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**FACULTY OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS**

**DETERMINANTS OF PRIVATE INVESTMENT IN SUB-SAHARAN AFRICA:
THE ROLE OF INSTITUTIONS**

BY

TSEPO BENJAMIN MAHLOANE

SUPERVISOR: DR LESEGO SEKWATI

CO-SUPERVISOR: DR MALEBOGO BAKWENA

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DECLARATION

I, Tsepo Benjamin Mahloane declare that this project, submitted in partial fulfillment of the award for Master of Arts in economics at the University of Botswana is wholly my original work. Where other people's work is used due reference is made. I declare that this work has not been submitted to any institution in support for another degree or qualification of this type in any another university.

Name.....

Signature.....

Contact details

Cell No: +266 57 89 17 28

Whatsup: +267 77 66 20 64

Email: mahloanetsebenjamin@gmail.com

APPROVAL

After being examined, this dissertation is hereby approved to have fulfilled the partial requirements
for the Master of Arts degree in Applied Economics.

Dr L. Sekwati

Supervisor

Head of Department

Date

Date

DEDICATION

I dedicate this research project to my son Matela Mahloane who has always been the source of my inspiration for the entire two years of my Master's program.

ACKNOWLEDGEMENTS

I would like to thank the constructive advice of my supervisor Dr. Lesego Sekwati. I thank him for making me see the art of academic writing from a different perspective. I am also grateful to my Co-Supervisor Dr. Malebogo Bakwena. Your contribution to my academic development has been more than shaping me into one of the best minds in economics. It came with parental support when I encountered depressing moments during my academic journey. I am indebted. I am also indebted to a kindred spirit in economics, my former supervisor, Dr. Emmanuel Letete. It is at this juncture that I deeply share in your sentiment that capital accumulation is just a proximate cause of economic growth. The most important source of economic growth is the quality of institutions. Botswana reverberates this sentiment. I am grateful for your contribution in the development of this study.

I would also like to acknowledge the marvelous financial support of the African Economic Research Consortium (AERC). Without this financial support, I would have not made it at the University of Botswana. Neither would I have been able to gather the valuable knowledge at the Joint facility for electives program held in Kenya.

ABBREVIATIONS

AIDS: Acquired Immune Deficiency Syndrome

ARDL: Autoregressive Distributed Lag

ERP: Economy Recovery Program

ERS: Economy Recovery Strategy

FE: Fixed Effects Model

FGLS: Feasible Generalized Least Squares

GMM: Arellano Bond Generalizes Method of Moments

HIV: Human Immunodeficiency Viruses

ICRG: International Country Risk Guide

LDCs: Least Developed Countries

MENA: Middle East and North Africa

OLS: Ordinary Least Squares

PA: Public accountability

PS: Political Stability

QA: Administrative quality

RE: Random Effects Model

SSA: Sub-Saharan Africa

UNCTAD: United Nations Commission on Trade and Development

WDI: World Development Indicators

WGI: World Governance Indicators

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ABSTRACT

This study pursued an investigation of the relationship between the quality of institutions and private investment in Sub-Saharan Africa (SSA). The literature on determinants of economic growth establishes the importance of investment in the growth of an economy. SSA countries have been experiencing deficiency in private investment growth for several decades with consequences on the growth of these countries. This study contributes to the debate on policies to promote private investment in the region. The study focused on the influence of administrative quality, public accountability and political stability. Dynamic panel econometric methods were applied to data from 25 SSA countries for the period 1990-2016. The empirical results of the Arellano-Bond first step generalized methods of moments support the notion that improvement in public accountability and political stable environment is likely to improve private investment in SSA. One way that this study can be extended is to investigate causality between institutional quality and private investment. This could potentially provide more insight on the interaction between the two.

Keywords: Private investment, administrative quality, public accountability, political stability

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND AND MOTIVATION OF THE STUDY

Evidence from economic studies has it that economic prosperity requires macroeconomic stability (Vasylieva *et al*, 2018), a reasonable level of certainty about government policies (Ali, 2001), good physical social and technological infrastructure (Palei, 2015), well defined property rights (Brunt, 2011), and sound judicial and contracting systems (Le, 2004). Well defined property rights, sound judicial and contracting systems are indicators of institutional quality. Good quality institutions have been established to have a significant bearing on investment acting to reduce uncertainty and the costs of doing business (North, 1993; Acemoglu *et al*, 2003; Acemoglu & Robinson, 2012). The role of institutions on capital accumulation from private firms (private investment) in sub-Saharan Africa (SSA) has been given a cursory treatment in the literature (see Akanbi (2012), Munemo (2012) and Ouedraogo & Kouaman (2014) among others). This study focuses on institutional and economic determinants of private investment in sub-Saharan Africa. SSA as a region has been experiencing low rates of private capital accumulation. Adding institutions to the analysis provides an opportunity to identify institutions that are crucial when modelling private investment behavior in the region.

The primary objective of every economy is to achieve higher growth of output which is associated with higher growth of employment opportunities, a higher standard of living, and an assurance of subsistence needs of its population (Garzerelli & Limam, 2019). Theories of economic growth isolate investment in physical capital as the foremost crucial determinant of economic growth. The importance of investment in the process of economic growth is also affirmed by economic growth

accounting studies indicating that investment in physical capital explains the most part of output growth across different regions of the world (Turner *et al*, 2013). Even with aggregate investment the distinction between public investment and investment by private firms is pertinent as the latter has more augmenting effect on economic growth than the former (Khan & Reihart, 1990).

Over the years SSA countries have struggled to maintain private investment at a level similar to other countries with the same level of economic development (Allard, 2018). According to Allard, the inability of SSA countries to develop policies that boost the growth of private investment has constrained the region's effort to improve social outcomes by holding back labor productivity and the resulting gains in real wage and household income. The generated tax revenues resulting from the increased wages and household income can be used to fund the infrastructural needs for the region. It is argued that the presence of adequate infrastructure reduces the cost of doing business (Barman & Gupta, 2010). This has the potential to further boost the demand for private investment and increasing the production capacities of economies thereby creating more economic growth (Bayraktar, 2003). In brief, private investment is the main element of economic growth and therefore any factors that may prove restrictive to the growth of this type of investment will negatively affect the economic growth prospects of the countries involved.

The evolution of the empirical studies on the causes of private investment has produced a rich crop of factors to target when dealing with the challenge of the sluggish growth of private investment. These factors range from capital inflows (Spatafora & Luca, 2012), fiscal and monetary policy actions (Zihui, 2008 and Omojolaibi & Okenesi, 2016), foreign exchange rate risk (Serven, 2003), and, financial and trade liberalization (Hye & Lau, 2018). The general finding from these studies is that all these economic factors matter in influencing private investment. This general observation holds irrespective of the geographical location and the level of economic development of the

countries being studied. The majority of countries in SSA have undertaken various economic reforms at some point in time to correct their economic systems and thus alleviate the slow growing and sometimes declining private investment. Notable amongst these reforms is the Ghanaian economic recovery program (ERP) and the Kenyan economic recovery strategy (ERS) of 2003. The dominant purpose of these programs was to improve economic productivity by restructuring the respective countries' economic institutions with the hope of creating conducive environment for the generation of private capital (Awal, 2012).

Nonetheless, the current level of private investment to GDP ratio for SSA is still yet unsatisfactory. Njuru (2012) proposes that this proportion should not be less than 15 percent at any time and countries should target and sustain private investment levels of at least 25 per cent of GDP. Njuru further suggests that sustaining the 25 percent level of private investment is one of the surest routes for any country to experience sustainable economic growth. As it stands, recent figures shows that private investment to GDP ratio for SSA averages 13.5 percent for the period 2000 to 2014 (UNCTAD, 2014). This low level of private investment occurs amid low quality institutions in the region (Han *et al*, 2014). This observation leaves a room to enquire about the potential impact of low quality institutions on private investment in the region.

1.2 PROBLEM STATEMENT

One of the most pressing issues in economic development is explaining the causes of (or lack of thereof) private investment thereby economic development. This issue is particularly relevant for countries in SSA. A number of these countries have had poor economic development performance over the past years and continue to face major development challenges. These challenges include but are not limited to; extreme poverty, lack of resources to finance their development programs, corruption, recurring civil wars and conflicts (Aryeetey *et al*, 2012). Other challenges include

inadequate capital development, a weak technological base and low agricultural productivity (Salami *et al*, 2017). A prerequisite for the solution of the majority of some of these economic problems is the presence of adequate levels of economic growth.

The situation in SSA is such that the growth of private investment, a key ingredient to enhanced productivity, is unsatisfactory. This fact can be seen from the recent data from World development indicators (WDI) for the period 2006 ending 2016 for different regions. The average private investment ratios for this period for SSA is 14.6 per cent, Latin America, 15.5 per cent; and South-Asia 28.7. The annual growth rate of real output for the three regions for the same period averages 1.7 per cent for SSA, Latin America 2.7 per cent; and South-Asia 7.0 per cent. This data confirms the assertion that the low level of private investment ratios in SSA partly explains the low level of economic growth in the region. The disappointing performance of private investment in SSA raises the obvious question. Why has SSA failed to grow private investment overtime? This study conjectures that this could be explained by institutional factors over and above economic factors.

The literature on institutional economics suggests that developing countries failure to grow private investment is due to weaknesses in institutions or lack of their enforcement (Acemoglu *et al*, 2003 and Acemoglu & Robinson, 2012). This literature singles out the protection of property rights, particularly political institutions to be the main binding constraints to private investment. This literature further argues that countries that exhibit poor quality institutions are characterized by high uncertainty in macroeconomics policies, political instability and uncertainty in the enforcement of institutions protecting the rights of investors (Rodrick, 2008). This variability in macroeconomic policies and institutions is a risk and present costs to investors who would otherwise be committed to avoid it.

Data from World Governance Indicators (WGI) reveal that SSA has persistently scored in regulatory quality and the rule of law (Han *et al*, 2014). Each one of these indicators from WGI is constructed to yield a value between -2.5 and +2.5 with higher values indicating a superior performance. The average for these two indices from Han *et al* show that the scores for SSA were consistently low compared to Latin America (LAC) and Asia for the period 1998 to 2011. The corresponding score for the regulatory quality for SSA is -0.71; Latin America -0.19; and for Asia -0.4; indicating a lower degree of the quality of institutions in SSA. Poor institutions can act as a tax and increase the cost of investment (Buchanan *et al*, 2012). Appropriate enforcement of the rule of law and finely tuned business regulations are the leading administrative components for conducive investment environment in a country (Aysan *et al*, 2007). Apart from poor administrative quality this study conjectures that the sluggish growth of private investment in SSA countries is due to high political instability the existence of public authorities that are not accountable to the demands of private investors. Further comparisons of the regional scores for political stability and absence of violence (SSA= -0.59, LAC=0.1, Asia= -0.2), and voice and accountability (SSA= -0.67, LAC=0.36, Asia= -0.27) as provided by Han *et al* indicate that SSA always came last in the quality of the conjectured institutions.

