

UNIVERSITY OF GHANA

**PRIVATE INVESTMENT, LABOUR DEMAND AND SOCIAL WELFARE IN
SUB-SAHARAN AFRICA**

BY

SAMUEL KWAKU AGYEI

The logo of the University of Ghana is a watermark in the background. It features a shield with three golden arrows pointing downwards, a central golden symbol, and a banner at the bottom with the motto 'SINCE PROGRESS THROUGH KNOWLEDGE'.

**A THESIS SUBMITTED TO THE DEPARTMENT OF FINANCE,
UNIVERSITY OF GHANA BUSINESS SCHOOL, UNIVERSITY OF GHANA,
LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE
AWARD OF PHD IN BUSINESS ADMINISTRATION (FINANCE OPTION)
DEGREE**

JUNE 2016

DECLARATION

I do hereby declare that this thesis is the result of my own research and has neither in whole nor in part been submitted to this university or any other institution for the award of any degree. All ideas other than my own have duly recognized.

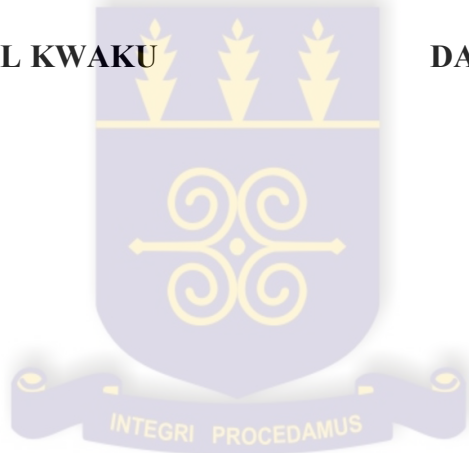
I also hereby accept full responsibility for any shortcomings that may result from this work.

.....

AGYEI, SAMUEL KWAKU
(10292234)

.....

DATE



CERTIFICATION

We hereby certify that this thesis was supervised in accordance with procedures laid down by the University.

SUPERVISORS:

.....

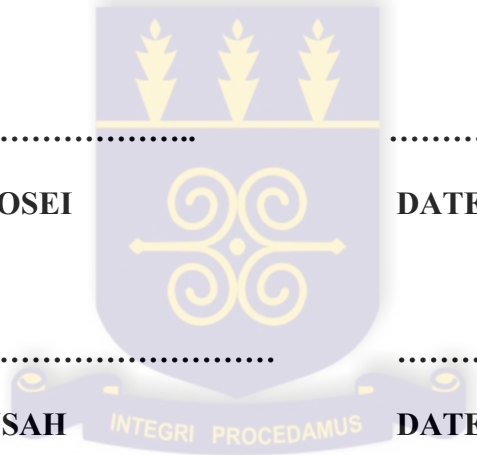
PROF. ANTHONY Q. Q. ABOAGYE **DATE**

.....

PROF. KOFI A. OSEI **DATE**

.....

DR. LORD MENSAH **DATE**



DEDICATION

I dedicate this work to my lovely wife, Mrs Ellen Animah Agyei and wonderful children, Nana Boatemaa Sefa-Agyei, Maame Boatemaa Sefa-Agyei and Kofi Konadu Boadi Agyei for their support in this life.



ACKNOWLEDGEMENTS

I sincerely thank the Almighty God for His protection, guidance and love. I am highly indebted to the Lord for the knowledge and strength He bestowed upon me and my family throughout my period of study. I am grateful to Jehovah for taking us this far.

I wish to also express my heartfelt gratitude to my supervisors, Prof. Anthony Q. Q. Aboagye, Prof. Kofi Acheampong Osei and Dr. Lord Mensah, for their guidance and assistance at all times. May the Lord grant their heart desires. Again, I thank all senior members of the Department of Finance for their constructive criticisms, suggestions and encouragement.

Moreover, I am grateful to University of Cape Coast for sponsoring this programme.

The efforts of Prof. Edward Marfo-Yiadom, Dr. Siaw Frimpong, Mr. Mohammed Anokye Adam, Mr. Kwabena Nkansah Darfur, Mr. Cyprain Amankwah, faculty members of the Department of Accounting and Finance of the University of Cape Coast and that of Kofi Ababio and Kwasi Adu-Boateng cannot be expended unappreciated.

Furthermore, I would like to thank Ms Selina Owusu-Konadu, Mr. Kwasi Acquah Sefa-Bonsu, Mr Mark Owusu-Asenso, Mr. Kwadwo Owusu Boateng and the late Mr. Charles Kofi Owusu for their assistance throughout my study.

Finally, I appreciate the help of my colleagues, Dr. Sarpong-Kumankuma and David, during the entire period of the programme.

TABLE OF CONTENTS

Declaration	ii
Certification.....	iii
Dedication	iv
Acknowledgement	v
Table of content.....	vi
List of tables.....	x
List of figures	xii
List of acronyms.....	xiv
Abstract.....	xvii
 CHAPTER ONE: INTRODUCTION	
1.0 Background of the Study.....	1
1.1 Stylised Facts.....	6
1.1.1 Investment Trends in SSA.....	6
1.1.2 Employment Trends in SSA	14
1.1.3 Welfare Trends in SSA.....	16
1.2 Problem Statement	17
1.2.1 Interrelationship between Private and Public Investments	17
1.2.2 Private Investment and Labour Demand in Africa	19
1.2.3 Private Investment, Labour Demand and Social Welfare in SSA	20
1.3 Objectives of the study.....	21
1.4 Hypotheses.....	21

1.5 Significance of the study	22
1.6 Scope and limitation for the study	23
1.5 Chapter disposition	23
References to chapter One	25
Appendices to chapter	33

CHAPTER TWO: INTERRELATIONSHIP BETWEEN PRIVATE AND PUBLIC INVESTMENTS IN SUB-SAHARAN AFRICA

Abstract	34
2.0 Introduction	35
2.1 Literature Review.....	38
2.1.1 Theoretical Literature Review.....	38
• The Keynesian Theory of Investment	38
• The Classical Theory of Investment	41
2.1.2 Empirical Literature Review	44
• Determinants of Private Investment	44
• Determinants of Public Investment	56
2.2 Methodology.....	57
2.3.0 Analysis and Discussions.....	83
2.3.1 Descriptive Statistics	83
2.3.2 Multicollinearity	85
2.3.3 Discussion of Regression Results.....	88
• Bi-causal relationship between private and public investment.....	88

- Determinants of private and public investments in SSA.....96
- 2.4 Conclusion.....103
- References to chapter two105
- Appendices to chapter two.....117

CHAPTER THREE: PRIVATE INVESTMENT AND LABOUR DEMAND IN SUB-SAHARAN AFRICA

Abstract 140

3.1 Introduction.....140

3.2 Literature Review.....147

- 3.2.1 Neoclassical Theory of Employment.....147
- 3.2.2 Empirical Literature Review.....152

3.3 Methodology160

- 3.3.1 Theoretical Justification of the Neoclassical Labour Demand Model160
- 3.3.2 Study sample169
- 3.3.3 Data169
- 3.3.4 Panel Data Methodology.....170
- 3.4.1 Dynamic Labour Demand.....170

3.5 Analysis and Discussion.....181

- 3.5.1 Descriptive Statistics.....181
- 3.5.2 Multicollinearity182
- 3.5.3 Discussion of Regression Results.....185

3.6 Conclusion.....193

References to chapter three.....196
Appendices to chapter three.....212

CHAPTER FOUR: PRIVATE INVESTMENT, EMPLOYMENT AND SOCIAL WELFARE IN SUB- SAHARAN AFRICA

Abstract214
4.1.0 Introduction214
4.2.0 Literature Review.....220
4.3.0 Methodology.....225
 4.3.1 Theoretical Justification of the Model.....225
 4.3.2 Panel Data Methodology.....230
4.4.0 Analysis and Discussion of Results237
 4.4.1 Descriptive Statistics237
 4.4.2 Multicollinearity Test240
 4.4.3 Discussion of Regression Results243
4.5.0 Conclusion246
References to chapter four.....248
Appendices to chapter four.....259

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction262
5.1 Summary262
5.2 Conclusion264
5.3 Recommendations.....267

LIST OF TABLES

TABLE	PAGE
Table 1.1: Investment Trends in SSA, with regional indicators.....	13
Table 1.2: Employment Trends in SSA.....	15
Table 1.3: Poverty Reductions in SSA and SAS	17
Table 1.4: Private Investment, Employment and Social Welfare	17
Table 2.1: Two Stage Least Squares regression. Dependent Variable: PRINV	67
Table 2.2: Definition of variables (proxies) and Expected signs for Determinants of Private and Public Investment.....	75
Table 2.3: Components of Country Governance Index.....	82
Table 2.4: Descriptive Statistics of Determinants of Private and Public Investment variables	85
Table 2.5A: Variance Inflation Factor Tables.....	86
Table 2.5B: Correlation Matrix.....	87
Table 2.6: Panel Unit root Test for Variables in the Panel VAR.....	88
Table 2.7: Panel VAR Estimation Results.....	90
Table 2.8: Granger Causality Results of the Estimated System Variables.....	94
Table 2.9: Variance Decomposition Results.....	95
Table 2.10: Regression Results based on Arellano and Bond Dynamic Panel Estimation	98
Table 3.1: Definition and Expected signs of variables used for the study on Private Investment and Labour Demand in SSA.....	175

Table 3.2: Descriptive Statistics of the variables used for Private Investment and Labour Demand study.....	182
Table 3.3: Variance inflation Factor Test.....	183
Table 3.4: Correlation Matrix.....	184
Table 3.5A: Regression Results for models 24, 25 and 26.....	187
Table 3.5B: Regression Results for models 27, 28 and 29.....	192
Table 4.1: Variable names, measurement and expected signs for the study on the relationship between Private Investment, Employment and Social Welfare in SSA.....	232
Table 4.2A: Descriptive Statistics of variables used for Private Investment, Employment and Social Welfare in SSA.....	239
Table 4.2B: Regional Distribution of below average performance countries	239
Table 4.3A: Variance Inflation factor Analysis.....	240
Table 4.3B: Correlation Matrix.....	241
Table 4.4: Regression Results - Dependent Variable HD.....	243

LIST OF FIGURES

FIGURE	PAGE
Figure 1.1: Relationship between Private Investment, Savings, Real Interest Rate and Governance in Africa.....	8
Figure 1.2A: Relationship between Private Investment, Savings, Real Interest Rate and Governance in the Southern Africa.....	8
Figure 1.2B: Relationship between Private Investment, Savings, Real Interest Rate and Governance in the West Africa.....	9
Figure 1.2C: Relationship between Private Investment, Savings, Real Interest Rate and Governance in the Central Africa.....	9
Figure 1.2D: Relationship between Private Investment, Savings, Real Interest Rate and Governance in the East Africa.....	10
Figure 1.3: Relationship between Output and Private Investment in Africa.....	11
Figure 1.4: Sub-Regional Distribution of Private Investment in Africa.....	11
Figure 1.5: Sub-Regional Distribution of GDP per Capita in Africa.....	12

LIST OF ACRONYMS

AB - Arellano-Bond

AB-GMM - Arellano Bond General Moments Method

ADF - Augmented Dickey Fuller

ADI - African Development Index

AfDB –African Development Bank

API - Agricultural Productivity Index

CA - Central Africa

CBB - Current Budget Balance

CC - Control of Corruption GDP - Gross Domestic Product

CGI – Country Governance Index

DCPS - Domestic Credit to Private Sector

EA - East Africa

EDS - External Debt Stocks

EMPFEM - Female Employment

EMPFEMY - Youth and Female Employment

EMPMAL - Male Employment

EMPMALY - Youth and Male Employment

EMPTOT - Total Employment

EMPTOTY - Total Youth employment

EMU - European Monetary Union

FDI – Foreign Direct Investment

FRL - Fiscal Responsibility Law

GDP - Gross Domestic Product

GE - Government Effectiveness

GMM - General Methods of Moments

GPINV - Public Investment

HD - Human Development

HDI - Human Development Index

IAWG - Inter-Agency Working Group

IFC - International Financial Corporation

IFC- International Finance Corporation

IFIs - International Financial Institutions

IGF - Internally generated funds

ILO - International Labour Organisation

IMF - International Monetary Fund

INF – Inflation

IRF - Impulse Response Functions

ISSER - Institute of Statistical Social and Economic Research

IV - Instrumental Variable

MDG – Millennium Development Goal

MENA - Middle-East and North Africa

MNC – Multi – National Corporation

MPP_L - Marginal Physical Product of Labour

NA - North Africa

NGO - Non-Governmental Organisations

OBB - Overall budget deficit

ODA - Gross Official Development Agency's

OECD - Organisation for Economic Development

OLS - ordinary least squares

PCA - Principal Component Analysis

POL - Political Discretion/Constraint

PPP - Public private partnership

PRINV- Private Investment

PS - Political Stability

PVAR - Panel-Data Vector Autoregression

RIR - Real Interest Rate

RL - Rule of Law

RQ - Regulatory Quality

RWR - Real Wage Rate

SA - Southern Africa

SAS - South Asia

SME – Small and Medium scale Enterprise

SOEs - State-Owned Enterprises

SSA - Sub-Saharan Africa

TOPEN - Trade openness

UNCTAD - United Nations Commission for Trade and Development

UNDP – United Nations Development Program

UNECA - United Nations Economic Commission for Africa

USA - United States of America

VA - Voice and Accountability

VIF - Variance Inflation Factors

WA - West Africa

WES - World Bank Enterprise Survey

WTO - World Trade Organisation

2SLS - Two-Stage Least Squares

ABSTRACT

Private investment, employment and social welfare are key socio-economic development policy variables of many a developing nation. Over the two decades (1990-2009) that this study covered, Sub-Saharan Africa (SSA) has experienced interesting dynamics in private investment, employment and social welfare. Key among them is a dwindling public sector investment and a marginal increase in private investment coupled with an increase in employment which is mostly driven by a surge in female employment as against a dip in male employment. These interesting dynamics have coincided with an improvement in the social welfare of the citizens of SSA with initial. In the wake of the above developments, this study was conducted to evaluate the relationship between private investment, labour demand and social welfare in SSA. To achieve this, three main sub-objectives were pursued: 1) assessing the possibility of a bi-causal relationship between private investment and public investment; 2) evaluating the relationship between private investment and labour demand in SSA; and 3) evaluating the relationship among private investment, labour demand and social welfare in SSA. In Chapter two, we set out with the basic objective of exploring the possibility of a bi-causal relationship between private investment and public investment in SSA. The study contributes to the unsettled debate on whether public investment facilitates (crowds-in) or discourages (crowds-out) private investment. Based on a Panel Vector Autoregressive model, the results show that public and private physical capitals are compliments and mutually dependent. However, when private and public investors compete for financial resources, they become substitutes. The results stress the need for governments in

SSA to reduce their activities in the domestic financial markets by being fiscally disciplined probably through strong commitment to Fiscal Responsibility Laws. This would not only facilitate private investment but also reduce the burden on governments for public investments. Thus, we argue that a public-private partnership based on a thorough comparative analysis of the respective strengths and weaknesses of public and private investment would facilitate development in SSA. In Chapter three, we concentrated on the second objective, that is, assess whether employment generation (total, male, female and youth) is part of the benefits that SSA economies get from private investment. We estimated a derived neoclassical labour demand model that allows for the inclusion of private investment, real labour cost, human capital and public investment. The results indicate that while private investment has a substitutive effect on employment (total, male and female), public investment compliments employment. Also, real wage rate and human capital have significantly negative relationships with labour demand. Meanwhile the result on the youth employment effect of private investment is inconclusive. Thus it is suggested that employment incentives policies should be offered to private investors to help mitigate their negative impact on labour demand while measures to sustain public investment are undertaken. Also, in Chapter four, the study concentrated on the last objective of assessing the effect of private investment and employment on social welfare in SSA, after accounting for economic inequality. We estimated a derived welfare function within the framework of random effects panel methodology. The results offer support for the growth-poverty-nexus by showing that growth components like investment and employment help explain social welfare dynamics.

Also, economic inequality and poverty worsen the social welfare condition of the citizens of SSA. Consequently, SSA countries should intensify policies aimed at improving per capita private investment, enhancing the efficiency of per capita public investment, offering good jobs and reducing poverty and inequality since they are conduits for improving the social wellbeing of the citizenry. These policies should target real interest rate and wage cost reductions, tax reforms that will motivate private sector to employ more while at the same time getting more tax revenue from the rich to facilitate social intervention programmes, fiscal discipline, control corruption and population and encourage labour intensive economic growth.

CHAPTER ONE

GENERAL INTRODUCTION

1.0 Background

Significant disparities in global standards of living are a source of worry not only to economists and politicians but also to religious bodies and social activist. In fact, bridging this gap is one of the main reasons in support of aid, grant and many activities of international donor agencies and non-governmental organizations. Miles and Scott (2005) argue that differences in overall value of physical capital among countries can account for a substantial part, but by no means, most of the differences in standard of living. In other words, the benefits that can be derived from investment can help advance the standard of living of the citizenry of any nation. Earlier, Cherian (1998) argued that investment may be considered the most important component of Gross Domestic Product (GDP) because (1) Plant and Equipment have a long-term effect on the economy's productive capacity, (2) Changes in investment spending directly affect levels of employment and worker's incomes in durable goods industries and (3) supply and demand are sensitive to changes in investment. Miles and Scott (2005) contend that understanding what drives investment is critical not only for understanding movements in the standard of living of countries but also business cycles. Probably, this may be as a result of the fact that investment has the potential to influence welfare and productivity through employment.

In view of the importance of investment in explaining the differences in global standards of living, empirical knowledge of the co-existence of the two main types of

investment (public and private) is of paramount importance. The empirical literature is rich with studies on determinants of investment in general, with some seeming overconcentration on private investment. But there is no consistent conclusion on whether public investment amplifies or curtails private investment. Empirical knowledge about the interrelationship between public investment and private investment is pertinent because a vibrant private sector is good for employment generation and poverty alleviation, which are traditionally considered to be the direct responsibility of government. Government can assist the private sector to achieve this through the provision of infrastructure and proper regulation. Unfortunately, however, when government compete with the private sector in search of factors of production like capital the negative effects of such actions on private investment can outweigh their positive effects.

Those who argue that public investment facilitates (crowds in) private investment explain that the provision of basic infrastructure like roads, power, education and health facilities and the provision of public goods that are complements to private goods are the main channels for the crowding-in effect. (Aschauer, 1989a, 1989b, 1990; Munnell, 1990; Cashin, 1995; Asante, 2000; Ghura & Barry, 2010; Altin, Moisiu & Agim, 2012). On the other hand, those who support the view that public investment curtails (crowds out) private investment contend that when public investment is in the provision of substitute products, crowding out is possible (Tatom, 1991; Holtz-Eakin, 1994; Evans & Karras, 1994; Deverajan, Easterly & Pack, 1999; Ajide & Olukemi, 2012; Munthali, 2012). In the midst of this debate,

some researchers argue that whether public investment crowds out or crowds in private investment depends on the stage of development of the economy (Belloc & Vertola, 2004; Erden & Holcombe, 2005; Munthali, 2008, 2012). They further explain that a crowding out relationship is more associated with a developed economy while a crowding in relationship is associated with a developing economy. In spite of this, some empirical results on developing economies, especially Africa, are not consistent with this conclusion (Asante, 2000; Altin, et al, 2012; Deverajan, et al, 1999; Ajide & Olekumi, 2012). Asante (2000) concluded from a study on the determinants of private investment in Ghana and also from time series data that private investment and public investment are compliments. Altin, et al, (2012) also explain that the relationship between public investment and private investment, even though positive, diminishes as a country moves from less developed to more developed. But Deverajan, et al, (1999) in a study of whether investment in Africa was too high or too low argued that public investment has a possibility of crowding out private investment than crowding in private investment. Ajide and Olekumi (2012) support the findings of Deverajan, et al, (1999) but with data from Nigeria. Thus, the relationship between public investment and private investment still remains an empirical question.

Meanwhile, researchers have overly concentrated on finding out whether public investment crowds-in or crowds-out private investment generally to the neglect of assessing the possibility of a reverse causality between public investment and private investment. In other words, does private investment crowd in or crowd out public

investment in Africa, where private investment sometimes leads public investment? Except under public private partnership (PPP) agreements, it is uncommon for private and public investments to coincide. What is likely, is for private investment to either precede or follow public investments. Depending on the kind of products (complements or substitutes) that public investments are made in, private investment may also crowd in or crowd out public investments. Also, if more public investments are in infrastructure and not in commercial goods then the presence of private investment may serve as an attraction for public investment projects. Again, the way in which public investments are funded would also play a key role in helping to resolve the crowding-in and crowding-out (herein referred to as crowding-in-out) debate. Where public investments are funded through internally generated funds (IGF) of government and not on the meagre domestic credit, the crowding out effect of public investment on private is likely to be minimal. The existing empirical literature on the crowding-in-out debate provides little or no information on this aspect of literature. This general empirical oversight, in the researcher's view, would not help us have a better understanding and conclusion of the crowding-in-out hypothesis. Thus, this study contributes to the existing literature by reassessing the crowding-in crowding-out hypothesis and the possibility of a bi-causal relationship between private and public investment in an SSA setting.

In spite of the uncertainty surrounding the relationship between public and private investment, it is less debatable that investment facilitates economic development. Through job creation which increases living standards, raises productivity and

facilitates social cohesion (World Bank, 2013) private investment may influence economic development. A developed economy is one that gives its citizens employment opportunities in order to empower them economically to meet, at least, the basic needs of life. Unfortunately, however, the 2008 global economic meltdown seems to have worsened the global unemployment challenge, in recent times. The International Finance Corporation (IFC-2014) indicates that unemployment estimates for 2020 show that most of the world's needs for jobs would have to come from Africa and Asia. These regions, especially Africa, need special attention because even in periods of rising economic growth, Emery (2003) warned of a decreasing employment content and rising inequality in Africa. Meanwhile, SSA has not only witnessed a steady rise in private investment but also a dwindling public investment component of a rising total investment, when the two decades (1990-1999 and 2000-2009) of the study period are compared. Consequently, this study also assessed, empirically, the contribution of the private sector to employment generation in the SSA, since limited studies (Asiedu, 2004; Sackey, 2007; Asiedu & Gyimah-Brempong, 2008; Aterido & Hallward-Driemeier, 2010) exist in this area and none of them considers it in a derived neoclassical labour demand model that expressly factors in private investment. Neoclassical labour demand models predict a negative relationship between real wage rate and employment (Symons, 1982; Andrews & Nickell, 1982; Sparrow, Ortmann, Lyne & Darroch, 2008) even though some other studies argue in favour of a positive association, especially in a recession (Keynes, 1936; Michailat & Saez, 2013). So, eventually, this study also contributes to the

discussion on the relationship between real wage rate and labour demand while assessing the contribution of private investment to labour demand.

Another way of assessing the economic developmental impact of private investment is through its impact on social welfare. Generally, economic growth is considered the single most important factor that influences welfare (Donaldson, 2008), when such growth benefits the poor (Thurlow & Wobst, 2006). In other words, when income inequality is reduced, it enhances the quality of growth to facilitate social welfare (Kalwij & Verschoor 2007; Ravallion, 2007; Fosu, 2008, 2010). Also, according to Adams (2004) when economic growth is labour intensive, it can be an appropriate channel through which growth can benefit the poor. Pfeffermann (2001) adds that a dynamic private sector is a key ingredient for ensuring long-run economic development. Given that economic growth influences social welfare and private investment as well as employment enhances economic growth (Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2010 and; Apergis, Lyroudia, & Vamvakidis, 2008), it would not be farfetched for one to conjecture that private investment and employment may influence social welfare, especially when some stylised facts suggest so. This, in effect, allows us to assess which growth structure influences social welfare.

1.1 Stylised Facts

1.1.1 Investment trends in SSA

The investment potential on the African continent cannot be contended; largely because of the huge natural resource endowment, vast developmental gap and the abundance of labour force. In spite of this, the general level of private investment in Africa has been relatively stable for more than a decade (1999-2009) over the study period (Figure 1.1) even though significant differences exist in the level of private investment at the sub-regional levels (Figures 1.2A, 1.2B, 1.2C and 1.2D). For instance, while private investment in Southern and Central Africa appears to be generally falling, in the last decade of the study period (2000-2009), that of West Africa (1.2B) rose sharply in the first five years before stabilizing in the last five years of the last decade. In the case of East Africa, there is a general rise in private investment all throughout the last decade (1.2D). Interestingly, private investment has been higher than public investment for all the periods and for all sub-regions in SSA except for the first decade (1990-1999) of the study period in East Africa (1.2D). Also, private investment is relatively more volatile than public investment. But the level of changes in both investment components does not reflect a consistent pattern with that of changes in real interest rate. In fact, in some periods (between 2005 and 2007 of Figure 1.1), it appears that private and public investments are adamant to changes in real interest rate.

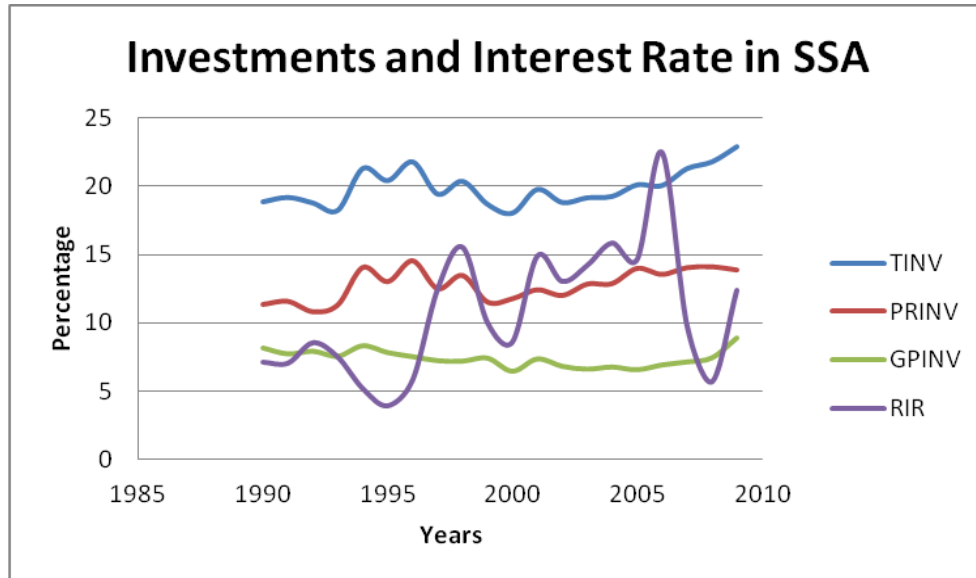


Figure 1.1: Investment and Interest Rate in SSA

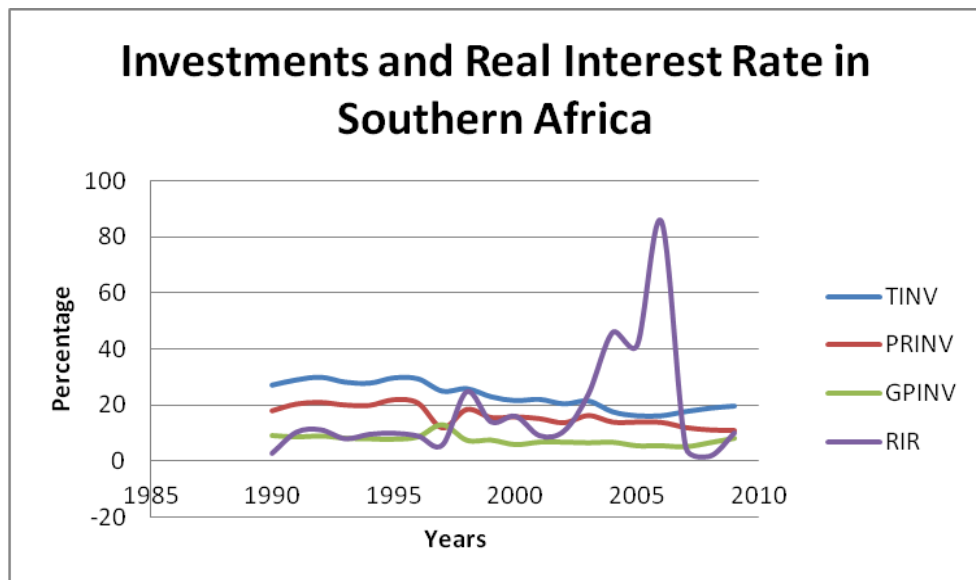


Figure 1.2A: Investment and Interest Rate in Southern Africa

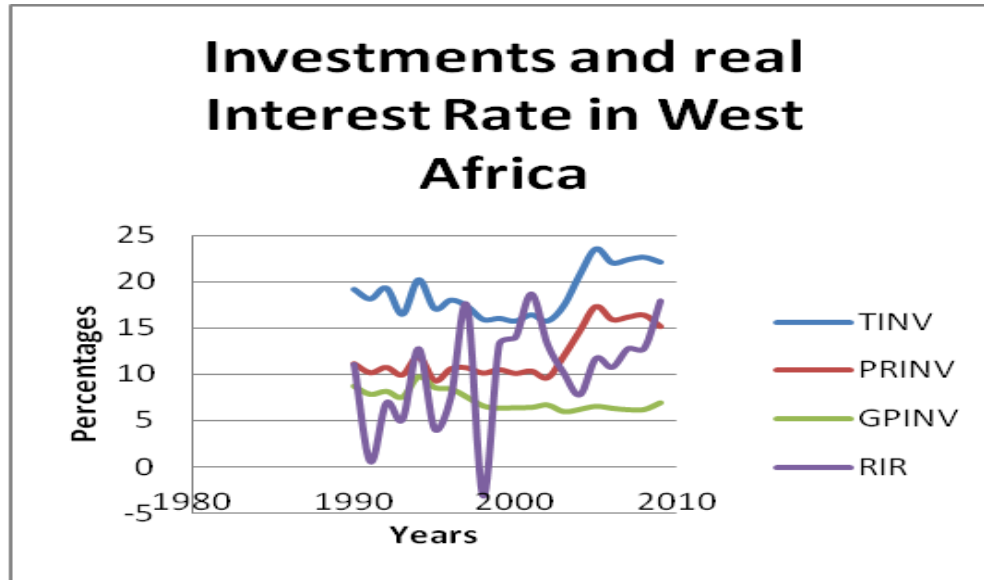


Figure 1.2B: Investment and Interest Rate in West Africa

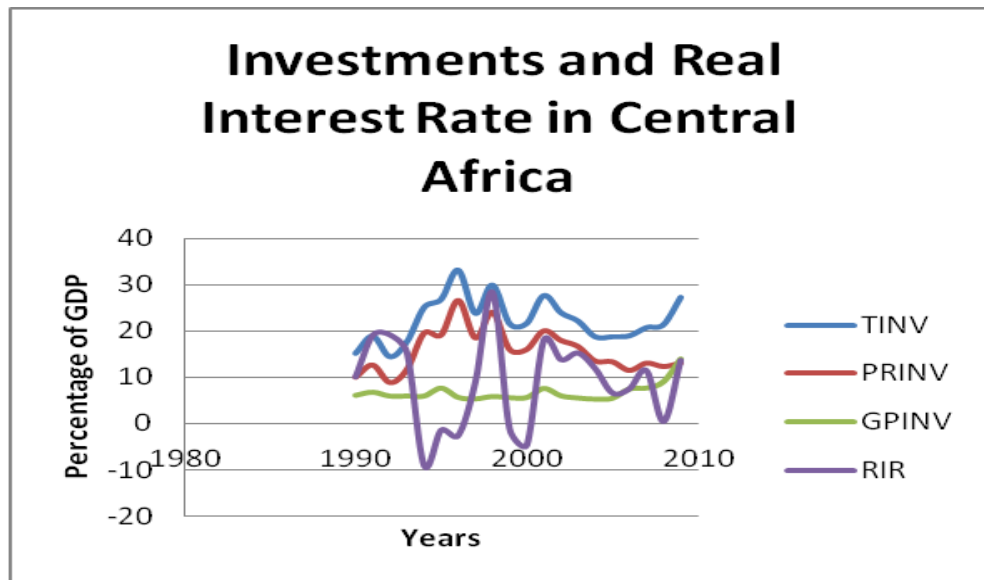


Figure 1.2C: Investment and Interest Rate in East Africa

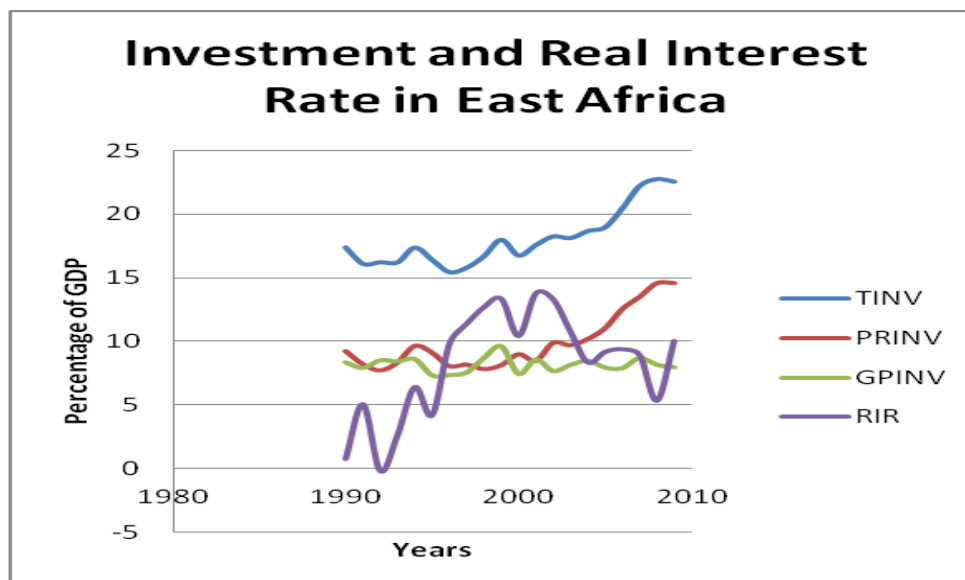


Figure 1.2D: Investment and Interest Rate in East Africa

In the last five years of the study period, the order of private investment attractiveness (in terms of sub-regional size of private investment) has been West Africa (WA), North Africa (NA), Southern Africa (SA), East Africa (EA) and Central Africa (CA) as shown in Figure 1.4. This notwithstanding, the wealth per person of Africa is bigger in North Africa, followed by Southern Africa, East and Central Africa and then West Africa (see Figure 1.5). Also, apart from West Africa, Figures 1.4 and 1.5 show that higher private investment can lead to higher standard of living as also shown also by Figure 1.3 when movements in private investment and GDP are compared for Africa. The situation in West Africa is worrying and raises concern about the fact that private investment attracted into the region are probably not being used effectively.

