transparency, accountability and corruption in the public sector threatens democracy and the economic, social and political benefits attributed to it. Most of the coup d'états that happened in many sub-Saharan Africa after independence was in the pretext of perceived high level of corruption in the public sector. Corruption in the public sector erodes property rights and may reduce incentive to invest, innovate and obtain foreign technology. North (1990) as cited in Mauro (1995) emphasised the importance of efficient judicial system to enforce contracts as a key determinant of economic performance. Similarly Murphy, Shleifer and Vishny (1991), argue that corruption causes the reallocation of talent away from entrepreneurial activities towards inefficient and unproductive rent-seeking activities, as the most talented people compete for the greatest payoffs available within the economy.

However Leff (1994) and Huntington (1968) as cited in Mauro (1995) argued that corruption has a potential to improve efficiency and foster growth by 'speeding money' to enable individuals avoid bureaucratic delays and also government services would be efficiently provided since public officials who receive bribes and view bribes as a piece-rate would work harder. Myrdal(1968) believes differently and argues that instead of speeding up procedures, corrupt public officials in order to attract more bribes actually have an incentive to cause greater administrative delays.

To recapitulate this section, it should be noted that if the four theories to explain why SSA countries are poor relative to the rest of the world were to work in favour of the sub-region, poverty and growth disasters will be a thing of the past.

2.2 Empirical Review

In this section,the focus is on some of the empirical evidence to explain the growth failures of SSA countries. According to a report issued by UNESCO in 2001, the literacy rate in Africa alone is less than 60 percent and in SSA since 1980, primary school enrolment has fallen from 58 percent to 50 percent. These figures are alarming and therefore there is the need to promote policies that will provide easy access to education for all. Similarly inflation rate has been high over the years in most parts of the sub-region and this has partly contributed to the low level of investment in the sub-region. For instance Zimbabwe is the first country in the 21st century to experience hyperinflation with an inflation rate of 79,600,000,000% in Mid-November 2008 and this figure is second to Hungary'sJuly 1946 world record of 1.30*10^16% for hyperinflation, Hanke (2009). He noted that the main cause of the hyperinflation in Zimbabwe was the massive and rapid increase in the amount of money without a corresponding increase in output growth.

2.2.1 Global

One of the most important papers on economic growth that is worth reviewing is Knight et al. (1993). By extending the work of Mankiw et al. (1992) to incorporate the level of openness and the stock of government fixed investment, they tested the conditional convergence hypothesis of the Solow model using panel data approach. They defined openness as 'closedness' of the domestic economy to foreign trade through tariff rates. Therefore the larger the value of this variable, the less open is the country to international trade. They had two sets of samples; one involving all the countries in the sample and the other for

developing countries only. They found evidence of conditional convergence as proposed by the Solow model. They also found a negative impact of openness on output growth but the effect was larger for developing countries than the other sample involving the entire countries. Similarly they found a positive impact of government fixed investment on growth with the effect being larger for developing countries. Their results support the arguments that international trade tend to promote economic growth in developing countries. Their results also suggest that government's role in terms of promoting growth and development is important in developing countries.

Nonetheless among the four theories, the institution hypothesis seems to be a primary determinant of economic fortunes in SSA economies, Acemoglu (2001).However, it should be noted that this does not imply that only institutions matter and the other theories are not. He noted that the four fundamental causes are possibly complementary. He went on and argued that empirical evidence suggests that institutions are the most pertinent one among these four causes, but does not deny the potential role of other factors, such as cultural influences.

Acemoglu et al (2005) studied the effects of institution on economic growth in a number of countries across the globe. They examined a bivariate relationship between the log of GDP per worker in 1995 and a broad measure of property rights, 'protection against expropriation risk' as a proxy for institutions which they averaged it over the period 1985-1995. Following in the foot-steps ofAcemoglu et al. (2001, 2002),Hall and Jones (1999) and Knack and Keefer (1995), they obtained their data on the proxy for economic institutions from Political Risk Service, a private company which assesses the expropriation risk that foreign investments face in different economies.

Although the data are imperfect measure of economic institutions[4], they found robust findings to using other available measures of economic institutions. Their findings revealed that countries with more secure property rights (better economic institutions) enjoyed higher average incomes than countries that had insecure property rights and hence countries with lower average incomes were mostly developing countries, particularly SSA countries.

Furthermore the fact that geography affected growth according to the geography hypothesis also motivated Acemoglu et al. (2005)to examine the relationship between latitude and income per capita. They found a positive association between latitude and income per capita, thus countries closer to the equator have lower average incomes as compared to those that are farther way from the equator. This result is consistent with the scholars who championed the geography hypothesis and Montesquieu's idea that warm climate makes people lazy and hence unproductive thereby affecting growth negatively.

It is important to note that this result implies that there is an omitted variable, geography, which explains both institutions and economic performance. Ignoring this would lead to mistaken conclusions. Hence as noted earlier, one should not be tempted to explain the correlation between institutions and economic prosperity or the correlationbetween geography and prosperity as something causal.To deal with a challenge of this type, Hall and Jones (1999) as cited in Acemoglu et al (2001), used distance from the equator as an instrument for social infrastructure since they believed latitude is correlated with 'Western influence' which leads to good institutions. One might not agree with Hall and Jones (1999) on this issue because as Acemoglu et al (2001) documented one cannot argue that the influence of the Western world in the Gold Coast and that of Belgium in the Congo during

[4] The data according to Acemoglu (2001) show how secure property rights are and these are based on the subjective assessments of some analysts. However the data emphasise the security of property rights which has important effect on economic incentives, Acemoglu (2001). For instance Acemoglu (2001) showed that the data reflect the 'market assessment' of property rights security since they are purchased by businessmen anticipating investment in different countries.

the slavery era promoted better institutions. A plausible solution to overcome the challenge of these 'identification problems' is of interest to this thesis.