1.3 OBJECTIVES OF THE STUDY

The broad objective of this study is to investigate the impact of institutional quality on private investment in SSA. The specific objectives are to:

- To investigate the impact of administrative quality on private investment in SSA
- To examine the impact of public accountability on private investment in SSA
- To investigate the impact of political instability on private investment in SSA
- To derive policy implications from the findings of the study

1.4 HYPOTHESIS

In line with the objectives this study will investigate the following null hypotheses:

- Administrative quality has no impact on private investment in SSA
- Public accountability has no impact on private investment in SSA
- Political instability has no impact on private investment in SSA

1.4 SIGNIFICANCE OF THE STUDY

The conventional approach to analyzing determinants of private investment in SSA has focused on variables that are of economic nature. Consequently, previous studies of private investment behavior have emphasized sound macroeconomic management as crucial a factor for the growth of private investment in developing countries. The role of institutions on private investment in SSA is often given a cursory treatment. Studies that include institutions often employ one measure such as freedom of the press (see Dutta & Roy, 2013) or one dimension of institutions from the same source (e.g. economic freedom, see Ullah *et al*, 2018). Given that institutional factors may be sociological, cultural and political in nature their diversity has made it difficult to have numerous measures of institutions in one study. This problem has led to existing studies overlooking institutional variables that might be important in influencing private investment.

In an attempt to minimize the problems associated with the caveat of missing important variables the current study adopts an integrated approach. It includes institutional variables which are combined by principal component analysis in trying to understand the impact of institutional quality on private investment. The study follows the nomenclature by Aysan *et al* (2007) in combining institutional variables. This allows disentangling institutional quality into three dimensions namely, administrative quality, public accountability and political stability. By

extracting only the crucial principal components in the changes of numerous institutional variables considered this study is able to avoid the likelihood of missing the important institutional variables that might affect private investment in SSA. Furthermore, the disaggregation of institutional quality will help us better understand the type of institutional aspects that are more likely to affect private investment in providing empirical evidence of factors influencing private investment in developing countries. On the policy front the study seeks to provide recommendations that can guide policy formulation in the process of institutional reforms aimed at promoting private investment.

1.7 ORGANIZATION OF THE DISSERTATION

This dissertation consists of six chapters. **Chapter 1** introduced the research problem: low private investment in SSA and the context in which it occurs. **Chapter 2** reviews the performance of institutions and private investment in SSA. The possible links that might exist between institutions and private investment are explored. **Chapter 3** reviews the theoretical and empirical literature on determinants of private investment. Both institutional and economic factors are discussed. **Chapter 4** develops the theoretical and empirical framework for investigating the relationship between private investment and the quality of institutions. The data sources and different methods for capturing the relationship between private investment and institutions are discussed. **Chapter 5** presents and discusses the empirical findings. **Chapter 6** concludes with policy implications and recommendations drawn from the results. The limitations of the study are also considered in **Chapter 6**.

CHAPTER 2

REVIEW OF SUB-SAHARAN AFRICAN COUNTRIES

2.1 INTRODUCTION

The problem of slowing growing private investment in the midst of poor institutions raises the question of the potential impact of the poor quality of institutions on private investment in SSA. Deficiency in the quality of institutions has been a subject of not only private investment but economic growth in various investigations. This chapter extends this issue by means of visualizations of institutions deemed important in promoting or hindering private investment with the objective of detecting the possible relationship that might exist between these two. Section 2.2 begins this task with the description of the geographical location and demographics of SSA countries. Section 2.3 provides a review of SSA GDP growth performance over the past years. Section 2.4 reviews the relationship between corruption and private investment. Section 2.5 reviews the relationship between laws governing investment and private investment. Section 2.6 presents the relationship between internal conflict and private investment. Section 2.7 reviews the evolution of political rights and civil liberties in SSA. The links between private investment and the selected institutions are also discussed in this chapter. Section 2.8 concludes.

2.2 OVERVIEW OF SSA

Sub-Saharan Africa (SSA) geographically comprise the part of Africa South of the Sahara desert. The region consists of 46 countries which exclude North African countries (Algeria, Egypt, Libya, Morocco, Tunisia and Sudan). It is one of the poorest regions and harbors most of the least developed countries in the world (Ehui & Pender, 2005). The minimal economic progress over the past years in the region has led to major development challenges including a high incidence of

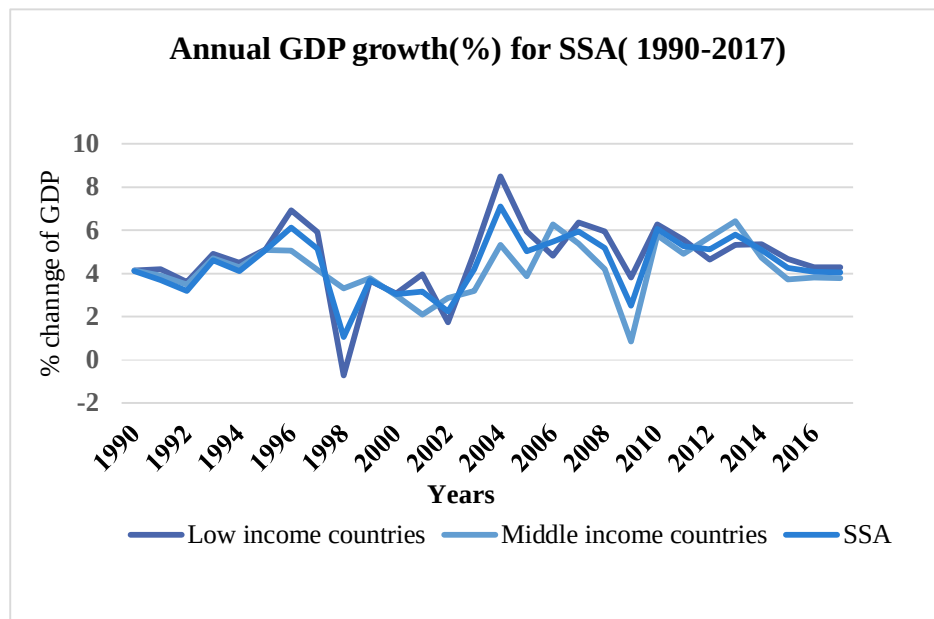
poverty, increasing environmental deterioration, illiteracy, poor health conditions, and the persistent surge of HIV/AIDS at a time when a number of regions in the developing world are reaping the economic fruits brought by globalization (Oruonye,2012).

SSA countries are distinctive in numerous dimensions. The region consists of 24 coastal countries, 16 landlocked countries and 7 insular countries located in the Atlantic and Indian Ocean (UNCTAD, 2006). SSA is often considered to have the highest population growth rate of all the world regions. According to the WorldBank (2014) the region had a population of 910.4 million people as of 2012, an average gross national income per capita of US \$ 1351, and life expectancy of 56 years at birth.

2.3 GDP GROWTH RATES TRENDS IN SSA

The previous years in the world economy has been dominated by a series of economic instabilities that has a significant impact on economic performance of individual countries and SSA as a region. Apart from the negative historical impact of the 1997 Asian Financial Crisis and the 2008 Global Financial Crisis, SSA has been experiencing continued economic growth since the 1990s. The region's economic boom has largely associated with increasing international demand for resources resulting in sustained upward trend of prices. For instance, in 2002 mineral prices surged, and in 2006 prices for agricultural products rose sharply (Morissey *et al*, 2012). These economic growth dynamics are evident in **Figure 2.1** which reveals only two major dips in the real GDP growth rate series of the region corresponding to the 1997 Asian financial and the 2008 financial crises. It is important to also note the growth of GDP has been high in low income countries compared to middle income countries in the region.

Figure 2.1: GDP growth trends in SSA

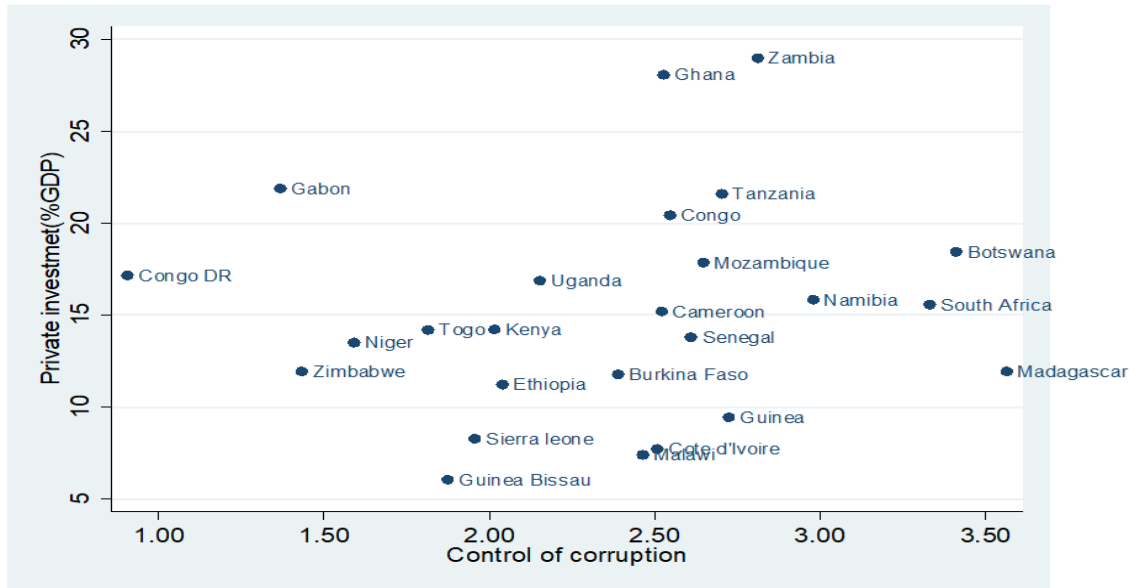


Source: Author's own computation using WDI data

2.4 PRIVATE INVESTMENT AND CORRUPTION IN SSA

The existence of endemic corruption is envisaged to be a threat to investment (Everhart *et al*, 2009). The most common type of corruption that directly affects investors is financial corruption in the form of demands for special payments and bribes connected with business licenses, tax assessments, and loans among others (Howell, 2011). Suggestions are that endemic corruption raises operational costs of businesses, creates uncertainty and thereby deters investment (Shleifer & Vishny, 1993). **Figure 2.2** shows the performance of private investment in SSA.

Figure 2.2: Private investment and control of corruption in SSA (1990 to 2016)



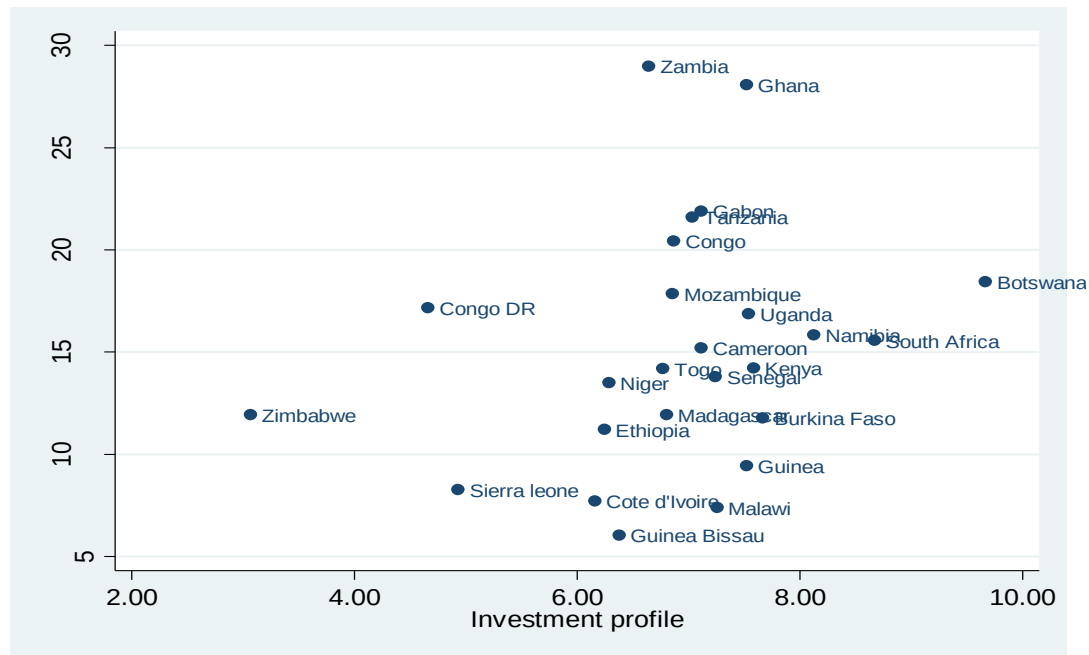
Source: own computation using data from African Development Bank Group and ICRG

The corruption measures used range from 0 to 6 with high values indicating the low incidence of corruption in a country. **Figure 2.2** indicate that SSA countries that have low incidence of corruption are associated with a higher level of private investment for the period 1990 to 2016. The relationship between corruption and private investment in SSA is not perfect. There are however outliers in the relationship with countries like Gabon and Democratic republic of Congo having high levels of corruption and high private investment.