Surprisingly, the United Nations Commission for Trade and Development-UNCTAD (2012) reported that Africa's investment outflows doubled to 0.5% of the world share

in 2010, compared to its average of 0.26% during the past decade. North Africa (contributed about half of the continents total), South Africa and Nigeria are the main contributors to this height. Even though this is encouraging, Africa needs to ensure that appropriate policies are pursued not only to attract inward investment but also ensure that these investments are properly diffused throughout the entire continent.

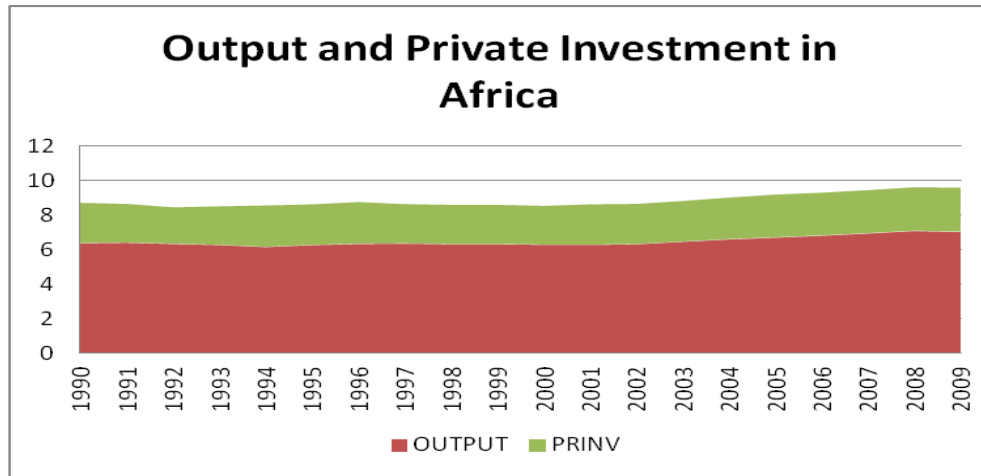


Figure 1.3: Output and Private Investment in Africa

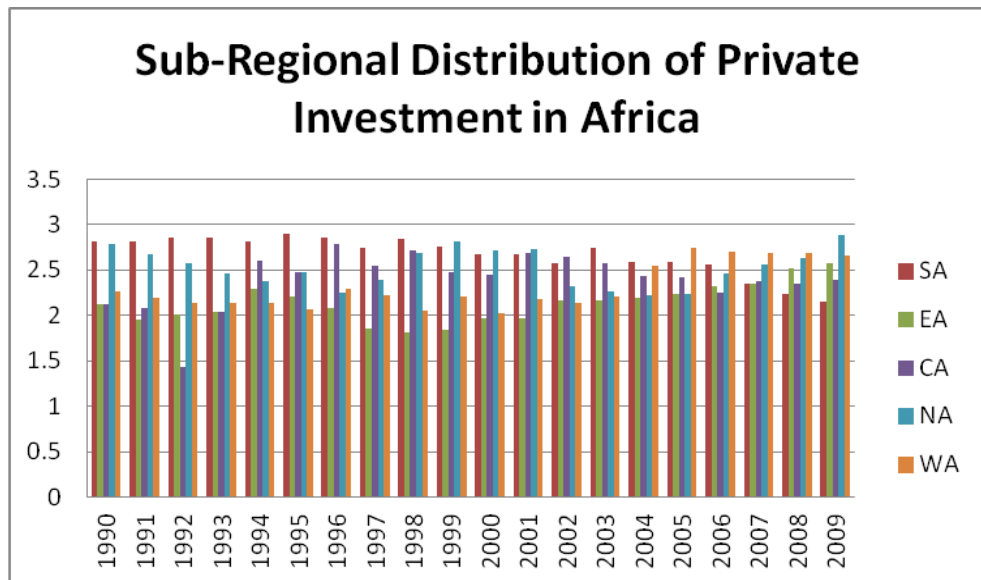


Figure 1.4: Sub-Regional Distribution of Private Investment in Africa

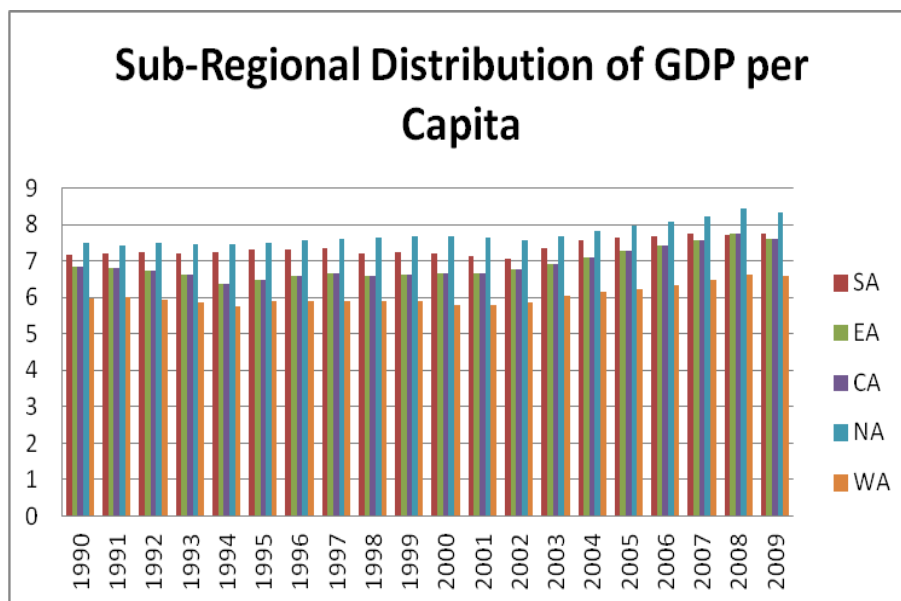


Figure 1.5: Sub-Regional Distribution of GDP per Capita in Africa

Moreover, investment has seen some considerable improvement. Total investment, based on Table 1.1, in the second decade of the study period (2000 – 2009) showed a marginal increase from 20.12% (1990 – 1999) to 20.27% of GDP. There is also evidence of a gradual shift from government led investment to private sector controlled investment in the SSA. Public sector investment fell from 7.72% (1990 – 1999) to 7.13% (2000 – 2009) while private investment increased from 12.40% of GDP to 13.14% of GDP. Appendix 1.1 shows that the differences in private and public investment, when the two decades are combined are statistically significant. At regional levels, Southern Africa (SA) recorded a fall in all investment. The result from Central Africa (CA) was akin to that of SA except for public investment which witnessed a rise. It is observed that the behaviour of total investment is largely as a result of investment trends in West Africa (WA) and East Africa (EA). All throughout the study period, private investment accounted for the greater proportion of total investment (Figure 1.1). Also, between 2001 and 2010 net flows of foreign

direct investment in Sub-Saharan Africa totalled about US\$33 billion—almost five times the US\$7 billion total between 1990 and 1999 (World Bank, 2011).

Table 1.1: Investment Trends in SSA, with regional indicators

	1st Decade (1990-1999)			2nd Decade (2000-2009)		
	TINV	PRINV	GPINV	TINV	PRINV	GPINV
SSA	20.1245	12.3997	7.72480	20.2665	13.1355	7.1310
SA	27.4418	18.7443	8.69743	19.9791	13.7153	6.2638
WA	18.4834	10.5179	7.96552	20.1737	13.7646	6.4091
CA	22.7307	16.6978	6.03294	22.0811	14.7379	7.3432
EA	16.7094	8.48001	8.22936	19.4726	11.3820	8.0906

Source: Author's Compilation based on Data from World Bank (2012).

In spite of these developments, Dinh, Palmade, Chandra, & Cossar, (2012) maintain that investment on the continent is low—less than 15 percent of gross domestic product compared with 25 percent in Asia,—and more than 80 percent of workers are stranded in low productivity jobs. They explain that in spite of this, the SSA's economic performance is at a turning point after almost 45 years of stagnation. Between 2001 and 2010 the region's gross domestic product grew at an average of 5.2 percent a year and per capita income grew at 2 percent a year, up from -0.4 percent in the previous 10 years (World Bank 2011). International Monetary Fund (2013) adds that even with the exclusion of Nigeria and South Africa, most countries in Sub-Saharan Africa recorded increases in GDP. Unfortunately, however, even in periods of economic growth, employment generation is not a natural consequence unless conscious effort is made to make that growth beneficial to job creation (Inter-Agency Working Group – IAWG, 2012 and Heinsz, 2000). But then these figures reinforce the need for Sub – Saharan Africa to put in measures to get the best out of private investment.

Generally, movement in interest rates is deemed to predict investment behaviour. In Africa, the relationship between real interest rate and private investment has been mostly inverse (between 1990-1997), occasionally direct (1997-1998) but recently indifferent (2005-2009, see Figure 1.1). Apparently, this is a reflection of the mixed relationships observed at the sub-regional level (Figures 1.2). Impliedly, not all changes in real interest rate necessitate changes in private investment, all times. This offers some support for the reason why both the classical and Keynesian theories emphasize different kinds of fluctuation of the investment curve. Whilst Classical economists believe that major changes in investment is brought about by changes in real interest rate, Keynesian economists stress that external factors that shift the investment demand curve account for large fluctuations in investment (Parker, 2010). Empirically, results have been largely concentrated at the firm level (Hu, 1999; Chatelain & Tiomo, 2001; Bokpin & Onumah, 2009) and also on developed economies where interest rates are less volatile.

1.1.2 Employment trends in SSA

Even though the Sub-Saharan African (SSA) region's unemployment rate, as at 2011, (about 8.8% of total labour force) was better than that of North Africa (about 10.9% of total labour force), Middle East (about 10.5% of total labour force), Central and South-Eastern Europe (about 9% of total labour force), it was about 2.4 percentage points worse than the global average. Also, most of the jobs in the SSA region seem not to be good, as the region was the second worst region in the world in terms of share of working poor. About 65% of total employment in 2011 was found to belong

to the working poor category. This situation is particularly worrying because it is more than double the global average (about 29%) (International Labour Organisation-ILO, 2012).

Analyses of the changes in employment in the SSA region, over the study period, show some interesting results (Table 1.2). Generally, the second decade of the study period (2000-2009) shows an increase in employment to population ratio from 63.77% (1990 – 1999) to 64.46%. Interestingly, while more females are joining the working populations (55.31% of total female population in employment to 57.18%), the opposite can be said of their male counterparts (fell from 72.60% of total male population in employment to 71.95%), when the two decades are compared. Apart from the fact that the total percentage of youth working fell (from 47.48% to 46.89%), the changes in female youth employment (increased from 42.93% to 43.10%) and that of male youth employment (decreased from 52.07% to 50.68%) is reminiscent of movements in total female employment and total male employment, when the first and second decades of the study periods are compared. Appendices 1.2 and 1.3 show that the differences in the various employment levels are statistically significant, when the two decades of the study period are compared.

Table 1.2: Employment Trends in SSA

	Emptot	Empmal	Empfem	Emptoty	Empmaly	Empfemy
1990-1999	63.7728	72.5988	55.3064	47.4807	52.0686	42.9281
2000-2009	64.4580	71.9456	57.1778	46.8864	50.678	43.092

Source: Author's Compilation based on Data from World Bank (2012).

1.1.3 Welfare Trends in SSA

Even though the world has made progress towards achieving the global target of reducing poverty by halve by 2015 (millennium Development Goal-MDG- 1), many countries in Sub-Saharan Africa (SSA) and Southeast Asia have not made significant progress (Kozak, Lombe, & Miller, 2012). Global extreme poverty level-people living on less than \$1.25 a day- has reduced by half from 1990 (36% of the world's population) to 2010 (18% of the world's population). But two (Nigeria and Congo DR) of the world's five countries (including India, China and Bangladesh) that make up two-thirds of the world's extreme poor are in SSA (World Bank, 2014). The report further states that five (Congo DR, 88%; Liberia, 84%; Burundi, 81%; Madagascar, 81% and Zambia, 75%) out of the high extreme poverty smaller countries are in SSA. A comparison of historical poverty records of SSA and South Asia (SAS) shows that the two sub-regions have recorded poverty reductions between 1981 and 2010 but SAS has made the most gains. SSA achieved a reduction of 5.83% in poverty levels while that of SAS was 49.34%, based on headcount ratio using \$1.25 standard. Similar results were recorded when the \$2.50 standard was used. While SAS recorded a reduction of 14.42%, SSA achieved a reduction of 1.76% (Table 1.3). Also, current poverty levels (as at 2010), using \$1.25 standard, shows that poverty level in SAS is about 17.5% lower than SSA but on the basis of \$2.50 standard, SSA is about 1.4% lower than SAS (Appendix 4.1). Obviously, SSA appears to be less aggressive in pursuing the poverty reduction agenda.

Table 1.3 Poverty Reductions in SSA and SAS

Poverty Reductions (1981-2010)	\$1.25	\$2.50
SSA	5.83%	1.76%
SAS	49.34%	14.42%

Source: Author's calculation from World Bank (2014) and Fosu (2014)

On social welfare, generally, all the SSA countries in the study have recorded increases in the level of human development (HD) index, even though the size of these increases is not homogenous (see Appendix 4.2). The improvements in poverty levels and social welfare in SSA coincide with improvement in private investment and employment levels (Table 1.4), with some interesting dynamics. In view of this, this study sought to assess whether there exist an empirical relationship between private investment, labour demand and social welfare in SSA.

Table 1.4: Private Investment, Employment and Social Welfare

	EMPTOT	PRINV	HD
1st Decade (1990-1999)	63.77284	12.3997	
2nd Decade(2000-2009)	64.458	13.1355	
2000 - 2004			47.823
2005 - 2009			51.36

Source: Author's Compilation Based on Data from World Bank (2012).

1.2 Problem Statement

1.2.1 Interrelationship between Private and Public Investments

Even though numerous studies exist on the determinants of private investment and more specifically the relationship between private investment and public investment, there is still no consensus on the directional effect of public investment on private investment (Aschauer, 1989a; Munnell, 1990; Erden & Holcombe, 2005; Cashin, 1995; Asante, 2000; Ghura & Barry, 2010; Evans & Karras, 1994; Deverajan, et al,

1999; Ajide & Olukemi, 2012; Munthali, 2012). In other words, empirical results are divided on whether public investment crowds out (Tatom, 1991; Holtz-Eakin, 1994; Evans & Karras, 1994; Deverajan et al, 1999; Ajide & Olukemi, 2012) or crowds in (Aschauer, 1989a, 1989b, 1990; Munnell, 1990; Cashin, 1995; Asante, 2000; Ghura & Barry, 2010; Altin et al, 2012) private investment. In fact, in some situations, the results have been inconclusive (Misati & Nyamongo, 2011; Munthali, 2012). In the process, what has emerged, though, is a conclusion that public investment crowds out private investment in developed economies while public investment exerts a crowding-in effect on private investment in a developing economy (Belloc & Vertola, 2004; Erden & Holcombe, 2005; Munthali, 2008, 2012).

However, this conclusion does not hold entirely because results from some developing economies of Africa (Asante, 2000; Ndikumana, 2000; Munthali, 2012) do not tell the same story. Also, it is quite surprising that in an attempt to find out whether public investment crowds in/out private investment, the closest we have come to assessing the possibility of a bi-causal relationship between public investment and private investment is a mention by Munthali (2012) that it deserves investigating. In view of this, it is pertinent for us to re-visit the crowding-in-out hypothesis in a developing economy setting like SSA especially when it is certain that existing studies seem to have controlled for different kinds of important conditioning variables at a time. Also, we tested, empirically, for the possibility of a bi-causal relationship between private investment and public investment in SSA using a derived public investment model.

1.2.2 Private Investment and Labour Demand in Africa

Africa and Asia need to create good jobs in order to help the global economy ameliorate the rising unemployment challenge. According to Nickell (2010), the 2008 global economic meltdown has partly caused the recent unemployment challenge. Meanwhile, Cherian (1998) argues that changing investment spending does not only affect levels of employment but also workers income. In fact, the stylised facts point to the direction that increases in total investment and private investment in particular seem to be associated with increases in labour demand.

In Africa, little is known about the employment benefits of private investment. Asiedu (2004) looked at the determinants of employment in SSA using data from foreign affiliates of US multinational enterprises in Africa; Sackey (2007) considered employment impact of private investment using a sample of SMEs from some African economies; Asiedu and Gyimah - Brempong (2008) studied the effect of liberalization of investment policies on investment and employment of multinational corporations in Africa; and Aterido and Hallward-Driemeier (2010) used firm-level survey data from 104 developing economies which included 31 sub-saharan countries to find out whether investment climate fosters employment growth.

This study fills the gap in literature by using national data to assess the relationship between private investment (Not only from USA, foreigners or SMEs) and employment (total, male, female, total youth, male youth and female youth) in SSA after considering the effect of the credit crunch, using a derived neoclassical labour

demand model. The neoclassical labour demand theory predicts a negative association between labour cost, real factor cost and labour demand and a positive relationship between output and labour demand (Symons, 1982 and; Andrews and Nickell, 1982 and Sparrow, Ortmann, Lyne and Darroch, 2008). In spite of this, other researchers argue that a positive association between wage cost and labour demand is possible, through the aggregate demand channel, especially in a recession (Keynes, 1936; Michailat & Saez, 2013).

1.2.3 Private Investment, Labour Demand and Social Welfare in SSA

The dynamics in investment behaviour does not only coincide with labour market dynamics but also with social welfare indicators. Empirical studies conclude that economic growth is good for the poor. Meanwhile knowledge of the structure and pattern of growth that supports poverty reduction or ensures improvement in social welfare is limited, even though Nissanke & Thorbecke (2006) consider that benefits from such empirical knowledge cannot be overemphasized. In situations where attempts have been made to unravel the impact of certain growth components on social welfare (Gohou & Somoure, 2012), income inequality has not been considered. But the real impact of growth on poverty reduction or social welfare improvements can be ascertained when the distribution of the entire economy's income has been factored in the analysis (Ravallion, 1997; Ravallion 2001; Ravallion & Chen, 2007; Kalwij & Verschoor 2007; Ravallion, 2007; Fosu, 2008, 2010). Unfortunately, however, the only known study on the African continent that assesses the impact of FDI on welfare assumes a fairly distributed income and thus ignores the

possible effect of inequality on social welfare dynamics (Gohou & Somoure, 2012). This study, therefore, bridges this gap in the literature by showing which growth components and structure facilitates social welfare improvements when inequality has been accounted for, using a derived welfare model that builds on a proposed function by Todaro and Smith (2012).

1.3 Objectives of the study

The general objective of this study was to ascertain the relationship between private investment, labour demand and social welfare in Sub-Saharan Africa. The following specific objectives were pursued in order to achieve the general objective:

1. assess whether public investment crowds out or crowds in private investment in SSA;
2. evaluate the possibility of a bi-causal relationship between private investment and public investment in SSA;
3. ascertain the relationship between private investment and labour demand in SSA and;
4. evaluate whether private investment and labour demand help explain social welfare dynamics in SSA.

1.4 Hypotheses

1. H_0 : Public investment does not crowd out private investment in SSA.
2. H_0 : There is no bi-causal relationship between private investment and public investment in SSA.

3. H_0 : There is no relationship between private investment and labour demand in SSA.
4. H_0 : Private investment and labour demand have no effect on social welfare in SSA.

1.5 Significance of the Study

This study sought to ascertain the relationship between private investment, labour demand and social welfare in SSA. The study makes the following theoretical and empirical contributions to the literature:

1. It provides further evidence on the debate on whether public investment crowds out or crowds in private investment and also extends the debate further on whether there is a bi-causal relationship between public investment and private investment.
2. The study also tests the neoclassical labour demand theory in SSA by expanding its application to assessing the impact of private investment on labour, using a derived neoclassical labour demand model.
3. The study further expands the growth-poverty nexus, by deriving a welfare model that builds on a welfare function proposed by Todaro and Smith (2012), to show which growth components or structure enhances social welfare in SSA.
4. Practically, the study offers directions to economic managers of SSA on how to attract private investment, explore the relationship between private and

public investments, facilitate employment generation and improve on social welfare.

1.6 Scope and Limitation

The study was done in the context of SSA, using various samples over the period of 1980 to 2009. So, findings from this study generally apply to SSA but cannot be taken to depict the specific conditions of the countries in SSA. Specific country-level studies could be undertaken not only to know how the findings fit in the general models but also to prescribe specific policies for these economies.

Also, insufficient data on certain key variables like inequality, poverty level and welfare made it difficult to estimate the derived model in its dynamic form or apply all the theoretical prescriptions to the letter. In spite of these challenges, the researcher believes the methods and estimation techniques used were appropriate for the available data. Also, the findings are robust enough for a general application to the SSA region.

1.6 Chapter Disposition

The entire study on private investment, labour demand and social welfare is organised as follows. Chapter ‘one’ offered an introduction to the study. It discussed the background to the study including stylised facts about some key variables, the problem statement, objectives of the study, hypotheses and the scope and limitations. Chapter ‘two’ is an empirical paper that assesses whether public investment crowds in or crowds out private investment and whether there exists a bi-causal relationship

between public and private investment. Next, the researcher presented another empirical paper in chapter ‘three’ on the relationship between private investment and labour demand in SSA while chapter ‘four’ covered the last empirical paper on the relationship between private investment, labour demand and social welfare in SSA. In chapter five, the researcher presented the summary, conclusion and recommendations for the entire study.

References to Chapter One

- Adams, R. Jr. (2004). Economic growth, inequality and poverty: Estimating the growth elasticity of poverty. *World Development*, 32(12), 1989–2014.
doi:10.1016/j.worlddev.2004.08.006.
- Ajide, K. B., & Olukemi, L. (2012). Modelling the Long-run Determinants of Domestic Private Investment in Nigeria. *Asian Social Science*, 8(13), 8(13), 139-152. doi:10.5539/ass.v8n13p139
- Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2010). Does foreign direct investment promote growth? Exploring the role of financial markets on linkages. *Journal of Development Economics*, 91(2), 242–256.
- Andrews, M. and Nickell, S. (1982). Unemployment in the United Kingdom since the War. *Review of Economics Studies*, 49(special), 731-59.
- Apergis, N., Lyroudia, K., & Vamvakidis, A. (2008). The relationship between foreign direct investment and economic growth: Evidence from transitional countries. *Transition Studies Review*, 15(1), 37–51.
- Asante, Y. (2000). *Determinants of Private Investment Behaviour* (No. 100). *AERC Research Paper, Nairobi: African Economic Research Consortium*.
- Asiedu, E. (2004). The Determinants of Employment of Affiliates of US Multinational Enterprises in Africa” *Development Policy Review*, 22(4), 371-379.
- Asiedu, E., & Gyimah-Brempong, K. (2008). The Effect of the Liberalization of Investment Policies on Employment and Investment of Multinational Corporations in Africa. *African Development Review*, 20(1), 49-66.

- Aschauer, D.A. (1989a). Is public expenditure productive? *Journal of Monetary Economics*. 23, 177–200.
- Aschauer, D.A. (1989b). Does public capital crowds out private capital? *Journal of Monetary Economics* 24, 171–88.
- Aschauer, D. A. (1990). Why is infrastructure important? Is there a shortfall in public capital investment? *Alicia Munnell. Boston: Conference Series of Federal Reserve Bank of Boston*.
- Aterido, R. & Hallward-Driemeier, M. (2010). *The Impact of the Investment Climate on Employment Growth: Does Sub-Saharan Africa Mirror Other Low-Income Regions?* (No. 5218). Policy Research Working Paper, Developmental Research Group, World Bank.
- Belloc, M., & P. Vertova. 2004. How does public investment affect economic growth in HIPC? An empirical assessment. Department of Economics, University of Sienna.
- Bokpin, G. A., & Onumah, J. M. (2009). An Empirical Analysis of the Determinants of Corporate Investment Decisions: Evidence from Emerging Market Firms. *International Research Journal of Finance and Economics*, 33, 134-141.
- Cashin, P. (1995). Government spending, taxes, economic growth. *IMF Staff Papers* 42(2), 237-269.
- Chatelain, J-B. & Tiomo, A. (2001). *Investment, the Cost Of Capital, and Monetary Policy in the Nineties in France: A Panel Data Investigation* (No. 106). Banque de France Working Paper.

- Cherian, S. (1998). The investment decision: A re-examination of competing theories using panel data. *Applied Economics*, 30(1), 95–104.
- Devarajan, S., Easterly, W., & Pack, H. (1999). Is Investment in Africa Too High or Too Low? Macro and Micro Evidence. *Journal of African Economies*, 10(2), 81-108.
- Dinh, H. T., Palmade, V. T., Chandra, V. & Cossar, F. (2012). *Light Manufacturing in Africa: Targeted Policies to Enhance Private Investment and create Jobs* (67209). African Development Forum, World Bank.
- Donaldson, J. A. (2008). Growth is Good for Whom, When, How? Economic Growth and Poverty Reduction in Exceptional Cases. *World Development*, 36(11), 2127–2143.
- Emery, J. J. (2003). *Governance, Transparency and Private Investment in Africa*. A paper presented at the Global Forum on International Investment, Johannesburg, South Africa OECD-Africa Investment Roundtable 19 November 2003, 1-16.
- Erden, L., & Holcombe, R. (2005). The effects of public investment in developing economies. *Public Finance Review*, 33(5), 575–602.
- Evans, P., & Karras, G. (1994). Are government activities productive? Evidence from a panel of U.S. states. *Review of Economics and Statistics* 76(1), 1-11.
- Fosu, A. K. (2008). *Inequality and the impact of growth on poverty: Comparative evidence for Sub-Saharan Africa* (No.2008.107). Research paper / UNU-WIDER.

- Fosu, A. K. (2010). Does inequality constrain poverty reduction programs? Evidence from Africa. *Journal of Policy Modeling*, 32, 818–827. <http://dx.doi.org/10.1016/j.jpolmod.2010.08.007>.
- Ghura, D., & Barry, G.(2000). Determinants of Private Investment: A Cross-Regional Empirical Investigation. *Applied Economics*, 32, 1819-1829.
- Henisz, W. J. (2000). The Institutional Environment for Economic Growth. *Economics and Politics*, 12(1), 1-31.
- Holtz-Eakin, D.(1994). Public-sector capital and productivity puzzle. *Review of Economics and Statistics*, 76 (1), 12-21.
- Hu, C. X. (1999). Leverage, Monetary Policy, and Firm Investment. *FRBSF Economic Review*, 2, 32 – 39.
- Inter-Agency Working Group (IWAG) (2012). *Promoting responsible investment for sustainable development and job creation* - Final report to the High-Level Development Working Group on the work of the Private Investment and Job Creation Pillar of the G20 multi-year action plan on development, Mexico Summit. Pp. 1-23. Accessed from <http://unctad.org/en/Pages/DIAE/G-20/Private-Investment-and-Job-Creation.aspx>.
- International Monetary Fund (2013). *Regional Economic Outlook: Sub-Saharan Africa, Building momentum in a Multi-Speed World*. World Economic and Financial Survey.
- International Labour Organisation (2012). *Global Employment Trends 2012*. International Labor Office, Geneva.

- International Labour Organisation (ILO, 2014). *Global Employment Trends 2014: Risk of a jobless recovery?* International Labour Office, Geneva.
- Kalwij, A. & Verschoor, A. (2007). Not by growth alone: The role of the distribution of income in regional diversity in poverty reduction. *European Economic Review*, 51, 805–829.
- Keynes, J.M. (1936). *The General Theory of Employment, Interest, and Money*, Harcourt.
- Kozak R., S., Lombe, M. & Miller, K. (2012). Global Poverty and Hunger: An Assessment of Millennium Development Goal #1. *Journal of Poverty*, 16(4), 469-485. doi: 10.1080/10875549.2012.720661
- Michaillat, P. and Saez, E. (2013). *A Model of Aggregate Demand and Unemployment* (CEPDP1235.London School of Economics, Centre for Economic Performance Paper.
- Miles D. & Scott A. (2005). *Macroeconomics: Understanding the Wealth of Nations* (2nd Ed.). Wiley.
- Munthali, T. C. (2012) Interaction of public and private investment in Southern Africa: a dynamic panel analysis. *International Review of Applied Economics*, 26(5), 597-622. doi:10.1080/02692171.2011.624500.
- Munnell, A. H. (1990). Why has productivity growth declined? Productivity and public investment. *New England Economic Review*, January/February, 3-22.
- Munthali, T.C. (2008). Investment in Southern Africa: Interaction of the public and private sectors. PhD thesis, April 2008, University of Leeds, UK.

- Ndikumana, L. (2000). Financial Determinants of Domestic Investment in Sub-Saharan Africa: Evidence from Panel Data. *World Development*, 28(2), 381-400.
- Nickell, S. (2010). *The Unemployment Challenge in Europe*. CESifo Forum, Ifo Institute for Economic Research at the University of Munich, 11(1), 3-6, 04.
- Nissanke, M. and Thorbecke, E. (2006). Channels and policy debate in the globalization–inequality–poverty nexus. *World Development*, 34(8), 1338–1360, doi:10.1016/j.worlddev.2005.10.008
- Parker, J. (2010). *Theories of Investment Expenditures*, Economics 314 Coursebook, Chapter 15. Accessed on 20th December, 2012 Available at academic.reed.edu/economics/parker/s11/314/book/Ch15.pdf
- Pfeffermann, G. (2001). Poverty Reduction in Developing Countries: the role of the Private Sector. *Finance and Development*, A quarterly magazine of the IMF. 38 (2).
- Ravallion, M. (2007). *Economic growth and poverty reduction: Do poor countries need to worry about inequality?* 2020 focus brief on the world's poor and hungry people. Washington, DC: International Food Policy Research Institute.
- Ravallion, M., & Chen. S. (2007). China's (Uneven) Progress against Poverty. *Journal of Development Economics*, 82(1), 1-42.
- Ravallion, M. & Chen, S. (1997). What can new survey data tell us about recent changes in Distribution and Poverty. *World Bank Economic Review*. 11(2), 357-382.

- Ravillion, M. (2001). Growth, Inequality and Poverty: Looking Beyond Averages. *World Development*, 29(11), 1803 – 1815.
- Sackey, H. A. (2007). *Private Investment for Structural Transformation and Growth in Africa: Where do Small and Medium-Sized Enterprises Stand?* Proceedings of the African Economic Conference, pp. 371-398.
- Sparrow, G. N., Ortmann, G. F., Lyne, M. C. & Darroch, M. A. G. (2008). Determinants of the demand for Regular Farm Labour in South Africa, 1960-2002. *Agrekon*, 47(1), 52-75.
- Symons, J.S.(1982). *Relative Prices and the Demand for Labour in British Manufacturing* (No. 137). London School of Economics, Centre for Labour Economics Discussion Paper.
- Tatom, J. A. (1991). Public Capital and Private Sector Performance. *Fed. Res. Bank of St. Louis Rev.*, 73(3), 3-15.
- Todaro, M. P. & Smith, S. C. (2012). *Economic Development*, 11th ed. Pearson.
- Thurlow, J. & Wobst, P. (2006). Not all growth is equally good for the poor: The case of Zambia.” *Journal of African Economies*, 15(4), 603–625.
doi:10.1093/jae/ejk012
- Ucal, M. S. (2014). Panel data analysis of foreign direct investment and poverty from the perspective of Developing Countries. *Procedia - Social and Behavioral Sciences*, 109, 1101 – 1105.
- UNCTAD (2012), *Global investment Trends Monitor No. 8*, January 2012, UNCTAD, Geneva.
- World Bank. (2011). *World Development Indicators 2011*. Washington, DC: World Bank.