Moreover Acemoglu et al. (2001) showed that the form of colonisation strategy adopted by the Europeans between the sixteenth and nineteenth centuries in most parts of SSA affected economic institutionswhich persisted till today. The Europeans were more likely to introduce or maintain institutions that facilitated the extraction of resources in countries they would benefit fromsuch extractions, Acemoglu et al. (2005). More so Acemoglu et al. (2001) argued that in countries where the Europeans faced high mortality rates[5] were areas they were unwilling to settle and as a result were more likely to set-up *extractive* form of colonisation which did not provide room for secure property rights and were detrimental to investment and economic progress.

Furthermore Acemoglu et al. (2001) hypothesised that European settler mortality rates (mostly caused by malaria and yellow fever) determined early European settlement which was a major determinant of early institution. They however argued that early institutions persisted and formed the basis of current economic institutions and this affected current economic performance. The extractive form of colonisation persisted to the presentin most SSA after independence since switchingto good institutions that protect and enforce property rights and provide checks against government power is relatively costly

Empirically, Acemoglu et al. (2001) examined the relationship between the log of GDP per capita in 1995 against the log of settler mortality rates per thousand for a sample of 75 countries. They obtained their data on settler mortality rates from mortality rates of soldiers,

[5]Curtin (1964) as cited in Acemoglu et al (2001), noted that in West Africa, early British expectations for settlement there were affected by very high mortality among early settlers; about half of whom could be expected to die in the first year. He however documented that 72 percent of the European settlers died in the first year of the Sierra Leone Company (1792-1793). Similarly,European mortality in the first year was 46 percent in the "Province of Freedom" (Sierra Leone), whiles on Mungo Park's Second Expedition (May-November 1805), 87 percent of Europeans died during the overland trip from Gambia to the Niger, and all the Europeans died before completing the expedition. [Acemoglu et al (2001, pp. 1373-1374)]

bishops, and sailors stationed in the colonies between the seventeenth and nineteenth centuries. Their data was based on the work of the historian Philip D. Curtin. They found a robust negative association between these variables. They concluded that colonies where Europeans face higher mortality rates, mostly SSA are today substantially poor relative to countries where they were healthy, e.g., Australia and United States of America. This relationship according to them shows the effect of early European settler mortally rate working via early institutions by Europeans. Thus European settler mortality rates have no direct effect on current income per capita except through institutional development.

In addition to their contribution to economic growth, Acemoglu et al. (2001) regressed current economic performance (log GDP per capita in 1995) on current institution (protection against expropriation risk averaged over the period 1985-1995), latitude and continental dummies which included Africa, Asia and 'other' continent with America as the omitted group. They obtained their data on protection against 'risk of expropriation' index as a proxy for current institution from the Political Risk Services. To deal with the possibility of endogeneity problem, they instrumented the endogenous variable, current institution by setter mortality rates. They found a robust negative relationship between settler mortality rates and current institutions.The corresponding two-stage least square estimates showed a highly significant impact of the effect of current institution on current economic performance. They showed that countries with good institution experienced better economic outcomes. Their results showed that neither distance from the equator (latitude)nor the dummy for Africa was significant after controlling for the effect of institutions on economic growth. The fact that the latitude variable is an insignificant determinant of economic performances goes contrary to what the proponents of the geography hypothesis emphasised. This result therefore means that Africa is poorer than the rest of the world because of worse institutions and not because of geographical or cultural factors.

2.2.2 Africa

Another most influential empirical paper to investigate the growth problems in Africa in general and SSA economies in particular is Fosu (2008).Whiles Acemoglu et al. (2001, 2005) traced the poverty situations or the growth problems of SSA countries back to the colonial era, Fosu (2008) argued that the choice of economic policies adopted and the series of political instabilitiesparticularly after independencein most parts of SSA in one way or the other has contributed to the growth problems of the sub-region.

In his paper, he noted that many SSA governments pursued *adverse redistribution*either based on ethnicity or to reward their cronies or regional constituencies, and this affected economic progress especially when such polarisation increased at a high rate.As an illustrative example, he noted that a redistributive policy occurred in Burundi over the period 1975-1987 when the Tutsi-dominated government formed a large number of public corporations that distributed rents to members of their political elite. He explained that in order to maintain political control, this policy coupled with political repression by the army-led Tutsi was in the pretext of the perceived fear of domination in a general democratic contestation by the majority Hutus who massacred the Tutsi minority in 1972.

To add to these, Fosu (2008) argued that some SSA governments especially those from resource-rich countries after independence embarked on state spending to undertake certain projects from a windfall in temporary public revenues from increases in prices of exports. He added that it often became necessary for these countries to borrow in order to reach spending targets, which often resulted in large fiscal deficits. As cited in Fosu (2008), the AfricanEconomic Research Consortium (AERC) referred to this situation as *Intertemporally Unsustainable Spending.* As an example, he explained that public investment in Togo increased from 13.4 percent in 1973 to 47 percent by late 1970's as the price of phosphate

boom in 1974 and 1975 and coffee prices rose in 1977 producing a temporally windfall in public revenues. According to him, as the markets of phosphate and coffee busted and government expenditure increased, the government was propelled to increase external borrowings which resulted in increase in external debt from 15.1 percent of GDP in 1970 to 116.4 percent in 1978.

Nonetheless Fosu (2008) emphasised that *state breakdown*, thus, when law and order collapse and the government is unable to perform its functions and duties as expected, usually emanates from civil wars and high frequencies of coups and counter-coups and it is one of the main contributors of the growth problems of the sub-region. As an illustrative example he noted that the period 1979-1984 in Chad can be described as*state breakdown*. He emphasised that the government after independence in 1960 failed to share the wealth in the south satisfactorily with the north and this led initially to a rebellion in the North and later to a civil war in 1979 which lasted until 1984. He went on and argued that the South were severely suppressed politically by the North after the civil war ended formally in 1984 and this led to post-war acute political instability.