2.5 PRIVATE INVESTMENT AND INVESTMENT LAWS IN SSA

The laws protecting the rights of investors in a country is another important assessment of the quality of institutions and the investment climate in general. Howell (2011) describes these laws as the investment profile of a country and it includes laws governing expropriation in contracts involving investors and the ability of investors repatriate profits to their respective countries.

Figure 2.3: Private investment and investment Profile (1990 to 2016)



Source: Author's own computation using data from African Development Bank Group and ICRG

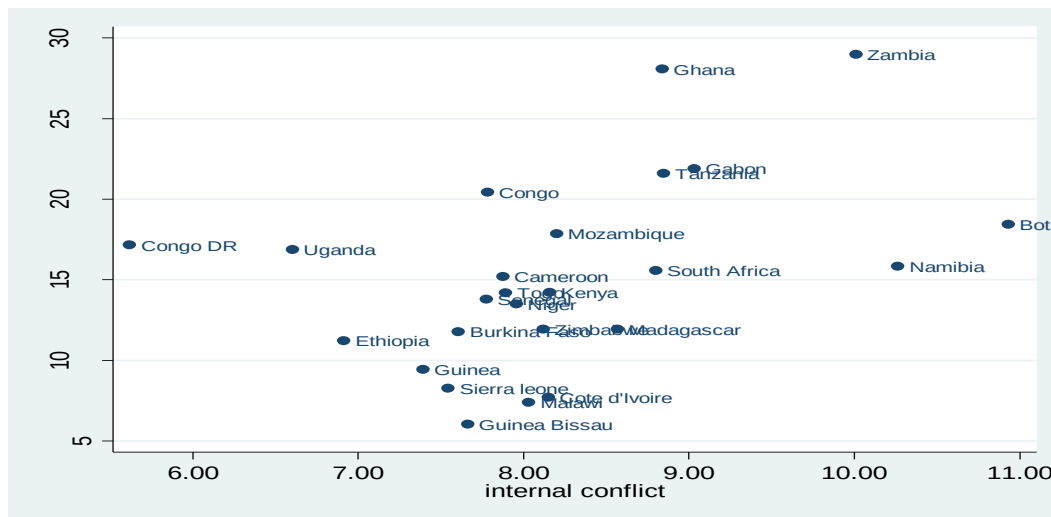
Figure 2.3 shows the performance of an investment profile in a country against the performance of private investment in SSA countries for the period 1990 to 2016. The investment profile indicator from ICRG is constructed in a manner that high values show a very low risk of expropriation from contracts. **Figure 2.3** reveals the same pattern observed with the control of corruption indicator. Countries that exhibit low risk in expropriation as indicated by strength in terms of laws protecting investment generally have high private investment rates.

2.6 PRIVATE INVESTMENT AND INTERNAL CONFLICT IN SSA

The post-independence era in SSA has been marked by events of coup detats with over 60 successful coups that resulted in government otherthrows, 70 abortive coups and 125 officially reported coup plots (Fosu, 2003). This political instability is regarded as harmful to economic performance. Suggestions are that political instability may lead to a macroeconomic policy

reversals creating volatility and thus negatively affecting human capital and physical accumulation (Aisen & Francisco, 2011).

Figure 2.4: Private investment and internal conflict (1990 - 2016)



Source: Authors own computation using African Development Bank Group and ICRG

There is evidence that there are large differences in incidences that lead to political instability in SSA countries. For example, Fosu (2003) notes that Ghana had at one time recorded 5 coups, 6 abortive coups and 13 reported coup plots in a period of less than four decades while countries like Botswana had never experienced any extreme event of political instability. **Figure 2.4** show internal conflict measure of political instability from ICRG against private investment for SSA countries. High values of internal conflict indicate low occurrences of political disruptions. It is clear from **Figure 2.4** that countries with by low incidence of internal conflicts are characterized relatively higher private investment rates during 1990 to 2016.

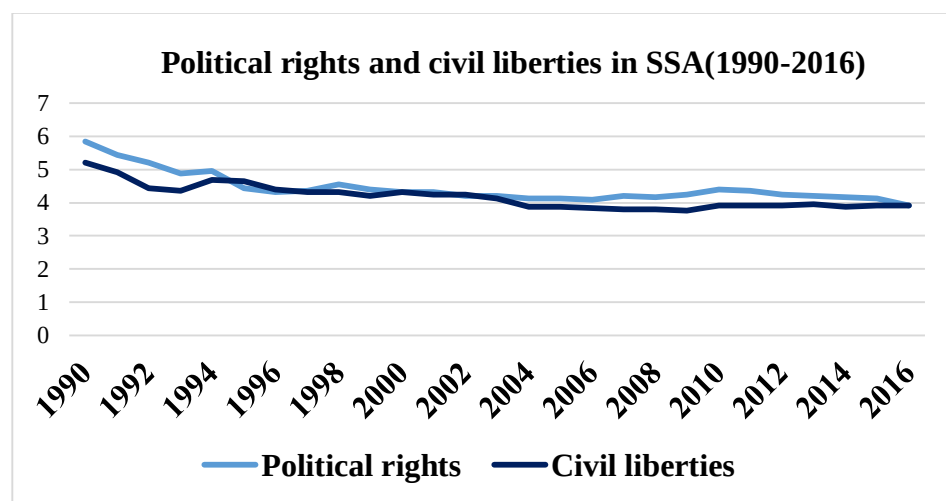
2.7 POLITICAL RIGHTS AND CIVIL LIBERTIES IN SSA

The ability to enforce political participation in policies affecting private investors is an important attribute of the investment environment. Such a role is often played by civil society organizations

who require autonomy from the government in order disseminate policy information regarding the welfare of private investors (Hamilton, 2009). SSA as a region has had a record of regimes which are capable of restrictions of political autonomy of civil society organizations and non-state actors (Aixala & Fabro, 2009). Such a record is in part fed by the proliferation of authoritarian and single party democracies capable of controlling access of information to the populace in an effort to prevent ideological opposition (Armstrong, 2011). Two indicators from Freedom House are often used to gauge political participation in designing policies affecting private investment: Political rights and civil liberties.

The importance of political rights and civil liberties in developing countries stem from their focus on liberties of people (Hamilton, 2009). Businesses do not only establish physical investments in countries but also people to initiate and maintain their operations. Therefore its clears managers and skilled worker adopt the host countries political rights and civil rights upon investing. On the other hand, the lack of political rights and civil liberties would constitute a social tension in societies which might imply further political and economic risks to investors (Tintin, 2013).

Figure 2.5 Political rights and civil liberties in SSA (1990 to 2016)



Source: *Author's own computation from Freedom House*

Figure 2.5 shows how political rights and civil liberties for the 25 countries have evolved over the period 1990 to 2016. The indicators of political rights range from 1 to 7 with low values indicating the most free societies in terms on civil society organizations and the ability of individual to participate in the election of the rulers of their choice. The figure suggests that both civil liberties and the political rights have improved in SSA throughout the period. This suggest that SSA has been moving towards a direction of more open political regimes capable of protecting the basic human rights of their citizens and capable of heeding to the demands of private investors in terms of policies laid for investment (Anwar & Cooray, 2012).

2.8 CONCLUSION

The chapter reveals the evolution and key relationships that might exist between measures of quality of institutions and private investment in SSA. Three indicators of investment climate (control of corruption, investment laws and internal conflict) show that the low level of the quality institutions seem to be associated with low levels of private investment s suggested in Chapter 1. This issue raise as concern as to the potential impact that these institutions might have on private investment as research has revealed that SSA has a deficiency in quality institutions (see Han *et al*, 2014). The visualizations also indicate that two indicators relating to freedoms of individuals to elect political authorities of their choice and freely express the rights as individuals have improved in SSA for the past years. The subsequent chapters of this study try to formalize this relationship in attempt to develop an operational framework that can establish the importance of the changes in the quality of institutions on private investment.

CHAPTER 3

REVIEW OF THE LITERATURE

3.1 INTRODUCTION

There are a number of theories that attempt to explain drivers of private investment. The assertions of these theories have been tested in different contexts with different results. This chapter provides a discussion of the main theoretical approaches and the related empirical evidence in the study of determinants of private investment. Section 3.2 provides the assertions of main theories of investments. Section 3.3 reviews the empirical evidence of the theoretical models of private investment and its relationship to economic factors. Section 3.4 explores how the theoretical models of investment have been extended to incorporate institutions. The empirical literature on institutions and private investment is also discussed in this section. Furthermore, in section 3.4 the institutional variables used in this study are isolated. Section 3.5 concludes with the summary of the literature.

3.2 ECONOMIC THEORIES OF PRIVATE INVESTMENT

One of the most commonly used theoretical frameworks for understanding the behavior of private investment is the accelerator principle pioneered by Clark (1917). The Clark accelerator model explains that the demand for investment in physical capital depends on the acceleration of the final demand of that the investment in capital produces (Twine *et al*, 2015). The focus on final demand in the Clark model makes growth of output the key variable that determines the level of private investment. In the Clark model the growth of output signifies the growth of the final demand of goods produced by investment. Thus, growth in output will exert a positive influence on private investment. One of the main of the main features of the accelerator model is that it assumes a

constant stable relationship between capital and growth of output. Thus, additional investments in every period instantaneously adjust to the desired stock of capital.

A useful feature of the Clark (1917) accelerator model is that it ignores the relevance of factors such as the influence of uncertainty on investment. As result the model has been reformulated to account for uncertainty in the flexible accelerator model by Koyck (1954). The flexible accelerator model is flexible in the sense that it allows investment to vary with relevant variables including those related to uncertainty and market imperfections (Erden & Holcombe, 2005). One important attribute of the flexible accelerator models is that it introduces lags. According to the flexible accelerator model, firms do not adjust instantaneously to the desired level of capital but rather take time to adjust to the desired level of capital due to issue relating to uncertainty and installing new capital.

Another subsequent theory of investment theory is the liquidity of investment developed by Dusenberry (1958). The theory asserts that investments depend mainly on the internal funds of a firm. In order words, the growth of investment can be constrained by the supply of internal funds (Samuel, 1999). An alternative theory to the flexible accelerator model that takes into account prices of capital goods is the neoclassical Jorgenson model of investment. The theory views investment as a function of the lags of the changes in the desired level of capital, price of output, and the user cost of capital. The advocates of this approach to modelling investment behavior view both the accelerator and the flexible accelerator model as atheoretical as it omits prices of capital goods (Omojolaibi *et al*, 2016).