World Bank (2013). *World Development Report 2013: Jobs* World Bank,
Washington, D.C.

World Bank (2014). *Prosperity for all-ending extreme poverty*. A note for the World
Bank Group spring meetings.

Appendices to Chapter One**Appendix 1.1: Test of Equality of Means between Private and Public Investment**

Method	df	Value	Probability
t-test	2	-11.29463	0.0077
Satterthwaite-Welch t-test*	1.914681	-11.29463	0.0090
Anova F-test	(1, 2)	127.5687	0.0077
Welch F-test*	(1, 1.91468)	127.5687	0.0090

*Test allows for unequal cell variances

Appendix 1.2: Test of Equality of Means between Total, Male and Female Employment

Method	df	Value	Probability
Anova F-test	(2, 3)	175.2956	0.0008
Welch F-test*	(2, 1.84365)	167.2223	0.0082

*Test allows for unequal cell variances

Appendix 1.3: Test of Equality of Means between Youth Employment Levels

Method	df	Value	Probability
Anova F-test	(2, 3)	90.68245	0.0021
Welch F-test*	(2, 1.44389)	108.1837	0.0267

*Test allows for unequal cell variances

CHAPTER TWO

INTERRELATIONSHIP BETWEEN PRIVATE AND PUBLIC INVESTMENTS IN SUB-SAHARAN AFRICA

Abstract

The basic objective in this chapter is to revisit the crowding-in crowding-out hypothesis by exploring the possibility of a bi-causal relationship between private investment and public investment in SSA. Based on a Panel Vector Autoregressive model, the results show that public and private physical capitals are compliments and mutually dependent. However, when private and public investors compete for financial resources, they become substitutes. The results stress the need for governments in SSA to reduce their activities in the domestic financial markets by being fiscally disciplined probably through strong commitment to Fiscal Responsibility Laws. This would not only facilitate private investment but also reduce the burden on governments for public investments.

2.0 Introduction

Generally, empirical literature is divided on the directional effect of public investment on private investment (Aschauer, 1989b, 1990; Munnell, 1990; Erden & Holcombe, 2005; Cashin, 1995; Asante, 2000; Ghura & Barry, 2010; Evans & Karras, 1994; Deverajan, et al, 1999; Ajide & Olukemi, 2012; Munthali, 2012). While some studies point to a crowding-in effect of public investment on private investment (Aschauer, 1989a, 1989b, 1990; Munnell, 1990; Cashin, 1995; Asante, 2000; Ghura & Barry, 2010; Altin et al, 2012) others claim public investment crowds-out private investment (Tatom, 1991; Holtz-Eakin, 1994; Evans & Karras, 1994; Deverajan et al, 1999; Ajide & Olukemi, 2012; Munthali, 2012; Tchouassi & Ngangue, 2014). This dichotomy appears to be related to the stage of development of the economy of study. It is claimed that crowding out effect is associated with developed economies while crowding-in is related to developing economies (Belloc & Vertola, 2004; Erden & Holcombe, 2005; Munthali, 2008, 2012).

Unfortunately, however, other studies on developing economies, especially Africa, reveal that the matter is still unresolved. For instance, Asante (2000) and Gin and Agim (2012) argue in favour of crowding-in effect but Deverajan et al., (1999), Ajide and Olekumi (2012) favour the crowding-out hypothesis. So the relationship between public investment and private investment still remains an empirical question in Africa. Also, researchers who have investigated this empirical question, either directly or indirectly, seem to have only highlighted certain key control variables and left out others that other researchers consider to be pertinent in resolving this debate.

For instance, Ndikumana (2000) investigated the crowding-in crowding-out hypothesis after controlling for financial sector development, government claims, government consumption interest rate and trade. This study did not consider governance or investment uncertainty as mediating factors. Nyamongo and Misati (2011) controlled for economic growth, public investment, fiscal deficit, financial sector development, corruption and economic freedom. Their study overlooked the role of trade, uncertainty and considered only one aspect of governance, corruption. Munthali (2012) factored in the accelerator effects, cost of capital, capital availability, risk and uncertainty, economic freedom and profitability but also ignored trade and governance as mediating factors. Tchouassi and Ngangue (2014) controlled for trade openness, GDP, domestic credit to private sector, external debt and population to conclude that public investment crowds out private investment. Their study obviously ignored the mediating effects of governance and uncertainty. Mlambo and Oshikoya (2001) factors, virtually, all the important mediating factors in their analysis of the macroeconomic determinants of private investment but not in a dynamic framework neither do they test for the possibility of a bi-causal relationship between private and public investment.

Related to this, is the fact that an important control variable, governance, has been ignored even though political stability has been factored in other studies. Governance systems in Africa prior to the 1990s were mostly characterized by political instability through coup d'états and in some cases colonial rule. From 1990, the continent started embracing democracy which is expected to offer some benefits probably

including private investment. The effect of this can be recognised through improvement in governance institutions like rule of law, control of corruption, government effectiveness, political stability, regulatory quality and voice and accountability.

Furthermore, quite surprisingly, researchers' attention appears to be over-concentrated on the effect of public investment on private investment, ignoring the possibility of a reverse causality. In developed economies, it is not uncommon for public investments in roads, water, telecommunication and electricity to lead private commercial or household investment. But in developing economies like Africa, private investments may prompt public investment (Sturm, 2001). In other words, attention of governments in developing economies is sometimes drawn to the provision of basic infrastructure for certain areas of their economy because of private investment activities in such areas. Also, in some cases, government investment activities are undertaken in certain sectors of the economy, like provision of transport services, because private sector involvement brings hardship to its citizens. Again, the way in which public investments are funded would also play a key role in helping to resolve the crowding-in and crowding-out debate. Where public investments are funded through internally generated funds of government and not on the meagre domestic credit, the crowding out effect of public investment on private is likely to be minimal. Thus, private investment activities may attract or reduce public investment. Unfortunately, to the best of the researcher's knowledge, the abundant literature on the crowding-in-out debate seems to have ignored this important issue, especially in

SSA. It is only Munthali (2012) who mentioned the possibility of bi-causal relationship but failed to test it.

This study contributes to the discussion on crowding-in-out hypothesis by: 1) re-examining the relationship between private investment and public investment after controlling for some relevant factors (including governance) in a dynamic panel framework; and 2) testing for the possibility of a bi-causal relationship between private investment and public investment.

2.1 Literature Review

Recent theories advanced to explain private investment behaviour include the accelerator, the neoclassical, the Tobin q and the cash flow theories (Koyck, 1954; Tobin, 1969; Jorgenson, 1971; Kopcke, 1985; Cherain, 1998; Bazoumana, 2005; Kul & Mavrotas, 2005) but only the accelerator and neoclassical theories are deemed to represent developing countries better, based on estimation feasibility (Misati & Nyamongo, 2011).

2.1.1 Theoretical Literature Review

The Keynesian Theory of Investment

Even though Keynesians recognize the effect of interest rate on investment, they deem this effect to be minimal and also recognize that interest rate alone does not tell the whole investment story. Unlike Classical economists, Keynesians believe that the economy is operating at less than full capacity. In view of this, increasing

government spending, for instance, causes minimal increase in interest rate while increasing output and income. They also contend that government expenditure increases private spending due to the positive effect of government spending on investors' expectations (Olweny & Chiluwe, 2012).

Keynes attributed the volatility of the investment-demand curve to firm's expectations of the profitability of investment. He was of the view that investors' sense of optimism or pessimism motivated by their own natural energy and spirit ('animal spirit') was the main driving force for investment or disinvestment. He explains further that factors that affect the market conditions of products of investors like political stability, cost of production and business climate have a strong influence on investors' mood or expectations. In fact, Keynesians contend that the level of government spending is one way investors' pick their expectations (Olweny & Chiluwe, 2012). In a situation where the economy shows signs of booming, investors expectation of continuing economic boom lead them to invest more in order to take advantage of expected favourable future market conditions. This then triggers demand for the capital goods, which are products of other companies, leading to economic expansion. On the other hand, where the economy shows signs of recession, investors' expectation of continuing abysmal economic performance discourage them from investment. Eventually, this reduces demand for capital goods (other company's products) which has the tendency of fuelling economic recession. Because these expectations normally precede the actual economic conditions, they may tend to cause the opposite. For instance, the optimist may realize that contrary to

expectation, the economy is not booming large enough to sustain the level of productivity that additional investment would bring and therefore stop investing. This initiates recession as demand falls. It falls to the level where, due to wear and tear, the productivity of existing property, plant and equipment will not be enough to meet demand which also sparks of economic booming. This phenomenon, within the general Keynes theory that output is determined by aggregate demand (consumption and investment), also explains the business cycle.

The accelerator principle and the multiplier-accelerator model are two related models that explain Keynes theory of investment. The Accelerator Principle contends that the level of new investment is brought about partly by the changes in the level of national income (output). It, therefore, postulates that it is the rate of change of income and not its level which determines investment. This position is in line with a much held view of Keynes that the aggregate demand of the private sector is subject to fluctuations which can have destabilising effect on the economy (Beardshaw, Brewster, Cormack & Ross, 1998). The basic assumption of the accelerator model is that since the focus is on short-run business cycle fluctuations, firms desired capital output ratio is constant. According to Parker (2010) the simplest accelerator model predicts that investment is proportional to the increase in output in the coming year and that firms observe a rise or decline in output and extrapolates that change into the future in determining their investment spending.

On the other hand, the multiplier- accelerator model explains that changes in consumption will amplify the effect of any change in investment on total output and income. This is against the assumption that aggregate demand – consumption and investment- explains output. Explained through the marginal propensity to consume principle, the multiply- accelerator model represents the total impact on the economy of an initial increase in demand like investment (Miles & Scott, 2005). For instance, if technological breakthrough causes investment to increase, the change in investment will cause an increase in income or output in the economy. A portion of that increase in income will be consumed and this will also cause another increase in the output thereby starting a new cycle. These cyclical effects will cause a more than proportionate change in output and investment, when there is an initial change in investment.

The Classical Theory of Investment

The Classical economists (Adam Smith, David Richardo and John Stuart Mill) use the general equilibrium principle to establish a relationship among interest rate, investment and savings. They are of the view that, through market forces, the rate of interest is fixed when the demand for investment is equal to the willingness to save, given a certain level of income. They base this conclusion on the assumption that the economy is at full employment. The return from any good investment should be able to cover the cost of the capital invested in that project. The cost of capital which is taken as the interest to be paid on the amount of money borrowed to fund viable projects is, therefore, considered by classical economists to be of utmost importance

in the investment decisions. Even in a situation where an organization decides to fund viable projects from internally generated funds, the cost of borrowed funds cannot be overlooked since there is an opportunity cost associated with putting the internally generated funds in the investment project. In other words, the organization could have at least lent that money for some returns-which would have been forgone as a result of undertaking the investment project.

It is the real interest rate which is of paramount importance and not the nominal. The real interest rate has accounted for the effect of inflation and therefore allows the investor to compare the expected return from the proposed investment against the interest rate that maintains the purchasing power of capital. The other important variable that explains investment decisions, to the classical economists, is the expected return on the investment project to be undertaken. Investments which have their expected return high enough to cover the cost of capital is therefore considered to be worthwhile. McConnel and Bruce (2005) summarize that the investment decision can be conveniently classified as a marginal-benefit-marginal-cost decision (with marginal benefit being expected return and marginal cost being interest on borrowed funds).

Included in the classical theory is the idea that because the economy is operating at full capacity, monetary policy especially government domestic debt has a negative effect on private sector investment. They argue that government borrowing crowds out private sector investment because of the reduction in loanable funds caused by

government borrowing (Olweny & Chiluwe, 2012). As government borrowing increases the demand for loanable funds, debt becomes expensive to the private sector. Government borrowing in the domestic market may go up as a result of tax cut or an increase in government spending (Barro, 1997).

The classical theory has received a number of criticisms albeit largely from Keynes. Keynes argue that the assumption of full employment is unrealistic, savings and investment are not interest-elastic, the theory ignored the function of money as a store of value; interest is the price for not hoarding and the price for not spending; equality of saving and investment is not brought by changes in rate of interest but changes in the level of income and that the theory itself is indeterminate.

The neoclassical theory explains that, as a result of diminishing marginal returns from investment, organizations undertake investment projects until the point at which the marginal benefit equals the marginal cost. In other words, if an organization aims at maximizing profit, then an investment project should be rejected if the expected rate of return on capital (i.e. the marginal product of capital which is the additional revenue or output as a result of adding on an extra unit of capital) is just the same as the user (rental) cost of capital.

In conclusion, the difference between Keynes theory investment and the classical theory of investment comes from what each theory emphasizes as the main driving force of investment behaviour. While Classicists believe that movement in real

interest rates that lead to movements on the investment-demand curve account for a greater portion of changes in investment, Keynes argue that investors' expectations which lead to shifts in the investment-demand curves are responsible for large changes in investment (Parker, 2010).

2.1.2 Empirical Literature Review

Determinants of Private Investment

Relationship between public investment and private investment

Discussions on whether public investment crowds-in or crowds out private investment has been generally inconclusive. A forcefully emerging conclusion is that public investment crowds out private investment when the economy is developed but crowds in private investment when the economy is developing (Erden & Holcombe, 2005; Munthali, 2012; Altin, Moisiu & Agim, 2012). For instance, Erden and Holcombe (2005) conclude based on data from 19 developing countries (including 4 African countries) and 12 developed countries that while developed countries experience crowding out, public investment crowds in private investment in developing countries.

Supporters of the crowding-in hypothesis (Khan & Gill, 2009) argue that public infrastructure like roads and power (Pereira & Andraz, 2010; Escobal & Ponce, 2011; DFID, 2012; Sahoo, Dash, & Nataraj, 2010; Tadeu & Silva, 2013) support the private sector in the discharge of their duties and thus amplifies their productive ability. Also through the growth channel, public investment serves as an indirect

means of accelerating private investment. According to Aschauer (1989) economy's productivity slow down can be linked to fall in public infrastructure, as witnessed by the United States of America (USA) in the 1980s. Cavallo and Daude (2011) concluded from a sample of 116 developing countries between 1980-2006 that public investment crowds-in private investment in the presence of strong institutions and access to finance. Oshikoya (1994) document that public investment crowds in private investment using data from 1970 to 1988 that covered seven African countries (Cameroon, Mauritius, Morocco, Tunisia, Kenya, Malawi and Tanzania). Similar results were found by Mlambo and Oshikoya (2001) after expanding the sample size to 18 countries and the time frame to 1996 and also factoring in some macroeconomic variables and political stability. At the country level, Asante (2000) provides support for crowding-in using data from Ghana (see similar results for Kenya (Maana et al., 2008).

Some empirical literature also show that public investment may crowd out private investment (Christensen, 2005; Emran & Farazi, 2009) if they compete for the same resources and/or markets (Erden & Holcombe, 2005). Ndikumana (2000) uses data from 31 Sub-Saharan African (SSA) countries between 1970 and 1995 to conclude that credit to governments crowds out private investment. Similarly, Tchouassi and Ngangue (2014) recently corroborated the crowding out hypothesis, using 14 selected Africa countries (13 SSA countries and Tunisia). Based on data from Nigeria, Ajide and Olekumi (2012) support crowding out hypothesis corroborating that of

Bakare (2011) (see also similar results from Malawi (Maganga & Abdi, 2012), Argentina (Acosta and Loza, 2005) and India (Pradhan, Ratha & Sarma, 1990; Mitra, 2006).

Apparently, empirical results in Africa have supported both sides of the crowding-in-out debate or are inconclusive. In effect, empirical results from the African continent, with virtually developing economies, are still inconsistent. This casts significant doubt on the emerging conclusion on the debate that crowding-out is associated with developed economies while crowding-in relates to developing economies. This inconsistency in results, the researcher believes, partly emanates from the inconsistency in the choice of control variables that condition the crowding-in-out effect. Certain key factors like financial sector development, economic uncertainty, cost of capital, accelerator effects, adjustment cost, trade openness, debt overhung, political stability and governance have been established in literature as important mediating factors. Unfortunately, however, none of the studies on the continent has tested for the crowding-in-out hypothesis in the presence of all of these control factors. Also, only two studies (Ndikumana, 2000; Misati & Nyamongo, 2011) are known to have studied the crowding-in-out hypothesis in SSA, but indirectly. Misati and Nyamongo (2011) cannot be taken to be purely an SSA study, even though it was captioned as such, because the study sample included Tunisia, Egypt, Algeria and Morocco. Ndikumana (2000) covered 31 SSA countries from 1970-1995. This study extends her study, by using 48 countries and including governance as an important variable that condition crowding-in-out relationship, in a more recent context (1990-

2010). Also, the empirical literature is silent on whether there exist a bi-causal relationship between public investment and private investment in the crowding-in-out debate. Thus, we believe the crowding-in-out hypothesis in the SSA sub-region needs to be empirically re-examined. This study is meant to provide further evidence on the crowding-in-out hypothesis and also test for the possibility of a bi-causal relationship between private and public investments using data from SSA, in a dynamic framework.

Other Determinants of Private Investment

Investments can be classified as autonomous or induced. Autonomous investment is brought about by exogenous factors like technological advancement even though there may not be any change in income. On the contrary, induced investment which is linked to the accelerator principle is that part of investment which is brought about as a result of changes in an endogenous (to the model of the economy) variable like income. Because it is difficult to split investment into these categories, the discussion of the factors that are likely to influence investment decisions does not take this distinction into consideration. Indeed, the present study does not consider whether a particular investment is autonomous or induced, investment is considered in total. Several important factors have been identified as the major contributors to the level of investment. Among these are financial sector development (Ndikumana, 2000; Misati & Nyamongo, 2011), governance (Wei, 2000; Emery, 2003; Svensson, 2005; Morrissey & Udomkerdmongkol, 2012), government domestic debt (Christensen,

2005; Khan and Gill, 2009 and Hubbard, 2012), accelerator (Beardshaw et al., 1998; McConnel & Bruce, 2005).

Financial Sector Development

Well developed financial and credit market facilitates private investment, especially in the long-run (Acosta & Loza, 2005). Possibly, through the reduction of financial constraint and the growth channel, financial intermediation improves domestic private investment irrespective of whether the financial system is bank-based or market-based (Ndikumana, 2005). Also, the nature of financial reforms like credit controls, liquidity and reserve requirements have effect on private investment (Ang, 2009). Thus, a developed financial market facilitates the channelling of financial resources from surplus spending units to deficit spending units making funds available at cheaper cost.

The ‘state of credit’ is an important determinant of investment (Keynes, 1937, 1973). Africa, over the years, has not benefited large enough from inflows of private foreign capital as compared to other developing economies like Latin America and Asian economies (Kasekende & Bhundia, 2000). This puts pressure on domestic credit as a means of financing the few investment projects that are undertaken by both private and public investors. Neoclassical theorists postulate that the cost of capital exerts a negative influence on private investment because of its ability to reduce the return on investment. On the other hand, the relationship between cost of capital and investment could be positive (as in Bokpin & Onumah, 2009) because high deposit

rates encourage savings which in turn supports domestic investment (McKinnon, 1973; Shaw, 1973). Meanwhile, availability of finance is widely considered as a key ingredient for fostering private investment (Ndikumana, 2000; Erden & Holcombe, 2005; Misati & Nyamongo, 2011; Munthali, 2012). Emran and Farazi (2009) concluded that private investment in developing countries critically depends on the availability of bank credit especially given that the capital market is not well developed and that evidence of crowding out is detrimental to both private investment and economic growth.

Chatelain et al., (2002) tested for the existence of not just the credit channel but the interest rate channel among the four largest countries of the euro area with micro dataset (1985 to 1999) for each country. For each of these countries they estimated the neo-classical investment relationship, (ie explaining investment by its user cost, sales and cash flow) and concluded that investment is sensitive to user cost changes in all the countries. Thus, they found support for the operation of the interest rate channel in these countries but did not find enough support for the broad credit channel as implied by Hu (1999). This notwithstanding, Chatelain and Tiomo (2001) confirmed the direct effect of the interest rate channel on investment, operating through the cost of capital in France (there is also an indirect effect of monetary policy shocks on the macroeconomic growth of sales, which also affects corporate investment) and the existence of a broad credit channel operating through corporate investment in France. The researchers applied a panel data methodology on 6,946 French manufacturing firms, from 1990 to 1999.

Bokpin and Onumah (2009) used data from emerging market firms to analyze the impact of macroeconomic factors and financial market development on corporate investment. They concluded that bond market development, GDP per capita and firm level factors like past investment, profitability, firm size, growth opportunities and free cash flows are significant factors that influence corporate investment decision. The study included firm's from four African countries (Egypt, Morocco, South Africa and Zimbabwe) and monetary policy but did not find monetary policy as a significant factor that influences corporate investment decision. Earlier and much more specifically on the African continent, between 1970-2001, Ndikumana (2005) sought to answer the question: "Can macroeconomic policy stimulate private investment in South Africa? The study was conducted on both aggregated data and disaggregated data of 27 sub-sectors of the manufacturing sector. The result indicated that government has a significant means of stimulating private investment through engaging in public spending, lowering of interest rates and minimizing exchange rate instability. At firm level, profitability was also found to stimulate private investment.

Government debt

High external debt reduces domestic investment. Countries would have to meet their debt obligations from a portion of total income which can lead to debt overhang (Krugman, 1988) or the extent of debt can deter international financial institutions from funding investment projects and also increases economic uncertainty (Greene & Villaneuva, 1991; Jenkins, 1998; Ndikumana, 2000). But Maana et al., (2008) argue that considerable level of financial development can help mitigate the negative effect

of government debt on private investment. This notwithstanding, considerable amount of empirical findings point to the fact that debt overhung reduces private investment (Ndikumana, 2000; Misati & Nyamongo, 2011; Tchouassi & Ngangue, 2014).

Governance

The study postulates that the benefits of good governance practices may not only be limited to corporate entities (Kyereboah –Coleman, 2007) but could also influence certain sectors of the general economy if applied at the national level. Indeed, Emery (2003) puts it more succinctly that the quality of governance directly affects the level and nature of private investment in a country which in turn influences economic growth and standard of living. Rules and regulations instituted to ensure transparency and accountability in country governance have the potential of either enticing private investment or even driving away existing ones. This is because if good governance practices are designed and instituted they will not only help reduce corruption, ensure accountability, political stability, effectiveness of government but will also help increase the confidence of existing and potential investors in the Africa.

Wei (2000) reported that investors are deterred by corruption, irrespective of the level of incentives offered by host countries. This could be as a result of the fact that corruption has a negative effect on the growth of firms, just as taxation (Fisman & Svensson (2007). Also, Svensson (2005) contended that corruption deter investment

because it can negatively bias an entrepreneur's assessment of the risks and returns associated with an investment. Agency problem is heightened with corrupt politicians and officials through directing state and private investment to areas which maximize their returns and not those of the society (Krueger 1993; Alesina & Angeletos, 2005; Jain 2011). In Africa, Gyimah-Brempong (2002, 2005) concluded that income inequality and corruption move in the same direction. Political and economic instability are harmful to investment in Nigeria (Tadeu & Silva, 2013). Political instability enhances the crowding out effect of FDI on domestic private investment in developing economies (Morrissey & Udomkerdmongkol, 2012)

Government policies influence the level of investment in their economies by directly undertaking investments and initiating policies that are attractive to private investors. In underdeveloped and some developing economies, government is the main investor whose actions or inactions regulate the level of investment in their economies. Also, through taxation (for example, tax incentives and amount of corporate tax charged) governments are able to affect the size of income available for investment. This can be looked at from the point of view of the free cash flow theory (McConnel & Bruce, 2005; Beardshaw et al., 1998). Aysan et al., (2006) depict the role of governance in private investment decisions is material. Specifically, their results support the notion that administrative quality in the form of control of corruption, bureaucratic quality, investment-friendly profile of administration, and law and order, as well as for "Political Stability" help encourage private investment in the Middle-East and North Africa (MENA) countries. The level of political stability, which is also under the

influence of governments, can serve as an attractive force for future investment or discourage investment. Generally, the system of governance practiced, freedom of speech of the media and the citizenry, the independence of the judiciary and level of threat of expropriation are all indicative of the level of political stability.

Although many Governments have been working on improving public governance, very few have done so in the context of investment promotion. If governments want to improve on governance with the objective of attracting investment then their governance strategy should have the following important elements; predictability, accountability, transparency and participation (UNCTAD, 2004). The study combines the country governance indicators provided by the World Bank into an index in order to cater for corruption, voice and accountability, rule of law, government effectiveness, regulatory quality and political stability. It is expected that good country governance should lead to higher private investment. Governance is measured with two proxies. The first variable Country Governance Index (CGI) is an index constructed by the researcher using Principal Component Analysis (PCA) applied to the new governance data from World Bank and the second index is an already constructed index (Polconiii) by Henisz (2010).

Accelerator Effects of GDP

According to the classical economists, investments should be undertaken so long as the expected return of an investment exceeds the interest rate. Investment decisions are thus influenced, to a large extent, by the expected returns from an investment.

Future expectations of an organizations return are dependent on how future cost of operations and sales would be. All these depend on the future social, political and economic conditions of the economy in which the organization operates. For instance, population size and growth, taste and preferences, political state, economic condition, educational level, income levels and standard of living are among the key variables that are likely to shape the expected returns of an investment and effectively the level of investment. Consequently, an investor who holds an optimistic view about an investment would not be perturbed about funding an investment with a high interest cost, while it would be extremely difficult, if not impossible, to convince a pessimistic investor to fund an investment even with a low interest cost (McConnel & Bruce, 2005; Beardshaw et al., 1998).

We capture the expectations of investors by using the growth of GDP. The relationship between the level of income and investment can be looked at from both direct and indirect viewpoints. Directly, when organizations make income large enough to cover the amount needed to cover operating activities, all other things being equal, the size of their investments increase. Indirectly, the level of income of an economy influences the size of investment through the expectations channel. Economies with large income can influence investors to be optimistic about the future returns of an investment. This notwithstanding, the relationship between the level of income and investment is considered to be bi-directional. The size of investment undertaken has the tendency of also influencing the level of income (Beardshaw et al., 1998). On the other hand, the Keynesian view of investment

considers that it is the rate of change in the national income and not the level of income that influences investors' expectations. In this way, the accelerator principle of investment can be explained. Research findings are consistent that growth in GDP positively influences private investment (Ndikumana, 2000; Erden & Holcombe, 2005; Munthali, 2012).

Uncertainty

The possibility of not knowing the exact outcome of an action like undertaking investment may influence investors' decision especially in developing economies where economies are rarely stable. Shocks on returns, such as exchange rate, inflation and trade liberalization, affect investment decisions (Acosta & Loza, 2005). In southern Africa, Munthali (2012) find that macroeconomic uncertainty reduces private investment but Ndikumana (2000) and Erden and Holcombe (2005) do not find economic uncertainty as a key factor that explains private investment. The researcher measured uncertainty with inflation rate and postulated that it will have a negative effect on private investment.

Trade openness

Even though some African countries went through some economic reforms in an attempt to reduce economic deficit on the continent, the effectiveness of such reforms is largely contended. In spite of this, the importance of structural reforms in facilitating profitability of private investment appears apparent. In this study, trade openness is used as a proxy for structural reforms. Trade openness facilitates private

investment through increasing competitiveness and providing access to enlarged markets (Balassa, 1978; Feder, 1982); originating economies of scale and productivity gains (Aysan, et al., 2006) and; enabling the use of tradable goods as a source of collateral for external finance (Caballero & Krishnamurthy, 2001)

Human Capital

Human capital can facilitate the attraction and maintenance of private investment through enhancing the benefits that could be derived from physical capital. Skilled workers increase the efficiency of physical capital, assist in dealing with changes, can handle new technologies better and provide strategies for expanding businesses (see Aysan, et al, 2006)

Determinants of Public Investment

Empirical literature on determinants of public investment is scarce. In his seminal work, Aschauer (1989) hypothesized that economy's productivity slow down can be linked to fall in public infrastructure, as witnessed by the United States of America (USA) in the 1980s. Turrini (2004) suggested, based on a theoretical model of public investment, that trend output, output gap, primary fiscal balance (total revenues less non-interest spending), public debt and the long-term real interest rate describe the trend in public investment. Mehrotra and Väilä (2006) modified the model advanced by Turrini (2004) to include a dummy for participation in European Monetary Union (EMU), net lending and components of net lending (current receipts and current disbursement). They concluded that public investment is determined by national

income, the stance of budgetary policies and fiscal sustainability considerations. Neither the cost of financing nor the fiscal rules embodied in EMU have had a systemic impact on public investment.

Earlier, Sturm (2001) concluded that Politico-institutional variables, like ideology, political cohesion, political stability and political business cycles do not seem to be important when explaining government capital formation in less-developed economies. On the other hand, variables like public deficits, private investment and foreign aid are significantly related to public capital spending. The study shows that contemporaneous variable of private investment has a significantly negative relationship with public investment but the lag or private investment exhibit a significantly positive relationship with public investment. This implies that public investment follows private investment but eventually crowds out private investment. Possibly, the crowding out effect is as a result of the fact that public investment follows private investment to compete with private investors but not with supporting public infrastructure. Where supporting infrastructure is provided, a crowding in effect will be expected. All these are matters that require empirical investigation in SSA.

2.2 Methodology

The main purpose of this study is to reassess the crowding-in-out hypothesis after controlling for financial sector development, government debt, country governance, political stability, cost of capital, uncertainty, trade openness, and credit crunch using

data from SSA and also examine whether there is a bi-causal relationship between private investment and public investment. We estimate our regression for the first objective based on a modified flexible accelerator investment model derived by Erden and Holcombe (2005). The flexible accelerator model, propounded by Chenery (1952) and Koyck (1954) builds on the rigid accelerator model by factoring in the dynamic nature of investment. The proportion of the discrepancy between desired and actual output in each period facilitates the adjustment of capital towards its desired level (Antonakis, 1987). This model allows for the inclusion of institutional and structural characteristics of SSA. The model is based on the assumption that desired capital stock is proportional to the level of expected output. The basic model is specified as follows:

$$PI_{i,t} = \alpha\alpha_0[1 - (1 - \delta)L]Y_{i,t}^e + \gamma_1 GI_{i,t} + \gamma_2 X_{i,t} + (1 - a_0)PI_{i,t-1} + u_{i,t}, \quad (1)$$

where $PI_{i,t}$ is private investment level; $Y_{i,t}^e$ is the expected level of output assumed to be future aggregate demand of country i in time t ; $GI_{i,t}$ is public investment; $X_{i,t}$ is a vector of control variables deemed to include financial sector development, government debt, country governance, uncertainty, trade openness, political stability and credit crunch; $PI_{i,t-1}$ is last year's level of private investment meant to capture the adjustment process; the subscripts $i = 1, \dots, N$ and $t = 1, \dots, T$ represent the cross-section and time-series dimension of the panel data, and $u_{i,t}$ is assumed to be equal $\mu_i + v_{it}$ where μ_i is the country specific variable and v_{it} is the white noise. The coefficient of $Y_{i,t}^e$ captures the accelerator effect and is expected to be positive; δ represents depreciation rate. It is assumed that government and private investment depreciate at the same rate. As a result of the difficulty in getting depreciation rates for the countries in the study, the

study used an arbitrarily chosen value of 0 based on studies by Blejer and Khan (1984) and Ramirez (1994). Their studies show that sensitivity analysis using depreciation values between 0 and 5 show no significant differences in results for developing economies. Similar results were also reported by Erden and Holcombe (2005) and Muthali (2012). The coefficient of GI can be positive or negative depending on whether public investment crowds in or crowds out private investment.

Thus,

$$X_{it} = f(\gamma_{21}RIR_{it}, \gamma_{22}POL_{it}, \gamma_{23}TOPEN_{it}, \gamma_{24}AID_{it}, \gamma_{25}EDS_{it}, \gamma_{26}CBB_{it}) \quad (2)$$

When equation (2) is substituted in (1), it leads to:

$$PI_{it} = \alpha\alpha_0([1 - (1 - \delta)L]Y_{it}^e + (1 - \alpha_0)PI_{it-1} + \gamma_1GI_{it} + \gamma_{21}DCPS_{it} + \gamma_{22}RIR_{it} + \gamma_{23}TOPEN_{it} + \gamma_{24}POL_{it} + \gamma_{25}INF_{it} + \gamma_{26}OBB_{it} + \mu_i + v_{it}) \quad (3)$$

Equation 3 can be re-written as follows:

$$PI_{it} = \beta_0([1 - (1 - \delta)L]Y_{it}^e + \beta_1PI_{it-1} + \beta_2GI_{it} + \beta_3DCPS_{it} + \beta_4RIR_{it} + \beta_5TOPEN_{it} + \beta_6POL_{it} + \beta_7INF_{it} + \beta_8OBB_{it} + \mu_i + v_{it}) \quad (4)$$

where,

$$\alpha\alpha_0 = \beta_0, (1 - \alpha_0) = \beta_1, \gamma_1 = \beta_2, \gamma_{21} = \beta_3, \gamma_{22} = \beta_4, \gamma_{23} = \beta_5, \gamma_{24} = \beta_6, \gamma_{25} = \beta_7,$$

$$\gamma_{26} = \beta_8$$

Assuming depreciation of private investment is 0, we get

$$PI_{it} = \beta_0Y_{it-1}^e + \beta_1PI_{it-1} + \beta_2GI_{it} + \beta_3DCPS_{it} + \beta_4RIR_{it} + \beta_5TOPEN_{it} + \beta_6POL_{it} + \beta_7INF_{it} + \beta_8OBB_{it} + \mu_i + v_{it} \quad (5)$$

The study then tested for the effect of private investment on public investment in a derived model that allows for the inclusion of other control variables that condition

the relationship. This is to help check the robustness of the relationship between private investment and public investment.