This section of the thesis has examined some of the most influential arguments on the growth problems of SSA countries. Whiles Acemoglu (2001, 2005) emphasised that earlier institutions persisted and affected current economic performance of SSA countries,Fosu (2008) traced the growth problems of the sub-region to the choice of economic policies adopted and series of political instabilities after independence. SSA has long suffered from political instability and this partly contributes to the low level of investment in the sub-region. However arguments from Fosu (2008)are indirectly in line with Acemoglu (2001, 2005) idea of institutions shaping the economic performances of countries since the three economic syndromes analysed in Fosu (2008) are as a result of no accountability on the part

of the government to the people, no checks against government power, no protection or enforcement of property rights and many others in these countries. Avoiding such economic syndromes and sticking to better economic institutions can go a long way of preventing growth problems and promoting sustainable growth and development in the sub-region.

It is important to note that none of the papers analysed above have sought to provide the fundamental cause (s) of the growth problems of sub-Saharan African countries. This thesis will provide the fundamental cause (s) of the growth failures of the sub-region by consideringinstitutions and other variables that are usually believed to affect economic outcomes in sub-Saharan Africa.

CHAPTER THREE

3.0 EMPIRICAL METHODOLOGY

To begin with, an attempt to estimate the model using the Ordinary Least Squares (OLS) Estimator will be considered. To compare results from the OLS regressions with a more powerful estimator that can handle the problem of omitted variable bias, the model will be estimated again using the Least Squares Dummy Variable (LSDV) estimator. Finally in order to account for potential endogenous regressors, autocorrelation and heteroskedasticity within individuals, fixed effects and the like, which may affect the model and to compare results, the Arellano-Bond linear dynamic panel-data generalised method of moments (GMM) estimation procedure will be adopted.

3.1 The Model (OLS)

Consider the following model: $\ln Y_{it} = \alpha + \beta \ln Y_{i,t-1} + \gamma \ln X_{it} + \ln Z'_{it} \rho + \phi D_{it} + v_{it}$. The equation above is a dynamic panel data model to be estimated by OLS, where $\ln Y_{it}$ is the log of per capita GDP in country i at time t and $\ln Y_{i,t-1}$ is its lagged value. The variable $\ln X_{it}$ is thelog of transparency, accountability, and corruption in the public sector rating in country i at time t and $\ln Z'_{it}$ is a vector of other covariates that may affect output per worker and include investment, openness, population and gender equality rating. The variable D_{it} is a dummy variable equal to one if a country is a landlocked country and equal to zero if otherwise. The random error term in this case is represented by v_{it} which consists of two components: the unobserved individual-level effects or the fixed effects, u_i, and the observation-specific errors or the idiosyncratic shocks, ε_{it}.

The coefficientof the lagged dependent variable should possibly be positive but below 1.00 since any figure above this would signify an unstable dynamic, with accelerating divergence away from equilibrium values. The third coefficient indicates that efficient institutions lead to higher economic performance. The estimate of investment is positive if investment impacts positively on income per capita. Again the coefficient of openness is expected to be positive, meaning that greater openness to international trade raises the level of income per capita. The coefficient of population is expected to be negative meaning that population increase impacts negatively on income per capita, according to the Solow model. Similarly, the coefficient of gender equality rating is expected to be positive signifying that promoting equal access for men and women in policy making, health, education and protection under the lawleads to higher income per capita. Lastly the coefficient of the dummy for being landlocked is expected to be negative,supporting the notion that unfavourable geography affects income per capita negatively.

3.2 The Model (LSDV)

If for instance any of the economic factors discussed earlier under the previous chapter is unobserved, but correlated with any of the regressors, then the least squares estimators will be biased and inconsistent as a result of omitted variable bias. To deal with this, the following model will be estimated using the least square dummy variable in order to allow for individual and time effect. The second model to be estimated is:

$$\ln Y_{it} = u_i + \beta \ln Y_{i,t-1} + \gamma \ln X_{it} + \ln Z'_{it}\,\rho + \phi D_{it} + \psi_t + \varepsilon_{it}$$

Where u_i allows for individual effects and ψ_t allows for time specific effects. This formulation assumes that differences across countries can be captured in differences in the constant term and also differences across time can be captured in differences across ψ_t. Thus u_i and ψ_t are each treated as unknown parameter to be estimated.

A key assumption for the OLS estimator to be a consistent estimator is that the regressors are *exogenous*, implying that they are not correlated with the error term. When this is violated, theregressors are *endogenous.* An immediate concern that arises in estimating this empirical problem by OLS is that the fixed effects in the error term is correlated with $\ln Y_{i,t-1}$, and this according to Nickell (1981) as cited in Roodman (2006) gives rise to "dynamic panel bias". To verify this, consider a case in which a country experiences a large negative shock in its income per capita in say, 2005 for some reason not modelled so that it appears in the error term. The country's fixed effects would be affected negatively, all things being equal. Thus in 2006, lagged per capita income and the fixed effects will both be negatively affected. With this direct association between the lagged dependent variable and the fixed effects, the assumption necessary for the OLS to be consistent is violated and in particular the estimate of the lagged dependent variable is biased upwards since predictive power is attributed to it even though it actually belongs to the fixed effects.

An intuitive way to work around this endogeneity problem is the use of the Least Squares Dummy Variables (LSDV) estimator to draw them out of the error term by entering dummies for each individual and time.