3.3 ECONOMIC FACTORS AND PRIVATE INVESTMENT

Different theories of investment have been modified and tested to study investment behavior over the years. For example, Outtara (2004) investigated determinants of private investment in Senegal by adopting the flexible accelerator model for the period 1970 to 2000. The study applied Johansen cointegration technique and the ARDL approach and found that GDP positively influences private investment. Public investment and foreign aid flows were also found to positively influence private investment while terms of trade and credit to the private sector were found to negatively influence private investment. Mlambo and Oshikoya (2001) examined determinants of private investment for 40 developing countries from Africa, South Asia, East Asia, and Latin America for the period 1970 to 1996 using the neoclassical model of investment. The study which applied panel pooled OLS found that real exchange appreciation, fiscal deficits, external debt, and inflation are found negatively associated with private investment in all regions. Furthermore, GDP growth rate, per capita GDP, public investment, telephones lines per 1000 people and trade openness were found to positively affect private investment. Political instability negatively affected private investment.

Ahangari and Saki (2012) investigated the impact of macroeconomic instability in Iran. The economic instability index used was constructed based on the long-term deviations of inflation rate, budget deficit, foreign debt, and the ratio of actual currency rate to nominal currency rate. The theoretical model used for the study included public investment, income from oil and gas exports, credit to the private sector banks and a dummy variable associated with political changes. Utilizing the Johansen cointegration technique and the error correction model the results of the study revealed that macroeconomic instability had negative impact on private investment both in the short and the long run for the period 1963 to 2003. Surprisingly, credit to the private sector and public investment had no impact on private investment. Credit to the private sector is often added under the rationale that private firms in developing countries rely heavily on bank credit as a source

of finance (Outtara, 2004). Serven (2003) also found that foreign exchange rate uncertainty, price of capital and real interest rate have a negative effect on private investment.

Twine *et al* (2015) used firm level survey data (period 1990-2003) and the flexible accelerator model to investigate the determinants investment in 5 Ugandan tea processing firms. The study included firm's output, profits, inflation rate, interest rate, exchange rate, ratio of M2 to GDP, ratio of industrial production to GDP and firm's age as explanatory variables. The results from system GMM of Blundell and Bond (1998) confirmed that investment is positively influenced by changes in output and profits in the long run while it is negatively influenced by the depreciation of the exchange rate. The study did not find any significant effect of inflation rate and interest and M2.

Inclusion of trade openness in private investment studies dates back to the classic ideas of Ronald Coase (1937). Coase suggest that the market for intermediary products are usually imperfect and firms as economic agents need to incur certain costs to complete a transaction. Coase postulated that this transaction cost can be minimized when markets are integrated through greater openness or free trade. Adhikary (2011) adds to this view that a reduction in transaction costs provide an opportunity for developing countries to gain larger access to international markets, and this helps them to increase foreign exchange reserves through increasing exports and investment.

Batu (2016) study conducted a systematic review (meta-analysis) of critical determinants of private investment using several published studies from 9 SSA countries. The study discovered that output, public investment, GDP per capita and the real exchange rate are the most critical variable affecting the performance of private investment. Batu (2016) discovered that in majority of cases public investment complements private partly resolving the long standing debate that public investment can crowd out private investment in developing countries. Furthermore, Batu

discovered that trade openness, interest rates, inflation rates and money supply slightly determines the performance of private investment.

Link (2006) investigated the impact of federal government consumption expenditures for the U.S. using quarterly data (period 1986-2004) and the OLS technique. The study included corporate profits as a percent of GDP, unemployment rate, percentage changes in private consumption, percentage changes in per capita GDP, return of ten year treasury bonds, interest rate yields from Moody, trade openness and M2 as a percent of GDP. Non stationary variables were entered in in differences in the regression model. Private investment was entered with three lags. The study revealed that government purchase had negative impact on private investment. Firms which invested three quarters ago were more likely to have higher investment in the current period. Profits and private consumption expenditures accelerated investment. Unemployment rate and interest rate yields from Moody had a significant negative impact on private investment. The study failed to detect any significant impact of M2, return on ten years treasury bonds, trade openness and percentage changes on per capita GDP.

In the same vein Omojolaibi *et al* (2016) studied fiscal policy and private investment in five West African countries. The study applied the flexible accelerator model, panel cointegration, and the fixed effect model (period 1993-2014). Omojolaibi discovered that recurrent expenditures and external debt crowded out private investment but the impact was insignificant. Tax revenues had a significant impact on private investment. Government capital expenditures and tax revenues had a significant positive impact on private investment. GDP output growth had an expected positive but insignificant impact. The GDP deflator carried a significant positive impact signifying the importance of prices as stated by the Jorgenson (1963) investment model.

The dissimilar levels of financial development between the developed and the developing world calls for studies to investigate the impact of financial development on private investment in both worlds. Boateng *et al* (2017) investigated the effect financial development and foreign direct investment on private investment in 16 SSA countries (period 1980-2014). The study applied the flexible accelerator model, Keynes theory of investment and the Mackinnon-Shaw hypothesis as the theoretical basis for the variables included in the empirical model. Panel cointegration techniques was employed within the panel pooled OLS, the fixed effect model, and the fully modified OLS. The study revealed a positive effect of foreign direct investment on private investment. Financial development as proxied by credit to the financial sector had a positive effect on investment. The interaction term between foreign direct investment and financial development had a positive effect on private investment showing the complementarity between these two variables in promoting private investment in SSA. GDP growth, savings, and trade openness significantly promoted domestic investment while inflation rate and interest rate inhibited private investment though the impact was insignificant.

Huang (2011) investigated the causality between private investment and financial development in 43 developing countries (period 1970-1998) using Granger causality and the common correlated effect pooled mean group estimator (CCEPMG) developed by Pesaran (2006). Financial development was constructed using principal components of liquid liabilities, credit to the private sector banks and the ratio of commercial bank assets to the sum of commercial and Central bank assets. The study discovered significant positive long run effect between private investment and financial development in both directions. This result did not alter when both GDP per capita and trade openness were added as controls.

3.3 INSTITUTIONAL FACTORS AND PRIVATE INVESTMENT

Recent investigations have pointed out that economic factors are by no means the only factors that matter in driving investment. The institutional economics literature suggests that institutional factors also matter particularly so in developing countries. According to this literature, uncertain and extractive political institutions in developing countries have led to persistent rent seeking behavior which has stifled investment and the process of economic development in developing countries (Acemoglu *et al*, 2003). The literature on institution points that most risk to investment decision stems from political instability. In the direction of this view, Le (2004) investigate political and economic factors that might pose risk and uncertainty on private investment in a panel of 25 developing countries. Using Feasible Generalized Least Squares (FGLS) and data (period 1975-1995) on 25 developing countries, Le (2004) found evidence that challenged the institutional economics view. The study discovered that peaceful demonstrations promoted private investment, while violent protests hampered private investment. The socio-political instability caused by unconstitutional government changes discouraged private sector investment.

One explanation of the negative influence of political instability revolves around the notion that in politically unstable regimes saving becomes unattractive and consumers increase their consumption (Campos & Nugent, 2003). In a related study (Feng, 2001) use OLS and annual data (period 1978-1988) for 42 least developed countries to investigate the impact of political freedom, political instability and policy uncertainty on private investment. The measure of political freedom used was a standardized variable of political rights and civil liberties. The study discovered that political freedom by improving human capital formation improves private investment. High political instability and policy uncertainty deterred private investment. Çeliköz and Arslan (2010) examined the relationship between the rule of law and investment in Turkey. The study used annual data (period 1984-2009) using the Johansen cointegration technique within the error correction

model. There was no long run relationship between the rule of law and private investment. The rule of law variable employed in the analysis by the authors was intended to capture the idea that countries with quality legal systems enforce secure property and low in investment transactions. Granger causality of the short run results indicated a positive effect running from private investment to the rule of law.

Ali *et al* (2013) investigated the relationship between political instability and private investment in Pakistan .The study employed the ARDL cointegration within the error correction model using annual data (period 1972-2009).The study found that political instability has a significant negative relationship with the private investment both in the long run and short run. The political instability measure employed was constructed using the first principal components of regime type, government change, government's longevity, assassinations, riots, demonstrations and general strikes. The relationship between public investment and private investment was positive. Credit to private sector had a negative impact on private investment in the long run. Uncertainty as measured by variability of government capacity had a negative effect on private investment.

Ullah *et al* (2018) investigated the impact of economic freedom on private capital flows in 6 Asian economies using the systems GMM technique. The panel data used was for the period 2002 to 2011.The economic freedom index used was from Heritage foundation and comprised of measures investment climate, business freedom, trade freedom, property rights, freedom from corruption and financial freedom. The study discovered that improvement in economic freedom promoted private capital flows. The study further discovered that GDP growth rate and official development assistance had a positive significant impact on private capital flows. Exchange rate appreciation had a negative significant impact on private inflows. The impact of inflation rate and natural resources came inconclusive.

3.4 SUMMARY OF THE LITERATURE

The literature reviewed in this chapter has pointed to progress in the knowledge and understanding of determinants of private investment including knowledge gaps that exist. It should be acknowledged that the list of the factors that might affect private investment given in this study is not exhaustive. The provided literature suggests that standard macroeconomic variables such as government expenditures, public debt, inflation rates, trade openness, foreign exchange rate and the real interest rate are important determinants of private investment. The quality of institutions also matters. Studies that include institutions affirm that improvement in institutions have a positive impact on private investment.

The literature mentioned attest to the issue that most studies on institutions often employ one aggregate measure of institutional quality. Given the diversity of institutional factors which may be sociological, cultural and political, analyzing the impact of all these factors in one study becomes difficult. This study adopts an integrated approach. It includes numerous institutional variables which are combined by principal component analysis in trying to understand the impact of institutional quality on private investment. In achieving this task the study by Aysan *et al* (2007) provides the nomenclature in combining institutional variables. The naming of these variables allows disentangling institutional quality into three dimensions namely, administrative quality, public accountability and political stability. By extracting only the crucial components in the changes of numerous institutional variables considered the study is able to avoid the likelihood of missing the important institutional variables that might affect private investment in SSA. Thus, the disaggregation allows inclusion of more variables of institutions which will help us better understand the type of institutional aspects that are more likely to affect private investment decisions in SSA.

CHAPTER 4

METHODOLOGY

4.1 INTRODUCTION

This chapter presents the methods and sources of data used in this study. The chapter is structured as follows: Section 4.2 presents the theoretical model specification by synthesizing the theoretical and empirical literature. To address the relationship between private investment and institutions Section 4.3 considers the empirical model specification for the panel of 25 SSA countries. Section 4.4 provides a description of the measures of institutional quality used. A description of how these measures are constructed is also provided. Section 4.5 presents the techniques used to estimate the empirical model. Section 4.6 contains the diagnostic tests for the estimated empirical model. Section 4.7 contains description of data sources. Section 4.8 provides the description of the variables. Section 4.9 concludes.