An empirical Model of Public investment

The model used in this part of the study relies on a similar derivation by Erden and Holcombe (2005) who build a private investment model from a flexible accelerator. According to Blejer and Kahn (1984) and Ramirez (1994), the flexible accelerator model begins on the premise that desired capital stock is proportional to the level of expected output:

$$K_{git}^* = \alpha Y_{it}^e, \quad (6)$$

where K_{git}^* is the desired public capital stock of country i in time t while Y_{it}^e is the expected level of output –taken to be future aggregate demand- of country i in time t .

In the absence of adjustment process and its associated cost, actual public capital stock and the desired or target public capital should be the same. But in reality, due to technical constraints and the time it takes to plan, decide, build and install new capital, adjustment process may be costly and not instantaneous. This implies that the adjustment process is partial. In other words, adjustment cost stalls the process of fully adjusting public capital stock from previous year's level to the current year. According to Salmon (1982), the partial adjustment function can be derived from the minimisation of the following cost function, J . Thus, we capture this dynamic structure of public investment behaviour by introducing a one-period quadratic adjustment cost function,

$$J = \beta(K_{git} - K_{git}^*)^2 + (1 - \beta)(K_{git} - K_{git-1})^2, \quad (7)$$

where K_{git} is actual public capital stock of country i in time t and K_{git-1} is the lag of actual public stock of country i in time t . The first term of equation (7) is the cost of disequilibrium, and the second term, the cost of adjusting toward equilibrium. The following partial adjustment mechanism can be derived from minimizing the cost of adjustment with respect to K_{git} :

$$K_{git} - K_{git-1} = \beta(K_{git}^* - K_{git-1}) \quad 0 \leq \beta \leq 1, \quad (8)$$

The evolution of public capital stock takes the following standard form

$$I_{git} = (K_{git} - K_{git-1}) + \delta K_{git-1} \quad (9)$$

where I_{git} is gross public investment and δ is the depreciation rate of public capital stock.

Equation (9) can be re-arranged as follows:

$$I_{git} = [1 - (1 - \delta)L]K_{git}, \quad (9a)$$

The steady state of equation (9a) can be specified as follows:

$$I_{git}^* = [1 - (1 - \delta)L]K_{git}^* \quad (9b)$$

When we substitute equation (6) in (9b) we get

$$I_{git}^* = [1 - (1 - \delta)L]\alpha Y_{it}^e \quad (9c)$$

The partial adjustment process in equation (8) can be written in terms of I_{git} , for empirical purposes, as follows:

$$I_{git} - I_{git-1} = \beta(I_{git}^* - I_{git-1}) \quad (10)$$

Based on the assumption that private investment and other relevant factors affect the speed at which the gap between actual public investment adjust towards the desired level in each short run period, the speed of adjustment can be specified in a linear function as follows:

$$\beta = \alpha_0 + [1/(I_{git}^* - I_{git-1})](\gamma_1 I_{pit} + \gamma_2 X_{it}), \quad (11)$$

Where α_0 is the intercept, I_{pit} is private investment and X_{it} is the vector of other relevant factors that condition the adjustment process.

When equation (11) is substituted in (10), it leads to

$$I_{git} - I_{git-1} = \{\alpha_0 + [1/(I_{git}^* - I_{git-1})](\gamma_1 I_{pit} + \gamma_2 X_{it})\}(I_{git}^* - I_{git-1}) \quad (12)$$

Re-arranging equation (12) leads to

$$I_{git} - I_{git-1} = \alpha_0 (I_{git}^* - I_{git-1}) + \gamma_1 I_{pit} + \gamma_2 X_{it} \quad (13)$$

When we substitute equation (9c) in (13) we get

$$I_{git} - I_{git-1} = \alpha_0 ([1 - (1 - \delta)L]\alpha Y_{it}^e - I_{git-1}) + \gamma_1 I_{pit} + \gamma_2 X_{it} \quad (14)$$

Re-arranging equation (14) leads to

$$I_{git} = \alpha \alpha_0 ([1 - (1 - \delta)L]Y_{it}^e + (1 - \alpha_0)I_{git-1} + \gamma_1 I_{pit} + \gamma_2 X_{it} + u_{i,t}) \quad (15)$$

$$X_{it} = f(\gamma_{21} RIR_{it}, \gamma_{22} CGI_{it}, \gamma_{23} TOPEN_{it}, \gamma_{24} AID_{it}, \gamma_{25} EDS_{it}, \gamma_{26} CBB_{it}) \quad (16)$$

When equation (16) is substituted in (15), it leads to:

$$I_{git} = \alpha \alpha_0 ([1 - (1 - \delta)L]Y_{it}^e + (1 - \alpha_0)I_{git-1} + \gamma_1 I_{pit} + \gamma_{21} RIR_{it} + \gamma_{22} CGI_{it-1} + \gamma_{23} TOPEN_{it} + \gamma_{24} AID_{it} + \gamma_{25} EDS_{it} + \gamma_{26} CBB_{it} + u_{i,t}) \quad (17)$$

Equation (17) can be re-written as follows:

$$I_{git} = \varphi_0 ([1 - (1 - \delta)L]Y_{it}^e + \varphi_1 I_{git-1} + \varphi_2 I_{pit} + \varphi_3 RIR_{it} + \varphi_4 CGI_{it} + \varphi_5 TOPEN_{it} + \varphi_6 AID_{it} + \varphi_7 EDS_{it} + \gamma_{26} CBB_{it} + u_{i,t}) \quad (18)$$

where,

$$\alpha\alpha_0 = \varphi_0, (1 - \alpha_0) = \varphi_1, \gamma_1 = \varphi_2, \gamma_{21} = \varphi_3, \gamma_{22} = \varphi_4, \gamma_{23} = \varphi_5, \gamma_{24} = \varphi_6, \gamma_{25} = \varphi_7,$$

$$\gamma_{26} = \varphi_8$$

Assuming depreciation of public investment is 0, we get

$$I_{git} = \varphi_0 Y_{it-1}^e + \varphi_1 I_{git-1} + \varphi_2 I_{pit} + \varphi_3 RIR_{it} + \varphi_4 CGI_{it} + \varphi_5 TOPEN_{it} + \varphi_6 AID_{it} + \varphi_7 EDS_{it} + \gamma_{26} CBB_{it} + u_{i,t} \quad (19)$$

Basically, equation (19) says that additions to public capital stock (I_{git}) is influenced by expected output levels (Y_{it}^e), previous year's public investment level (I_{git-1}), current level of private investment (I_{pit}), a host of other relevant factors (X_{it}) and $u_{i,t}$ is assumed to be equal $\mu_i + v_{it}$ where μ_i is the country specific variable and v_{it} is the white noise.. The coefficient of expected output could be positive or negative because it is used to capture the effect of cyclical factors on public capital expenditure. In a situation where the economy is not performing well, governments' stabilization policies would be geared towards increasing capital expenditure to correct the down turn and vice versa. Also the coefficient of private investment is ambiguous. If governments respond to private investments with the provision of basic infrastructure to facilitate their business, then a positive relationship would be expected. On the other hand, if private investments into SSA region are basically through acquisition of state-owned enterprises (SOEs) or governments respond to private investments with the establishment of competitive SOEs, a negative relationship would be expected. The

coefficient of the lagged dependent variable is expected to be positive. Also, it is assumed that government and private investment depreciate at the same rate of zero based on previous empirical findings (for example Blejer & Khan, 1984; Ramirez, 1994; Erden & Holcombe, 2005; Muthali, 2012).

In order to reduce the bias in the coefficient estimates of expected output, private investment and lagged dependent variable and also to capture the other relevant factors that condition the adjustment process, we include other control variables that other researchers have found to influence public investment. Generally, these variables are grouped into macro-economic and politico-institutional variables (Turrini, 2004). Those included in this study are aid, budget deficit, trade openness (Sturm, 2001), interest rate, governance (Henrekson, 1988; Roubini & Sachs, 1989; De Haan & Sturm, 1997; Mogues, 2013)), fiscal discipline and external public debt (Sturm, 2001; Turrini, 2004; Mehrotra & Väililä, 2006). These are captured in X_{it} .

Test of Endogeneity

Before we estimate the above two models (private investment and public investment models in equations 5 and 19 respectively), we examine whether, empirically, there exists a bi-causal relationship between private investment and public investment by first subjecting the assumption of endogeneity to test, using the two-stage least squares (2SLS) approach. In the presence of endogeneity, an instrumental variable approach (IV) offers consistent parameter estimates which help to overcome the inconsistencies in the parameter estimates of ordinary least squares (OLS).

The 2SLS is based on a reduced form private investment model that controls for trade openness and domestic credit to the private sector and accounts for public investment as an endogenous variable. Other instruments used for the endogenous variable, in addition to trade openness and credit to the private sector included regional dummies and dummy for credit crunch.

Firstly, the variables are subjected to unit root test using the Augmented Dickey Fuller (ADF) option of the Fisher-type unit root test for panels. The Fisher-type unit root test conducts unit-root test on each panel's series separately and then combines the p-values to obtain an overall test of whether the panel series contains a unit root (Whitehead, 2002, sec. 9.8). The combination of the p-values is based on the inverse, inverse-normal, inverse-logit and modified inverse transformation methods proposed by Choi (2001). The Fisher-type unit root test the null hypothesis that all panels contain unit root against the alternate that at least one panel is stationary. The researcher used the no-trend option and zero lags but included the drift option because we do not expect the means of the variables included in the work to be nonzero. Meanwhile, the cross-sectional means of the variables are removed by demeaning the data. The results of the panel unit root test, as shown in appendix 2.1, show that the four variables ($\ln\text{PRINV}$, $\ln\text{GPINV}$, $\ln\text{TOPEN}$ and $\ln\text{DCPS}$) are stationary.

The 2SLS is used for this study because of its popularity. The general form of the IV model is specified below:

$$y_i = Y_i B_1 + X1_i B_2 + \mu_i \quad (20)$$

$$Y_i = X1_i \Pi_1 + X2_i \Pi_2 + v_i \quad (21)$$

where y_i is the dependent variable (Private Investment) for the i th observation, Y_i represents the endogenous regressor (Public Investment), $X1_i$ represents the included exogenous regressors (trade openness and domestic credit to private sector) and $X2_i$ represents the excluded exogenous regressors (regional dummies and dummy for credit crunch). $X1_i$ and $X2_i$ are collectively called the instruments. μ_i and v_i are zero-mean error terms, and the correlations between μ_i and the elements of v_i are presumably nonzero.

Subsequent to the estimation of the 2SLS, the Durbin (1954) and Wu–Hausman (Wu 1974; Hausman 1978) tests were used to test the null hypothesis that public investment is exogenous. In all cases, if the test statistic is significant, then the variables being tested must be treated as endogenous. The results of the 2SLS and the Durbin (1954) and Wu–Hausman (Wu 1974; Hausman 1978) tests are reported in Table 2.1. The results indicate that all the two tests of endogeneity reject the null hypothesis in favour of the alternate. Thus, we conclude that public investment is endogenous.

Table 2.1: Two Stage Least Squares regression. Dependent Variable: lnPRINV

Variables	Coef.	Std. Err	Z	Prob.
lnGPINV	-0.7539	0.30213	-2.50	0.013
lnTOPEN	0.3432	0.04697	7.31	0.000
lnDCPS	0.2599	0.05579	4.66	0.000
Constant	1.9328	0.5118	3.78	0.000
Obs.	714		Durbin(Score) Chi2	12.5424 (0.0004)
			Wu-Hausman	
Wald Chi2(3)	111.61		F(1,709)	12.6773 (0.0004)
Prob.	0.0000			

Instrumented: lnGPINV

Instruments: lnTOPEN, lnDCPS, 2.Catvr, 3.Catvr, 4.Catvr and Creditcrunch

where lnPRINV is private investment; lnGPINV is public investment; lnTOPEN is trade openness; lnDCPS is domestic credit to private sector; 2.Catvr, 3.Catvr and 4.Catvr are regional dummies for west, east and central Africa; and Credit crunch is a dummy variable for the global credit crunch starting from 2008.

Panel Vector Autoregression Approach

This chapter also has an objective of assessing the possibility of a bi-causal relationship between private investment and public investment. A panel-data vector autoregression (PVAR) approach introduced by Holtz-Eakin, Newey and Rosen (1988) was used in order to simultaneously estimate the system of equations specified below. All variables in the specified system are assumed to be endogenous

and each variable is regressed on its lagged values and the lagged values of all other variables in the system, after controlling for the unobserved individual heterogeneity in that system of equations. Thus, the approach combines the advantages of normal vector autoregression approach and benefits from panel data analysis.

Following Abrigo and Love (2015), Ahlfeldt, Moeller and wendland (2014) and Love and Zicchino (2006), a k -variate PVAR model of order p with country specific and time specific fixed effects can be specified generally as follows:

$$Y_{it} = A_1 Y_{it-1} + A_2 Y_{it-2} + \dots + A_p Y_{it-p} + u_i + v_t + e_{it} \quad (22)$$

$$i \in \{1, 2, \dots, 48\}, t \in \{1, 2, \dots, 20\}$$

where Y_{it} is a $(1 \times k)$ vector of dependent variables (public investment, LNPGPINV; private investment, LNPRINV; and economic growth per capita, LNGDP_{it-1}); u_i , v_t and e_{it} is the $(1 \times k)$ vectors of dependent variable-specific country and time fixed-effects and idiosyncratic errors, respectively. The $(k \times k)$ matrices A_1, A_2, \dots and A_p are parameters to be estimated. The innovations are assumed to have the following characteristics: $E[e_{it}] = 0, E[e'_{it} e_{it}] = \Sigma$ and $E[e'_{it} e_{is}] = 0$ for all $t > s$. The estimation of the above parameters, either jointly with the fixed-effects or separately (after some transformation) using equation-by-equation ordinary least squares would lead to biased results even with large N , because of the presence of lagged dependent variables in the independent variables of the system of equations (Nickell, 1981; Abrigo & Love, 2015). This bias cannot be assumed to be getting to zero in this particular study, as is generally considered when T becomes larger, because

significant bias was found by Judson and Owen (1999) even when $T=30$. One way to eliminate this bias and offer consistent results, especially with small T and large N , is to base the estimations on the General Methods of Moments (GMM) conditions. This method uses the lagged levels of endogenous regressors as instruments and transforms the data by first differencing it (Holtz-Eakin, Newey & Rosen, 1988).

The inclusion of the time specific and country specific dummies in equation (1) makes the model for the system of equations close to reality, by showing that the underlying structure is not the same for each cross-sectional unit. Meanwhile, these variables may be correlated with the other regressors because of the lagged dependent variables. The time-specific dummies are eliminated through the differencing approach. The country specific dummies are eliminated by applying the ‘Helmert procedure’ which uses the forward mean-differencing approach to remove only the forward mean, the mean of all future observations available for each country. The ‘Helmert procedure’ preserves the orthogonality between transformed variables and lagged regressors so that the lagged regressors can be used as instruments and the coefficient of the system of equations estimated by system of GMM (Arellano & Bover, 1995; Love & Zicchino, 2006). Meanwhile, the application of the ‘Helmert procedure’ requires that all variables are time demeaned, first.

Generally, PVAR estimation requires that the variables should be stationary. In view of this, all the variables included in the system estimation were subjected to

stationarity test using the Fisher-type unit root test because of the nature (large N and small T) of the panel data used.

After estimating the PVAR, we also presented the impulse response functions (IRF) as well as the variance decompositions. The IRFs were estimated in order to assess the responses of private and public investments to shocks to any of these variables (private and public investment) and how long the effect of these shocks persist in the short run. The variance decomposition depicts the total percentage change in one variable which is explained by a shock in another variable, over a specific period. These were done with the intention of knowing the specific effects of private investment on public investment and vice versa when other factors are held constant.

Based on the general PVAR form, the following specific system of equations was estimated:

$$LNGPINV_{it} = \alpha_1 LNGPINV_{it-1} + \beta_1 LNPRINV_{it-1} + \delta_1 LNGDP_{it-2} + u_{1i} + v_{1t} + e_{1it} \quad (23)$$

$$LNPRINV_{it} = \alpha_2 LNGPINV_{it-1} + \beta_2 LNPRINV_{it-1} + \delta_2 LNGDP_{it-2} + u_{2i} + v_{2t} + e_{2it} \quad (24)$$

$$LNGDP_{it-1} = \alpha_3 LNGPINV_{it-1} + \beta_3 LNPRINV_{it-1} + \delta_3 LNGDP_{it-2} + u_{3i} + v_{3t} + e_{3it} \quad (25)$$

where α , β and δ are parameters to be estimated in the equations in the system. The lag of economic growth per capita was used in the system in order to cater for the possibility of simultaneity between economic growth and the two investment variables. Thus, $LNGDP_{it-2}$ is the lag of economic growth per capita. The lag length for the variables included in the model was selected based on the Hannan-Quinn Information Criterion (see appendix 2.5) and the constant series was used as

exogenous variable. All other variables assume the meaning as indicated in equation 22. Equation 23 in the system shows that current levels of public investment are not influenced by contemporaneous factors of private investment and economic growth because of the time-to-build effect but on its own previous levels, previous levels of private investment and economic growth. This is because, it is argued that public investment may follow private investment either to provide infrastructure to compliment private investment efforts or offer competitive products/services in order to mitigate the hardship on its citizens. Meanwhile, public investment may follow economic growth because of the fact that resources may be available to fund them or in order to accelerate growth.

Equation 24 is premised on the assumption that private investment is influenced by its lag and the lags of public investment and economic growth. Public investment may precede private investment because the existence of good public infrastructure may serve as an attraction for private investment. Also, in some instances, private investors' means of entry into certain industries are based on acquisition of existing public investments. Private investors use economic growth to gauge the attractiveness of economies and either follow it or not. Equation 25 simply reiterate the widely held economic view that physical capital of an economy explains its growth and that because of the time-to-build effect such relationship is not expected to be contemporaneous.

Study sample

The study included data from all SSA countries except South Sudan. The exclusion of South Sudan was basically based on lack of data. In all, 48 countries were included in the study over a 20 year period, from 1990 to 2009.

Dynamic Panel Methodology

The nature of data used for the study allows for panel data methodology. Panel data methodology allows researchers to undertake cross-sectional observations over several time periods and also control for individual heterogeneity due to hidden factors, which, if neglected in time-series or cross-section estimations leads to biased results (Baltagi, 1995). The general form of the panel data model can be specified as:

$$Y_{it} = a + \beta X_{it} + e_{it} \quad (26)$$

Where the subscript i denotes the cross-sectional dimension and t represents the time-series dimension. Y_{it} represents the dependent variable in the model. X contains the set of explanatory variables in the estimation model. a is the constant and β represents the coefficients. e_{it} is the error term. According to Baltagi (2005), most panel data applications have been limited to a single regression with error components disturbances which is explained as:

$$Y_{it} = \beta X_{it} + \mu_i + \lambda_t + v_{it} \quad (27)$$

where the subscript i denotes individuals and t represents the time. Y_{it} represents the dependent variable in the model. X_{it} is a vector of observations on k explanatory variables. β is a vector of unknown coefficients. μ_i is an unobserved individual specific effect. λ_t is an unobserved time specific effect. v_{it} is a zero mean

random disturbance with variance δ_v^2 .

The nature of the test to be carried out requires that a dynamic panel methodology is applied. In addition to other benefits associated with panel data methodology, dynamic panel allows for measuring the speed of adjustment (through the lagged dependent variable) using the partial adjustment based approach. The dynamic panel approach accounts for individual effects, which mostly is the cross sectional (see Baltagi, 2005) even though the time specific effects can also be included. The dynamic error components regression is characterized by the presence of a lagged dependent variable among the regressors i.e.

$$Y_{it} = Y_{it-1} + \beta X_{it} + \mu_i + v_{it}, \quad (28)$$

where Y_{it} is the dependent variable in country i for time t , Y_{it-1} is the dependent variable in the previous period, βX_{it} is a vector of explanatory variables, i is equal to 1.....48, t is equal to 1.....20.

In this particular study, the Arellano Bond General Moments Method (AB-GMM (1991)) approach, first proposed by Holtz-Eakin, Newey and Rosen (1988), was used because of its popularity in dynamic panel modelling. The Arellano-Bond GMM approach is designed with the ability to handle the econometric problems that may arise in estimating equations (5) and (19). It also uses the differencing (first differencing) GMM approach to wipe out the time invariant country specific effects (which may be correlated with the explanatory variables) and also caters for the

problem of autocorrelation which may be caused by the inclusion of the lagged dependent variable. Lastly, the AB approach has been designed for small-T (20 years) and large-N (48 countries) panels (Mileva, 2007).

Diagnostic Tests

The Sargan test and autocorrelation test are the two main diagnostic tests relevant to this study. The Sargan test for over-identifying restrictions is used to determine if the instruments are suitable. The null hypothesis states that “the instruments as a group are exogenous”. Consequently, a higher p-value is preferred. The null hypothesis of no autocorrelation is applied to the differenced residuals (Mileva, 2007). Sargan test results and results for AR (1) and AR (2) test reported in Table 2.10 show that the model is well specified.

Two models are used: Equation (29) is used to re-assess the crowding-in-out hypothesis in the presence of good governance; and equation (30) is to test for the determinants of public investment and private investment in expanded models.

$$\begin{aligned} \ln PRINV_{it} = & \beta_0 \ln GDP_{it-1} + \beta_1 \ln PRINV_{it-1} + \beta_2 \ln GPINV_{it} + \beta_3 \ln DCPS_{it} + \beta_4 \ln RIR_{it} + \\ & \beta_5 \ln TOPEN_{it} + \beta_6 \ln POL_{it} + \beta_7 \ln INF_{it} + \beta_8 \ln OBB_{it} + \mu_i + \nu_{it} \end{aligned} \quad (29)$$

$$\begin{aligned} \ln PINV_{it} = & \varphi_0 \ln GDP_{it-1} + \varphi_1 \ln GPINV_{it-1} + \varphi_2 \ln PRINV_{it} + \varphi_3 \ln RIR_{it} + \varphi_4 \ln CGI_{it} + \\ & \varphi_5 \ln TOPEN_{it} + \varphi_6 \ln AID_{it} + \varphi_7 \ln EDS_{it} + \varphi_8 \ln CBB_{it} + x_i + z_{it} \end{aligned} \quad (30)$$

where the variables are explained in Table 2.2 below

Table 2.2: Definition of variables (proxies) and Expected signs

VARIABLE	DEFINITION	THEORY	EXPECTED SIGN
PRINV	Private Investment = investment output ratio and is computed as the ratio of private investment to GDP of country i in time t . Private investment covers gross outlays by the private sector (including private non-profit agencies) on additions to its fixed domestic assets.	Crowding-in -out effect	indeterminate
GPINV	Public investment covers gross outlays by the public sector on additions to its fixed domestic assets. This is scaled by GDP and is taken for country i in time t ;	Crowding-in -out effect	indeterminate
RIR	Real Interest Rate (independent Variable) = is the year end real interest rate of country i in time	Neoclassical Theory	Negative

t;

CGI	Country Governance Index (1): Is an index constructed using principal component analysis from six global governance indicators provided by the world bank. The index is constructed for country <i>i</i> in time <i>t</i> ;	Governance	Positive
POL(Polconiii)	Political Discretion/Constraint = It is measured as the level of political discretion or constraint and ranges from 1 (political discretion) to 0 (political constraint) of country <i>i</i> in time <i>t</i> based on Henisz (2010);	Governance	Positive
INF	Inflation = Consumer price index reflects changes in the cost to the average consumer of acquiring a basket of goods and services that	Uncertainty	Negative

may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used. This is calculated using 2005 base year for country i in time t .

DCPS	Domestic credit to private sector (a measure of financial sector development) refers to financial resources provided to the private sector, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises. This is scaled by GDP and is taken for country i in time t ;	Financial Sector Dev't	Positive
------	--	------------------------	----------

TOPEN	Trade openness = This shows exports, imports and sum/average of exports and imports as percentage of nominal gross domestic product (GDP) for country i in time t . The indicators are calculated for trade in goods, trade in services and total trade in goods and services.	Structural Adjustment	Positive
OBB	Overall budget deficit is current and capital revenue and official grants received, less total expenditure and lending minus repayments. This is scaled by GDP and is taken for country i in time t ;	Fiscal Discipline/ Crowding-in-out hypothesis	Negative
CBB	Current Budget Balance – Is the excess of current revenue over current expenditure, scaled by GDP and taken for country i in time t ;	Fiscal Discipline	Negative

EDS	Is external debt stocks for Public and publicly guaranteed debt which comprises long-term external obligations of public debtors, including the national government, political subdivisions (or an agency of either), and autonomous public bodies, and external obligations of private debtors that are guaranteed for repayment by a public entity. It is scaled by GDP and taken for country i in time t ;	Positive
AID	This is Gross Official Development Agency's (ODA) aid disbursement for economic infrastructure. It is the aggregate total for transport and storage; communications; energy; banking and financial services; business and	Positive

other services. It is scaled by GDP and taken for
country i in time t ;

μ_i, ν_{it} Are the country specific and white noise

Data

All the data were taken from the online edition of the African development index of the World Bank except that of Trade openness and Polconiii. The variable for trade openness was taken from UNCTAD but that of Polconiii is an index built by Henisz (2010). All the variables are presented in their natural log form in order to control for heteroskedasticity and also help in the determination of their elasticities.

Country Governance Indexes

Two main governance variables (which are also indexes) are used in the study. The first variable (CGI) is constructed by the researcher using Principal Component Analysis applied to the governance data from World Bank and the second index is an already constructed index (Polconiii) by Henisz (2010).

Polconiii measures the level of political discretion or political constraints using data drawn from political science databases. These data give information about the number of independent branches of government with veto power over policy change. In this model investors are interested in the extent to which a given political actor is a constraint in his or her choice of future policies. Thus, the level of political discretion and constraint ranges from 1 (political discretion) to 0 (political constraint).

Henisz (2002) states that “The strength of the measure is that it is structurally derived from a simple spatial model of political interaction which incorporates data on the number of independent political institutions with veto power in a given polity and

data on the alignment and heterogeneity of the political actors that inhabit those institutions. The first weakness of the measure is that its validity is based upon the validity of the assumptions imposed upon the spatial model in order to generate quantitative results. Another weakness is that many features of interest are left out of the model including agenda setting rights, decision costs, other relevant procedural issues, the political role of the military and/or church, cultural/racial tensions, and other informal institutions which impact economic outcomes.”

Apart from Polconiii, CGI variable is measured as an index constructed by the researcher (using the Principal Component Analysis - PCA) from the global governance indicators published by the World Bank. The following equation was used for the construction of the governance index.

$$CGI_t = W_1CC_t + W_2GE_t + W_3PS_t + W_4RQ_t + W_5RL_t + W_6VA_t \quad (31)$$

where the components have been explained in the Table 2.3 below:

Table 2.3: Components of Country Governance Index

Variable	Meaning	Measurement
CC	Control of Corruption	Number of sources
GE	Government Effectiveness	Number of Sources
PS	Political Stability	Number of sources
RQ	Regulatory Quality	Number of sources
RL	Rule of Law	Number of sources
VA	Voice and Accountability	Number of sources

The variance proportions of the various countries used in the study, as shown in Appendix 2.2 below shows that, in all the countries, the first composition gives the best weights to be used in the calculation of the governance index.

2.3.0 Analysis and Discussion

2.3.1 Descriptive Statistics

Table 2.4 presents the descriptive statistics for the study. On the average private investment to gross domestic product (in percentage) was as low as about 12.75% with a variation of 9.54. Some economies recorded as low as -2.64% with others as high as 112.35% in some years. The wide difference between the minimum and maximum ratios also attests to the fact that private investment activities on the continent are not evenly distributed. While others were able to attract even more than their national output in certain years, others experienced a reduction in private investment in certain years over the study period. A comparison of the size of credit to the private sector (17.87%) and the size of private investment over the period shows that a greater proportion of credit to private sector (71.35%) goes into capital projects. Again, private investment as a percentage of GDP was almost double that of public investment (7.41%), depicting a gradual shift from the fact that governments in Africa invest more than the private sector.

Meanwhile, real interest rate on the continent, averaged at 10.8% but with huge disparities. The minimum and maximum rates were -96.87% and 508.74% respectively meaning that real interest rates on the continent are far from being

homogenous. Impliedly, the result does not truly reflect the position of the entire continent. Consequently, a lot of work needs to be done in the area of monetary policy harmonization if the continent is really committed towards economic integration. The average Country Governance Index was 1.33. Again, the wide difference between the minimum and maximum (-33.7 and 31.6) only goes to confirm the disparities in governance structures of African economies. Whilst some economies have good structures to facilitate control of corruption, government effectiveness, political stability, regulatory quality, rule of law and voice and accountability, others are destroying the few structures they put up, through post election conflict. Nonetheless, the measure of political discretion shows that African political leaders have a fair level of political discretion.

The average growth rate of GDP was about 4%. The volume of trade in SSA was about 31 times the size of aid the sub-region gets for economic infrastructure. If SSA was making more exports from this volume or importing more capital items for manufacturing, then a lot may be achieved through trade than aid. Also, the average overall budget balance (-219.72%) shows that the fiscal discipline of managers of the SSA region leaves much to be desired, even though current budget balance (4,516.69%) is more comforting. Together, the two measures of fiscal discipline confirm why SSA relies so heavily on external debts (81.33%) for financing capital investments.

Table 2.4: Descriptive Statistics

Variable	Obs	Mean	Std Dev.	Min	Max
PINV	841	7.407808	4.82583	0.1001	42.9755
PRINV	840	12.75484	9.77695	-2.6404	112.352
DCPS	881	17.86645	20.791	0.6828	161.98
CGI	532	0.470989	18.1122	-33.695	31.6019
POL	419	0.319523	0.15062	0.02	0.73
TOPEN	838	31.4506	21.2424	2.68738	140.576
INF	819	69.48733	868.735	-11.686	23773.1
RIR	641	10.84186	27.7605	-96.87	508.741
CBB	850	4516.69	128957	-50.95	3759757
OBB	860	-219.724	1457.95	-13910	80.4527
AID	374	1.116619	1.24082	-0.2216	10.7369
GDP	916	3.92338	8.29937	-51.031	106.28
EDS	882	81.32798	79.4891	1.8722	862.108

2.3.2 Multicollinearity

In order to test for the presence of multicollinearity among the regressors, two main tests were conducted. The correlation among the variables (as shown in Table 2.5B) was estimated just as their variance inflation factors (VIF). The results, as indicated in Table 2.5A show that the presence of multicollinearity is minimal. This is reflected in the low correlation values and a very low mean VIF of 1.36 and 1.64. Multicollinearity is deemed to be high if VIF is greater than 5 (as a common rule of

thumb) and according to Kutner, Nachtsheim and Neter (2004), VIF of 10 should be the cut off.

Table 2.5A: Variance Inflation Factor Tables

<i>Public Investment Model</i>			<i>Private Investment Model</i>		
Variable	VIF	I/VIF	Variable	VIF	I/VIF
LNGDP _{t-1}	1.70	0.588	LNGDP _{t-1}	2.12	0.472246
LNEDS	1.42	0.703	LNTOPEN	2.05	0.487389
LNCBB	1.42	0.705	LNOBB	1.62	0.615
LNCGI	1.41	0.708	LNPINV	1.56	0.642
LNAID	1.36	0.735	LNINF	1.55	0.644
LNPRINV	1.30	0.771	LNDCPS	1.55	0.644
LNRIR	1.16	0.859	LNRIR	1.35	0.741
LNTOPEN	1.12	0.893	LNPOL	1.33	0.754
Mean VIF	1.36		Mean VIF	1.64	

2.3.3 Discussion of Regression Results

Bi-Causal Relationship between Private Investment and Public Investment

Presentation of Unit Root Results

The results from the unit root test, as shown in Table 2.6, suggest that the time-demeaned helmert transformed data used for the panel VAR estimations are stationary at their levels.

Table 2.6: Panel Unit root Test

	LNGPINV	LNPRINV	LNGDP(-1)
ADF-Fisher Chi-square	181.828***	190.378***	127.850***
ADF-Choi Z-stat	-5.54731***	-6.12863***	-2.99246***
No. of Obs.	748	733	786

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Presentation of PVAR Results

The results of the estimated system of equations are presented in Table 2.7 below. The estimated coefficients are after the elimination of the country-specific and time-specific effects. The system of equations estimated has private, public investments and economic growth as the main variables of interest. Apparently the study offers support for the argument that past levels of both private and public acquisition of fixed assets help explain each other. In other words, the results suggests that previous levels of private investment in SSA serve as a source of attraction for government investment in the areas of infrastructure such as the provisions of electricity, roads, health and education. Thus, public investments follow private investment in SSA to provide basic public goods and other complimentary products. Similar results were

recorded for economic growth. Previous levels of high economic growth are catalyst for subsequent additions to public investment either because of resource availability or positive signals picked by governments.