3.3 The Model (System GMM)

According to Arellano and Bond (1991), the model in 3.1 can be estimated by the difference GMM estimator**.** However according to Arellano and Bover (1995), Blundell and Bond (1998) and Roodman (2006), a particular problem with the original Arellano-Bond (1991) estimator (difference GMM estimator) is that sometimes the lagged levels of the independent variables may be poor instruments for the first-differenced regressors if the variables are close to a random walk. They showed that more instruments can be obtained to increase

efficiency if the original equation in levels is added to the system. Thus they argued for the use of the system GMM estimator[6] which uses theOLS model to obtain a system of two equations; one differenced and one in the levels. The differenced equation is:

$$\ln Y_{it} - \ln Y_{i,t-1} = \beta(\ln Y_{i,t-1} - \ln Y_{i,t-2}) + \gamma(\ln X_{it} - \ln X_{i,t-1}) + (\ln Z_{it} - \ln Z_{i,t-1})'\rho + \phi(D_{it} - D_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1})$$
$$\Rightarrow \Delta \ln Y_{it} = \beta \Delta \ln Y_{i,t-1} + \gamma \Delta \ln X_{it} + \Delta \ln Z_{it}'\rho + \phi \Delta D_{it} + \Delta \varepsilon_{it}$$

and the levels equation is:

$$\ln Y_{it} = \alpha + \beta \ln Y_{i,t-1} + \gamma \ln X_{it} + \ln Z'_{it}\rho + \phi D_{it} + v_{it}$$

They noted that in the original equation in levels, variables in levels are instrumented with suitable lags of their own first differences. They however emphasised that the assumption required is these first differences are uncorrelated with the unobserved individual-level effects. This therefore means that the constant term is not differenced out once the equation in the levels is included.

As cited in Roodman (2006), Kiviet (1995) explained that applying LSDV to a model of this kind is an easy way to handle dynamic panel bias even though it only works for balanced panels and does not account for the potential endogeneity of other regressors. Aside this potential source of omitted variable bias, one should be careful not interpret these relationships as causal. For instance, rich countries may be able to afford, or possibly prefer, better institutions. Thus because causality may run in both directions – from institutions to income per capita and vice versa – these regressors may be correlated with the error term. Moreover the presence of the lagged dependent variable gives rise to autocorrelation. Disregarding the problem of autocorrelation inflates the accuracy or precision of the estimators. Thus the standard errors are underestimated, for example. Also estimating the model in the presence of autocorrelation is likely to underestimate the true error variance resulting in overestimated R^2 and hence overestimated $\overline{R}^2$. This therefore leads to misleading

[6] The augmented version, system GMM estimator, was fully developed by Blundell and bond (1998).

conclusions about the statistical significance of the estimates since the t and F tests are no longer valid.

The system GMM estimator is designed to eliminate these sources of trouble. According to Roodman (2006), the estimator is designed to account for situations with 1) a linear functional relationship; 2) few time periods and many individuals; 3) autocorrelation and heteroskedasticity within individuals but not across them; 4) fixed individual effects; 5) a single left-hand-side variable that is dynamic; 6) independent variables that are correlated with the error. For the system GMM estimator, the only instruments available are internal and do not allow the inclusion of external instruments, thus they are obtained from the equation in levels.The system GMM reports the Sargan test of overriding restrictions of whether the instruments as a group are exogenous. Also the system GMM reports the Arellano-Bond test for autocorrelation, which is applied to the differenced residuals. To deal with autocorrelation resulting from the presence of the lagged dependent variable, the first-differenced lagged dependent variable is instrumented with its past levels.

However the null hypothesis of no autocorrelation is usually rejected in the test for first-order autoregressive scheme (AR (1)) in first-difference but this is expected since $\Delta \ln \varepsilon_{it} = \ln \varepsilon_{it} - \ln \varepsilon_{i,t-1}$ and $\Delta \ln \varepsilon_{i,t-1} = \ln \varepsilon_{i,t-1} - \ln \varepsilon_{i,t-2}$ should correlate because both have $\ln \varepsilon_{i,t-1}$. The test for AR (1) in levels can be obtained by referring to AR (2) in differences, on the knowledge that this will identify the relationship between $\ln \varepsilon_{i,t-1}$ in $\Delta \ln \varepsilon_{it} = \ln \varepsilon_{it} - \ln \varepsilon_{i,t-1}$ and the $\ln \varepsilon_{i,t-2}$ in $\Delta \ln \varepsilon_{i,t-2} = \ln \varepsilon_{i,t-2} - \ln \varepsilon_{i,t-3}$.

Nevertheless the system GMM estimator deals with the problem of fixed effects or omitted variables by transforming the model by first-difference to remove the fixed effects. Even though the fixed effects are removed, the lagged dependent variable will still be potentially

endogenous since the $\ln Y_{i,t-1}$ in $\Delta \ln Y_{i,t-1} = \ln Y_{i,t-1} - \ln Y_{i,t-2}$ is correlated with $\ln \varepsilon_{i,t-1}$ in $\Delta \ln \varepsilon_{it} = \ln \varepsilon_{it} - \ln \varepsilon_{i,t-1}$. Thus $\Delta \ln Y_{i,t-1}$ is now endogenous to $\Delta \ln \varepsilon_{it}$. The system GMM deals with this by instrumenting $\Delta \ln Y_{i,t-1}$ with deeper lagged levels of it. Similarly, this dissertation considers a panel of 39 SSA countries for 5 years. As noted earlier, the system GMM estimator is designed for few time period and many individuals. If the time period were large, a shock to a country's fixed effect, which shows in the error term, will dwindle or decline with time and so would the endogeneity problem. To deal with heteroskedasticity, the Windmeijer-corrected standard errors from the two-step system GMM also provide efficient standard errors that are robust to panel-specific autocorrelation and heteroskedasticity.