4.2 THEORETICAL MODEL SPECIFICATION

The literature reviewed in the previous chapter revealed different theoretical arguments used in the study of private investment. These include but are not limited to the accelerator theory of investment and the neoclassical theory of investment. This literature has been extended to consider several other factors including institutional factors. These models have been applied in many empirical studies on the behavior of private investment. What is clear from the literature is that there is no model that considers all factors that matter in the behavior of private investment. Researchers normally build their models from the literature taking into account the relevant context and data availability. For example, to study the relationship between private investment and

governance for Nigeria Akanbi (2012) specified a model that included output, user cost of capital, financial constraints, and governance as determinants of private investment (see equation (4.1))

$$\ln inv_t = f[\ln rgdp_t, \ln UCC_t, \ln finconst_t, gov_ind_t] \quad (4.1)$$

Where, $\ln inv_t$ denotes the natural logarithm of domestic investment, $\ln rgdp_t$ is the natural logarithm of real GDP, $\ln UCC_t$ is the natural logarithm of the user cost of capital, $\ln finconst_t$ is the natural logarithm of financial constraint, and gov_ind_t is the level of governance. The user cost of capital was derived from the neoclassical theory of investment by Jorgenson (1963). The user cost capital is the extra cost incurred by owners of capital of financing an extra unit of capital investment. This cost normally includes the marginal corporate tax rate, the price of capital goods and the depreciation rate. This study followed a similar approach. The study adopted the model by Akanbi (2012), but extended the model to account for other institutional factors that are of interest in the study. The model is specified in equation (4.2).

$$I_{pvit} = f[GDPGR_{it}, Ucc_t, InstQ_{it}, Trade_{it}] \quad (4.2)$$

Where, denotes I_{pvit} is private investment as a percent of GDP, $GDPGR_{it}$ is the growth rate of real GDP, Ucc_t is the user cost of capital, $InstQ_{it}$ is the aggregate measure of institutional quality constructed by principal components analysis. The variable $InstQ_{it}$ is intended to capture institutional quality in SSA.

This study disaggregates $InstQ_{it}$ into three measures of institutional quality: public accountability, administrative quality, and political instability. The aim of this disaggregation is to include more institutional variables and increase the chance of detecting variables that are significant in influencing private investment. Public accountability is captured using civil liberties and political rights. These two variables are often used to measure the degree of democratization and the extent to which governments are open and accountable to laid policies. The study includes these two

variables because evidence suggests that SSA has gone through a significant evolution in terms of political liberalization with significant progress in civic and political rights (see Masaki & Van de Walle, 2014 and Figure 2.5). Thus including public accountability is likely provide information as to whether this change in governments' openness to laid policies has had any influence to private investment in the region. Further justification for considering political and civil liberties as suggested by Anwar and Cooray (2012) is that these variables are close measures of capabilities of governments to protect the basic human rights of their citizens and heed to the demands of private investors in terms of policies laid for investment. In a nutshell, political rights and civil liberties represent the scale of accountability on the part public authorities entrusted with investment policies.

The measures of corruption, rule of law, and indices of the strength of investment laws in SSA are considered in creating the administrative quality variable. Africa is considered (including SSA) is as the world most corrupt places (see Hanson, 2009). Endemic corruption especially in the form of bribes can increase the cost for administration of businesses to investors (Howell, 2011). As suggested in the introductory Chapter SSA has been scoring low in the rule of law as compared to Latin American and Asian countries. This study include the rule of law to capture the idea that countries with quality legal systems enforce secure property rights and encounter low costs in terms of investment transactions (Çeliköz & Arslan, 2010).

SSA has been marked by a series of coup detats resulting in government otherthrows making it the most political unstable region in the world (see Fosu (2003)). As suggested by the literature, political instability is regarded as harmful to economic performance. Suggestions are that political instability may lead to a macroeconomic policy reversals creating volatility and negatively affect human capital and physical accumulation (Aisen & Francisco, 2011). To capture the suggested

political instability the study include internal conflict, external conflict and ethnics tension to create the political stability variable. The absence of political stability will indicate the presence of political instability in the region. This study therefore hopes to reveal the impact of the mentioned political instability on private investment. It should be clear that this study follows Aysan *et al* (2007) only in categorizing the three institutional quality measures and bundling of different variables that form these measures. Since SSA seems to lack quality in terms of most institutions considered in Aysan *et al* (2007), the current study follows a similar approach as it allows for inclusion of numerous variables of institutions in one study. The current study deviates from study by the latter authors in the use of a different theoretical framework and considering a dynamic panel estimation approach.

The inclusion of trade openness is intended to control for the economic structure of developing countries which largely remain unintegrated into the world markets. According to Adhikary (2011), trade openness provides an opportunity for developing countries to gain larger access to international markets and this helps them to increase exports. A higher degree of openness also reduces the transaction costs of investment and influences economic growth by increasing investment (*ibid*). Thus trade openness is expected to positively influence private investment.

4.3 EMPIRICAL MODEL SPECIFICATION

To facilitate the empirical analysis this study employed the model specified in equation (4.3):

$$I_{pvit} = \alpha_0 + \alpha_1 I_{pvit-1} + \alpha_2 GDPGR_{it} + \alpha_3 Ucc_{it} + \alpha_4 InstQ_{it} + \alpha_5 Trade_{it} + \mu_{it} \quad (4.3)$$

In the model, I_{pvit} denotes the current level of private investment, I_{pvit-1} is lagged private investment, $GDPGR_{it}$ is the growth rate of real GDP, Ucc_{it} is the user cost of capital, $InstQ_{it}$ is

the measure of institutional quality, $Trade_{it}$ is trade openness, μ_{it} is the error term. The flexible accelerator model has pointed out that investment is persistent. This is corroborated by numerous studies that finds the significance impact of past lags of private investment (see Serven (2003); Link (2006); Twine *et al* (2015) and Ullah *et al* (2018) among others). This observation imply that having high or low private levels in the immediate past will affect current levels of private investment. The current study takes this detail into consideration in order to closely mimic the behavior of private investment by including lags of private investment in the empirical model.

4.4 MEASURES OF INSTITUTIONAL QUALITY

Studies of institutional quality often include the level of corruption, the rule of law, political instability, and sometimes the autonomy of the country judicial institutions. As explained having one measure often obscures the impact of the several dimensions of institutional quality on private investment. This study separate institutional quality into three broad measures that are likely to affect private investment decisions. The study considered administrative quality (QA), public accountability (PA), and political stability (PS).

4.4.1 Administrative Quality

According to Aysan *et al* (2007), administrative quality is the ability of governments to deal with investors and provide them with an investment friendly and reliable environment free of corruption and laws to protect investor's contracts and their assets. Strong rule of law, absence of corruption and strong laws governing investment provide stable environment upon which investors can conduct their investment projects (Marthur & Singh, 2013). This study employed three measures of administrative quality namely: control of corruption, the rule of law, and the investment friendly profile of a country.

4.4.2 Public Accountability

This variable intends to measure an assurance that policies made to promote investment are implemented in a more transparent manner that ensures the availability of credible information needed for investment decisions (Aysan et al (2007). Such an information make it possible to hold public authorities accountable for any failures in implementing investment policies. Two variables used to capture public accountability in this study are indices of political rights and civil liberties. These indices are often used to measure the freedoms that citizens of a country possess in electing political leaders of their own liking or democratization (Armstrong, 2011). According to Anwar and Cooray (2012), open political regimes are capable of protecting the basic human rights of their citizens and are accountable to the demands of private investors in terms of policies laid for investment (Anwar & Cooray, 2012).

4.4.3 Political stability

The absence of political stability increases uncertainty in the economy and deters risk averse entrepreneurs to take action for profitable investment opportunities (Mlambo and Oshikoya, 2001). The study used three indices to gauge political stability; internal conflict, external conflict and ethnic tensions.

PRINCIPAL COMPONENTS ANALYSIS

Indicators of institutions are highly correlated measures and their inclusion in a regression might render some parameters of the model unidentifiable (Globerman & Shapiro, 2002). The obstacle of collinear variables is alleviated through principal component analysis which groups the institutional variables that are highly correlated into principal components of the three broad measures of the investment environment (administrative quality, public accountability and

political stability). Principal components analysis extracts crucial information from a data set and expresses it as a set of new orthogonal variables (Chakamera & Alagidede, 2017). Principal components analysis has been shown to reveal latent structures in the data (Markaki *et al*, 2014), and make it easy to analyze data (Unglert *et al*, 2016). The goal of principal component analysis in the study is to provide principal components that provide greater explanation in the quality of institutions data set. For instance, identifying the first component of administrative quality Z_1 which is a linear combination of original variables X variables (in this case control of corruption, law and order an investment laws):

$$Z_1 = u_1X_1 + u_2X_2 + u_3X_3 \quad (4.4)$$

The vector of weights (u_1, u_2, u_3) are normalized by making the sum of squared values equal one (Wold, 2009). It is important to note that the choice of the components to be used in forming each index depends on the percentage of the variance of the principal components in explaining the information in the original indicators, and whether the components can be meaningfully interpreted (Olawale and Garwe, 2010). For this study, varimax orthogonal rotation method developed by Kaiser (1958) was used to facilitate interpretation of the components. According to the Kaiser rule the principal components with Eigen values greater than one should be retained in forming an index. To avoid issues of multicollinearity each indicator of institutional quality (administration quality, public accountability and political stability) was introduced separately into the regression when estimating equation (4.3).

4.5 MODEL ESTIMATION TECHNIQUES

Two important issues arise when estimating equation (4.3). First, the introduction of the lagged dependent variable result in Nickel (1981) bias or the dynamic panel bias (Roodman, 2009) in the

presence of country specific effects. Second, studies on institutions have established that countries are not exogenously endowed with quality institutions. The level of the quality of institutions may depend on the country legal origins, type of laws that govern the country, and the level of economic development (Buchanan *et al*, 2011). Although the aim of this study is not to establish causality between institutions and private investment its presence might lead to biased parameter estimates if not accounted for by an appropriate estimation technique. Research has shown that the issue unbiased parameter estimates caused by reverse causation may be more pronounced especially in the presence of lagged independent variables (Bond, 2002).

The within transformation employed in the traditional fixed effect model normally sweeps away the country specific effects but at the expense of some lagged time demeaned dependent variables still being correlated with past error terms. In such an instance the fixed effect model has been shown to produce biased but consistent estimates but for large time periods. Nickel (1981) shows that the bias introduced by the presence of the lagged dependent variable in the fixed effects model does not go away even when the number of countries increases. Nickel (1981) shows that the traditional random effects random effects model or generalized least squares are both biased and inconsistent. The dynamic panel bias exacerbates even more in both the fixed and random effects model in the presence of other explanatory variables that are endogenous apart from the lagged dependent variable (Phillips & Sul, 2007).

One solution to a model with a lagged-dependent variable as in equation (4.3) is to perform the first difference transformation to remove all constant terms including the country specific effects. With the country specific effects removed instruments can be formed for the lagged dependent variable from second lags, either in levels or differences beginning with the second or third lag.

This is the Anderson-Hsiao instrumental variable estimator considered by Anderson and Hsiao (1981). The problem with this estimator is that with the second and third lags no longer available to use the estimator is thus inefficient though consistent (Arellano & Bond, 1991).

In order to eliminate endogeneity bias and produce an efficient estimator Arellano and Bond (1991) mimic the ideas of Anderson and Hsiao (1981) by including lagged levels or differences of the dependent variable as instruments. The Arellano-Bond general method of moments (GMM) estimator includes zeros in the instrument matrix for the second and third lags making them available in later time periods and thus producing a more efficient estimator.