The results from the private investment model indicate that private and public investments are compliments even though, contrary to expectation, previous levels of economic growth appear to deter private investment. In other words, even though private investment may precede public investment in SSA, public investment in infrastructure also serves as an attraction for private investment. Unfortunately, however, private investors' confidence in the sustainability of previous economic growth levels seems to be minimal. In fact, in SSA, private investors appear to reduce their investment when preceding periods are characterised by high economic growth. Thus, private investors in SSA, expect a recession in periods following high economic growth, casting doubts on the sustainability of growth policies undertaken in the sub region.

The results support established growth theories that investment propels economic growth. Previous levels of both private and public investment have a positively significant relationship with current levels reiterating the fact that investment drives growth.

Consequently, both private and public investment in physical capital complement each other and eventually enhance economic growth but growth send different signals to both public and private investors in SSA.

Log likelihood	-220.3319	-187.806	360.0754
Akaike AIC	0.714880	0.612597	-1.1103
Schwarz SC	0.763915	0.661633	-1.061265
Mean dep.	-0.069438	-0.065701	-0.25458
S.D. dependent	0.471493	0.475636	0.287632
No. of Obs.	636	636	636
<hr/>			
Determinant resid covariance (dof adj.)	0.000239		
Determinant resid covariance	0.000231		
Log likelihood	-45.17886		
Akaike information criterion	0.208110		
Schwarz criterion	0.355215		

Source: Author's computation from data taken from World Bank (2012)

Impulse Response Functions (IRF)

Based on the results of the reduced form equation estimated and shown in Table 2.7, the IRF graphs as (shown in Figure 1) and Appendix 2.3 have been derived. The IRF shows how much a variable in the system would change if there is a shock or an innovation to another variable and how long such a change would persist in the short run.

Generally, the results from the IRF support that of the PVAR results showing that public investment and private investment are positively mutually dependent. It is observed that a 1% shock to private investment, even though does not depict any change in period 1, shows a positive change in public investment by 0.031(in logs) in

the second period. This effect trickles down to the ten periods observed, albeit with reducing effect. The delay in the effect of a shock to private investment on public investment could be assigned to the time-to-build effects especially on the part of public investors. Similar results are observed for the lag of economic growth.

Furthermore, the results also show that a 1 percent shock to public investment exhibits a negative effect on private investment in the first period but positive effects in the subsequent periods (2 to 10). It is also observed that while periods 1 to 4 witnesses an increasing effect, periods 5 to 10 exhibits diminishing effects. The negative effect in the first period could be assigned to the fact that public investments, especially in the area of construction of roads and bridges sometimes lead to displacement of some private settlements and businesses. But when these investment projects are completed they tend to attract private investment. Meanwhile, the results depict that shocks to the lag of economic growth exhibit a negative effect on private investment, after the first period.

Thus, the effect of shocks to both private and public investments on each other is positive but with one period delayed effect which is not homogenous.

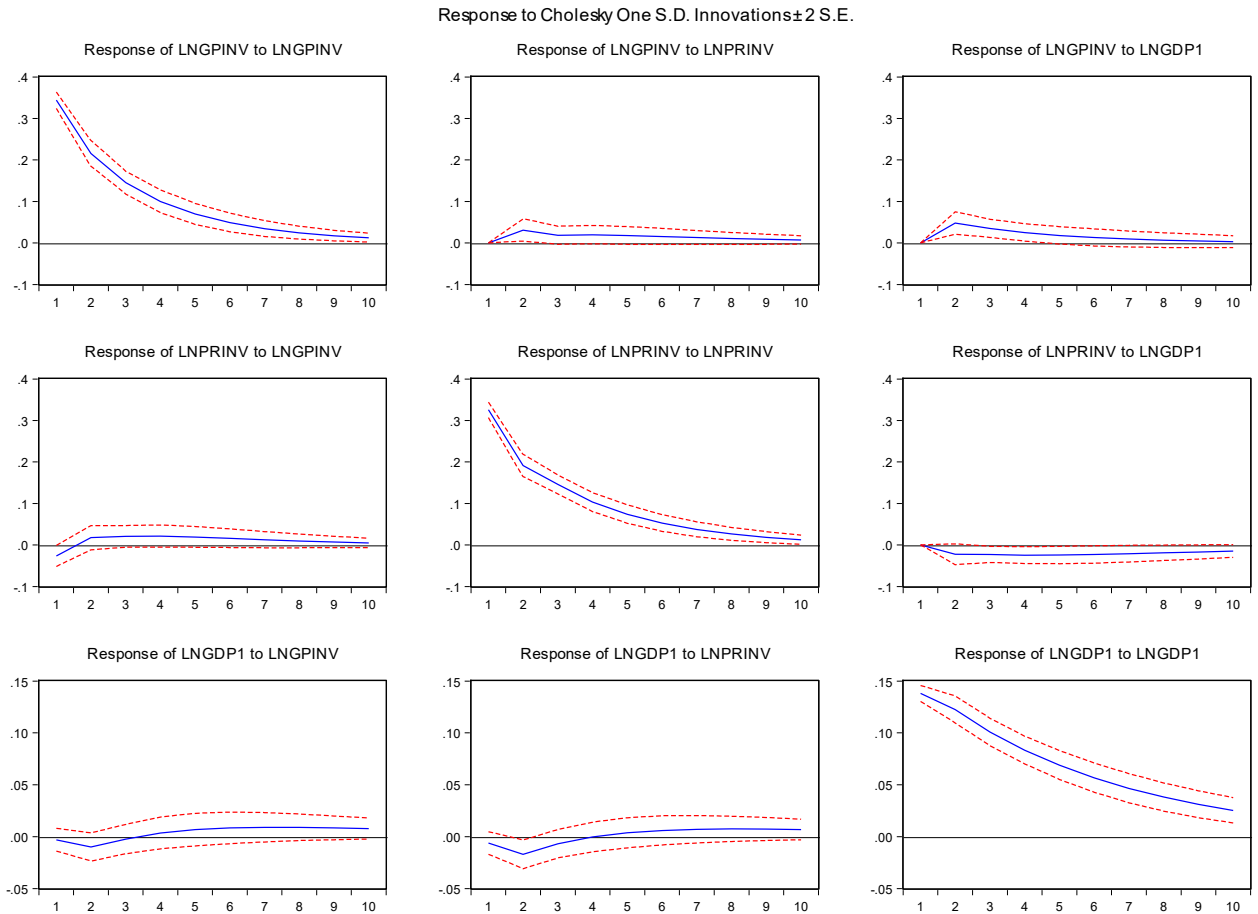


Figure 2.1: Impulse Response Graphs based on Author's Estimated PVAR.

Granger Causality

The establishment of bi-causal relationships among the variables in the system of equations makes it imperative to estimate whether the variables granger cause each other and to what extent. The results of the granger causality, as depicted in Table 2.8 below, show that the null hypotheses that each of the variables in the system (public investment, private investment and economic growth) does not granger cause each other is rejected. Thus, it is observed that each of the variables in the system granger causes each other, confirming a bi-causal relationship between each pair and the suspicion of the existence of mutual dependency.

Table 2.8: Granger Causality Results of the Estimated System Variables.

Dependent variable: LNGPINV			
Excluded	Chi-sq	Df	Prob.
LNPRINV	7.055067	2	0.0294
LNGDP(-1)	13.49447	2	0.0012
All	19.56045	4	0.0006
Dependent variable: LNPRINV			
Excluded	Chi-sq	Df	Prob.
LNGPINV	8.160320	2	0.0169
LNGDP(-1)	8.284912	2	0.0159
All	14.91521	4	0.0049
Dependent variable: LNGDP(-1)			
Excluded	Chi-sq	Df	Prob.
LNGPINV	6.518796	2	0.0384
LNPRINV	10.92833	2	0.0042
All	15.90552	4	0.0031

Source: Author's computation from data taken from World Bank (2012)
 No. of observations: 636

Variance Decomposition

Finally, the variance decomposition results, as shown in Table 2.9 and Appendix 2.4, for period 1 shows that whereas public investment explains about 0.657 of the change in private investment and 0.047 of the change in economic growth, private

investment and the economic growth do not explain any portion of the change in public investment. This result suggest that it takes a relatively longer time for public investment to respond to private investment and economic growth due probably because cost of public investment and political will.

Table 2.9: Variance Decomposition Results

Percentage of variation in		LNGPINV	LNPRINV	LNGDP(-1)
Explained by	LNGPINV	100.0000	0.000000	0.000000
	LNPRINV	0.656587	99.34341	0.000000
	LNGDP(-1)	0.047825	0.199902	99.75227

Source: Author's computation from data taken from World Bank (2012)

Subsequent to the establishment of a bi causal relationship between private and public investment, the expanded forms (equation 29 and 30) of private and public investment models (equations 23, 24 and 25) used for the PVAR test are estimated. Table 2.10 below presents the results of the reassessment of the crowding-in-out relationship between private investment and public investment in SSA and the assessment of the determinants of public investment in an expanded model. The results are based on the Arellano-Bond (AB) dynamic model in order to account for adjustment process and cost inherent in investment decisions.

Determinants of Private and Public Investments

Re-assessment of the Crowding-in-out Hypothesis

Directly, the relationship between private investment and public investment is negative but insignificant. Indirectly, through the credit channel (Overall Budget Balance-OBB- variable), the relationship can be seen not only to be negative but significant at 1% conventional level. When governments are not disciplined and over spend, they move beyond the option of funding investment and other recurrent expenditures from internally generated funds to borrowing, either internally or externally. This situation has the potential of harming private investment in SSA. In fact, for every 1% change in overall budget balance, private investment reduces by 0.049. Thus, we argue that government involvement in the credit market, as a result of budget imbalance, squeeze out the little credit available for private investment. Where the available credit is to be rationed between government and private investors, private investors lose out because generally, investors consider business with government as risk-free. Thus, this study is indifferent about the relationship between private investment and public investment when the measure of public investment is physical public investment but supports the crowding out hypothesis, strongly, when the basis for measurement is through the credit channel. In effect the study sits well with the strand of literature on the African continent that concludes that public investment crowds-out private investment (Ndikumana, 2000) but casts doubt on the conclusion that crowding-in is associated with developing economies while crowding-out is associated with developed economies (Erden & Holcombe, 2005).

The size of the effect of fiscal imbalance on private investment in SSA is akin to that of the relationship between real interest rate and private investment. The results depict a strong negative relationship between real interest rate and investment in Africa (in line with the neoclassical theory). The result suggests that as real interest rate is increased, it tends to have an inverse relationship with the level of private investment in Africa. Specifically, a 1% increase in real interest rate wipes out private investment by 0.054. An increase in the real interest rate makes it more expensive to acquire loanable funds for private investment projects. In a continent where most of the secondary markets are underdeveloped and size of businesses are not as large as that of developed economies, dependence on bank loans is a major way of financing. This places particular significance on changes in real interest rate. Thus, economic managers could undertake policies that lead to increase in the real interest rate if they intend to cause a reduction in the level of private investment on the continent and vice versa. In other words, embarking on a policy change that could lead to a certain directional change in real interest rate is an indication of the desired direction of private investment on the continent.

Surprisingly, the relationship between growth and private investment is not only negative but also significant at 1%. Plainly, the results depict that private investors base their current investment decisions on the previous year's performance of the economy. Not only that, the result also says that where the economy performed well in the previous year, private investors are likely to invest less in the current year and vice versa. Similar results were recorded for Cameroon (Oshikoya, 1994) although

contrary to most studies in the area (Ndikumana, 2000; Erden & Holcombe, 2005; Misati & Nyamongo, 2011). The result may reflect the constant economic stability programmes being pursued by most SSA countries. These programmes may reduce the reliability of economic signals sent by SSA countries.

Table 2.10: Regression Results based on Arellano and Bond Dynamic Panel Estimation

Dependent Var.: Private Investment		Dependent Var.: Public Investment	
LNPRINV _{t-1}	0.6613*** (0.1074)	LNPINV _{t-1}	0.3478*** (0.0954)
LNDCPS	0.5194*** (0.1334)	LNPRINV	-0.1835* (0.1003)
LNPOL	0.5614*** (0.0811)	LNCGI	-0.0844 (0.0086)
LNPINV	-0.0053 (0.0617)	LNTOPEN	0.4674* (0.2617)
LINF	0.011 (0.0262)	LNRIR	0.0023 (0.0491)
LNTOPEN	1.1992*** (0.2668)	LNGDP _{t-1}	0.3907*** (0.152)
LNGDP _{t-1}	-0.5900*** (0.1601)	LNCBB	-0.0583* (0.0349)
LNRIR	-0.0538*** (0.0171)	LNEDS	0.2356*** (0.079)

LNOBB	-0.0491***	LNAID	0.0762**
	(0.0179)		(0.0387)
Wald Chi2(9)	163.4	Wald Chi2(9)	40.34
Prob>Chi2	0.0000	Prob>Chi2	0.0000
Autocorrelation		Autocorrelation	
1	z(Prob.) -1.385(0.166)	1	z(Prob.) -2.1201(0.0340)
2	z(Prob.) -0.8603(0.390)	2	z(Prob.) -0.5726(0.567)
Sargan Test:		Sargan Test:	
		Chi2	
	Chi2 (3) 2.459951	(3)	79.54982
	Prob. 0.4826	Prob.	0.1401

*** = 1%, ** = 5% and * = 10% robust Standard errors in parenthesis.

Source: Author's Computation based on Data from World Bank (2012).

A developed financial market that facilitates the movement of funds to the private sector also enhances private investment through reduction in search cost and making funds available to the private sector for investing activities. Given that the private sector predominantly uses borrowed funds for investment activities, developing a financial system that facilitates this would enhance private sector activities in SSA. Thus, the results show a significantly (at 1%) positive relationship between domestic credit to private sector and private investment. On governance, the results strongly indicate that political discretion has a significantly positive relationship with private investment. When governments are relatively stable and have enough power to

exercise their discretion, it gives confidence to private investors and reassures them that their investments are safe. In effect, private investors prefer economies where bureaucratic procedures do not unnecessarily hinder or delay government decisions.

Structural adjustment, as proxied by trade openness offers support for private investment. Specifically, countries that export more are more likely to improve upon their private fixed capital formation to meet their increased demand. Also, more imports go with expansion/construction of warehouses, acquisition of delivery vans and importation of capital equipments. Furthermore, trade openness does not only expose firms to improved technology but can also enable them to benefit from technological spillovers. In view of this, it is imperative for the sub-region to trade more among themselves and with the rest of the world. Blanket tax policies meant to discourage all forms of imports and make short-term returns are not totally helpful. Taxes on capital goods should be moderate since the long-term benefits of these items on the economy far outweigh the cost of the partial or full waiver.

The effect of Private Investment on Public Investment

Results from Table 2.6 show that key factors that influence public investment include private investment, adjustment cost, aid, external debt, economic growth, trade openness and current budget deficit.

The results show that private investment reduces public investment. This may, probably be as a result of privatization of state-owned enterprises and private sector

engagement in social activities that lead to the provision of social goods. It, therefore, suggests that more private investment may be an alternative means of reducing the burden on public sector, in terms of provision of economic and social infrastructure. In effect, this result in a way completes the crowding-in-crowding-out story in SSA. In SSA, private investment and public investments are substitutes. In other words, private investors are partners in the development of SSA. A thorough assessment of the relative strengths and weaknesses of each of these major forms of investment would enable a more formidable formulation of public private partnerships that would speed up the development of the sub-region. The need for private sector protection such as building strong institutions and less participation of governments in the domestic credit markets is encouraged.

There is a widely held assertion that most infrastructures in Africa are funded by aid from development agencies or loans, with very few supported by internally generated funds (IGF). This study confirms the special role played by development agencies in the development of Sub-Saharan Africa. Aid has a significantly positive relationship with public infrastructure. Thus, aid that supports economic infrastructural development is a major source of public investment in SSA. Similarly, trade and external debt stocks facilitate public investment just like aid. Governments benefit from trade, through taxes on imports and exports and accessibility of capital goods, facilitates public capital formation. Also, as the region borrows more, externally, public investment also increases. This relationship could emanate from the discipline that international financial institutions (IFIs) instill in countries when they borrow

from them. Also, these debts go with restrictive covenants and strict supervision from the IFIs. Governments, therefore, find it difficult to use their discretion to divert these borrowed funds, as is common with IGF budgetary allocations. Comparatively, external debt stock (significant at 1%) has the biggest impact on public investment, followed by aid (significant at 5%) and trade openness (significant at 10%). This calls to question recent agitation of the African continent for trade instead of aid, as the results point to the fact that public investment benefits more from aid than trade. Apparently the continent needs to strategize to benefit more from trade if trade is to be a good substitute for aid. Also, the sub-region needs to build the needed capacity to attract external loans to fund public investment, if IGF proves futile. This would not only enhance public investment but would reduce governments' activity in the domestic credit market, thereby, reducing its crowding-out effect on private investment.

Fiscal indiscipline harms public investment. When governments are not able to maintain current budget balance, it reduces public investment. Current budget deficit increases governments' activities in the domestic financial market reducing credit to the private sector. When governments find it difficult to even meet their current budget requirements, nothing or little is left for infrastructural development. Thus, fiscal discipline enhances the IGF of governments in order to generate funds for investment. IGF could also improve through the growth channel. Economic growth has a significantly positive relationship with public investment. Thus, ensuring high economic growth could also be an avenue of reducing governments' over-

dependence on the domestic market, thereby enabling more domestic credit to go into private investment funding.

2.4 Conclusion

This study sought to reassess the unsettled crowding-in-out hypothesis and also examine the possibility of a bi-causal relationship between private and public investments in SSA, using two separate models in a dynamic panel framework and a panel vector autoregressive approach.

We conclude that private investment crowds out public investment much the same as public investment does to private investment when they compete for financial resources. Directly, through the public investment variable, the result is inconclusive on whether public investment crowds in or crowds out private investment in Sub-Saharan Africa. Even though there exists a negative relationship between public investment and private investment, this relationship is not significant. But indirectly, through fiscal indiscipline (overall budget balance), public investment crowds-out private investment. This result is conditioned on the fact that a political system that gives enough room for the executive to make decisions, benefits from trade and a developed financial sector that channels enough funds to the private sector facilitate private investment while real interest rate and unfavourable budget balance harm private investment.

However, in assessing the possibility of a reverse causality, it is evident that private and public investments are mutually dependent and that public physical capital compliments private physical capital. Meanwhile, economic and infrastructural aid, discipline from external borrowing, economic growth and trade are reliable sources for enhancing public investment while fiscal indiscipline is not. Thus, the results reiterate the need for governments to be fiscally disciplined, put in measures to get the maximum benefit from trade and grow the economy so as to reduce their activities in the domestic credit market in order to allow private investors to have more access to domestic credit. These would not only facilitate private investment but also reduce the burden on governments for public investments.

References to Chapter Two

- Abrigo, M. R., & Love, I.(2015). *Estimation of Panel Vector Autoregression in Stata: a Package of Programs*.
- Acosta, P. & Loza, A. (2005). Short and long run determinants of private Investment in argentina *Journal of Applied Economics. VIII* (2), 389-406.
- Ahfeldt, G. M., Moeller, K. & Wendland, N. (2014). *Chicken or Egg? The PVAR Econometrics of Transportation*. Spatial Economics Research Centre, SERC Discussion Paper No. 158.
- Ajide, K. B., & Olukemi, L. (2012). Modelling the Long-run Determinants of Domestic Private Investment in Nigeria. *Asian Social Science*, 8(13), 139-152. doi:10.5539/ass.v8n13p139
- Alesina, A. F. & Angeletos, G. M. (2005). Corruption, Inequality and Fairness. *Journal of Monetary Economics*, 52 (7), 1227-1244.
- Altin, G., Moisiu, D. and Agim, A. (2012). Crowding-out Effects of Public Investment on Private Investment: an empirical investigation. *Journal of Business & Economics Research (JBER)*, 10(5), 269-276.
- Ang, J. B. (2009). Private Investment and Financial Sector Policies in India and Malaysia. *World Development*, 37(7), 1261–1273.
- Arvind K. & Jain, A. K. (2011). Corruption: Theory, Evidence and Policy. *CESifo DICE Report 2/2011*.
- Asante, Y. (2000). *Determinants of Private Investment Behaviour* (No. 100). *AERC Research Paper, Nairobi: African Economic Research Consortium*.

- Aschauer, D.A. (1989a). Is public expenditure productive? *Journal of Monetary Economics*. 23, 177–200.
- Aschauer, D.A. (1989b). Does public capital crowds out private capital? *Journal of Monetary Economics* 24, 171–88.
- Aschauer, D. A. (1990). Why is infrastructure important? Is there a shortfall in public capital investment? *Alicia Munnell. Boston: Conference Series of Federal Reserve Bank of Boston.*
- Assa, M., & Abdi, E. K. (2012). Selected Macroeconomic Variables Affecting Private Investment in Malawi. *mpa.ub.uni-muenchen.de*
- Aysan, A. F., Nabli, M. K., & Véganzone–Varoudakis, M-A. (2006). *Governance and Private Investment in the Middle East and North Africa* (No. 3934). World Bank Policy Research Working Paper.
- Bakare, A. S. (2011). A theoretical analysis of capital formation and growth in Nigeria. *Far East Journal of Psychology and Business*, 3(2), 11-24.
- Balassa, B. (1978). Exports and Economic Growth-Further Evidence. *Journal of Development Economics*, 5(2), 181-189.
- Baltagi, B. H., (1995). Testing for Correlated Effects in Panels. *Econometric Theory*, 11(02), 401-402.
- Baltagi, B. H., (2005). *Econometric Analysis of Panel Data*. John Wiley & Sons, Ltd.
- Barro, R. J. (1997). Myopia and Inconsistency in the Neoclassical Growth Model (No.6317). NBER Working Papers, National Bureau of Economic Research, Inc.

- Bazoumana, O. (2005). Modeling the long run determinants of private investment in Senegal (No. 04/05). Credit Research Paper.
- Beardshaw, J., Brewster, D., Cormack, P. & Ross, A. (1998). *Economics: A students Guide* (4th Ed.). 280 – 428. Pearson, Edinburgh.
- Blejer, M., & Khan, M. S. (1984). Government policy and private investment in developing countries. *IMF Staff Papers*, 31(2), 379–403.
- Belloc, M., & P. Vertova. 2004. How does public investment affect economic growth in HIPC? An empirical assessment. Department of Economics, University of Sienna.
- Bokpin, G. A., & Onumah, J. M. (2009). An Empirical Analysis of the Determinants of Corporate Investment Decisions: Evidence from Emerging Market Firms. *International Research Journal of Finance and Economics*, 33, 134-141.
- Caballero, R., & Arvind, K. (2001). *A Dual Liquidity Model for Emerging Markets* (No.8758). NBER Working Paper, National Bureau of Economic Research, Cambridge, Massachusetts.
- Cashin, P.(1995). Government spending, taxes, economic growth. *IMF Staff Papers* 42(2), 237-269.
- Cavallo, E., & Daude, C. (2011). Public investment in developing countries: A blessing or a curse? *Journal of Comparative Economics* 39 (1), 65–81.
- Chatelain, J-B., Generale, A., Hernando, I., Von Kalckreuth, U. & Vermeulen, P., (2002). *Firm Investment and Monetary Policy Transmission in the Euro Area* (No. 97). Banque de France Working papers.

- Chatelain, J-B., Generale, A., Hernando, I., Von Kalckreuth, U. & Vermeulen, P., (2003). New Findings on Firm Investment and Monetary Policy Transmission in the Euro Area. *Oxford Review of Economic Policy*, 19 (1), 1-11.
- Chatelain, J-B. & Tiomo,. (2001). *Investment, the Cost Of Capital, and Monetary Policy in the Nineties in France: A Panel Data Investigation* (No. 106). Banque de France Working Paper
- Chenery, H.B. (1952). Overcapacity and the Acceleration Principle. *Econometrica: Journal of the Econometric Society*, 1- 28.
- Cherian, S. (1998). The investment decision: A re-examination of competing theories using panel data. *Applied Economics*, 30(1), 95–104.
- Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance*, 20: 249–272.
- Christensen, J. (2005). Domestic Debt Markets in Sub-Saharan Africa. *IMF Staff Papers*, 52 (3) 518 – 538.
- de Haan, J., & J.E. Sturm (1997). Political and economic determinants of OECD budget deficits and government expenditures: A reinvestigation. *European Journal of Political Economy*, 13, 739-750.
- Devarajan, S., Easterly, W., & Pack, H. (1999). Is Investment in Africa Too High or Too Low? Macro and Micro Evidence. *Journal of African Economies*, 10 (2), 81-108.
- Durbin, J. (1954). Errors in variables. *Review of the International Statistical Institute* 22, 23–32.

- Emery, J. J. (2003). *Governance, Transparency and Private Investment in Africa*. A paper presented at the Global Forum on International Investment, Johannesburg, South Africa OECD-Africa Investment Roundtable 19 November 2003, 1-16.
- Emran, M. S., & Farazi, S. (2009). *Lazy Banks? Government Borrowing and Private Credit in Developing Countries* (IIEPWP20099). Institute for International Economic Policy Working Paper Series.
- Erden, L., & Holcombe, R. (2005). The effects of public investment in developing economies. *Public Finance Review*, 33(5), 575–602.
- Escobal J.A., & Ponce C. (2011). Access to public infrastructure, institutional thickness and pro-poor growth in Rural Peru. *Journal of International Development*, 23(3), 358–379.
- Evans, P., & Karras, G. (1994). Are government activities productive? Evidence from a panel of U.S. states. *Review of Economics and Statistics* 76(1), 1-11.
- Feder, G. (1982). On Exports and Economic Growth. *Journal of Development Economics*, 12, 59-73.
- Fisman, R., & Svensson, J. (2007). Are Corruption and Taxation Really Harmful to Firm Growth? Firm Level Evidence. *Journal of Development Economics*, 83, 63–75.
- Ghura, D., & Barry, G.(2000). Determinants of Private Investment: A Cross-Regional Empirical Investigation. *Applied Economics*, 32, 1819-1829.

- Gjini, A., & Kukeli, A. (2012). Crowding-out Effects of Public Investment on Private Investment; An Empirical Investigation. *Journal of Business and Economic Research*, 10(5), 269-276.
- Greene, J., & Villanueva, D. (1991). Private investment in developing countries. *IMF Staff Papers*, 38 (1), 33-58.
- Gyimah-Brempong, K. (2002). Corruption, Economic Growth and Income Inequality in Africa. *Economics of Governance*, 2, 183–209.
- Henrekson, M. (1988), Swedish Government Growth: A Disequilibrium Analysis, in: J.A. Lybeck and M. Henrekson (eds.), *Explaining the Growth of Government*, Amsterdam: North Holland.
- Holtz-Eakin, D., Newey, W., & Rosen, H. S. (1988). Estimating vector autoregressions with panel data. *Econometrica*, 56, 1371 – 1395.
- Holtz-Eakin, D.(1994). Public-sector capital and productivity puzzle. *Review of Economics and Statistics*, 76 (1), 12-21.
- Hu, C. X. (1999). Leverage, Monetary Policy, and Firm Investment. *FRBSF Economic Review*, 2, 32 – 39.
- Hubbard, G. (2012). Consequences of Government Deficits and Debt. *Journal of Central Banking*, 8 (1), 203 – 235.
- Jenkins, C. (1998). Determinants of private investment in Zimbabwe. *Journal of African Economies*, 7 (1), 34-61.
- Jorgenson, D. W. (1971). Econometric Studies of Investment Behavior: A Survey. *Journal of Economic Literature*, 9(4), 1111-1147.

- Keynes, M. J. (1937). *The general theory of employment, interest, and money*. New York, Harcourt Brace Jovanovich.
- Keynes, M. J. (1973). *The collected writings of John Maynard Keynes*. London: Macmillan.
- Khan, R. E. A. & Gill, A. R. (2009) *Crowding Out Effect of Public Borrowing: A Case of Pakistan* (No. 16292). MPRA Paper. Online at <http://mpra.ub.uni-muenchen.de/16292/>
- Kopcke, R. (1985). The determinants of investment spending. *In New England Econometric Review*. Federal Reserve Bank of Boston, 19–35.
- Koyck, L. M. (1954). *Distributed lags and investment analysis*. North Holland.
- Krueger, A. O. (1993), Virtuous and Vicious Circles in Economic Development. *American Economic Review*, 83(2), 351–55.
- Krugman, P. (1988). Financing vs. forging a debt overhang. *Journal of Development Economics*, 29, 253-268.
- Kul, L., & Mavrotas, G. (2005). *Examining private investment heterogeneity: Evidence from a dynamic model* (No. 2005/11). UNU-WIDER, Discussion Paper.
- Kutner, M., Nachtsheim, C. & Neter, J. (2004). *Applied Linear Regression Models* (4th Ed.). McGraw-Hill Irwin.
- Kyereboah-Coleman, A. (2007) *Corporate Governance and Firm Performance in Africa: A Dynamic Panel Data Analysis*. A Paper Presented at the International Conference on Corporate Governance in Emerging Markets organized by the Global Corporate Governance Forum (GCGF) and Asian

- Institute of Corporate Governance (AICG) 15th–17th November, 2007, Sabanci University, Istanbul, Turkey.
- Kyereboah-Coleman, A., (2007). The impact of capital structure on the performance of micro finance institution. *The Journal of Risk Finance*, 8(1), 56-71.
- Love, I. & Zicchino, L. (2006). Financial development and dynamic investment behaviour: Evidence from panel VAR. *The Quarterly Review of Economics and Finance*, 46, 190-210.
- Maana, I., Owino, R. & Mutai, N. (2008). *Domestic Debt and its Impact on the Economy – The Case of Kenya*. A Paper Presented During the 13th Annual African Econometric Society Conference in Pretoria, South Africa from 9th to 11th July 2008 pp. 1-27.
- McConnel, C. R., & Bruce, S. L. (2005). *Economics: Principles, problems and Policies*. 16th (Ed). 159 – 164. McGraw-Hill Irwin (1)
- McKinnon, R. (1973). *Money and capital in economic development*. Washington DC, Brookings Institution.
- Mehrotra, A. and Väililä, T. (2006). Public Investment in Europe: Evolution and Determinants in Perspective. *Fiscal Studies*, 27(4), 443–471.
- Miles D. & Scott A. (2005). *Macroeconomics: Understanding the Wealth of Nations* (2nd Ed.). Wiley.
- Mileva, E (2007). *Using Arellano – Bond Dynamic GMM Estimators in Stata: Tutorials with Examples using Stata 9.0* (Retrieved from the internet on 2/9/2013).

- Misati, R. N. & Nyamongo, M. E. (2011). Financial development and private investment in Sub Saharan Africa. *Journal of Economics and Business*, 63, 139–151.
- Mitra, P. (2006). Has Government Investment Crowded out Private Investment in India? *The American Economic Review*, 96(2), 337-341.
- Mlambo, K., & Oshikoya, T. W. (2001). Macroeconomic factors and investment in Africa. *Journal of African Economies*, 10(suppl 2), 12-47.
- Mora, N., & Logan, A. (2012). Shocks to bank capital: evidence from UK banks at home and away. *Applied Economics*, 44(9), 1103-1119.
- Morrissey, O., & Udomkerdmongkol, M. (2012). Governance, Private Investment and Foreign Direct Investment in Developing Countries. *World Development*, 40(3), 437–445. doi:10.1016/j.worlddev.2011.07.004
- Mogues, T. (2013) *Political Economy Determinants of Public Investment-Decision Making in Agriculture: Lessons from and for Africa* (No. 032). Ghana Strategy Support Programme, International Food Policy Research Institute, Discussion Paper.
- Munthali, T. C. (2012) Interaction of public and private investment in Southern Africa: a dynamic panel analysis. *International Review of Applied Economics*, 26(5), 597-622. doi:10.1080/02692171.2011.624500.
- Munnell, A. H. (1990). Why has productivity growth declined? Productivity and public investment. *New England Economic Review*, January/February, 3-22.

- Munthali, T.C. (2008). Investment in Southern Africa: Interaction of the public and private sectors. PhD thesis, April 2008, University of Leeds, UK.
- Ndikumana, L. (2000). Financial Determinants of Domestic Investment in Sub-Saharan Africa: Evidence from Panel Data. *World Development*, 28(2), 381-400.
- Ndikumana, L. (2005). Financial development, financial structure, and domestic investment: International evidence. *Journal of International Money and Finance*, 24, 651-673.
- Olweny, T., & Chiluwe, M. (2012). The effect of monetary policy on private sector investment in Kenya. *Journal of applied finance & banking*, 2(2), 239-287.
- Oshikoya, T. W. (1994). Macroeconomic determinants of domestic private investment in Africa: an empirical analysis. *Economic Development and Cultural Change*, 42(3), 573-596.
- Parker, J. (2010). *Theories of Investment Expenditures*, Economics 314 Coursebook, Chapter 15. Accessed on 20th December, 2012 Available at academic.reed.edu/economics/parker/s11/314/book/Ch15.pdf
- Pereira, M. A. and Andraz, J. M. (2010). *On the economic effects of public infrastructure investment: A survey of the International evidence* (No. 108) Universidade do Algarve, College of William and Mary, Department of Economics Working Paper, 1-33.
- Pradhan, B. K., Ratha, D. K. & Sarma, A.(1990). Complementarity between public and private investment in India. *Journal of Development Economics*, 33, 101-116.