3.4 Sources of Data and Sample

This dissertation considers a panel dataset of 48SSA countries for 5 years (2005-2009). However the sample size reduces to 195 observations as nine of these countries do not have reported data on the measure of institutions.[7]The data onreal GDP per capita computed using Chain series, investment, population and openness are obtained from Penn World Table (PWT) version 7.0 constructed by Aten, Heston and Summers in March 2011. Their dataset include 189 countries from 1950-2009 with 2005 as the reference year. The openness variable is a measure of total trade, thus, exports plus imports, as a percentage of GDP. That is the larger the value of this variable, the 'more open' is the domestic economy to foreign trade and vice versa, all else equal.

Furthermore the data on the proxy for institutions, transparency, accountability, and corruption in the public sector rating is obtained from the World Bank Group, Country Policy and Institutional Assessment (CPIA) database. The dataset covers the period 2005-2009.

[7] The countries dropped are Botswana, Equatorial Guinea, Gabon, Mauritius, Namibia, Seychelles,Somalia, South Africa and Swaziland.

CPIA reports a value between 1 and 6 for each country and year, with 1 corresponding to low level of transparency and accountability and high level of corruption in the public sector and 6 corresponding to highlevel of transparency and accountability and low level of corruption in the public sector.This measure is appropriate for the purpose of this thesis since it gives differences in institutions originating from different countries and also provides a measure of institutional performances across countries.

The notion of worse institution should correspond to a low value of this index, whiles better institution should correspond to high values. CPIA explained that transparency, accountability, and corruption in the public sector assesses the extent to which the electorates, legislature and the judiciary have access to information on public affairs and can hold the executive and public employees within the executive accountable for their administrative decisions, use of resource, performances and results obtained.

Moreover transparency in simple language may imply communication, openness and no room for privacy. Thus transparency within the public sector exists whengovernment actions, financial statements, budgets, laws, rules, decisions and all information within the government are opened to the general public and press discussions and may be freely reviewed by anyone. That is transparency within the public sector impliesless opportunity for public officials to abuse power in their own interest.

Similarly accountability may be referred to as liability, responsibility, answerability or blameworthiness or simply, account-giving.Accountability within the public sector is therefore the acknowledgment and assumption of responsibility for actions and decisions. It involves the obligation to report, explain and be answerable for actions and to suffer punishment in the case of eventual misconduct. Accountability in the public sector provides checks against the power of public officials.

Also corruption in the public sector refers to the misuse of legislated powers by public officials for private gain. Corruption may include bribery, embezzlement or extortion. Corruption hinders the efficiency of public services and undermines the confidence or trust in government or public institutions thereby escalating the cost of public transactions. Corruption therefore undermines economic progress by reduces transparency and accountability within the public sector.

Moreover data on gender equality is obtained from CIPA with the same rating as that of the proxy for institution. According to the CPIA, gender equality assesses the extent to which policies and laws within a country promote equal access for men and women in policy making, health, education and protection under the law.

CHAPTER FOUR

4.0 ANALYSIS OF RESULTS

Table 4.1 below provides descriptive statistics for the key variables of interest. The variables are real GDP per capita, transparency, accountability and corruption in the public sector rating, gender equality rating, population, openness, investment and dummy for being landlocked. Information on the mean, standard deviation, minimum and maximum values of these variables are given in this table. Although the data on transparency, accountability and corruption in the public sector rating and gender equality rating are measured on a scale of 1 to 6, the table shows that none of the countries is rated more than 4.5. However the minimum value for transparency, accountability and corruption in the public sector rating is 1 whereas that of gender equality index is 2. The mean and standard deviation for transparency, accountability and corruption in the public sector rating are 2.753927 and 0.6506457 respectively. Similarly, the mean and standard deviation for gender equality rating are 3.217277 and 0.5293143 respectively.

TABLE 4.1 - DESCRIPTIVE STATISTICS

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Real GDP per capita	240	2812.58	4639.565	135.9534	26676.85
Transparency, accountability and corruption in the public sector rating	191	2.753927	0.6506457	1	4.5
Openness	240	80.08076	44.67776	1.774683	251.7523
Investment	240	5400000	13100006859604	9740000	
Population	24016470.14		25077.82	83.886	149229
Gender equality rating	1913.217277		0.5293143	2	4.5
Dummy for being landlocked	2400.3125		0.4644811	0	1

The measure for institutions, transparency, accountability and corruption control in the public sector covers the period 2005-2009 and is from the World Bank Group, Country Policy and Institutional Assessment (CPIA) database and is measured on a scale of 1 to 6, where a higher score means better institutions; gender equality rating is also from the CPIA and is measured on that same scale where higher score implies better gender equality; dummy for being landlocked is the measure of geography and is equal to 1 if a country is landlocked and 0 otherwise; the other variables come from Penn-World Table 7.0 constructed byAten, Heston and Summers in March 2011.

Source: Author's field work

Moreover over the period 2005-2009, the minimum and maximum values for real GDP per capita is 135.9534 and 26676.85 respectively whilst the mean and the standard deviation are 2812.58 and 4639.565 respectively. For the openness variable, the results show minimum and maximum values of 1.774683 and 251.7523 respectively and the mean and standard deviation are 80.08076 and 44.67776 respectively. Also investment over the same time period had a minimum of 6859604 and a maximum of 9740000 whereas the mean is 5400000 and the standard deviation is 1310000. Again over the five-year period, population had a minimum value of 83.886 and a maximum value of 149229whereas the mean and standard deviation are 16470.14 and 25077.82 respectively. Lastly since the measure for geography, dummy for being landlocked, is a dummy variable, the minimum and maximum values are 0 and 1 respectively whilst the mean and standard deviation are 0.3125 and 0.4644811 respectively.