The Arellano and Bond GMM estimator was initially designed for time periods which are greater than the number of cross-sections, variables that are not strictly exogenous, a linear functional relationship, heteroskedasticity and autocorrelation within individual units but not across them, and the inclusion of external instruments (Roodman, 2009). The Arellano and Bond GMM estimator based on the first differences of equation (4.3) is as follows:

$$I_{pvit} - I_{pvit-1} = \alpha_1 (I_{pvit-1} - I_{pvit-2}) + \alpha_2 (GDPGR_{it} - GDPGR_{it-1}) + \alpha_3 (Ucc_{it} - Ucc_{it-1}) + \alpha_4 (InstQ_{it} - InstQ_{it-1}) + \alpha_5 (Trade_{it} - Trade_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1}) \quad (4.5)$$

Where all the variables are as explained and $t - 2$ represent the second lag. The Arellano and Bond GMM techniques use higher order lags to estimate equation (4.5). The Arellano and Bond GMM estimator is typically estimated in two ways: the one-step estimator and the two-step estimator. The study estimate the first step estimator but with the robust option to correct for large variances of the one step estimator.

4.6 ARELLANO AND BOND GMM ESTIMATOR DIAGNOSTIC TESTS

Two conditions must be met for the implementation of Arellano and Bond GMM estimator. First, the instruments used must be valid. The Sargan Hansen test of over-identifying restrictions checks whether the instruments are not correlated with the error term which is a condition for their validity. Second, the Arellano-Bond GMM estimator assumes that there is first-order serial correlation and there is no second order serial correlation. The Arellano and Bond M1 and M2 statistics are used to test of first-order serial correlation and no second order serial correlation. These two assumptions are requirements for the proper implementation of the Arellano and Bond GMM technique and their satisfaction ensures that lags of the dependent variables or any instruments are not endogenous and therefore not bad instruments.

4.7 DATA TYPES AND SOURCES

The empirical investigation of determinants of private investment is carried out 25 SSA countries beginning 1990 to 2016. The choice of the study period and the number of countries depends on data availability and the need to achieve a balanced panel. The study employed simple non-overlapping averages of three years making the effective time period to be ten years. These averages are made to make it easy to employ the Arellano and Bond GMM estimator which requires that the number of countries should be larger than the time periods. Secondary data for private investment was sourced from the African Development Bank Group. To capture the user cost of capital the prices of capital goods was sourced from Penn-World tables. Annual growth rate of gross domestic product (GDP), Exports and Imports data were sourced from World Development Indicators (WDI). Data on corruption, the rule of law, investment profile, external conflict, internal conflict and ethnic tensions was sourced from the International Country Risk Guide (ICRG). Data on Political rights and civil liberties was sourced from Freedom House.

4.8 VARIABLE DEFINITIONS AND EXPECTED SIGNS

Private investment ratio: This variable is the dependent variable for the study. The African Development Group defines private investment as outlays by the private sector including outlays by private non-profit agencies on additions to their fixed domestic assets.

Administrative quality (QA): This variable is an independent variable. It is intended to capture the ability of governments to provide investors with investment friendly environment. An improvement in administrative quality is expected to positively influence private investment. The administrative quality variable is derived from principal component analysis of three variables: corruption control, law and order, and investment profile:

Control of corruption:

Corruption in this study involves special demands for special payments in the form of bribes connected with export and import licenses, exchange controls, tax assessments, police protection, or loans as defined by ICRG. The control of corruption measure also includes corruption in the form of excessive patronage, nepotism, job reservations, favors to favors, secret party funding, and suspiciously close ties between politics and business.

Law and order:

This variable measures the strength and impartiality of the legal system including the efficiency of the judicial system in keeping crime under control (Faruq & Taylor, 2011).

Investment friendly profile:

According to the ICRG, investment friendly profile is an assessment of laws that prevent expropriation in contracts, provide flexibility in repatriation of profits by investors and prevent payment delays.

Data on all the variables were obtained from the ICRG. The ratings for ICRG indicators range from 0 to 12. The highest value indicates low risk of corruption, a strong legal system or a more favorable investment environment.

Public accountability (PA): This is an independent variable. It is intended to capture the extent to which public authorities can be tied to outcomes of private investment policies and the flexibility of economies in changing such authorities in case of incompetence or negative results in the implementation of investment policies. It is expected that the more accountable governments are to investors and their people the greater the private investment. The public accountability variable is derived from principal component analysis of two variables: political rights and civil liberties.

Political rights: According to the Freedom House political rights indicate the rights to citizens of a country to be subjected to free and fair elections. Political rights also involve ensuring that people who are elected actually rule, political parties are competitive, the opposition plays important role and enjoy real power, and the interests of minority groups are well represented in politics and government (House, 2018).

Civil liberties: According to the Freedom House civil liberties are freedoms that include freedom of expression of ideas, freedom of assembly, freedom of association, freedom of education and freedom to join any religion. Countries with strong civil liberties have an established and generally fair legal system that ensures the rule of law, allow freedom of economic activity, and tend to strive

for equality of opportunity for everyone including women and minority groups (House, 2018). The ratings of political rights and civil liberties range from 1 to 7, with 1 representing the greatest degree of freedom 7 the smallest degree of freedom.

Political stability (PS): This is an independent variable. It is intended to capture the impact of political risk on private investment. High political instability increases uncertainty and risk and deters risk averse entrepreneurs in taking profitable investment opportunities (Mlambo & Oshikoya, 2001). Furthermore, political instability leads to macroeconomic policy reversals creating volatility, and thus negatively affecting human capital and physical accumulation (Aisen & Francisco, 2011). Accordingly, it is expected that political stability positively influence private investment and the presence of political instability will negatively affect private investment. The political stability variable is derived from principal component analysis of ethnic tensions, internal conflict and external conflict.

Ethnic tensions: The variable Ethnic tensions is inversely related to political stability since it increases the chances for divisions and civil unrest and leads to unstable political environment (Faruq *et al*, 2011). Ethnic tension is an assessment of the degree of tension with a country attributable to racial, nationality, or language divisions (Howell, 2011).

Internal conflict: The ICRG defines internal conflict as assessment of a country political violence and its actual impact on governance. The measure includes an assessment of the presence of civil wars or opposition to the ruling government and whether the government does not indulge in random violence against its own people.

External conflict: According to the ICRG external conflict measures the risk of the ruling government from foreign action ranging from non-violent diplomatic pressures, withholding of aid, restrictions on operations to trade and investment to violent cross-border conflicts to all-out war. External conflicts can negatively affect businesses in many ways including sanctions to trade and investment, distortions in allocation of economic resources, and violent changes in the structure of the society (Howell, 2011). All the indicators of political stability are obtained from the ICRG. The rating of political stability ranges from 0 to 12 with high values indicating low risk of political instability.

Trade openness: Trade openness is the sum of exports and imports as a proportion of real GDP. Greater trade openness makes it easy for private investors to access international markets. Easy access of international market allows private investors to increase exports and therefore investment (Adhikary, 2011). The availability of cheap imports also provides necessary intermediary goods for production of investment goods (Coase, 1937). It is therefore expected that greater trade openness will positively affect private investment.

GDP growth rate: According to the World Bank GDP growth rate represents the annual percentage change of GDP at market prices based on constant local currency. The World Bank defines GDP as the sum of gross value added of by all resident producers in an economy plus any product taxes and minus any subsidies not included in the value of the products. This variable is intended to capture the accelerator effect. The growth rate of GDP is an indication to domestic firms of an increasing demand for goods and services which firms respond to by increasing investment (Chirinko, 1993). A positive relationship between GDP growth rate and private investment is expected.

User cost of capital: This variable captures the user cost of capital of price of investment goods. According to Penn World, it is measured as the price level of the output-based GDP that is represented by investment relative to price level output-based GDP based in the US. A high user cost of capital is expected to have a negative impact on private investment.

4.9 CONCLUSION

In this chapter the various aspects of the methodology have been discussed i.e. theoretical and empirical models, data types and data sources used in the analysis. The next chapter presents the results of the empirical analysis.

CHAPTER 5

PRESENTATION AND DISCUSSION OF RESULTS

5.1 INTRODUCTION

This chapter presents results of the empirical analysis. The chapter is structured as follows: Section 5.2 provides a summary of the results of the principal components analysis for the measures of institutional quality. Section 5.3 provides a summary of descriptive statistics for the variables used in the regression analysis. Regression analysis is often preceded by tests of stationarity for variables included in the analysis. Results of stationarity tests are summarized in section 5.4. The summary of diagnostic checks for the estimated models is provided in section 5.5. The main results are discussed in section 5.6. Section 5.7 concludes the chapter.

5.2 PRINCIPAL COMPONENT ANALYSIS RESULTS

Table 5.1 presents the results of principal component analysis for the construction of administrative quality variable. **Table 5.2** contains the results of principal analysis of political stability variable. **Table 5.3** presents summary results for the principal components analysis for public accountability. The Kaiser rule recommends the retention of components with Eigen values greater than one. Examination of **Tables 5.1** through **Table 5.3** shows that only the first components have Eigen values greater than one. For administrative quality the first component has an Eigen value of 1.880 while the second component has an Eigen value of 0.778. For political stability the first component has an Eigen value of 1.91147. For public accountability has an Eigen value of 1.833. For public accountability, the first component has total variation of 93.37 percent. Thus, when all the two indicators of public accountability are bundled the first component represents about 93.37 percent while the remaining component represents 6.63 percent of total variability in the two constituent indicators.

The results for matrix factors loadings which show the correlation between the principal components and the original indicator variables can be found in **Figure A.1** to **Figure A.3** in **Appendix A**. This study performs varimax orthogonal rotation to predict administrative quality, political stability and public accountability variables. The summary descriptive statistics of these three predicted indicators are contained in **Table 5.4** in the next section.

Table 5.1 PCA administrative quality (QA) for SSA

Components	Eigenvalue	Proportion	Cumulative
Component 1	1.880	0.627	0.627
Component 2	0.778	0.259	0.886
Component 3	0.342	0.114	1.000

Source: Author's computation using STATA 14.2

Table 5.2 PCA results for political stability (PS) for SSA

Components	Eigenvalue	Proportion	Cumulative
Component 1	1.911	0.637	0.637
Component 2	0.787	0.262	0.899
Component 3	0.302	0.101	1.000

Source: Author's computation using STATA 14.2

Table 5.3 PCA results for public accountability (PA) for SSA

Components	Eigenvalue	Proportion	Cumulative
Component 1	1.833	0.934	0.934
Component 2	0.167	0.066	1.000

Source: Author's computation using STATA 14.2

5.3 SUMMARY STATISTICS FOR THE VARIABLES USED IN THE ANALYSIS

The constructed administrative quality (QA) index ranges from -2.369 to 2.658 for the whole region. The standard deviation of the QA index is 0.973. Similarly the predicted public accountability (PA) index ranges from -1.784 to 2.312 with the standard deviation of 0.991. The created political instability index ranges from -3.525 to 1.389 with the standard deviation of 0.978. What is clear from these summary descriptive statistics is that most variability comes from variables that created administrative quality (control of corruption, rule of law and investment laws). The next highest variability comes from institutions that created public accountability. The maximum value in terms of the three dimension of institutional quality is 2.658 for administrative quality. The average private investment for the region for the study period is 15.359. This is below the 25 percent long run level proposed by Njuru (2012) to ensure for sustainable economic growth.