- Ramírez, D. (1994). Public and private investment in Mexico, 1950–90: An empirical analysis. *Southern Economic Journal*, 61(1), 1–17.
- Roubini, N., & J. Sachs (1989), Government Spending and Budget Deficits in the Industrial Countries. *Economic Policy*, 8, 99-132..
- Sahoo, P., Dash, R. K., & Nataraj, G. (2010). *Infrastructure development and economic growth in China* (261). Institute of Developing Economies (IDE) Discussion Paper.
- Salmon, M. (1982). Error correction mechanisms. *The Economic Journal*, 615-629.
- Shaw, E. S. (1973). *Financial deepening in economic development*. New York: Oxford University Press.
- Sturm, J. E. (2001). *Determinants of public capital spending in less-developed countries*. University of Groningen.
- Suri, T. (2011). Selection and Comparative Advantage in Technology Adoption. *Econometrica*, 79, 159–209. doi: 10.3982/ECTA7749
- Svensson, J. (2005). Eight Questions about Corruption. *Journal of Economic Perspectives*, 19(3), 19-42.
- Tadeu, H. F. B., & Silva, J. T. M. (2013). The Determinants of the Long Term Private Investment in Brazil: An Empirical Analysis Using Cross-section and a Monte Carlo Simulation. *Journal of Economics, Finance and Administrative Science*, 18, 11-17.
- Tatom, J. A. (1991). Public Capital and Private Sector Performance. *Fed. Res. Bank of St. Louis Rev.*, 73(3), 3-15.

- Tchouassi & Ngangue (2014). Private Investment and Public Investment in Africa: A time-series cross-country analysis. *International Journal of Economics and Finance*, 6(5), 264 – 273.
- Turrini, A. (2004). *Public investment and the EU fiscal framework* (No. 202). European Commission, Directorate-General for Economic and Financial Affairs, Economic Paper.
- UNCTAD (2012). *Global investment Trends Monitor No. 8*, January 2012, UNCTAD, Geneva.
- Wei, S.-J. (2000). How Taxing is Corruption to International Investors. *The Review of Economics and Statistics*, 82, 1–11.
- Whitehead, A. (2002). *Meta-Analysis of Controlled Clinical Trials*. Chichester, UK: Wiley.
- Wu, D.-M. (1974). Alternative tests of independence between stochastic regressors and disturbances: Finite sample results. *Econometrica*, 42, 529–546.

Eigenvalue	7.71756	0.46429	0.17843	0.04291	0.01348	8.76E-16
Variance Prop.	0.91694	0.05516	0.0212	0.0051	0.0016	0
Cumulative Prop.	0.91694	0.9721	0.9933	0.9984	1	1
Eigenvectors:						
Variable	Vector 1	Vector 2	Vector 3	Vector 4	Vector 5	Vector 6
CONTROL OF CORRUPTION	-0.3229	0.46678	0.15906	-0.3875	0.04938	-0.7071
GOVT EFFECTIVENESS	-0.3229	0.46678	0.15906	-0.3875	0.04938	0.70711
POLITICAL STABILITY	-0.1981	-0.6558	0.61821	-0.3509	0.15933	5.97E-15
REGULATORY QUALITY	-0.4123	0.05596	0.37309	0.47776	-0.6778	#####
RULE OF LAW	-0.5567	-0.0103	-0.0712	0.50573	0.65508	1.40E-14
VOICE AND ACCOUNTABILITY	-0.5219	-0.3618	-0.6503	-0.3043	-0.2849	#####
SUDAN						
	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6
Eigenvalue	19.5954	0.45814	0.20809	0.12587	0.02328	0.01982
Variance Prop.	0.95912	0.02242	0.01019	0.00616	0.00114	0.00097
Cumulative Prop.	0.95912	0.98154	0.99173	0.99789	0.99903	1
Eigenvectors:						
Variable	Vector 1	Vector 2	Vector 3	Vector 4	Vector 5	Vector 6
CONTROL OF CORRUPTION	-0.434	-0.2535	-0.4658	0.52894	0.20712	-0.4558
GOVT EFFECTIVENESS	-0.3772	-0.3419	0.30534	-0.368	-0.5608	-0.4446
POLITICAL STABILITY	-0.1437	0.09423	0.62897	0.70807	-0.2145	0.16585
REGULATORY QUALITY	-0.2335	-0.544	0.39122	-0.1765	0.64756	0.21442
RULE OF LAW	-0.4236	-0.2102	-0.3642	-0.0098	-0.3509	0.72151
VOICE AND ACCOUNTABILITY	-0.6441	0.68542	0.09241	-0.2284	0.23271	-0.0217
SWAZILAND						
	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6
Eigenvalue	15.1106	0.39887	0.25197	0.05855	0.01338	#####
Variance Prop.	0.95435	0.02519	0.01591	0.0037	0.00085	0
Cumulative Prop.	0.95435	0.97954	0.99546	0.99916	1	1
Eigenvectors:						
Variable	Vector 1	Vector 2	Vector 3	Vector 4	Vector 5	Vector 6
CONTROL OF CORRUPTION	-0.4492	0.11832	0.27813	0.00037	0.84076	1.79E-14
GOVT EFFECTIVENESS	-0.335	-0.0906	0.36606	0.40368	-0.2875	-0.7071
POLITICAL STABILITY	-0.1945	-0.7931	-0.4982	0.23517	0.17237	3.34E-15
REGULATORY QUALITY	-0.335	-0.0906	0.36606	0.40368	-0.2875	0.70711
RULE OF LAW	-0.5228	-0.2203	0.09531	-0.7687	-0.2795	#####
VOICE AND ACCOUNTABILITY	-0.5125	0.54046	-0.6304	0.16692	-0.1414	#####

TANZANIA						
	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6
Eigenvalue	54.4799	1.02293	0.26752	0.16864	0.12254	0.01485
Variance Prop.	0.97153	0.01824	0.00477	0.00301	0.00219	0.00027
Cumulative Prop.	0.97153	0.98977	0.99454	0.99755	0.99974	1
Eigenvectors:						
Variable	Vector 1	Vector 2	Vector 3	Vector 4	Vector 5	Vector 6
CONTROL OF CORRUPTION	-0.4475	0.1897	-0.804	0.31485	0.03925	-0.1292
GOVT EFFECTIVENESS	-0.3354	-0.3927	-0.0675	-0.0991	0.19838	0.82434
POLITICAL STABILITY	-0.1427	0.00551	-0.157	-0.4674	-0.8544	0.08109
REGULATORY QUALITY	-0.2427	-0.8212	0.09694	0.24676	-0.1569	-0.4146
RULE OF LAW	-0.4974	0.05372	0.1	-0.6765	0.40225	-0.3468
VOICE AND ACCOUNTABILITY	-0.6004	0.36409	0.5523	0.3925	-0.2068	0.07132
TOGO						
	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6
Eigenvalue	24.1122	0.67568	0.32881	0.09815	0.02879	0.01337
Variance Prop.	0.95467	0.02675	0.01302	0.00389	0.00114	0.00053
Cumulative Prop.	0.95467	0.98143	0.99445	0.99833	0.99947	1
Eigenvectors:						
Variable	Vector 1	Vector 2	Vector 3	Vector 4	Vector 5	Vector 6
CONTROL OF CORRUPTION	-0.4325	-0.0125	-0.8156	0.37299	-0.0357	-0.0848
GOVT EFFECTIVENESS	-0.3928	0.04031	-0.0288	-0.3427	-0.1645	0.83593
POLITICAL STABILITY	-0.2118	-0.4839	-0.1863	-0.7262	0.20978	-0.339
REGULATORY QUALITY	-0.3447	0.52699	0.12271	-0.2633	-0.5939	-0.4079
RULE OF LAW	-0.4807	0.41368	0.24589	0.04667	0.7277	-0.075
VOICE AND ACCOUNTABILITY	-0.5138	-0.5614	0.47302	0.38028	-0.2131	-0.0841
UGANDA						
	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6
Eigenvalue	63.8922	0.84957	0.33722	0.20848	0.07751	0.01003
Variance Prop.	0.97732	0.013	0.00516	0.00319	0.00119	0.00015
Cumulative Prop.	0.97732	0.99031	0.99547	0.99866	0.99985	1
Eigenvectors:						
Variable	Vector 1	Vector 2	Vector 3	Vector 4	Vector 5	Vector 6
CONTROL OF CORRUPTION	0.47237	0.47204	0.47351	-0.5409	-0.1053	-0.1619
GOVT EFFECTIVENESS	0.33824	-0.2986	0.16478	-0.1193	0.25669	0.83017
POLITICAL STABILITY	0.15967	0.13345	-0.1323	0.2187	-0.8898	0.31575
REGULATORY QUALITY	0.25369	-0.805	0.03811	-0.2871	-0.2777	-0.3558
RULE OF LAW	0.47358	-0.0474	0.3847	0.74946	0.12749	-0.2181

VOICE AND ACCOUNTABILITY	0.5902	0.14127	-0.7627	-0.0358	0.19492	-0.1037
ZAMBIA						
	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6
Eigenvalue	47.6698	0.72116	0.38538	0.19543	0.06518	0.02558
Variance Prop.	0.97161	0.0147	0.00786	0.00398	0.00133	0.00052
Cumulative Prop.	0.97161	0.98631	0.99417	0.99815	0.99948	1
Eigenvectors:						
Variable	Vector 1	Vector 2	Vector 3	Vector 4	Vector 5	Vector 6
CONTROL OF CORRUPTION	-0.4562	-0.4403	-0.5514	0.47466	0.00911	0.26186
GOVT EFFECTIVENESS	-0.3593	0.26248	-0.179	0.15854	-0.1875	-0.8424
POLITICAL STABILITY	-0.1518	-0.2005	-0.1858	-0.4409	0.81158	-0.2219
REGULATORY QUALITY	-0.2617	0.79525	-0.0485	0.23823	0.35746	0.335
RULE OF LAW	-0.4754	0.12433	-0.1974	-0.6979	-0.4156	0.24463
VOICE AND ACCOUNTABILITY	-0.5876	-0.2216	0.76686	0.10698	0.07505	0.02208
ZIMBABWE						
	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6
Eigenvalue	43.6282	0.37813	0.23857	0.14482	0.04048	0.02123
Variance Prop.	0.98148	0.00851	0.00537	0.00326	0.00091	0.00048
Cumulative Prop.	0.98148	0.98999	0.99535	0.99861	0.99952	1
Eigenvectors:						
Variable	Vector 1	Vector 2	Vector 3	Vector 4	Vector 5	Vector 6
CONTROL OF CORRUPTION	0.44395	-0.3746	0.80135	0.01799	0.05534	0.1306
GOVT EFFECTIVENESS	0.32439	-0.4166	-0.2544	0.1072	0.10564	-0.7962
POLITICAL STABILITY	0.18354	0.18027	0.07816	-0.0598	-0.9447	-0.1779
REGULATORY QUALITY	0.26024	-0.5463	-0.4798	0.23896	-0.2119	0.54919
RULE OF LAW	0.48575	0.12496	-0.2193	-0.8192	0.13131	0.10971
VOICE AND ACCOUNTABILITY	0.60026	0.58275	-0.0937	0.50638	0.17648	0.0612

Source: Author's Construct from World Development Indicators (World Bank, 2012)

Appendix 2.3: Impulse Response Tables for the Estimated PVAR

Response of LNGPINV

Period	LNGPINV	LNPRINV	LNGDP(-1)
1	0.344049 (0.00936)	0.000000 (0.00000)	0.000000 (0.00000)
2	0.215670 (0.01465)	0.030876 (0.01312)	0.048092 (0.01421)
3	0.145106 (0.01355)	0.018517 (0.01125)	0.034915 (0.01163)
4	0.100020 (0.01380)	0.019801 (0.01157)	0.025068 (0.01117)
5	0.069783 (0.01290)	0.017876 (0.01122)	0.018004 (0.01117)
6	0.048879 (0.01134)	0.015543 (0.01020)	0.012935 (0.01084)
7	0.034431 (0.00962)	0.013049 (0.00892)	0.009215 (0.01019)
8	0.024383 (0.00799)	0.010717 (0.00759)	0.006503 (0.00933)
9	0.017353 (0.00656)	0.008653 (0.00635)	0.004535 (0.00838)
10	0.012405 (0.00535)	0.006894 (0.00525)	0.003114 (0.00741)

Response of LNPRINV :

Period	LNGPINV	LNPRINV	LNGDP(-1)
1	-0.026488 (0.01331)	0.325821 (0.00900)	0.000000 (0.00000)
2	0.017614 (0.01517)	0.191588 (0.01456)	-0.022632 (0.01183)
3	0.020484 (0.01364)	0.145763 (0.01185)	-0.022878 (0.00906)
4	0.021281 (0.01379)	0.103145 (0.01177)	-0.024641 (0.00947)
5	0.019028 (0.01308)	0.074090 (0.01121)	-0.024343 (0.01001)
6	0.015878 (0.01169)	0.052809 (0.01022)	-0.023095 (0.01005)
7	0.012564 (0.01008)	0.037475 (0.00906)	-0.021248 (0.00969)
8	0.009533 (0.00849)	0.026402 (0.00787)	-0.019123 (0.00905)

9	0.006956 (0.00704)	0.018432 (0.00674)	-0.016922 (0.00827)
10	0.004871 (0.00579)	0.012715 (0.00572)	-0.014774 (0.00743)

Response of LNGDP(-1):

Period	LNGPINV	LNPRINV	LNGDP(-1)
1	-0.003021 (0.00548)	-0.006176 (0.00576)	0.137959 (0.00380)
2	-0.010005 (0.00710)	-0.017168 (0.00722)	0.122490 (0.00648)
3	-0.002371 (0.00744)	-0.006835 (0.00685)	0.100682 (0.00636)
4	0.003502 (0.00800)	-0.000356 (0.00725)	0.083301 (0.00633)
5	0.006726 (0.00812)	0.003628 (0.00741)	0.068865 (0.00657)
6	0.008345 (0.00783)	0.005890 (0.00725)	0.056710 (0.00672)
7	0.008928 (0.00729)	0.007021 (0.00686)	0.046543 (0.00672)
8	0.008854 (0.00664)	0.007394 (0.00633)	0.038081 (0.00656)
9	0.008382 (0.00594)	0.007280 (0.00573)	0.031071 (0.00628)
10	0.007690 (0.00526)	0.006869 (0.00511)	0.025286 (0.00592)

Source: Author's computation from data taken from World Bank (2012)

Appendix 2.4: Variance Decomposition Tables of the Estimated PVAR**Variance Decomposition of LNGPINV:**

Period	S.E.	LNGPINV	LNPRINV	LNGDP(-1)
1	0.344049	100.0000 (0.00000)	0.000000 (0.00000)	0.000000 (0.00000)
2	0.410060	98.05759 (0.89824)	0.566963 (0.48152)	1.375447 (0.75288)
3	0.436769	97.46912 (1.15550)	0.679473 (0.59863)	1.851410 (1.00495)
4	0.449212	97.10168 (1.35006)	0.836657 (0.74873)	2.061667 (1.14349)
5	0.455307	96.86826 (1.50973)	0.968548 (0.88574)	2.163197 (1.24267)
6	0.458370	96.71535 (1.63699)	1.070626 (0.99811)	2.214026 (1.31701)
7	0.459939	96.61709 (1.73274)	1.143827 (1.08263)	2.239085 (1.37145)
8	0.460755	96.55504 (1.80228)	1.193882 (1.14304)	2.251076 (1.41045)
9	0.461185	96.51659 (1.85160)	1.226861 (1.18467)	2.256546 (1.43796)
10	0.461414	96.49316 (1.88609)	1.247971 (1.21265)	2.258865 (1.45719)

Variance Decomposition of LNPRINV:

Period	S.E.	LNGPINV	LNPRINV	LNGDP(-1)
1	0.326896	0.656587 (0.67415)	99.34341 (0.67415)	0.000000 (0.00000)
2	0.379986	0.700812 (0.53414)	98.94445 (0.68698)	0.354737 (0.45310)
3	0.408142	0.859349 (0.61792)	98.51895 (0.86044)	0.621700 (0.63095)
4	0.422231	1.056976 (0.83605)	98.02156 (1.13419)	0.921468 (0.81702)
5	0.429794	1.216117 (1.04702)	97.57375 (1.40219)	1.210129 (1.00600)
6	0.433932	1.326929 (1.21411)	97.20265 (1.63642)	1.470420 (1.19192)
7	0.436246	1.395840 (1.33318)	96.91208 (1.82742)	1.692083 (1.36135)
8	0.437566	1.434897	96.69221	1.872891

		(1.41286)	(1.97767)	(1.50682)
9	0.438336	1.455043	96.52961	2.015349
		(1.46367)	(2.09317)	(1.62605)
10	0.438796	1.464314	96.41121	2.124479
		(1.49478)	(2.18056)	(1.72039)

Variance Decomposition of LNGDP(-1):

Period	S.E.	LNGPINV	LNPRINV	LNGDP(-1)
1	0.138130	0.047825	0.199902	99.75227
		(0.29894)	(0.39814)	(0.50805)
2	0.185684	0.316795	0.965514	98.71769
		(0.57711)	(0.84264)	(1.02674)
3	0.211347	0.257110	0.849847	98.89304
		(0.55576)	(0.85597)	(1.02283)
4	0.227199	0.246239	0.735644	99.01812
		(0.52227)	(0.80501)	(0.95491)
5	0.237529	0.305462	0.696376	98.99816
		(0.58507)	(0.75588)	(0.94524)
6	0.244418	0.405048	0.715742	98.87921
		(0.72222)	(0.73627)	(1.02016)
7	0.249069	0.518556	0.768731	98.71271
		(0.87723)	(0.74887)	(1.14731)
8	0.252228	0.628869	0.835538	98.53559
		(1.01954)	(0.78279)	(1.28755)
9	0.254377	0.726862	0.903379	98.36976
		(1.13881)	(0.82517)	(1.41764)
10	0.255838	0.808932	0.965173	98.22589
		(1.23393)	(0.86709)	(1.52813)

Source: Author's computation from data taken from World Bank (2012)

Appendix 2.5: Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-241.5654	NA	0.000772	1.347468	1.379653	1.360261
1	192.8371	859.2313	7.41e-05	-0.996347	-0.867607*	-0.945174
2	215.3213	44.10129	6.88e-05	-1.070641	-0.845345	-0.981087*
3	227.1831	23.07010	6.77e-05	-1.086408	-0.764557	-0.958474
4	246.2986	36.86175	6.41e-05	-1.142141	-0.723734	-0.975826
5	252.4223	11.70763	6.51e-05	-1.126294	-0.611331	-0.921599
6	270.1595	33.61770	6.20e-05	-1.174433	-0.562915	-0.931357
7	277.6543	14.08115	6.26e-05	-1.166140	-0.458066	-0.884684
8	288.8499	20.84912*	6.18e-05*	-1.178237*	-0.373608	-0.858401

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

CHAPTER THREE

PRIVATE INVESTMENT AND LABOUR DEMAND IN SUB-SAHARAN AFRICA

Abstract

This chapter presents the empirical work on the second objective. That is, assessing whether employment generation (total, male, female and youth) is part of the benefits that Sub Saharan African (SSA) economies get from private investment. I estimated a derived neoclassical labour demand model that allows for the inclusion of private investment, real labour cost, human capital and public investment. The results indicate that while private investment has a substitutive effect on employment (total, male and female), public investment compliments employment. Also, real wage rate and human capital have significantly negative relationships with labour demand. Meanwhile the result on the youth employment effect of private investment is inconclusive. Thus, it is suggested that employment incentive policies through tax reliefs and exemptions should be offered to private investors while measures to sustain public investment are undertaken.

3.1.0 Introduction

The development of every nation is the ultimate goal of all economic, social and political policies. Job creation contributes to development by boosting living standards, raising productivity, and fostering social cohesion (World Bank, 2013). Unfortunately, however, some 200 million people (predominantly young people) are unemployed (International Financial Corporation-IFC, 2013). ILO (2014) report

indicates that global unemployment increased in 2013 by five million people. The estimates are even gloomier because apart from the fact that about 600 million new jobs would have to be created by 2020 (mainly in Africa and Asia), these jobs need to be good (IFC, 2013).

Some claim that the global credit crunch is responsible for worsening an already deteriorating global employment condition. The effect of the crunch on employment has been a dipping global employment level, further aggravating an age-long problem. Nickell (2010) asserted that the worldwide credit crunch and collapse of aggregate demand should be blamed for the recent rise in unemployment. Earlier, Kessing (2003) argued that the effect of the economic crises on public sector employment has been a reduction in real wage and not the level of employment. But recently, the International Labour Organisation – ILO (2013) report indicated that global employment trends do not only show a rise in unemployment but with significant regional differences. The report further states that five years after the outbreak of the global financial crisis, labour markets remain deeply depressed and unemployment has started to rise again as the economic outlook worsens. Through spillovers, the African economy was not insulated from the negative effect of the crunch including that of the growing global unemployment challenge (ILO, 2013). The employment condition in Africa needs special attention not only in periods of economic down turn but also in eras of rising economic growth. Emery (2003) warned of a decreasing employment content of growth and increasing inequality over

the preceding few decades. Thus, employment generation still remains a global challenge especially for Africa which need not just create more jobs but good ones.

These have resuscitated a new search for fighting unemployment and its related problems. In the search for solutions for this global challenge, Guy Ryder - ILO director, advises (in ILO Report 2013) that “The global nature of the crisis means countries cannot resolve its impact individually and with domestic measures only.” He explained that the cloud of uncertainty surrounding investment and job creation means that countries need to take concerted actions to help resolve this growing global challenge. Investment is one of the traditional ways of curbing unemployment basically because manpower compliments or serves as a substitute for physical capital. Cherian (1998) argued that investment may be considered the most important component of GDP because (1) Plant and Equipment have a long-term effect on the economy’s productive capacity, (2) Changes in investment spending directly affect levels of employment and worker’s incomes in durable goods industries, and (3) supply and demand are sensitive to changes in investment. In an analysis of the relationship between governance, transparency and private investment in Africa, Emery (2003) observed that private investment in a country had positive effects not only on growth but also on the incidence of poverty. Impliedly, private sector investment, including domestic and foreign direct private investment, when operated in a conducive environment, can be a key driver of economic development, job creation and inclusive growth. Consequently, the role of the private sector in solving

this global challenge cannot be underestimated, especially in developing economies where about 90% of jobs are provided by the private sector (IFC, 2013).

Even though the Sub-Saharan African (SSA) region's unemployment rate, as at 2011, (about 8.8%) was better than that of North Africa (about 10.9%), Middle East (about 10.5%), Central and South-Eastern Europe (about 9%), the performance of the region was about 2.4 percentage points worse than the global average. Also, most of the jobs in the SSA region seem not to be good, as the region was the second worst region in the world in terms of share of working poor. About 65% of total employment in 2011 was found to belong to this category. This situation is particularly worrying because it is more than double the global average (about 29%) (International Labour Organisation-ILO, 2012). Analyses of the changes in employment in the SSA region, over the study period, show some interesting results. Generally, the second decade of the study period (2000-2009) shows an increase in employment to population ratio from 63.77% (1990 – 1999) to 64.46%. Interestingly, while more females are joining the working populations (55.31% to 57.18%), the opposite can be said of their male counterparts (fell from 72.60% to 71.95%), when the two decades are compared. Apart from the fact that the total percentage of youth working fell (from 47.48% to 46.89%), the changes in female youth employment (increased from 42.93% to 43.10%) and that of male youth employment (decreased from 52.07% to 50.68%) is reminiscent of movements in total female employment and total male employment, when the first and second decades of the study periods are compared.

Meanwhile investment has seen some considerable improvement, based on data used for the study. Total investment in the second decade of the study period (2000 – 2009) showed a marginal increase from 19.72% (1990 – 1999) to 20.06% of GDP. There is also evidence of a gradual shift from government led investment to private sector controlled investment in SSA. Public sector investment fell from 7.72% (1990 – 1999) to 7.10% (2000 – 2009) while private investment increased from 12.40% of GDP to 13.10% of GDP. All throughout the study period, private investment accounted for the greater proportion of total investment (Table 1.1). Also, between 2001 and 2010 net flows of foreign direct investment in Sub-Saharan Africa totaled about US\$33 billion—almost five times the US\$7 billion total between 1990 and 1999 (World Bank, 2011).

In spite of these developments, Dinh et al., (2012) maintain that investment on the continent is low—less than 15 percent of gross domestic product compared with 25 percent in Asia,—and more than 80 percent of workers are stranded in low productivity jobs. They explain that in spite of this, the continent’s largest geographical bloc’s, Sub-Saharan Africa’s (SSA) economic performance is at a turning point after almost 45 years of stagnation. Between 2001 and 2010 the region’s gross domestic product grew at an average of 5.2 percent a year and per capita income grew at 2 percent a year, up from –0.4 percent in the previous 10 years (World Bank, 2011). International Monetary Fund (2013) adds that even with the exclusion of Nigeria and South Africa, most countries in Sub-Saharan Africa recorded increases in GDP. Unfortunately, however, even in periods of economic

growth, employment generation is not a natural consequence unless conscious effort is made to make that growth beneficial to job creation (Inter-Agency Working Group – IAWG, 2012 and Heinsz, 2000). But then, these figures reinforce the need for Sub-Saharan Africa to put in measures to get the best out of private investment. One way of doing so is by assessing the employment benefits of private investment.

Empirically, little is known on the employment benefits of private investment. Discussions on the continent on private investment have largely been concentrated on how to attract private investment (Oshikoya, 1994; Mlambo & Oshikoya, 2001). In 1999, Devarajan, Easterly & Pack opened the argument box on whether it is the size of private investment on the continent that should be of grave concern or the productivity of private investment. They concluded that investment on the continent was not low because what even existed, at the time of their study, was largely not productive. Also, quite recently, AfDB,OECD,UNECA and UNDP (2012) reported that even though FDI remains the largest external financial flow to Africa, the increase in investment in recent decades did not produce more inclusive growth or sufficient jobs as most of the finance went onto the hunt for resources. These studies seem to cast doubt on the actual benefits of private investment to the African continent. But to Kaplinsky and Morris (2009), SSA should use their resource endowment to get the maximum benefit from their investment relations with large state-owned Chinese firms and other large firms who seek to benefit from their resource endowment. These benefits, the study believes may include employment generation.

On employment in Africa, Asiedu (2004) looked at the determinants of employment in SSAs using data from foreign affiliates of US multinational enterprises in Africa; Sackey (2007) considered employment impact of private investment using a sample of SMEs from some African economies; Asiedu and Gyimah - Brempong (2008) studied the effect of liberalization of investment policies on investment and employment of multinational corporations in Africa; and Aterido and Hallward-Driemeier (2010) used firm-level survey data from 104 developing economies which included 31 sub-saharan countries to find out whether investment climate fosters employment growth.

This study differs from that of Asiedu (2004), Sackey (2007), Asiedu and Gyimah-Brempong (2008) and Aterido and Hallward-Driemeier (2010) because it uses national data to assess the relationship between private investment (Not only from USA, foreigners or SMEs) and employment in SSA using a derived neoclassical labour demand model. The neoclassical labour demand theory predicts a negative association between labour cost, real factor cost and labour demand and a positive relationship between output and labour demand (Symons, 1982; Andrews & Nickell, 1982; and Sparrow, Ortmann, Lyne & Darroch, 2008). In spite of this, other researchers argue that a positive association between wage cost and labour demand is possible, through the aggregate demand channel, especially in recession (Keynes, 1936 and Michailat & Saez, 2013).

Thus, the study contributes to the discussion on the benefits of private investment to the African continent through the channel of employment generation using a derived neoclassical labour demand model. The study is concentrated in this particular area because: 1) even though job creation contributes to development, it has become a global challenge, especially after the crunch (World bank, 2013 and ILO, 2013); 2) job creation is a way of testing empirically for one of the pillars for assessing private investment impact (IAWG, 2012); 3) it is an appropriate channel to economic growth which has seen some improvements in Africa in recent times and seem to coincide with improvements in FDIs as well (World Bank, 2011; Dinh et al., 2012); 4) employment seems to be an appropriate channel for ameliorating poverty (Emery, 2003) -one of the deep seated problems of the African Continent- and as a possible means of achieving Millennium Development Goal – MDG 1; 5) the study contributes towards the discussion on the effect of wage cost on labour demand and; 6) insufficient labour demand is among the biggest causes of unemployment in Africa and indeed the biggest obstacles to youth employment on the continent (AfDB et al., 2012). It is postulated that vigorous private investment is an important vehicle for creating jobs not only for young people (AfDB et al, 2012) but also for the entire working population.

3.2.0 Literature Review

3.2.1 Neoclassical Theory of Employment

This study relates to the neoclassical theory of employment. The neoclassical theory is popular in the area of demand for capital and labour (Van Reenen & Bond, 2005).

The classical employment analysis is based on the Market Law (Say, 1834) of exchange activity: "Supply creates its own demand." Based on this view, Classicists view unemployment as voluntary, temporary and partial. The theory explains that when labour supply is more than labour demand, employees are expected to accept pay cut so that employers can be motivated to employ more people in order to restore equilibrium in the labour market through the self- equilibrating tendency of the economic forces. The theory positions itself on the assumptions that the economy operates at full employment and that prices and wages are flexible. A firm's labour demand is then based on its marginal physical product of labour (MPP_L).

The theory is criticized by Keynes (1936) on the grounds that the market law which forms the bedrock of the classical labour demand theory can only exist in a barter economy but not in a modern economy where money plays a major role as a medium of exchange. Thus, this casts doubt on the self-equilibrating tendency of the economic forces. Also, Keynes argues that prices and wages flexibility does not always create equilibrium conditions. For instance a reduction in wage rates in periods of deep depression in an attempt to curb unemployment may worsen the unemployment situation because it would reduce aggregate demand. Thus, aggregate demand better explains employment than wage rate.

Earlier researches failed to establish the predicted negative relationship between wage rate and employment as postulated by the neoclassical theory (Dunlop, 1938). Some of the reasons assigned to this were poor data quality (Symons & Layard,

1986), the size of expected output (Barro & Grossman, 1971) and costly adjustment of workforce (Sargent, 1978). But latter studies supported the theory albeit after accounting for the simultaneous effect of real price of raw materials and lags of real wage (Symons, 1982; Andrews & Nickell, 1982). These studies, therefore, placed particular importance on the effect of adjustment cost in determining the magnitude of wage shocks on labour demand (Kessing, 2003). It was Oi (1962) who set the tone for this area of research in labour demand. He explained that because of adjustment cost, labour is not a perfectly flexible factor of production.

Kessing (2003) explains that changes in real wage rate do not sometimes have the desired impact on labour demand because changes in labour demand are affected by the adjustment process and its related cost. In other words, it takes time and money, for instance, to employ more people as a result of a fall in real wages because it requires training of new employees and expansion of existing facility. Weak labour mobility also stalls the adjustment process. Thus, firm response to wage changes is smaller in the short term than in the intermediate or long-term (Lichter , Peichl & Siegloch, 2013).

Job security provisions like high firing costs also have the likelihood of improving long-run employment outlook for all workers. But then firing cost might reduce average labour demand for seasonal jobs. Turnover cost affects employment dynamics more than average employment (Lazear, 1990; Bentolila & Bertola 1990; Bertola, 1990; Bertola, 1991). Bertola (1991) concluded that firing cost may increase

average employment while hiring cost reduces average employment. Hamermesh (1988) revealed that employment levels only changes with large shocks and not with smaller shocks signalling that adjustment cost influences employment responses to policy changes. Goux, Maurin and Pauchet (2001) found in France that the firing cost of indefinite –term contracts is greater than their hiring cost and that because of the relative cost of hiring and firing workers, it is less costly to adjust the number of fixed term contracts than to adjust the number of indefinite-term contracts. From their study, the effect of hiring and firing cost is of particular importance to non-production workers than for production workers.

Following from these, some studies have sought to estimate the speed of the adjustment and generally concluded that the adjustment period is faster, within a year (Hamermesh, 1993). Exceptions to this include Nickell and Wadhvani (1991), Bentolila and Gilles (1992) and Mairesse and Dormont (1985). The presence of adjustment cost makes it imperative to use dynamic models in modeling labour demand, in order to account for the inclusion of both contemporaneous and lagged values of the variables (Lichter et al., 2013).