From Appendix A, it can be seen that countries show different patterns of growth. While growth rate was reasonably strong in much of sub-Saharan Africa between 2005 and 2009, other countries experienced economic stagnation over this period. Among the 39 countries, Eritrea and Zimbabwe from east Africa experienced negative growth rate (i.e. -2.01% and -4.82% respectively) over the period 2005-2009. However Angola from central Africa had the highest growth of 12.85% over this period with Ethiopia from east Africa recording the second highest growth rate of 10.53%. Thus high and low growth rates are not restricted to specific geographical regions.

In addition, the idea that institutions affect growth is evidenced in Appendix A. The Appendix shows the effect of institutions on growth. On average, countries with weaker institutions experience sluggish growth and vice versa. Zimbabwe for example had the worse growth rate over this period with the least institutional index of 1.5 for 2005 and 2009.

TABLE 4.2 - ORDINARY LEAST SQUARES (OLS) REGRESSIONS

Dependent variable is log GDP per capita				
Constant	-0.17			
	(0.08)			
	{0.05}			
Lag (one year) of the regressand	0.98			
	(0.01)			
	{0.00}			
Transparency, accountability and corruption in the public sector rating	0.04			
	(0.02)			
	{0.10}			
Dummy for being landlocked	0.01			
	(0.01)			
	{0.50}			
Investment				0.03
				(0.01)
				{0.00}
Openness				-0.01
				(0.01)
				{0.20}
Population				-0.02
				(0.01)
				{0.02}
Gender equality rating				-0.02
				(0.03)
				{0.55}
$\overline{R^2}$	0.99			
Number of observations	153			
Breusch-Pagan test for heteroskedasticity (p-value)				0.01
Breusch-Godfrey test of autocorrelation. (p-value)			0.01	

Notes: standard errors are reported below the parameter estimates; p-values are in the braces. The measure for institutions, transparency, accountability and corruption control in the public sector covers the period 2005-2009 and is from the World Bank Group, Country Policy and Institutional Assessment (CPIA) database and is measured on a scale of 1 to 6, where a higher score means better institutions; gender equality rating is also from the CPIA and is measured on that same scale where higher score implies better gender equality; dummy for being landlocked is the measure of geography and is equal to 1 if a country is landlocked and 0 otherwise; the other variables come from Penn-World Table 7.0 constructed byAten, Heston and Summers in March 2011.

Source: Author's field work

Table 4.2 above reports OLS regressions for the log of income per capita on the measure of institutions, geography and other variables. This would usually be a simple attempt to estimate the model. The results show evidence of autocorrelation and heteroskedasticity. The

$\overline{R^2}$ of the regression indicates that about 99 percent of the variation in income per capita is explained by the variations in the independent variables.

Many social scientists, including Bloom and Sachs (1998), Montesquieu (1784), Myrdal (1968) and Sachs (2001) have argued for a direct effect of climate on economic performance and Collier and O'Connell (2008) documented that being landlocked may impact negatively on economic growth. To control for this, the dummy for being landlocked is added as a regressor. In contrast to what the arguments made by the proponents of the geography hypothesis, the result shows that being a landlocked country is an insignificant determinant of economic performance.

The institutional index is insignificant with a coefficient of 0.04. Although openness to international trade and gender equality index is found to affect economic performance negatively, these variables are insignificant determinant of economic performance. The result shows that promoting investment in sub-Saharan Africa has a significant effect on economic performance whiles population increase reduces GDP per capita significantly. This therefore implies that population increase increases the dependency ratio and in the transition period affect income per capita negatively.

TABLE 4.3 - LEAST SQUARES DUMMY VARIABLE (LSDV) REGRESSIONS

Dependent variable is log GDP per capita	
Constant	8.13 (3.83) {0.04}
Lag (one year) of the regressand	0.45 (0.08) {0.00}
Transparency, accountability and corruption in the public sector rating	0.001 (0.04) {0.97}
Investment	0.12 (0.04) {0.01}
Openness	-0.13 (0.06) {0.03}
Population	-0.64 (0.39) {0.11}
Gender equality rating	-0.18 (0.15) {0.23}
$\overline{R^2}$	0.35
Number of observations	153
Number of groups	39

Notes: robust standard errors are reported below the parameter estimates; p-values are in the braces. Dummy for being landlocked is omitted by STATA because of collinearity. The measure for institutions, transparency, accountability and corruption control in the public sector covers the period 2005-2009 and is from the World Bank Group, Country Policy and Institutional Assessment (CPIA) database and is measured on a scale of 1 to 6, where a higher score means better institutions; gender equality rating is also from the CPIA and is measured on that same scale where higher score implies better gender equality; dummy for being landlocked is the measure of geography and is equal to 1 if a country is landlocked and 0 otherwise; the other variables come from Penn-World Table 7.0 constructed byAten, Heston and Summers in March 2011.

Source: Author's field work

Table 4.3 aboveprovides results that deal with the problem of omitted variable bias. Overall, the results of the LSDV from Table 4.3 are quantitatively different from the results of the OLS estimator from Table 4.2. Surprisingly, in the OLS regression, the lagged income per capita was correlated positively with the error, inflating its estimated coefficient; however this is not the case now. The estimate for the coefficient on the lagged dependent variable

falls from 0.98 to 0.45. Howevera good estimator of the true parameter should lie close to or in this bound. As Roodman (2006) noted,a reliable estimate should possibly be below 1.00 since values above thismay signifies an unstable dynamic, with accelerating divergence away from equilibrium values.