Table 5.4 Summary statistics for panel data for SSA (1990-2016)

Variables	Mean	Min	Max	Std. dev.	Observations
Private investment	15.359	2.190	41.021	8.072	250
User cost of capital	0.512	0.046	1.776	0.224	250
GDP growth rate	3.810	-9.290	16.844	3.638	250
Trade openness	65.435	13.444	152.142	24.428	250
Administrative quality	0.003	-2.369	2.658	0.973	250
Public accountability	0.010	-1.784	2.312	0.991	250
Political stability	-0.048	-3.525	1.389	0.978	250

Source: Author's computation using STATA 14.2

5.4 STATIONARITY TEST RESULTS

The Arellano and Bond GMM estimator was used to analyze the impact of institutional quality on private investment in this study. Although the Arellano and Bond GMM estimator is able to control

for bias caused by country specific effects and endogeneity of some or all the explanatory variables, in the presence of non-stationary explanatory variables, the method could lead to biased parameter estimates and larger variances in small samples (Blundell & Bond, 1998). In such situations research suggests the use of the systems GMM (Tun *et al*, 2012). Stationarity are normally carried out before regression analysis can begin. The results for stationarity are reported in **Table 5.5**. Both the Levin, Lin and Chun (LLC) and Im, Pesaran and Shin (IPS) stationarity tests were carried out. The results of LLC and IPS stationarity indicate that all the variables are stationary in levels. Since all three years non-overlapping averages of the variables used in this study are stationary in levels, it is concluded that it is safe and appropriate to carry out the regression analysis using the Arellano-Bond GMM estimator.

Table 5.5: Panel unit root test results for SSA (1990- 2016)

Variable	Levin, Lin & Chu		Im, Pesaran & Shin	
	Levels	First Difference	Levels	First Difference
Private investment	-5.160***	-7.819***	-2.219**	-3.026***
User cost of capital	-9.659***	-12.671***	-2.400***	-2.759***
GDP growth	-15.516***	-14.4175***	-2.859***	-4.530***
Trade openness	-7.804***	-22.100***	-1.972**	-3.355***
Administrative quality	-4.774***	-4.370***	-2.788***	-3.635***
Public accountability	-8.272***	-30.000***	-2.755**	-3.947***
Political stability	-29.628**	-49.223***	-4.774***	-4.370***

Source: Author's computation using STATA 14.2

***, ** and * implies statistical significance at 1%, 5% 10% level of significance respectively.

5.6 DIAGNOSTICS CHECKS FOR THE ARELLANO AND BOND GMM ESTIMATOR

The results of the regressions analysis are summarized in **Table 5.6** through **Table 5.8**. The results from the three tables indicate that the fixed effects not the random effects are common in all the three models as shown by the significant Hausman test statistic and the insignificant Lagrange multiplier statistic. The availability of fixed effect make it appropriate to use the dynamic panel

methods. According to Bond (2002) for the Arellano-Bond GMM estimator to be considered valid the estimated lagged coefficient of the dependent variable should lie between the fixed effects (FE) estimator and that of pooled OLS (POLS) estimator. Examination of **Table 5.6** through **Table 5.8** confirms that the estimated coefficient of the lagged dependent variable for the Arellano-Bond GMM estimator lies between that of FE and POLS estimators for the three estimated models and so the results are considered valid. For the first model $FE = 0.471 < AB\ GMM = 0.610 < POLS = 0.719$, $FE = 0.488 < AB\ GMM = 0.621 < POLS = 0.728$ for the second model, and $FE = 0.489 < AB\ GMM = 0.617 < POLS = 0.720$ for the third model.

Compared to the OLS, the GMM technique does not assume normality in the data (Oseni, 2016). GMM estimators also allow for the control of heteroskedasticity, linear functional relationship and further assumes that the error terms are not autocorrelated. The procedure often used to check for the appropriate statistical assumptions of the GMM models is to check for the validity of the instruments. According to Arellano and Bond (1991) the GMM estimator assumes that there is first-order serial correlation but there is no second-order serial correlation. These two assumptions are tested by M1 and M2 tests for first-order serial correlation and second-order serial correlation respectively. The null hypothesis of these two assumptions is that there is no first-order and second-order serial correlation. From **Table 5.6** to **Table 5.8** the assumption of no first-order serial correlation is rejected at the 1% level of significance for all the GMM models while the assumption of no second-order serial correlation cannot be rejected at all levels. Thus, this result supports the validity of the model specifications for this study.

In addition, the Hansen-J statistic tests the null hypothesis that the instruments used in the models are valid (Oseni, 2016). Oseni (2016) argues that the Hansen-J statistic is the most commonly used statistic to check for the appropriateness of the GMM models. The null hypothesis of valid

instruments cannot be rejected for all levels for the three GMM models in **Table 5.6** to **Table 5.8** which confirm the correct usage of instruments. At this juncture it is important to note that the first lag of private investment and the first lag GDP growth rate were entered as internal instruments while the rest of all other variables were entered as exogenous variables.

Table 5.6: Regressions of private investment at 3 year intervals (1990-2016) for SSA

Private investment	FE	AB GMM	POLS
Lagged investment <i>l. I_{pvit}</i>	0.471*** (0.0061)	0.610*** (0.087)	0.719*** (0.046)
<i>GDPGR_{it}</i>	0.090 (0.111)	0.224 (0.154)	0.269** (0.111)
<i>Ucc_{it}</i>	-3.854 (2.405)	-1.942 (1.576)	-0.7364 (1.873)
<i>Trade_{it}</i>	0.080** (0.032)	0.056*** (0.017)	0.045*** (0.016)
<i>PA_{it}^a</i>	-1.964*** (0.685)	-0.843* (0.431)	-0.470 (0.381)
Constant	5.283* (2.943)	Dropped	0.503 (1.824)
Observations	225	225	225
Instruments		22	
<i>R</i> ²	0.551		0.631
Adjusted <i>R</i> ²			
Hausman	38.43***		
Lagrange multiplier	0.000		
<i>F</i> statistic	8.50***	113.02***	27.75***
Sargan χ^2		13.74	
Hansen		8.05	
<i>M1</i>		-3.04***	
<i>M2</i>		-0.80	

Source: Author's own computation using STATA

^a Higher index indicates deterioration

Notes: 1. The Lagrange multiplier test the hypothesis that the non-observable country specific effects are not relevant in explaining private investment. 2. The Hausman statistic test the null hypothesis that the non-observable country specific effects are not correlated with the explanatory variables. 3. The Wald statistic test the null hypothesis of the non-significance of all the explanatory variables in explaining private investment. 4. The *F*-statistic test the null hypothesis of non-significance of all the estimated parameters in explaining private investment. 5. The Sargan statistic test the null hypothesis of validity of the instruments used. 6. The *M1* tests the null hypothesis of the first order autocorrelation. 7. The *M2* tests the null hypothesis of the absence of second order autocorrelation. 8. ***, ** and * implies statistical significance at 1%, 5% 10% respectively. 9. Standard errors are in parentheses.

Table 5.7 Regressions of private investment at 3 year intervals (1990-2016) SSA

Private investment	FE	AB GMM	POLS
Lagged investment $l. I_{pvit}$	0.488*** (0.654)	0.621*** (0.083)	0.728*** (0.045)
$GDPGR_{it}$	0.096 (0.136)	0.247* (0.139)	0.286** (0.112)
Ucc_{it}	-2.816 (2.442)	-2.055 (1.704)	-0.966 (1.886)
$Trade_{it}$	0.0753** (0.032)	0.059*** (0.016)	0.047*** (0.016)
QA_{it}^b	0.430 (0.584)	0.200 (0.546)	0.129 (0.424)
Constant	5.341 (3.001)	Dropped	0.297 (1.851)
Observations	225	225	225
Instruments		22	
R^2	0.594		0.629
Adjusted R^2			
Hausman	30.09***		
Lagrange multiplier	0.000		
F statistic	7.60***	117.36***	27.46***
Sargan χ^2		11.85	
Hansen		8.12	
M1		-2.96***	
M2		-0.79	

Source: Author's own computation using STATA

^b Higher index indicate more administrative quality

Notes: 1. The Lagrange multiplier test the hypothesis that the non-observable country specific effects are not relevant in explaining private investment. 2. The Hausman statistic test the null hypothesis that the non-observable country specific effects are not correlated with the explanatory variables. 3. The Wald statistic test the null hypothesis of the non-significance of all the explanatory variables in explaining private investment 4. The F-statistic test the null hypothesis of non-significance of all the estimated parameters in explaining private investment. 5. The Sargan statistic test the null hypothesis of validity of the instruments used 6. The M1 tests the null hypothesis of the first order autocorrelation 7. The M2 tests the null hypothesis of the absence of second order autocorrelation. 8. ***, ** and * implies statistical significances at 1%, 5% 10% respectively. 9 Standard errors are in parentheses.

Table 5.8: Regressions of private investment 3 year intervals (1990-2016) for SSA

Private investment	FE	A-B GMM	POLS
Lagged investment $l. I_{pvit}$	0.489*** (0.0646)	0.617*** (0.084)	0.720*** (0.045)
$GDPGR_{it}$	0.073 (0.133)	0.226 (0.153)	0.270** (0.110)
Ucc_{it}	-2.926 (2.413)	-1.920 (1.458)	-0.794 (1.864)
$Trade_{it}$	0.0729** (0.032)	0.052*** (0.016)	0.042** (0.016)
PS_{it}^c	1.240* (0.685)	0.811* (0.410)	0.584 (0.437)
Constant	5.514* (2.983)	Dropped	0.769 (1.857)
Observations	225	225	225
Instruments		22	
R^2	0.587		0.631
Adjusted R^2			0.609
Hausman	32.15***		
Lagrange multiplier	0.000		
F statistic	7.990***	119.56***	27.81***
Sargan χ^2		10.110	
Hansen		8.040	
M1		-3.000***	
M2		-0.83	

Source: Author's computation using STATA

^c Higher index indicate more political stability

Notes: 1. The Lagrange multiplier test the hypothesis that the non-observable country specific effects are not relevant in explaining private investment. 2. The Hausman statistic test the null hypothesis that the non-observable country specific effects are not correlated with the explanatory variables. 3. The Wald statistic test the null hypothesis of the non-significance of all the explanatory variables in explaining private investment. 4. The F-statistic test the null hypothesis of non-significance of all the estimated parameters in explaining private investment. 5. The Sargan statistic test the null hypothesis of validity of the instruments used. 6. The M1 tests the null hypothesis of the first order autocorrelation. 7. The M2 tests the null hypothesis of the absence of second order autocorrelation. 8. ***, ** and * implies statistical significance at 1%, 5% 10% respectively. 9. Standard errors are in parentheses.

5.5 REGRESSION ANALYSIS: DETERMINANTS OF PRIVATE INVESTMENT

Table 5.6 presents the results of the empirical analysis of the relationship between private investment and institutions when public accountability is included as a measure of institutional quality. **Table 5.7** shows the results of private investment and institutions when administrative quality is included as a measure of institutional quality. **Table 5.8** presents the results of private investment and institutions when political stability is included as a measure of institutional quality

for the 25 SSA countries considered. The results for the GMM are for the first step Arellano-Bond GMM. The GMM was estimated with the robust option to correct for heteroskedasticity. The impact of public accountability as measured by the first principal components of political rights and civil liberties is negative and significant at the 10% percent level. This means that all other factors held constant a one unit increase (deterioration) in public accountability index leads to an average reduction of about 0.843 units to private investment across the region.

The impact of administrative quality as measured by the principal components of investment friendly laws, control of corruption and the rule of law is insignificant at all levels. Political stability is significant at the 10 percent level of significance. This means that all other factors held constant a one unit increase (improvement) in political stability as measured by the principal components of internal conflict, external conflict and ethnic tensions will lead to a rise of about 0.811 on average to private investment for the whole SSA region. The sign and the magnitude on the political stability index conversely imply that a reduction in political stability by one unit (more political instability) will lead to an average reduction in private investment by 0.811 units across the region. The results of the effects of indicators of institutional quality are consistent with institutional economics ideas on investment that countries that exhibit poor institutional quality are less likely to attract investment.