Empirical results on the relationship between real factor costs and labour demand have been generally negative. Symons and Layard (1984) concluded that real factor prices (real wage cost and raw material cost) are more important in determining the level of employment than aggregate demand. Also, Boug (1999) reports, using data from Norwegian manufacturing and time series analysis that labour demand is

influenced positively by production and negatively by the stock of real capital, real factor prices and total factor productivity. Pierluigi and Roma (2008) depict, based on data from the five largest Euro area countries, that job creation is enhanced through labour cost moderation, even though, the extent of enhancement varies across countries and sectors. But, according to Köllő, Kőrösi and Surányi (2003), when labour is assumed to be homogeneous, the cost of capital has no significant role in labour demand. They also concluded that Production and labour costs are equally important explanatory variables of firm-level labour demand and that labour demand was more elastic downward than upward. Furthermore, in South Africa, Sparrow et al., (2008) reported that an increase in the cost of regular farm labour as a result of minimum wage legislation, resulted in a marked structural decline in the demand for regular farm labour.

In spite of the generally negative results found on the relationship between real wage cost and employment, the debate on the exact impact of wage cost on employment seems to be far from being resolved. Quite recently, Michailat and Saez (2013) posit that when profits and wage are not equally distributed, a rise in wage rate may stimulate aggregate demand and reduce unemployment. This position casts doubt on the neoclassical theory but supports the Keynes view of employment.

Knowledge about the wage elasticities of labour demand is important not only for economic research but also for policy analysis (Lichter et al., 2013; Hamermesh, 1993). Own wage elasticities of demand is not homogeneous across countries and

that differences in institutional regulations play a major role in influencing this behaviour (Pierluigi & Roma, 2008; Lichter et al., 2013). In the short-run, the neoclassical model considers only wage cost as the main determinant of labour demand while wage cost, real interest cost and output are seen to influence long-run labour demand. This study contributes to the neoclassical theory by using disaggregated demand variable, private investment, to assess its impact on labour demand after controlling for other important factors like public investment and political stability in Sub-Saharan Africa.

3.2.2 Empirical Literature Review

This study tests, empirically, the potency of private investment in generating employment, as espoused in literature (Cherain, 1996; Emery, 2003), using data from Sub-Saharan Africa. Researches in this area have largely been concentrated on the employment impact of: FDI (Driffield & Taylor, 2000; Henneberger & Ziegler, 2006; Karlsson, Lundin, Sjöholm, & He, 2007; Ndikumana & Sher, 2008; Mucuk & Demirsel, 2013; Habib & Sarwar, 2013) minimum wage (Neumark & Wascher, 2006; Neumark & Wascher, 2007; Herr, Kazandziska & Mahnkopf-Praprotnik, 2009); infrastructure investment (Garrett-Peltier, 2010; Pereira & Andraz, 2012); Wage cost (Peichl & Siegloch, 2012); Technology and innovations (Berman, Bound & Griliches, 1994; Machin, Van Reenen & Ryan, 1996; Van Reenen, 1997; Falk & Koebel, 2004; and Addison, Bellman, Schank & Paulino, 2008); globalization (Hijzen, Gorg & Hine, 2005; and Hijzen & Swaim, 2010); ownership structure (Barba Navaretti, Turrini & Chcchi, 2003) and; capital structure (Funke, Maurer &

Strulik, 1999). Very few concentrate on private investment (foreign and domestic), in total, on labour demand (Psaltopoulos, Skuras & Thomson, 2011).

Blomstrom, Fors and Lipsey (1997) revealed that in US larger foreign production is associated with lower parent employment, because of relatively low productive activities in parent country. They further explained that foreign production in developing economies and not developed countries was the main source of lower parent employment and that U.S. firms were enticed by lower wages in those regions. On the other hand, Swedish parents exhibited the opposite because their overseas production was more capital intensive. Impliedly, the study also brings to bear the employment effects of the nature of production systems. Capital intensive production systems have relatively low labour demand content and labour intensive production systems obviously have relatively high labour content. Thus, the trade-off between the labour cost and physical capital cost is probably an important determinant of labour demand. Also, Harrison and McMillan (2004) postulate that increased capital mobility may be associated with negative labour outcomes for both the US and abroad.

Garrett-Peltier (2010) assessed the employment impact of the US economy's investment in renewable energy and energy efficiency and reported that this investment would lead to approximately three jobs being created in clean energy sectors for each job lost in the fossil fuel sector.

From rural areas in southern Europe, Psaltopoulos et al., (2011) show that private investment in agriculture showed a moderate impact on regional employment even though analysis of economy-wide jobs created showed that gross cost per job was significantly lower. Pereira and Andraz (2012) concluded in Portugal that investment in railway infrastructure does not only crowd in private investment and employment at the aggregate level but also show similar effects even at the regional level.

The effect of FDI on employment depends on the type of FDI (inward or outward) and the predominant type of production system (machine intensive and labour intensive) in use. Henneberger and Ziegler (2006) concluded that FDI can have both complimentary and substitutive effect on the labour market but the positive effect of FDI on employment is minimal. This partially supports Rosen's (1969) and Griliches' (1969) hypothesis that capital and skills are compliments. Masso, Varblane and Vahter (2007) investigated the employment effects of outward FDI on Estonia, a low-cost medium- income transition economy. They revealed that outward FDI had a positive impact on home country employment and the employment effects of domestic Estonian firms investing abroad was higher than that of foreign firms in Estonia investing abroad. To the researchers, better economic management magnified these employment benefits and that the service industry performed better than the manufacturing firms. In Taiwan, overseas production is generally detrimental to domestic employment even though it has the tendency to increase domestic employment through increased domestic output, from enhanced competitiveness

(Chen & Ku, 2003). Görg and Hanley (2005) stress that international outsourcing leads to significant decreases in plant level labour demand but outsourcing of services appear to have lesser negative impact than outsourcing of materials.

Karlsson et al., (2007) report a positive relationship between FDI and job creation and this is facilitated by some firm specific characteristics particularly access to export markets. This included direct employment by foreign owned firms and spillover effects on domestic firms. Thus, in the long run, FDI influences employment (Jayaraman & Singh, 2007)

Driffield and Taylor (2000) observe that increase in FDI's increase the demand for skilled labour directly and indirectly through technological spillovers which increases the relative skilled labour demand of domestic firms. Habib and Sarwar (2013) conclude, from time series analysis, that FDI and per capita GDP have positive relationship with employment levels in Pakistan. Buzás and Foti (2006) assert that FDI leads to job creation in Hungary. Malik, Chaudhry, and Javed (2011) opine that while FDI creates employment opportunities in Pakistan, trade openness and social and political dimensions of globalisation negatively affects employment. On the other hand, although FDI affects development in general it may also lead to wage inequalities (ODI, 2002). Subsequent OECD-ILO (2008) report indicated that workers engaged in MNEs tend to earn comparatively higher pay in their host countries.

Mehmet and Demirsel (2013) investigated the relationship between FDI and unemployment in seven developing countries (Argentina, Chile, Colombia, Philippines, Thailand, Turkey and Uruguay) by using panel data analysis. They revealed that FDI and unemployment have long-run relationship but their relationship is not homogeneous. While FDI was found to increase unemployment in Argentina and Turkey, it was found to reduce unemployment in Thailand.

Klette and Førre (1998) argue that research and development investment and high-tech industries do not lead to job creation, using data from Norwegian Manufacturing firms. They cast doubt on the optimistic view about job creation in R&D intensive firms and high-tech industries (Katsoulacos, 1984). But partially supports Schumpeter's (1943) creative destruction view.

In Iran, government consumption and investment expenditures affect employment differently. While increase in government consumption expenditure is associated with decreases in production, employment and investment, increase in government investment expenditure - apart from industry and mining sectors - increases employment, Fouladi (2010).

In an attempt to meet the forecasted employment needs of some 100 million new jobs in the Middle East and North Africa (MENA), the World Bank (2004) reported that the new development model for that region should be based on a reinvigorated private sector. The report further explained that this model should also include better

governance, greater integration into the world economy, and better management of the oil resources in the region. In the same region, Ianchovichina, Estache, Foucart, Garsous and Yepes (2012) report that, for the following decade, if the region is able to meet the infrastructural investment needs of about 6.9 percent of gross domestic product, annual job creation (direct and indirect) would be about 4.5million. This is in spite of the fact that job creation from this channel alone would not be enough to solve the region's unemployment. Also, in the 2000s and in the MENA region, Infrastructure investment in the construction sector was a major source of employment for the citizenry, as compared to other countries and sectors (World Bank, 2013b). The study further predicts that if the MENA region is able to commit to infrastructural investment estimated at \$106million annually through 2020, it would generate approximately 2.5million infrastructure related jobs (Estache, Ianchovichina, Bacon & Salamon, 2013).

In Africa, Ndikumana and Sher (2008) posit that the continent has witnessed an increase in FDI inflow but the effect of this resource inflow on economic development is yet to be ascertained. Even though the study recognised that one of the ways of assessing economic development impact of FDI is through its employment impact, the study did not do so. However, they concluded that FDI and domestic private investment are compliments in Africa rather than substitutes. Huang and Ren (2013) report from a survey of 16 Chinese enterprises in Johannesburg (South Africa) that these investments brought about job increment to the local people

(local-skilled and unskilled labour) partially refuting international observers' assumption that Chinese investment in Africa lacks significant employment content.

In Egypt, lack of access to the private sector is a recipe for unemployment. For instance, during the transition to private-sector-led economy in Egypt, unemployment was more prevalent among young educated women than their male counterparts, as a reflection of the fact that unemployment was becoming less generalized but more concentrated among groups that have a difficulty in accessing the private sector (Assaad, El-Hamidi & Ahmed, 2000).

Notably, the present study is particularly related to that of Asiedu (2004), Sackey (2007), Asiedu and Gyimah - Brempong (2008) and Aterido and Hallward-Driemeier (2010). Asiedu (2004) concluded that good infrastructure, higher income, openness to trade and an educated labour force have a significantly positive impact on employment. Even though the study was on the determinants of employment in Sub-Saharan Africa, it only used data from foreign affiliates of US multinational enterprises in Africa. In addition, this study concentrates on the effect of private investment (foreign or domestic) on labour demand. It further analyses this effect from the point of view of total, male, female and youth employment and also controls for additional important variables such as public investment and political stability. Again, the current study also tests for the dynamic nature of labour demand because of adjustment cost effect.

Sackey (2007) as part of a broader work of analysing the role played by small and medium scale enterprises (SMEs) in how private investment influences structural transformation and economic growth in Africa also considered employment impact of private investment using a sample of SMEs including some African economies. The study concluded, using a probit model, that investing firms are more likely to record net additions to employment than non-investing firms. Apart from the fact that the study was not domiciled solely in Sub-Saharan Africa, it did not also consider the employment impact of private investment beyond SMEs. In addition, the study did not consider whether private investment in SMEs had the same impact on the various employment components (like male, female and youth) just as it did on total employment. Also, certain key factors that the researcher believes would influence the level of employment in the SSA like political stability and trade openness were also left out. This study factors all these observations in an SSA setting.

In another related study, Asiedu and Gyimah-Brempong (2008) studied the effect of liberalization of investment policies on investment and employment of multinational corporations in Africa. They revealed that liberalization has a significantly positive effect on investment and that its relationship on multinational employment is indirect. Data on employment was from employment of US affiliates in MNCs in Africa. Thus, the Wage variable used, may be distorted because it carried within it the impact of the wage conditions that exist in the mother company since it included compensation of expatriates employed by the American affiliate in the host country.

Aterido and Hallward-Driemeier (2010) used firm-level survey data from 104 developing economies which included 31 SSA countries to find out whether investment climate (like number of outages, share of firms with bank loans and others) fosters employment growth and whether there exist some similarities among the countries. They concluded that average firm level employment growth rate is quite similar in spite of differences in the quality of investment climate. Although this study offers useful insights from disaggregated data it fails to test directly the effect of investment and in particular private investment on employment in SSA, which is the focus of this chapter.

3.3.0 Methodology

3.3.1 Theoretical Justification of the Neoclassical Labour Demand Model

The focus of this chapter is to assess, empirically, whether the benefits from private investment include employment, using data from SSA and within an Arellano-Bond dynamic framework. A derived neoclassical labour demand model that allows for the explicit inclusion of real wage rate, private investment, public investment human capital and other relevant external factors that may condition labour demand in SSA is estimated.

Neoclassical labour demand model depicts that labour demand is wage elastic. The model also specifies that labour should be hired up to the point where marginal revenue is just equal to marginal cost, based on diminishing marginal returns principle. The demand for labour is derived from the demand for output. The

derivation of this neoclassical labour demand model relies on related ones like Layard, Nickell and Jackman (1991) and Lewis and MacDonald (2002) that use a Cobb Douglas production function. But other studies use a constant elasticity of substitution (CES) function (Rowthorn, 1999; Pierlugi & Roma, 2008). Following Mankiw, Romer and Weil (1992), consider a Harrod-neutral (deemed to be consistent with the existence of steady state - Barro and Sala-i-Martin, 2004) three-factor Cobb-Douglas (1928) production function as follows:

$$Q_{it} = f(K, L, H) = K_{it}^{\alpha} A L_{it}^{\beta} H_{it}^{1-\alpha-\beta}, \quad \alpha > 0, \beta > 0, \alpha + \beta < 1 \quad (1)$$

Where H is human capital, K is physical capital, A is labour augmenting technological progress, L is labour and Q is output. Also, α , β and $1-\alpha-\beta$ are the physical capital, labour and human capital elasticities respectively. i represents countries and t represents time.

The marginal product of labour (MP_L) is the change in output with respect to a unit change in labour which is stated mathematically as:

$$MP_L = \beta \left(\frac{Q_{it}}{L_{it}} \right) \text{ OR } \frac{\partial Q_{it}}{\partial L_{it}} \quad (2)$$

Given that

$$Q_{it} = K_{it}^{\alpha} A L_{it}^{\beta} H_{it}^{1-\alpha-\beta}, \text{ when we multiply both sides of the output equation by } \frac{\beta}{L_{it}} \text{ it}$$

leads to

$$\frac{\beta}{L_{it}} Q_{it} = \frac{\beta}{L_{it}} (K_{it}^{\alpha} A L_{it}^{\beta} H_{it}^{1-\alpha-\beta}) = MP_L \quad (3)$$

$$MP_L \equiv \frac{\partial Q_{it}}{\partial L_{it}} = \beta A K_{it}^\alpha L_{it}^{\beta-1} H_{it}^{1-\alpha-\beta} \quad (4)$$

We are interested in the effect of private investment on labour demand. So we decompose the total capital stock variable into private and public components, with some conditions. These conditions are necessary because, even though, private investment and public investment are shown to be substitutes (based on results of Chapter 2), a certain minimum level of public investment in basic infrastructure is necessary for private investment to thrive. Thus, the relationship between private and public investments is shown below:

$$\text{Let } K_{it} = K_{git}^\lambda K_{pit}^\psi \quad \forall K_{git}^{a\lambda}, K_{pit}^{a\psi} > 0, \quad 0 < \alpha\lambda + \alpha\psi < 1 \quad (5)$$

where

K_{git}^λ = is public capital Stock;

K_{pit}^ψ = is private capital stock.

The evolution of the private and public capital stocks takes the following standard forms;

$$I_{pit} = (K_{pit} - K_{pit-1}) + \delta K_{pit-1} \quad (5A)$$

$$I_{git} = (K_{git} - K_{git-1}) + \delta K_{git-1} \quad (5B)$$

where I_{pit} and I_{git} are the private and public investments, respectively; δ is the depreciation rate of investment, assumed to be the same for both private and public. As a result of the difficulty in getting depreciation rates for the countries in the study, the

study used an arbitrarily chosen value of 0 based on studies by Blejer and Khan (1984) and Ramirez (1994). Their studies show that sensitivity analysis using depreciation values between 0 and 5 show no significant differences in results for developing economies. Similar results were also reported by Erden & Holcombe (2005) and Muthali (2012).

When equation (5) is substituted into (4), we get

$$MP_L = \beta A (K_g^\lambda K_p^\psi)_{it}^\alpha L_{it}^{\beta-1} H_{it}^{1-\alpha-\beta} \quad (6)$$

The profit maximizing level of employment occurs at the point where marginal revenue product of labour (MRP_L) is equal to nominal wages, which is stated mathematically as:

$$MRP_L = w \quad (7)$$

$$p \times MP_L = w \quad (8)$$

$$MP_L = \frac{w}{p}, \quad (9)$$

where MRP_L is further explained as the product of marginal revenue (p), which is equal to the price of each unit of output sold and MP_L . That is equation (8)

Equations (6) and (9) are then equated as follows:

$$\beta A (K_g^\lambda K_p^\psi)_{it}^\alpha L_{it}^{\beta-1} H_{it}^{1-\alpha-\beta} = \frac{w}{p_{it}} \quad (10)$$

Taking the natural logarithm of both sides of equation (10) leads to

$$\ln(\beta A) + \alpha \lambda \ln K_{git} + \alpha \psi \ln K_{pit} + (\beta - 1) \ln L_{it} + (1 - \alpha - \beta) \ln H_{it} = \ln \frac{w}{p_{it}} \quad (11)$$

And solve for labour

$$\ln(\beta A) + \alpha \lambda \ln K_{git} + \alpha \psi \ln K_{pit} + (1 - \alpha - \beta) \ln H_{it} - \ln \frac{w}{p_{it}} = -(\beta - 1) \ln L_{it} \quad (12)$$

$$\frac{1}{1 - \beta} \left[\ln(\beta A) + \alpha \lambda \ln K_{git} + \alpha \psi \ln K_{pit} + (1 - \alpha - \beta) \ln H_{it} - \ln \frac{w}{p_{it}} \right] = [(1 - \beta) \ln L_{it}] \frac{1}{1 - \beta} \quad (13)$$

$$\ln L_{it} = \frac{1}{1 - \beta} \ln(\beta A) + \frac{1 - \alpha - \beta}{1 - \beta} \ln H_{it} + \frac{\alpha \lambda}{1 - \beta} \ln K_{git} + \frac{\alpha \psi}{1 - \beta} \ln K_{pit} - \frac{1}{1 - \beta} \ln \frac{w}{p_{it}} \quad (14)$$

Equation (14) can be re-written as

$$\ln L_{it} = \gamma_0 \ln \beta + \gamma_0 \ln A + \gamma_1 \ln K_{git} + \gamma_2 \ln K_{pit} + \gamma_3 \ln \frac{w}{p_{it}} + \gamma_4 \ln H_{it} \quad (15)$$

$$\text{where } \gamma_0 = \frac{1}{1 - \beta}, \gamma_1 = \frac{\alpha \lambda}{1 - \beta}, \gamma_2 = \frac{\alpha \psi}{1 - \beta}, \gamma_3 = -\frac{1}{1 - \beta}, \gamma_4 = \frac{1 - \alpha - \beta}{1 - \beta}$$

Equation (15) shows that changes to labour are explained by private investment, public sector investment, real wage cost and human capital. Equation (15) assumes that in the absence of transaction cost and other adjustment cost, the observed change in labour demand (L_t) and the desired or target labour demand (L_t^*) should be the same. But, most empirical studies on labour demand show that the level of employment follows a partial adjustment process because of market imperfections such as institutional or cost restrictions. Thus, changing economic conditions like investment and wage rate might not have instantaneous effect on employment levels, as shown by equation (15). In other words, adjustment cost stalls the process of fully adjusting labour demand from previous year's level to the current year.

Consequently, actual employment partially adjusts to the desired optimal level, as shown in equation (16) (Oi, 1962; Nickell, 1986; Hamermesh & Pfann, 1996; Pierlugi & Roma, 2008).

$$\Delta \ln L_t = \delta(\ln L_t^* - \ln L_{t-1}) \quad (16)$$

Where $\ln L_t^*$ is the desired optimal level of employment and δ captures the degree of persistence to the target labour demand, starting from the previous year, L_{t-1} . It is assumed that adjustment cost is restricted to $|\delta| < 1$ implying that $L_t \rightarrow L_t^*$ as $t \rightarrow \infty$. On the other hand, if $|\delta| > 1$, the adjustment in labour demand is considered to be more than necessary but labour demand cannot be deemed to be at its target level (see Loof, 2003; Drobotz & Wanzenried, 2006). Lastly, because the presence of adjustment cost is entrenched in the labour demand literature, the absolute value of the speed of adjustment cannot be assumed to be equal to 1.

Other Labour Demand Determinants

Other factors have also been generally linked with employment generation, in addition to investment. From surveys, Afram and Del Pero (2012) report that even though Nepal has recorded growth in certain niche sectors and private sector employment is increasing (by almost 4 percent a year between FY2005/06 and FY2007/08) constraints (political instability, poor infrastructure, poor labor relations, poor access to finance, and declining exports) to the investment climate are hindering this progress.

Aterido, Hallward-Driemeier and Pagés (2007) reveal that business environment that does not support access to finance and business regulation reduce the employment growth of all firms but micro and small firms suffer the most. Also, corruption and poor access to infrastructure are detrimental to employment growth of medium size and large firms. These conclusions were based on World Bank Enterprise Survey (WES) data from about 70,000 enterprises in 107 countries. In other words, institutional and structural variables play a key role in labour demand analysis (Pierluigi & Roma, 2008)

Heinsz (2001) postulated that increases in political instability explain the largest portion of the decline in the rate of investment in South Africa. In that study, econometric estimates showed significant negative effects of higher average product wages and greater political unrest on the labor-capital ratio. Also, among South African manufacturing firms, Edwards and Behar (2006) report that trade liberalization and technological change have affected the skill structure of employment. They explain that export orientation, raw materials imports, training, investment in computers and firm age are positively associated with the skill intensity of production.

Some research also link employment with human capital development (Pryor & Schaffer, 1999; Card, 1999; Wolman, Young & Blumenthal, 2008). In Nigeria, Aromolaran (2004) postulates that even though private returns to schooling associated with levels of educational attainment for wage and self employed workers

are low at primary and secondary level, they are substantial at post-secondary education level. But then discrimination and technology seem to reduce the magnitude of this effect. For instance, Bertrand and Mullainathan (2003) argue that white men experience higher return to more resume credentials than black men. Also, Autor, Levy and Murnane (2003) asserted that technology is taking over routine jobs. A position Manning (2013) does not only support but argues that is the main reason for job polarisation and its associated inequality (Goos & Manning, 2007). Baldwin (1995) concluded that the employment benefits of increased exports far outweigh the employment-displacing effects of increased imports even though the study could not conclude on the employment effects of foreign direct investment (FDI). Nickell (2010) argues that even though unemployment is falling in Europe, in the credit crunch recovery period, if there is no rise in GDP growth, this fall may not have any significant impact.

In other to account for the adjustment process in the model, the lag of the dependent variable, labour demand, is included as an explanatory variable. Also, other explanatory variables for political stability, trade openness, agricultural productivity and credit crunch have also been included as control variables in the model.

Thus, we factor in the adjustment cost by including the lag of the dependent variable ($\delta_0 L_{it-1}$) and also augment the model to include other relevant factors (X_{it}) that condition labour demand

$$X_{it} = f(\gamma_5 Pol_{it}, \gamma_6 TOPEN_{it}, \gamma_7 API_{it}, \gamma_8 CC_{it}, \varepsilon_{it}) \quad (17)$$

When we include the adjustment cost and the other relevant factors of labour demand in equation (15) we get

$$\ln L_{it} = \gamma_0 \ln \beta A + \delta_0 \ln L_{it-1} + \gamma_1 \ln K_{git} + \gamma_2 \ln K_{pit} + \gamma_3 \ln \frac{w}{p_{it}} + \gamma_4 \ln H_{it} + \gamma_5 \ln Pol_{it} + \gamma_6 \ln TOPEN_{it} + \gamma_7 \ln API_{it} + \gamma_8 \ln CC_{it} + \varepsilon_{it} \quad (18)$$

Taking one- year lag of equation (18), leads to

$$\ln L_{it-1} = \gamma_0 \ln \beta A + \delta_0 \ln L_{it-2} + \gamma_1 \ln K_{git-1} + \gamma_2 \ln K_{pit-1} + \gamma_3 \ln \frac{w}{p_{it-1}} + \gamma_4 \ln H_{it-1} + \gamma_5 \ln Pol_{it-1} + \gamma_6 \ln TOPEN_{it-1} + \gamma_7 \ln API_{it-1} + \gamma_8 \ln CC_{it-1} + \varepsilon_{it-1} \quad (19)$$

Subtracting equation (19) from (18), leads to

$$\begin{aligned} \ln(L_{it} - L_{it-1}) = & \gamma_0 \ln(\beta A - \beta A) + \delta_0 \ln(L_{it-1} - L_{it-2}) + \gamma_1 \ln(K_{git} - K_{git-1}) + \gamma_2 \ln(K_{pit} - \\ & K_{pit-1}) + \gamma_3 \ln\left(\frac{w}{p_{it}} - \frac{w}{p_{it-1}}\right) + \gamma_4 \ln(H_{it} - H_{it-1}) + \gamma_5 \ln(Pol_{it} - Pol_{it-1}) + \gamma_6 \ln(TOPEN_{it} - \\ & TOPEN_{it-1}) + \gamma_7 \ln(API_{it} - API_{it-1}) + \gamma_8 \ln(CC_{it} - CC_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1}) \end{aligned} \quad (20)$$

This leads to equation (21) in the following form

$$\Delta \ln L_t = \delta_0 \Delta \ln L_{t-1} + \gamma_1 \Delta \ln K_{gt} + \gamma_2 \Delta \ln K_{pt} + \gamma_3 \Delta \ln \frac{w}{p_t} + \gamma_4 \Delta \ln H_t + \gamma_5 \Delta \ln Pol_t + \gamma_6 \Delta \ln TOPEN_t + \gamma_7 \Delta \ln API_t + \gamma_8 \Delta \ln CC_t + \varepsilon_t \quad (21)$$

where:

$\ln L$ is the natural log of employment (Labour Demand);

$\ln \frac{w}{p}$ is the natural log of labour cost measured as real wage cost;

$\ln H$ is the natural log of human capital;

$\ln K_g$ is the natural log of public physical capital (public investment or investment by government) and;

$\ln K_p$ is the measure of private investment.

Pol is a measure of political discretion

$\ln TOPEN$ is a measure of trade openness

$\ln API$ is agricultural productivity index

CC is a dummy for credit crunch

In order to check whether private investment influence the demand for total labour the same way as male labour demand, female labour demand, total youth, male and female youth labour demands, separate models are written in respect of each of the labour demands. This resulted in estimating six main models.

3.3.2 Study sample

The study included data from 48 countries in Sub-Saharan Africa excluding South Sudan. The exclusion of South Sudan was basically based on lack of data. All these countries are studied over a 20 year period, from 1990 to 2009.

3.3.3 Data

All the data were taken from the online edition of the African Development Index (ADI) of the World Bank except that of Trade openness and Political Discretion (Pol). The variable for trade openness was taken from UNCTAD but that of Political Discretion (Pol) is an index built by Henisz (2010). All the variables, except political discretion (Pol), human capital and Agricultural Productivity Index (API), are presented in their natural log form in order to control for heteroskedasticity.

3.3.4 Panel Data Methodology

The nature of the data allows for the use of panel data methodology for the analysis. Panel data methodology has the advantage of not only allowing researchers to undertake cross-sectional observations over several time periods, but also control for individual heterogeneity due to hidden factors, which, if neglected in time-series or cross-section estimations leads to biased results (Baltagi, 2005). The general form of the panel data model can be specified as:

$$Y_{it} = \beta X_{it} + v_{it} \quad (22)$$

where the subscript i denotes the cross-sectional dimension (equal to 1.....48), and t represents the time-series dimension (1 to 20 years). Y_{it} , represents the dependent variables in the model, which are total, male and female employment. X contains the set of explanatory variables in the estimation model and β represents the coefficients. $v_{it} = \mu_i + \nu_{it}$ where μ_i is an unobserved individual specific effect, and ν_{it} is a zero mean random disturbance with a variance of σ_v^2 .

3.4.1 Dynamic Labour Demand

The nature of the test to be carried out requires that a dynamic panel methodology is applied. In addition to other benefits associated with panel data methodology, dynamic panel allows for measuring the speed of adjustment (through the lagged dependent variable) using the partial adjustment based approach. The dynamic panel approach accounts for individual effects which mostly are the cross sectional effects (see Baltagi, 2005), even though the time specific effects can also be included. The

dynamic error components regression is characterized by the presence of a lagged dependent variable among the regressors i.e.

$$Y_{it} = Y_{it-1} + \beta X_{it} + \mu_i + v_{it} \quad (23)$$

Where Y_{it} is the dependent variable in country i for time t , Y_{it-1} is the dependent variable in the previous period, βX_{it} is a vector of explanatory variables, i is equal to 1.....48, and t is equal to 1.....20.

The inclusion of the lagged dependent variable makes the ordinary least squares (OLS) estimator bias and inconsistent even if there is no serial correlation in the v_{it} 's. This occurs as a result of the fact that the lagged dependent variable is correlated with the error term. A condition created by the fact that Y_{it} is a function of μ_i . The fixed effect model estimator does not totally help solve the problem created by the autoregressive nature of dynamic panel models, even though the within transformation wipes out the μ_i s. Also, the random effects General Least Squares Regression (GLS) is not helpful in a dynamic panel model. Because the quasi-demeaning that is performed when using GLS still makes the Y_{it-1}^* to be correlated with μ_i (See Anderson & Hsiao, 2003; Sevestre & Trognon, 1985; Baltagi, 2005)

One way of getting around this problem as proposed by Anderson and Hsiao (1981), is to first difference the model to eliminate the μ_i and then apply an Instrumental Variable (IV) method. However, even though this method leads to consistent results, it does not necessarily lead to efficient estimates because not all available moment

conditions are used (Ahn & Schmidt, 1995) and does not take into account the differenced structure on the residual disturbances (Baltagi, 2005).

In view of the weakness in the methodology proposed by Anderson and Hsiao (1981), Arellano and Bond (1991) suggest that after taking the first difference to eliminate the individual effects, one should then use all past information of the dependent variable as instruments. This, they argue, gives a more efficient estimation procedure. They make this proposition on the grounds that additional instruments can be obtained if one uses the orthogonality conditions that exist between Y_{it} and v_{it} .

Thus, in all the dynamic models, the Arellano and Bond-AB- (1991) estimation technique was used. It is an instrumental variable (IV) estimator that accounts for correlated fixed effects and endogenous regressors (Asiedu & Gyimah-Brempong, 2008). Subsequent to the AB estimation the Sargan (1958) and autocorrelation tests were applied to identify whether the models were well specified. The Sargan (1958) test for over-identifying restrictions is used to determine if the instruments are suitable. The null hypothesis states that “the instruments as a group are exogenous”. Consequently, a higher p-value is preferred. The null hypothesis of no autocorrelation is applied to the differenced residuals (Mileva, 2007). Sargan test results and results for AR (1) and AR (2) test results reported in Tables 3.5A and 3.5B show that the models are well specified.

Also, the study used one year lag of the investment (public and private) variables but

maintained the level of real wage cost in the dynamic models estimated. The assumption is that real wage cost and investment sometimes have delayed effect on employment because of adjustment cost (Oi, 1962; Kessing, 2003; Asiedu & Gyimah-Brempong, 2008). But in the case of real wage cost, the time lag of adjustment is restricted to within a year because the general conclusion, from annual data, is that the adjustment takes place within 6 to 12 months and even faster when number of working hours is used instead of level of employment (Hamermesh, 1993; Köllö et al., 2003).