The index of institution is still insignificant and falls from 0.04 to almost zero. As in the OLS regression, theresultsshow that promoting investment in SSA has a significant positive effect on income per capita. The estimated coefficient of investment increases from 0.03 in the OLS regression to 0.12 in the LSDV regression. Alsoin contrast to the familiar arguments that outward-oriented trade policies tend to promote economic growth in SSA, the results indicate that being more opened to foreign trade has a significant negative impact on economic performance. However population and gender equality index are found to have an insignificant negative effect on income per capita.

TABLE 4.4 - ARELLANO-BONDDYNAMIC PANEL DATA ESTIMATOR, TWO-STEP SYSTEM GMM

Dependent variable is log GDP per capita			
Constant		0.30	
		(0.40)	
		{0.46}	
Lag (one year) of the regressand		0.79	
	(0.16)		
		{0.00}	
Transparency, accountability and corruption in the public sector rating		0.25	
		(0.08)	
		{0.00}	
Dummy for being landlocked		-0.13	
		(0.12)	
		{0.26}	
Investment			0.09
			(0.09)
			{0.28}
Openness			-0.14
			(0.08)
			{0.09}
Population			-0.01
			(0.05)
			{0.91}
Gender equality rating			-0.19
			(0.33)
			{0.57}
Number of instruments		29	
Number of observations	153		
Number of groups	39		

Notes: corrected standard errors are reported below the parameter estimates; p-values are in the braces. The measure for institutions, transparency, accountability and corruption control in the public sector covers the period 2005-2009 and is from the World Bank Group, Country Policy and Institutional Assessment (CPIA) database and is measured on a scale of 1 to 6, where a higher score means better institutions; gender equality rating is also from the CPIA and is measured on that same scale where higher score implies better gender equality; dummy for being landlocked is the measure of geography and is equal to 1 if a country is landlocked and 0 otherwise; the other variables come from Penn-World Table 7.0 constructed byAten, Heston and Summers in March 2011.

Source: Author's field work

Arellano-Bond test for AR(1) in first difference: z = -2.35Prob>z = 0.019

Arellano-Bond test for AR(2) in first difference: z = 0.14Prob>z = 0.886

Sargan test of overriding restrictions: chi2(18)= 16.31 Prob> chi2 = 0.571

Table 4.4 shows thatthe Sargan test of overriding restrictions is not rejected. Thus Table 4.4 shows that the instruments as a group are exogenous. Also the test for AR(2) in first difference is not rejected,signifying that there is no autocorrelation.As noted earlier, in the OLS regression, the lagged income per capita was endogenous to the fixed effects in the error term, biasing its estimated coefficient upwards. However from Tables 4.2 and 4.3, the results indicate that this estimated coefficient fell from 0.98 (under the OLS estimator) to 0.45 (under LSDV estimator) as the fixed effects was drawn out of the error term with the introduction of dummies for each individual and time. As was argued earlier, a good estimator of the true parameter should lie close or within this bracketing. From Table 4.4, the coefficient estimate of the lagged dependent variable is 0.79 which is within the range of 0.98 to 0.45.

Although the proxy for institutions is an imperfect measure of economic institutions, the results show a significant positive effect of institutions on the log of GDP per capita. The estimate is 0.25 with a standard error of 0.08 and in fact larger than the OLS and LSDV estimators reported in Table 4.2 and 4.3 respectively. This result implies that measurement error in the institutional index that creates attenuation bias is likely to be more pertinent than say, omitted variables bias. However the estimated effect is not large (estimate of approximately 0.25 on institutions) as compared to the findings of Acemoglu et al (2001) (estimate of approximately 0.94 on institutions from column (1) of their Table 4).

The results reveal that the estimated coefficient of the dummy for being landlocked has a negative sign and is insignificant. Thus geography (dummy for being landlocked) is an insignificant determinant of economic performance in SSA and this result is consistent with the findings of Acemogluet. al. (2001) and is contrary to the arguments that geography affected economic outcomes.

Investment, openness, population, gender equality rating and dummy for being landlocked are all statistically insignificant. The fact that these variables are insignificant suggests that the reason why SSA countries are poor and have failed to grow is not necessarily due to geographical factors, gender inequality, high population rate, low level of investment and more or less opened to foreign trade, but mostly accounted for by the existence of worse institutions as evidenced by high level of corruption accompanied by low levels of transparency and accountability in the public sector in SSA.

Nonetheless it is essential to note that the result that investment is an insignificant determinant of economic performance is inconsistent with economic theory since theory predicts the reverse. The reason for such a result could be that the time period is rather short which may result in many of these variables (for instance, investment) having a delayed effect so that such variables are found to be insignificant over 2005-2009. Preferably, a longer span of data is needed.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

This dissertation has explored the fundamental cause (s) of the growth problems of sub-Saharan African countries using a panel of 39 countries over the years 2005-2009. To examine the effect of institutions, geography, investment, population, gender equality and openness to foreign trade on economic performance, the thesis estimates a dynamic model using the ordinary least squares (OLS) estimator, least squares dummy variable (LSDV) estimator and the Arellano-Bond dynamic panel data estimator - two-step system GMM.The findings are weaker in the case of OLS and LSDV regressions as compared to the results from the Arellano-Bond GMM estimator as the former estimators can be affected by potential identification problems.

Findings from the Arellano-Bond system GMM estimator shows that after controlling for the effect of institutions, investment, gender equality, geography, population and openness to foreign trade on GDP per capita, sub-Saharan African countries are poor because of worse institutions and not necessarily because of gender inequality, geography, high population, low investment level, or being more or less opened to international trade.Overall, the results show a significant effect of institutions on economic performance.

On the contrary, economic theory predicts that investment is a significant determinant of per capita income. The findings that investment is an insignificant determinant of per capita income could result from the fact that the time period is relatively short which may result in for example investment having a delayed effect so that it is found to be insignificant over the period 2005-2009. Ideally, a longer span of data is desirable.