The results indicate that the impact of lagged private investment is positive and significant at the 1 % level of significance for the three empirical model specifications. The highest coefficient for one lag of private investment $\alpha_1 = 0.620$. The average adjustment of private investment towards the optimal level of private investment $\delta = (1 - \alpha_1)$ is about 0.38 for the whole SSA region. This result is in line with *a-priori* expectations. The coefficient of GDP growth rate carries an expected positive sign. This coefficient is insignificant in the model of public accountability and political

instability. Only when administrative quality is included as measure of institutional quality does GDP growth rate show a statistical positive effect on private investment at the 10 % level of significance. This result is in accordance with the accelerator theory of investment. The coefficient of the user cost of capital is negative although insignificant in all the three empirical model specifications which is consistent with the user cost of capital theory. Trade openness shows an expected positive and significant effect on private investment at the 1% level of significance in all models. This result is consistent with Adhikary (2011) who suggests that trade openness provides an opportunity for developing countries to gain access to the international markets which helps them to expand exports and investment.

The regression results show very little variation, an indication that the results are robust. For example, the lagged coefficient of private investment is positive and significant in all regressions. Trade openness is positive and significant in all models. The user cost is insignificant in all models. GDP growth rate is positive in all models. All models indicate that country specific effects are relevant in explaining private investment as shown by the insignificant Lagrange multiplier test and significant Hausman test indicating that the models should be estimated using dynamic panel data methods. Finally, the F statistic is significant in all models at the 1% percent level for all models showing the joint significance all variables used to predict private investment.

5.7 CONCLUSION

This chapter described the results of the empirical analysis. The next chapter provides conclusions drawn from the results and related policy implications and recommendations.

CHAPTER 6

CONCLUSION, POLICY IMPLICATIONS AND LIMITATIONS

6.1 CONCLUSION AND POLICY IMPLICATIONS

This study investigated the relationship between institutional quality and private investment in SSA. Principal components analysis was used to generate indices of institutional quality used in the study namely: administrative quality, public accountability and political stability. Panel data methods were subsequently used in the regression analysis.

The panel data results from the study shows that improvement in accountability as proxied by political rights and civil liberties promotes private investment. The related policy recommendation that can be inferred from this observation is that that SSA governments that allow citizens to choose political leaders of their choice and allow freedom of expression are more likely to attract private investment. This finding is analogous to the view that in politically open governments possess public authorities can be tied to the outcomes of investment policies and removed if incompetent which promotes private investment (see McDonagh, 2008).

Considering administrative quality the study indicate that improvement in administrative quality as captured by the first principal components of corruption, rule of law and investment laws improves private investment though this relationship is not statistically significant. There is however a positive and statistically significant impact positive relationship between GDP growth rate and private investment when administrative quality is considered as an indicator for institutional quality in SSA. The policy recommendation following from the finding is that reducing corruption, ensuring quality judicial systems and strengthening investment laws promotes private by indirectly making growth of GDP to positively influence private investment.

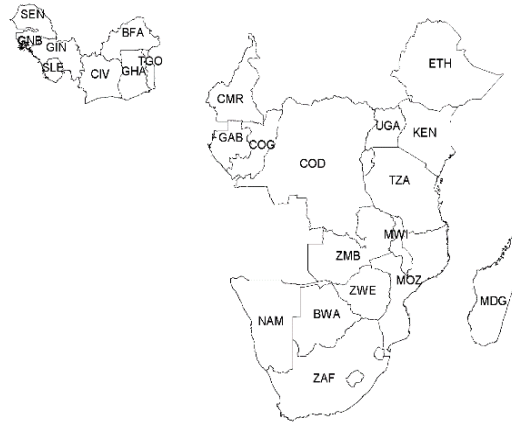
The relationship between political stability and private investment studied at the regional level shows that there is statistically significant relationship between reduction in political instability and private investment in SSA. SSA governments will therefore experience in growing private investment if measures intended to reduce internal conflicts, external conflicts and ethnic tensions are put into place. Overall, trade openness which is used to control for the economic structure of SSA is positive and significant. In accordance with other studies of private investment the impact of the user cost of capital is negative but not statistically significant.

6.2 LIMITATIONS OF THE STUDY

This study has not examined the causality between private investment and institutions. Since the study has estimated a significant relationship between the quality of institutions and private investment it might be worth investigating whether private investment cause institutions or vice versa. Such an analysis will provide important insights into the interaction between private investment and institutional quality. Causality analysis may shed light on the channels through which other variables can influence institutional quality and hence promote private investment. It will also be important to conduct individual country studies as panel data does not reveal countries' specific effects such as major changes in political regimes and economic developments that might impact private investment. These changes can be clearly identified and specified in time series studies.

APPENDIX A

Map A1: Map of SSA countries used for panel data analysis



Source: Obtained from GADM maps with modifications

Table A1: List of SSA countries used for panel data analysis

Country	Code	Country	Code
Botswana	BWA	Malawi	MWI
Burkina Faso	BFA	Mozambique	MOZ
Cameroon	CMR	Namibia	NAM
Congo	COG	Niger	NER
Congo DR	COD	Senegal	SEN
Cote d'Ivoire	CIV	Sierra leone	SLE
Ethiopia	ETH	South Africa	ZAF
Gabon	GAB	Tanzania	TZA
Ghana	GHA	Togo	TGO
Guinea	GIN	Uganda	UGA
Guinea Bissau	GNB	Zambia	ZMB
Kenya	KEN	Zimbabwe	ZWE
Madagascar	MDG		

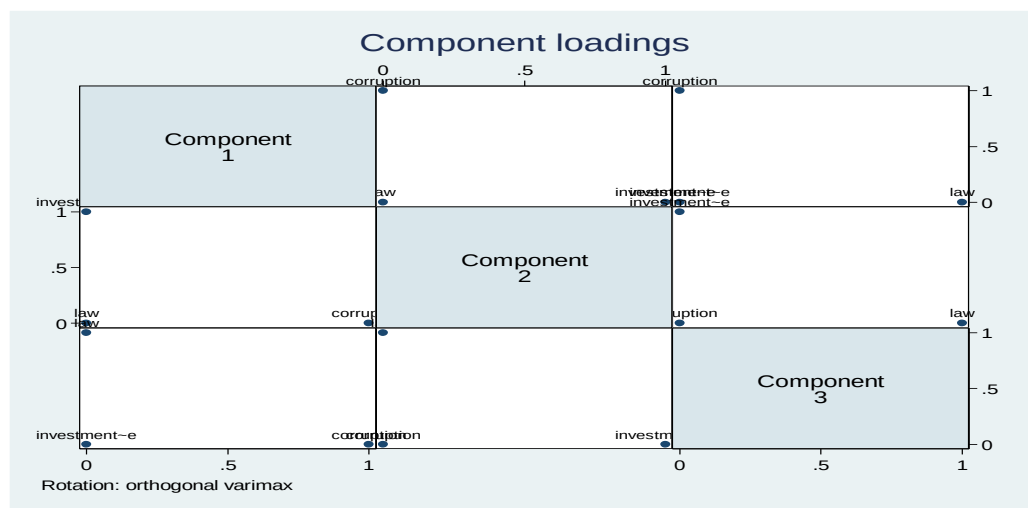
Table A.2: Correlation matrix for SSA

	Private investment	User cost	GDP rate	Trade	Administrative quality	Public accountability	Political stability
<i>Private investment</i>	1.000						
<i>User cost</i>	0.013	1.000					
<i>GDP rate</i>	0.120***	0.013	1.000				
<i>Trade</i>	0.303***	0.265***	0.451**	1.000			
<i>Administrative quality</i>	0.0444	0.006	0.031	0.008	1.000		
<i>Public accountability</i>	-0.255***	0.061	-0.169***	0.239***	-0.231***	1.000	
<i>Political stability</i>	0.187***	-0.006	0.165***	0.290***	0.144***	0.476***	1.000

Source: Author's computation using STATA 14.2

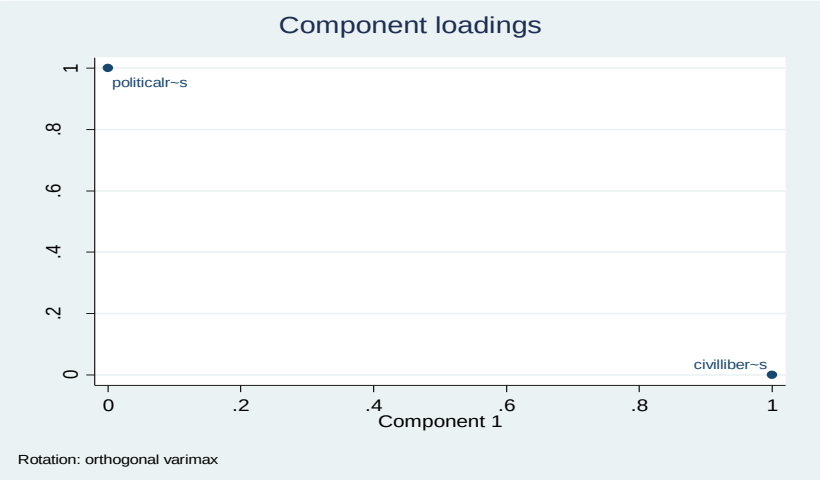
*** implies a rejection of the null hypothesis of no correlation at 1% level of significance

Figure A.1: Factor loadings plots for administrative quality in SSA



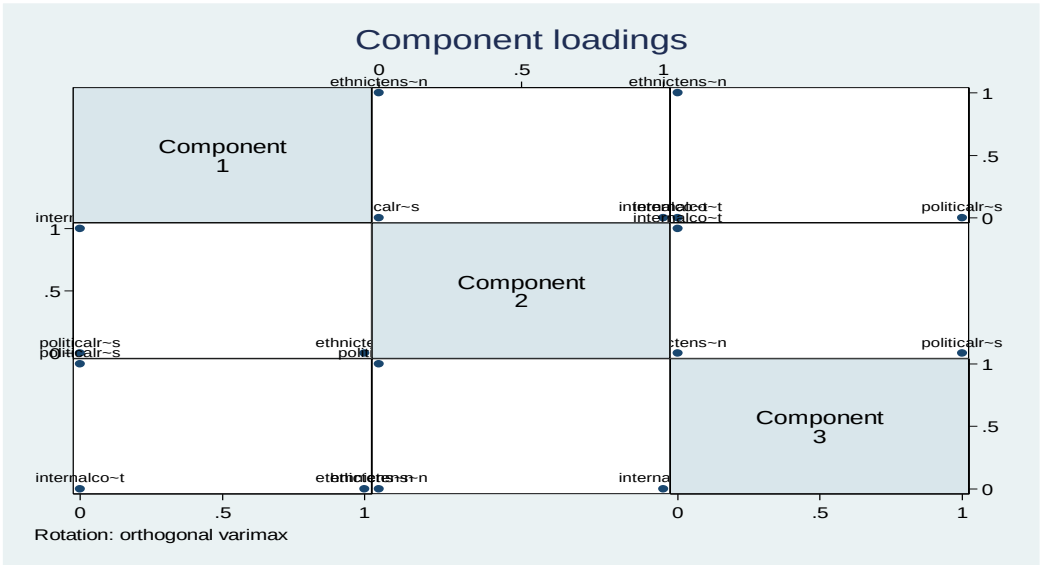
Source: Author's computation using STATA14.2

Figure A.2: Factor loadings plot for public accountability in SSA



Source: Author’s computation using STATA 14.2

Figure A.3: Factor loadings plots for political stability in SSA



Source: Author’s computation using STATA 14.2

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