With respect to government policies, the evidence indicates that income per capita is enhanced by better maintenance of transparency, accountability and corruption control in the

public sector. The results therefore indicate that reducing corruption and improving transparency and accountability in the public sector would result in significant gains in income per capita in sub-Saharan Africa.

To conclude, it isrecommended that policies to deal with the growth problems and promote poverty-reducing economic progress in sub-Saharan Africa should focus on reducing corruption and improving transparency and accountability in the public service.The high level of corruption, low levels of transparency and accountability in the public sector has caused the poor in the society to be denied of basic services and amenities. There is therefore the need to make corruption a high risk and low gain venture by strengthening existing laws to include the imposition of stiffer punishment such as long-term imprisonment for perpetrators of corruption including individuals who engage in rent seeking activities. Governments must institute awards in the public sector for those who exhibited high standards of commitment and performance in their duties. In addition, governments must commit itself in effectively implementing and enforcing laws meant to limit corruption and promote transparency and accountability. It must also commit itself to strengthening the roles of anti-corruption agencies to help fight corruption instead of seeing them as opposition. There is also the need to promote leadership by example. Thus promote integrity and foster resistance to corruption among leaders in the public service in order for their subordinates to emulate such behaviours. Moreover, there is the need to ensureeffective monitoring and supervision in state agencies.

Similarly there is the need to ensure protection for whistle-blowers. One cannot be too sure that when one volunteers information on corrupt practices, appropriate investigations would be taken and appropriate sanctions implemented. One may therefore feel reluctant to report cases of corruption because they may find themselves being victimised or may even lose their

jobs. There is therefore the need for prompt action on reported cases, as well as the provision of protection or assurance for people who report cases of corruption in the public sector. Stemming corruption and improving transparency and accountability in the public sector requires a well-performing parliament and judiciary and an independent and properly resourced audit and anti-corruption agencies. Fighting corruption and promoting transparency and accountability is crucial to ensure the good functioning of public services and ensure that resources are channelled to their right places in order to promote economic development.

Moreover this thesis recommends the use of the Arellano-Bond system GMM estimator in estimating econometric models in a dynamic form when studying economic growth since the results from this study has shown that this estimator produces better and reliable estimates unlike the usual OLS and LSDV estimators.In addition, future research should consider including other variables in the model which are likely to affect output per worker in sub-Saharan African when studying the growth problems in the sub-region.

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APPENDIX A

Number	Country	Code	Sample WA	EA	CA	SA	Growth 2005-2009	TAC 2005	TAC 2009
1.	Angola	AGO	0	0	1	0	.129	2.5	2.5
2.	Benin	BEN	1	0	0	0	.014	3.5	3.5
3.	Burkina Faso	BFA	1	0	0	0	.040	3.5	3.5
4.	Burundi	BDI	0	1	0	0	.038	3	2
5.	Cameroon	CMR	0	0	1	0	.025	2.5	2.5
6.	Cape Verde	CPV	1	0	0	0	.083	4.5	4.5
7.	Central A. Republic	CAF	0	0	1	0	.063	2.5	2.5
8.	Chad	TCD	0	0	1	0	.020	2	2
9.	Comoros	COM	0	1	0	0	.016	2.5	2.5
10.	Congo, Dem. Rep.	ZAR	0	0	1	0	.047	2	2
11.	Congo, Republic of	COG	0	0	1	0	.030	2.5	2.5
12.	Cote d`Ivoire	CIV	1	0	0	0	.024	2	2.5
13.	Djibouti	DJI	0	1	0	0	.036	2.5	2.5
14.	Eritrea	ERI	0	1	0	0	-.020	2.5	2
15.	Ethiopia	ETH	0	1	0	0	.105	2.5	2.5
16.	Gambia, The	GMB	1	0	0	0	.085	2	2
17.	Ghana	GHA	1	0	0	0	.062	3.5	4
18.	Guinea	GIN	1	0	0	0	.011	2.5	2
19.	Guinea-Bissau	GNB	1	0	0	0	.028	2.5	2.5
20.	Kenya	KEN	0	1	0	0	.035	3	3
21.	Lesotho	LSO	0	0	0	1	.028	3.5	3.5
22.	Liberia	LBR	1	0	0	0	.087		3
23.	Madagascar	MDG	0	1	0	0	.034	3.5	2.5
24.	Malawi	MWI	0	1	0	0	.069	3	3
25.	Mali	MLI	1	0	0	0	.054	3.5	3.5
26.	Mauritania	MRT	1	0	0	0	.058	2.5	2.5
27.	Mozambique	MOZ	0	1	0	0	.066	3	3
28.	Niger	NER	1	0	0	0	.042	3	2.5
29.	Nigeria	NGA	1	0	0	0	.089	3	3
30.	Rwanda	RWA	0	1	0	0	.079	3	3.5
31.	Sao Tome and P.	STP	0	0	1	0	.064	3.5	3.5
32.	Senegal	SEN	1	0	0	0	.031	3	3
33.	Sierra Leone	SLE	1	0	0	0	.061	2.5	3
34.	Sudan	SDN	0	1	0	0	.066	2	1.5
35.	Tanzania	TZA	0	1	0	0	.079	3.5	3
36.	Togo	TGO	1	0	0	0	.027	2	2
37.	Uganda	UGA	0	1	0	0	.070	3	2.5
38.	Zambia	ZMB	0	1	0	0	.086	3	3
39.	Zimbabwe	ZWE	0	1	0	0	-.048	1.5	1.5

Note: WA, EA CA and SA are West Africa, East Africa, Central Africa and Southern Africa respectively from UN scheme of geographic regions. TAC refers to CPIA Transparency, Accountability and Corruption index. Growth rate is for the period 2005-2009.