The following expanded six main models were, thus, estimated:

$$\begin{aligned} \ln EMPTOT_{it} = & \beta_1 \ln EMPTOT_{it-1} + \beta_2 \ln RWR_{it} + \beta_3 \ln HDI_{it} + \beta_4 \ln GPINV_{it-1} + \\ & \beta_5 \ln PRINV_{it-1} + \beta_6 \ln POL_{it} + \beta_7 \ln TOPEN_{it} + \beta_8 \ln API_{it} + \beta_9 CC_{it} + \mu_i + v_{it} \end{aligned} \quad (24)$$

$$\begin{aligned} \ln EMPMAL_{it} = & \beta_1 \ln EMPMAL_{it-1} + \beta_2 \ln RWR_{it} + \beta_3 \ln HDI_{it} + \beta_4 \ln GPINV_{it-1} + \\ & \beta_5 \ln PRINV_{it-1} + \beta_6 \ln POL_{it} + \beta_7 \ln TOPEN_{it} + \beta_8 \ln API_{it} + \beta_9 CC_{it} + \mu_i + v_{it} \end{aligned} \quad (25)$$

$$\begin{aligned} \ln EMPFEM_{it} = & \beta_1 \ln EMPFEM_{it-1} + \beta_2 \ln RWR_{it} + \beta_3 \ln HDI_{it} + \beta_4 \ln GPINV_{it-1} + \\ & \beta_5 \ln PRINV_{it-1} + \beta_6 \ln POL_{it} + \beta_7 \ln TOPEN_{it} + \beta_8 \ln API_{it} + \beta_9 CC_{it} + \mu_i + v_{it} \end{aligned} \quad (26)$$

$$\begin{aligned} \ln EMPTOTY_{it} = & \beta_1 \ln EMPTOTY_{it-1} + \beta_2 \ln RWR_{it} + \beta_3 \ln HDI_{it} + \beta_4 \ln GPINV_{it-1} + \\ & \beta_5 \ln PRINV_{it-1} + \beta_6 \ln POL_{it} + \beta_7 \ln TOPEN_{it} + \beta_8 \ln API_{it} + \beta_9 CC_{it} + \mu_i + v_{it} \end{aligned} \quad (27)$$

$$\begin{aligned} \ln\text{EMPMALY}_{it} = & \beta_1 \ln\text{EMPMALY}_{it-1} + \beta_2 \ln\text{RWR}_{it} + \beta_3 \ln\text{HDI}_{it} + \beta_4 \ln\text{GPINV}_{it-1} + \\ & \beta_5 \ln\text{PRINV}_{it-1} + \beta_6 \ln\text{POL}_{it} + \beta_7 \ln\text{TOPEN}_{it} + \beta_8 \ln\text{API}_{it} + \beta_9 \text{CC}_{it} + \mu_i + v_{it} \end{aligned}$$

(28)

$$\begin{aligned} \ln\text{EMPFEMY}_{it} = & \beta_1 \ln\text{EMPFEMY}_{it-1} + \beta_2 \ln\text{RWR}_{it} + \beta_3 \ln\text{HDI}_{it} + \beta_4 \ln\text{GPINV}_{it-1} + \\ & \beta_5 \ln\text{PRINV}_{it-1} + \beta_6 \ln\text{POL}_{it} + \beta_7 \ln\text{TOPEN}_{it} + \beta_8 \ln\text{API}_{it} + \beta_9 \text{CC}_{it} + \mu_i + v_{it} \end{aligned}$$

(29)

The definition of the variables used in the study and their expected signs are provided in Table 3.1 below

Table 3.1: Definition of variables (proxies) and Expected signs

VARIABLE	DEFINITION	THEORY	EXPECTED SIGN
EMPTOT	Total Employment (Dependent Variable) = Total Employment to Total Population ratio is the proportion of a country's population that is employed. Ages 15 and older are generally considered the working-age population. This is calculated for country i in time t ;		
EMPMAL	Male Employment (Dependent Variable) = Male Employment to Male population ratio is the proportion of a country's population that is employed. Ages 15 and older are generally considered the working-age population. This is calculated for country i in time t ;		

EMPFEM	Female Employment (Dependent Variable) = Female Employment to Female Population ratio is the proportion of a country's Female population that is employed. i.e. Percentage of total employment that is female for country i in time t . Ages 15 and older are generally considered the working-age population.	
EMPTOTY	Youth employment to population ratio is the proportion of a country's youth population that is employed. Proportion of total youth employed for country i in time t . Ages 15-24 are generally considered the youth population.	Neoclassical Labour Demand Theory
EMPMALY	Employment to population ratio is the proportion of a country's youth population that is employed. Proportion of male youth employed for country i in time t . Ages 15-	

24 are generally considered the youth population.

EMPFEMY Employment to population ratio is the proportion of a country's population that is employed. Proportion of female youth employed for country i in time t . Ages 15-24 are generally considered the youth population.

RWR Real Wage Rate = Nominal Wage Rate Neoclassica Negative
 (NWR)/Consumer Price Index for country i in time t ; 1 Labour
 Nominal Wage Rate is Compensation of employees as a Demand
 percentage of total expenses for country i in time t ; Theory
 Compensation of employees consists of all payments in
 cash, as well as in kind (such as food and housing), to
 employees in return for services rendered, and
 government contributions to social insurance schemes
 such as social security and pensions that provide benefits

to employees.

HD	Human Capital Index = Measures 2 indicators (a) Health and Welfare and (b) education. It is based on Ibrahim Index measures reported by the World Bank for country i in time t ;	Neoclassical Labour Demand Theory	Positive
POL(Polconiii)	Political Discretion/Constraint = It is measured as the level of political discretion or constraint and ranges from 1 (political discretion) to 0 (political constraint) of country i in time t based on Henisz (2010);	Governance	Positive
TOPEN	Trade openness = This shows exports, imports and sum/average of exports and imports as percentage of nominal gross domestic product (GDP) for country i in time t . The indicators are calculated for trade in goods, trade in services and total trade in goods and services.	Structural Adjustment	Indeterminate

The data is taken from UNCTAD Database.

PRINV	<p>Private Investment (Gross Fixed Capital Formation by the Private Sector) = investment output ratio and is computed as the ratio of private investment to GDP of country i in time t. Private investment covers gross outlays by the private sector (including private non-profit agencies) on additions to its fixed domestic assets.</p>	<p>Neoclassical Labour Demand Theory</p>	<p>Positive</p>
GPINV	<p>Gross public investment (see definition below) as a percentage of GDP (%). Public sectors' gross domestic fixed investment (gross fixed capital formation) comprises all additions to the stocks of fixed assets (purchases and own-account capital formation), less any sales of second-hand and scrapped fixed assets measured at constant prices, done by government units and non-</p>	<p>Neoclassical Labour Demand Theory</p>	<p>Positive</p>

financial public enterprises. Most outlays by government on military equipment are excluded. It is calculated for country i in time t ;

API

Agricultural Production Index =The FAO indices of agricultural production show the relative level of the aggregate volume of agricultural production for each year in comparison with the base period 1999-2001. They are based on the sum of price-weighted quantities of different agricultural commodities produced after deductions of quantities used as seed and feed weighted in a similar manner. The resulting aggregate represents, therefore, disposable production for any use except as seed and feed. This is calculated for country i in time t ;

Positive

μ_i, v_{it}

Are the country specific and white noise

3.5.0 Analysis and Discussion

3.5.1 Descriptive Statistics

Table 3.2 gives the descriptive statistics of the variables used in the study. Total employment level among the working population in Africa is about 64.13%. Expectedly, more men (72.26%) are engaged in employment than women (56.29%) because of the traditional role of men in most African cultures. The dispersion among female employment is quite worrying. The records showed that some countries recorded as low as 12.7% while others as high as 88.2%. Mauritania recorded the minimum total female, female youth and total employment levels while Rwanda achieved the maximum total female, female youth, and total employment levels. Meanwhile, the maximum levels of total investment, public investment and private investment were recorded by Equatorial Guinea (see Appendix 3.1)

During the study period, employers spent about 35% of their total expenses on their workforce for engaging their services, with the lowest and highest rates being 10.2% and 60.6% respectively. Meanwhile real interest rate averaged at 10.8%. Private investment (12.6%), over the two decades of study, was greater than the level of governments' (7.5% of GDP) involvement in investment activities. Privatization of state-owned enterprises and the proliferation of non-governmental organisation could be contributing factors. This notwithstanding, the productivity of the agricultural sector appeared to be relatively representative.

Table 3.2: Descriptive Statistics

Var.	Obs.	Mean	Std Dev	Min	Max
EMPTOT	855	64.13345	12.62545	31.8	88.3
EMPMAL	855	72.25497	10.24244	44.1	88.6
EMPFEM	855	56.29135	17.46347	12.7	88.2
EMPTOTY	855	47.16795	16.03483	10.5	80
EMPMALY	855	51.33673	16.3792	13.9	79.7
EMPFEMY	855	43.01439	17.7237	6.1	81.1
NWR	262	35.5873	10.96368	10.1795	60.6036
HDI	470	49.61005	14.89904	10.3805	89.4437
GPINV	841	7.407808	4.825831	0.100101	42.9755
PRINV	840	12.75484	9.776949	-2.64039	112.352
POL	419	0.319523	0.15062	0.02	0.73
TOPEN	838	31.4506	21.24236	2.68738	140.576
API	954	88.52479	19.37031	37.67	208.04
CC	960	0.15	0.3572575	0	1

Source: Author's computation from data taken from World Bank (2012)

Multicollinearity Test

In order to test for the presence of multicollinearity among the regressors, two main tests were conducted. The correlation among the variables was estimated just as well as the variance inflation factors (VIF) of the regressors. The results, as indicated in Table 3.3 and 3.4 show that the presence of multicollinearity is minimal. This is reflected in the low correlation values and a low mean VIF of 2.18. Multicollinearity

is deemed to be high if VIF is greater than 5 (as a common rule of thumb) and according to Kutner, Nachtsheim and Neter (2004), VIF of 10 should be the cut off.

Table 3.3: Variance inflation Factor Test

Variable	VIF	1/VIF
LNHDI	3.26	0.306656
LNTOPEN	2.90	0.344969
LNPRINV _{it-1}	2.12	0.471109
LNRWR	2.09	0.477615
LNGPINV _{it-1}	1.99	0.503023
CC	1.89	0.528694
API	1.65	0.607476
POL	1.38	0.649304
Mean VIF	2.18	

Source: Author's computation from data taken from World Bank (2012)

Table 3.4: Correlation Matrix

	Ingempt	lnempmal	lnempfem	Inemptoty	Inempmaly	Inempfemy	Inrwr	Lnhdi	Ingpinv	Inprinv	Inpol	Intopen	Inapi
Lnemptot	1.000												
Lnempmal	0.8357***	1.000											
Lnempfem	0.9321***	0.5878***	1.000										
Inemptoty	0.9143***	0.9203***	0.7615***	1.000									
Inempmaly	0.7690***	0.9426***	0.5375***	0.9477***	1.000								
Inempfemy	0.9634***	0.7984***	0.9137***	0.9460***	0.7960***	1.000							
Inrwr	0.1229*	0.0615	0.1542**	0.0349	-0.0556	0.1138	1.000						
Lnhdi	-0.138***	-0.1941***	-0.069	-0.219***	-0.211***	-0.199***	-0.183**	1.000					
Ingpinv _{t-1}	0.1185***	0.1356***	0.1152***	0.2059***	0.2303***	0.1715***	-0.270***	0.129***	1.000				
Inprinv _{t-1}	-0.204***	-0.1725***	-0.172***	-0.172***	-0.108***	-0.2047***	-0.260***	0.3929***	0.0891***	1.000			
LnPol	-0.0154	0.0909*	-0.0733	0.0398	0.0764	-0.0064	-0.278***	-0.0879	0.0921*	-0.148***	1.000		
Intopen	-0.288***	-0.3323***	-0.187***	-0.316***	-0.294***	-0.2847***	0.1046	0.3054***	-0.0671*	0.3617***	0.0203	1.000	
Lnapi	-0.0415	-0.1026***	0.0121	-0.095***	-0.104***	-0.0659**	0.1700**	0.2018***	-0.0411	0.2131***	-0.12*	0.3691***	1.000
Cc	0.0209	-0.0119	0.0361	-0.0234	-0.0336	-0.0095	-0.190***	0.1120**	0.0393	0.0867**	0.0181	0.1094***	0.40

*** = 1%, ** = 5% and * = 10%

Source: Author's computation from data taken from World Bank (2012)

3.5.3 Discussion of Regression Results

This study assessed the impact of private investment on employment in SSA. The results, from the Arellano-Bond dynamic model, as shown in Table 3.5A and 3.5B show that private investment together with public investment, real wage cost, previous levels of labour demand, human capital, trade openness and productivity of the agric sector are among the key factors that influence labour demand in SSA.

Previous year's private investment does not enhance employment in SSA. The results indicate a significantly negative (at 1%) relationship between the lag of private investment and labour demand. Thus, as investment in physical assets gradually becomes fully operational, they tend to destroy labour demand. This partially supports Schumpeter's (1943) creative destruction view of innovation and suggests that technology is gradually taking over jobs (Autor et al., 2003; Manning, 2013). It does not suggest that technology totally replaces labour but suggest that private sector investment activities lead to more job displacements than placements. In fact, those who eventually continue to keep their employment or gain employment are those with the requisite skills to work with technologies associated with private investments.

The main driver for the negative relationship between private investment and labour demand may be profitability. Decisions by private investors are driven more by profit than any other motive, such as employment. In view of this employment and other social benefits that emanate from private investment decisions are mostly unintended.

Also, most of the largest external financial flow (FDI) into the African continent goes in to hunt for resources (AfDB et al., 2012). Meanwhile, the extractive industry does not only have weak linkages with the other sectors but also has weak labour absorption rate as against the manufacturing sectors (see Aryeetey & Baah – Boateng, 2007). Also, as these natural resources deteriorate over time, initial stages of private investments may be accompanied by increased labour demand but later stages would be associated with a reduction in labour demand, when the resources start depleting. Again, in situations where these private investments are created at the instance of construction contracts by either public or private institutions, the life span of the projects would normally determine its effect on labour demand. In any case, the results indicate, unequivocally, that private investment is not a reliable source of labour demand for Africa. As a result, it is paramount for economic managers to attract private investment into longer term employment sustainable sectors (like manufacturing). Motivations through tax incentives for manufacturing and employment are also encouraged.

Table 3.5A: Regression Results for model 24, 25 and 26

	ALL		
	Total	Male	Female
$\ln\text{EMPTOT}_{it-1}$	0.4193*** (0.0988)		
$\ln\text{EMPMAL}_{it-1}$		0.4514*** (0.0490)	
$\ln\text{EMPFEM}_{it-1}$			0.4454*** (0.1336)
$\ln\text{RWR}$	-0.0177*** (0.0035)	-0.0161*** (0.0034)	-0.0211*** (0.0038)
$\ln\text{HD}$	-0.0459** (0.0189)	-0.0425*** (0.0134)	-0.0524** (0.0258)
$\ln\text{GPINV}_{it-1}$	0.0126*** (0.0046)	0.0080* (0.0044)	0.0142*** (0.0055)
$\ln\text{PRINV}_{it-1}$	-0.0219*** (0.0046)	-0.0130*** (0.0044)	-0.0158*** (0.0056)
$\ln\text{POL}$	0.0005 (0.0011)	0.0001 (0.0010)	-0.0012 (0.0011)
$\ln\text{TOPEN}$	-0.0283*** (0.0089)	-0.0232*** (0.0074)	-0.0297*** (0.0115)
$\ln\text{API}$	0.0003*** (0.0001)	0.0002*** (0.0001)	0.0004*** (0.0001)

CC	-0.0036 (0.0022)	-0.0024 (0.0017)	-0.0056** (0.0029)
Wald Chi2(9)	1824.95	1680.56	4908.88
Prob>Chi2	0.0000	0.0000	0.0000
Autocorrelation			
1 z(Prob.)	-0.95856(0.3378)	-1.0184(0.3085)	-1.110(0.2670)
2 z(Prob.)	-1.2062(0.2277)	-1.3607(0.1736)	-0.994(0.32)
Sargan Test:			
Chi2 (34)	40.63802	39.55595	40.03811
Prob.	0.2011	0.2357	0.2198

*** = 1%, ** =5% and * = 10% robust Standard errors in parenthesis

Source: Author's computation from data taken from World Bank (2012)

On the other hand, the lag of public investment has a complementary effect on labour demand. The acquisition of these public investment vehicles like roads, bridges, dams, schools, expansion electricity etc take time and sometimes displace petty traders and households. But after the constructions are complete, they tend to ease business and facilitate job creation or serve as employment agents themselves. These probably explain the significantly positive relationship between public investment and labour demand in SSA. So, in the long run, public investment increases labour demand possibly due to the fact that investments by the state are generally not for profit motive. Consequently, this result confirms the exceptional role governments

play in employment generation on the African continent and probably offers an explanation why certain public entities operate unprofitably. It is, therefore, pertinent that public investments are undertaken more efficiently since it is a reliable conduit for employment generation either directly or indirectly through facilitating the activities of the citizens. Thus, while public investment increases labour demand private investment reduces labour demand. The results then show that investment can have both complimentary and substitutive effect on labour depending on the nature of that investment (Rosen, 1969; Griliches, 1969; Henneberger & Ziegler, 2006).

The study depicts that changes in current levels of wage rates has an inverse relationship with employment levels. At 1% significant level, current real wage rate has a negative relationship with labour demand. When wage rates are increased in SSA, the general reaction of employers is that jobs are cut unlike when wage rates are reduced. In order to be competitive, SSA economies should work towards keeping wage rates at their barest minimum. This would facilitate employment generation. But this should be done cautiously since it also has implications for economic empowerment, economic growth and social welfare improvements. The result is in line with the predictions of the neoclassical labour demand theory that there is a negative relationship between real wage rate and labour demand.

Trade openness does not favour employment in SSA mainly because the continent is a net importer. Even though the continent is endowed with a lot of primary resources, its weak manufacturing sector means that most of these resources are exported at

their raw stages at very low competitive prices than their eventual final products. Ironically, the continent serves as a major market for these final products, worsening our net export position. In effect, the SSA sub-region ends up creating markets and for that matter jobs for the countries that manufacture the final products. Thus, an increase in consumption of these goods and services increases the employment demand of the manufacturing country and not the consuming country.

Surprisingly, human capital measured as human development index consistently and significantly shows a negative relationship with employment demand. This could probably be as a result of the fact that, given the developmental stage of the continent, there do not exist enough job openings for highly skilled workers. Also, the negative relationship between human capital and employment seem to suggest that the SSA economy has not been expanding large enough to accommodate the kind of human capital that exists in the region. Consequently, any improvement in human capital which increases the productivity per worker means that less people will have to be engaged, thereby harming employment. This position is similar to the negative effect technological advancement has on employment. Also, even though the effect of the credit crunch on labour demand in SSA has been negative in all the models estimated, its effect is significant on female labour demand and youth labour demand. It suggests that female employment and youth employment were the hardest hit by the credit crunch and more attention should be given to them in employment recovery plans.

Meanwhile, the results show a positive and significant relationship between agricultural productivity index and employment. This result reiterates the exceptional role of the agricultural sector to the SSA sub-region. Measures to enhance the agric sector through subsidies on fertilizers, insecticides and cost of use of tractors should be encouraged. Conscious efforts should be made to diffuse the notion that the agric sector is the preserve of the poor, illiterate and the old. Agric-based policies such as national service personnel getting involved in agric must be encouraged.

The dynamic models show strongly that employment level in the previous year positively informs employment level in the current year, at 1% significant level. Implying that factors that influenced previous year's employment translate to the current year confirming that labour demand follows a partial adjustment process ((Oi, 1962; Nickell, 1986; Hamermesh & Pfann, 1996; Pierlugi & Roma, 2008). The results are consistent for all the labour demand models estimated. Also, the results of the Sargan (1958) and autocorrelation test conclude that the models are well specified.

Table 3.5B: Regression Results for models 27, 28 and 29

	Youth		
	Total	Male	Female
$\ln\text{EMPTOT}_{it-1}$	0.7062*** (0.0511)		
$\ln\text{EMPMAL}_{it-1}$		0.7692*** (0.0725)	
$\ln\text{EMPFEM}_{it-1}$			0.5924*** (0.0717)
$\ln\text{RWR}$	-0.0318*** (0.0125)	-0.0289** (0.0121)	-0.0296** (0.01284)
$\ln\text{HDI}$	-0.0865** (0.0377)	-0.0837*** (0.0283)	-0.0839* (0.0460)
$\ln\text{GPINV}_{it-1}$	0.0049 (0.0137)	-0.0033 (0.0152)	0.0173 (0.0139)
$\ln\text{PRINV}_{it-1}$	-0.0344 (0.0213)	-0.0267 (0.0191)	-0.0349* (0.0199)
$\ln\text{POL}$	-0.0007 (0.0028)	-0.0003 (0.0021)	-0.0014 (0.0033)
$\ln\text{TOPEN}$	-0.0206 (0.0171)	-0.0104 (0.0141)	-0.0420* (0.0232)
$\ln\text{API}$	0.0005** (0.0002)	0.0005* (0.0003)	0.0003 (0.0002)

CC	-0.0071*	-0.0066**	-0.0081
	(0.0041)	(0.0033)	(0.0051)
Wald Chi2(9)	25347.77	462661.51	9016.39
Prob>Chi2	0.0000	0.0000	0.0000
Autocorrelation			-
1 z(Prob.)	-1.3862(0.1657)	-1.7107(0.0871)	0.58338(0.5596)
			-
2 z(Prob.)	-1.2272(0.2197)	-1.4345(0.1514)	1.0876(0.2768)
Sargan Test:			
Chi2 (34)	39.80449	38.64895	43.6891
Prob.	0.2274	0.2676	0.1234

*** = 1%, ** =5% and * = 10% robust Standard errors in parenthesis

Source: Author's computation from data taken from World Bank (2012)

3.6 Conclusion

The basic objective of this Chapter was to assess whether employment generation is part of the benefits that Sub-Saharan African economies can get from private investment, which some consider not to be enough (Dinh et al., 2012) and others unproductive (Devarajan et al., 1999). Data was taken from the World Bank, UNCTAD and Henisz (2010) covering 48 Sub-Saharan African countries over a period of 20years (1990-2009). The researcher estimated a derived neoclassical labour demand model that allows for the inclusion of private investment, real labour

cost, human capital and investment by the public sector. The model also controls for political stability, trade openness, agricultural productivity and credit crunch. Within the framework of dynamic panel methodology, the model was then estimated for total, male, female and youth labour demands with the Arellano and Bond (1991) GMM technique.

The results indicate that while private investment has a substitutive effect on labour demand public investment has a complementary effect on labour demand. Also, increase in real wage rate reduces labour demand just as advances in human capital, trade openness and credit crunch. Meanwhile, agricultural productivity has a significantly positive relationship with labour demand. The models are well specified and the results consistent with all the estimated models.

Consequently, the SSA region should intensify measures to attract private investment to more productive areas especially manufacturing, motivate the private sector through tax incentives, improve on the judicious use of public investment through checking corruption and ensuring value for money investments, promote exports, and embark on policies that grow the economy. In addition, conscious effort should be made to assess the impact of investment on the economy. This impact assessment should include employment impact of investment assessment which should be handled by a body independent of that which granted the permit for investment, in order to ensure objectivity. The study, thus, offers partial support for the neoclassical labour demand theory in SSA region. Specific country-level studies

(especially for countries that performed well and badly, in terms of private investment size and employment levels) are encouraged for specific actions. Also, it would be instructive for the sub-region to know the effect of private investment on different types of labour (skilled and unskilled, fixed contract and indefinite contract, etc).

References to Chapter Three

- Addison, J., L. Bellmann, T. Schank, & Paulino (2008). The Demand for Labor: An Analysis Using Matched Employer - Employee Data from the German LIAB. Will the High Unskilled Worker Own-Wage Elasticity Please Stand Up? *Journal of Labor Research* 29(2), 114 -137.
- AfDB, OECD, UNECA & UNDP (2012). *Africa Economic Outlook; Promoting Youth Employment*, pp. 37-58.
- Afram, G. G. & Del Pero, A. S. (2012). Nepal's Investment Climate: Leveraging the Private Sector for Job Creation and Growth. Directions in Development (Private Sector development) *World Bank Report* 67525. doi: 10.1596/978-0-8213-9465-6abi
- Ahn, S.C. & Schmidt, P. (1995). Efficient estimation of models for dynamic panel data. *Journal of Econometrics*, 68, 5-27.
- Anderson, T. W. & Hsiao, C. (1982). Formulation and estimation of dynamic models using panel data. *Journal of Business and Economic Statistics*, 9, 317-323.
- Andrews, M. and Nickell, S. (1982). Unemployment in the United Kingdom since the War. *Review of Economics Studies*, 49(special), 731-59.
- Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *The Review of Economic Studies*, 58, 277-297.
- Aromolaran, A. B. (2004). Wage Returns to Schooling in Nigeria. *African Development Review*, 16(3), 433 – 455.

- Asiedu, E. (2004). The Determinants of Employment of Affiliates of US Multinational Enterprises in Africa. *Development Policy Review*, 22(4), 371-379.
- Asiedu, E., & Gyimah-Brempong, K. (2008). The Effect of the Liberalization of Investment Policies on Employment and Investment of Multinational Corporations in Africa. *African Development Review*, 20(1), 49-66.
- Assaad, R., El-Hamidi, F., & Ahmed, A. U. (2000). *The Determinants of Employment Status in Egypt (No. 88)*. International Food Policy Research Institute – Food Consumption and Nutrition Division (IFPRI- FCND) Discussion Paper, pp. 1-107.
- Aterido, R., Hallward-Driemeier, M. & Pagés, C. (2007). *Investment Climate and Employment Growth: The Impact of Access to Finance, Corruption and Regulations across Firms (No. 3138)*. Forschungsinstitut zur Zukunft der Arbeit. Institute for the Study of Labor Discussion Paper IZA.
- Aterido, R. & Hallward-Driemeier, M. (2010). *The Impact of the Investment Climate on Employment Growth: Does Sub-Saharan Africa Mirror Other Low-Income Regions? (No. 5218)*. Policy Research Working Paper, Developmental Research Group, World Bank.
- Autor, D., Levy, F. & Murnane, R. (2003). The Skill Content of Recent Technological Change: An Empirical Exploration. *Quarterly Journal of Economics*, 118(4), 1279-1333.

- Aryeetey, E. & Baah-Boateng, W. (2007). Growth, Investment and Employment in Ghana (No. 80). *Working paper*, Policy integration Department, International Labour Organisation.
- Baldwin, R. E. (1995). *The Effects of Trade and Foreign Direct Investment on Employment and Relative Wages* (No. 4). OECD Jobs Study Working Papers, OECD Publishing. <http://dx.doi.org/10.1787/888157653682>.
- Baltagi, B. H., (2005). *Econometric Analysis of Panel Data*. John Wiley & Sons, Ltd.
- Barba N, G., Turrini, A. & Checchi, D. (2003). Adjusting Labor Demand: Multinational Versus National Firms: A Cross-European Analysis. *Journal of the European Economic Association*, 1(2-3), 708 - 719.
- Barro, R. J. & Grossman, H. I. (1971). A General Disequilibrium Model of Income and Employment. *The American Economic Review*, 61(1), 82-93. URL: <http://www.jstor.org/stable/1910543>
- Barro, R. J. & Sala-i-Martin, X. (2004). *Economic Growth* (2nd Ed.). The MIT Press, Cambridge.
- Bentolila, S. & Gilles, S. P. (1992). The Macroeconomic Impact of Flexible Labor Contracts, with an Application to Spain. *European Economic Review*, 36(5), 1013–1053.
- Bentolila, S. & Bertola, G. (1990). Firing Cost and Labour Demand: How Bad is Euroclerosis? *Review of Economic studies*, 57, 381 – 402.
- Berman, E., Bound, J. & Griliches Z. (1994). Changes in the demand for skilled labor within US manufacturing industries: Evidence from the Annual survey of manufacturing. *Quarterly Journal of Economics*, 109, 367-98.

- Bertrand, M. & Sendhil M. (2003). *Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination* (No. 9873). Cambridge, Massachusetts: National Bureau of Economic Research working paper.
- Bertola, G. (1990). Job Security, Employment and Wages. *European Economic Review*, 34, 851 – 886.
- Bertola, G. (1991). *Labour turnover cost and Average Labour Demand* (No. 3866). NBER Working Paper.
- Blejer, M., & Khan, M. S. (1984). Government policy and private investment in developing countries. *IMF Staff Papers*, 31(2), 379–403.
- Blomstrom, M., Fors, G. & Lipsey, R. E. (1997). *Foreign Direct Investment and Employment: Home Country experience in the United States and Sweden* (No. 6205). NBER Working Paper Series. www.nber.org/papers/w6205.
- Boug, P. (1999). *The Demand for Labour and the Lucas Critique: Evidence from Norwegian Manufacturing Statistics* (No.256). Norway Research Department, Discussion Papers.
- Buzás, S. & Fóti, K. (2006). Industrial Competitiveness and Labour Market Transformation in Hungary: Macroeconomic Developments and Empirical Analysis (No. 174). Institute For World Economics Hungarian Academy of Sciences Working Papers.
- Card, D. (1999). The Causal Effect of Education on Earnings. *Handbook of Labor Economics*, 3, 1801-1863.

- Chen, T. & Ku, Y. (2003). *The Effect of Overseas Investment on Domestic Employment* (10156). NBER Working Paper. Available at <http://www.nber.org/papers/w10156>.
- Cherian, S. (1998). The investment decision: A re-examination of competing theories using panel data. *Applied Economics*, 30(1), 95–104.
- Cobb, C. W. & Douglas P. H. (1928). A Theory of Production. *American Economic Review* 18(1), 139-165.
- Devarajan, S., Easterly, W. & Pack, H. (1999). Is Investment in Africa Too High or Too Low? Macro and Micro Evidence. *Journal of African Economies*, 10 (supplement 2) pp. 81-108.
- Dinh, H. T., Palmade, V. T., Chandra, V. & Cossar, F. (2012). *Light Manufacturing in Africa: Targeted Policies to Enhance Private Investment and create Jobs* (67209). African Development Forum, World Bank.
- Driffield, N. & Taylor, K. (2000). FDI and the labour market: A review of the evidence and policy implications. *Oxford Review of Economic Policy*, 16(3), 90 - 103.
- Drobotz, W. & Wanzenried, G. (2006). What determines the speed of adjustment to the target capital structure? *Applied Financial Economics*, 16, 941–958.
- Dunlop, J. T. (1938). The Movement of Real and Money Wage Rates. *Economic Journal*, 48, 413-434.
- Edwards, L. & Behar, A. (2006). Trade Liberalisation and Labour Demand within South African Manufacturing Firms. *J. Stud. Econ. Econometrics*, 30(2), 1-21.

- Emery, J. J. (2003). *Governance, Transparency and Private Investment in Africa*.
OECD Global Forum on International Investment, Johannesburg, 17-18
November 2003, pp. 1-16.
- Erden, L., & Holcombe, R. (2005). The effects of public investment in developing
economies. *Public Finance Review*, 33(5), 575–602.
- Estache, A., Ianchovichina, E., Bacon, R. & Salamon, I. (2013). *Infrastructure and
Employment Creation in the Middle East and North Africa* (74918).
International Bank for Reconstruction and Development / The World Bank
Policy Research Working Paper.
- Falk, M. & Koebel, B. (2004). The impact of office machinery, and computer capital
on the demand for heterogeneous labour. *Labour Economics*, 11 (1),
99 -117.
- Flaig, G. & Steiner, V. (1989). Stability and Dynamic Properties of Labour Demand
in West-German Manufacturing. *Oxford Bulletin of Economics and
Statistics*, 51, 395 - 412.
- Fouladi, M. (2010). The Impact of Government Expenditure on GDP, Employment
and Private Investment a CGE Model Approach” *Iranian Economic
Review*, 15(27), 53 – 76.
- Funke, M., Maurer, W. & Strulik, H. (1999). Capital Structure and Labour Demand:
Investigations Using German Micro Data. *Oxford Bulletin of Economics and
Statistics*, 61(2), 199 – 215.

- Garrett-Peltier, H. (2010). *The Employment Impacts of Economy-Wide Investments in Renewable Energy and Energy Efficiency*. An unpublished PhD Thesis submitted to the Graduate School of the University of Massachusetts Amherst.
- Goos, M. & Manning, A. (2007). Lousy and Lovely Jobs: The Rising Polarization of Work in Britain. *Review of Economics and Statistics*, 89(1), 118-133.
- Görg, H. & Hanley, A. (2005). Labour demand effects of international outsourcing: Evidence from plant level data. *International Review of Economics and Finance*, 14(3) 365-376.
- Goux, D., Maurin, E. & Pauchet, M. (2001). Fixed-term contracts and the dynamics of labour demand. *European Economic Review*, 45, 533 – 552.
- Griliches, Z. (1969). Capital-skill complementarity. *Review of Economics and Statistics*, 51(4), 465-468.
- Habib, M. D. & Sarwar, S. (2013). Impact of Foreign Direct Investment on Employment Level In Pakistan: A Time Series Analysis. *Journal of Law, Policy and Globalization*, 10, 46-55.
- Hamermesh, D. S. (1988). *Labour Demand and Structure of Adjustment Costs* (No. 2572). NBER Working Paper.
- Hamermesh, D. S. (1993). Spatial and Temporal Aggregation in the Dynamics of Labor Demand. In: Jan, C. – Pfann, J. A. – Ridder, G. (ed): *Labor Demand and Equilibrium Wage Formation*. North-Holland, Amsterdam, pp. 91–108.

- Harrison, A. E. & McMillan, M. S. (2004). *The Impact of Overseas Investment by US Multinationals on Wages and Employment*. Conference Paper presented at the 2005 ASSA Conference, see: http://www.aeaweb.org/assa/2005/0108_1430_0402.pdf
- Henisz, W. J. (2000). The Institutional Environment for Economic Growth. *Economics and Politics*, 12(1), 1-31.
- Henisz, W. J. (2002). The institutional environment for infrastructure investment. *Industrial and Corporate Change*, 11(2), 355 -389.
- Henisz, W. J. (2010). *POLCON 2010 codebook*. Manuscript, University of Pennsylvania.
- Henneberger, F. & Ziegler, A. (2006). *Employment Effects of Foreign Direct Investment in the Service Sector: A Systematic Approach* (Nr. 109) der Reihe Diskussionspapiere des Forschungsinstituts für Arbeit und Arbeitsrecht an der Universität St. Gallen
- Herr, H., Kazandziska, M. & Mahnkopf-Praprotnik, S. (2009, February). *The Theoretical Debate about Minimum Wages* (No. 6). Global Labour University Working Papers.
- Hijzen, A., H. Gorg, & R. C. Hine (2005). International Outsourcing and the Skill Structure of Labour Demand in The United Kingdom. *The Economic Journal*, 115(506), 860-878.
- Hijzen, A. & Swaim, P. (2010). Off shoring, labour market institutions and the elasticity of labour demand. *European Economic Review*, 54(8), 1016 - 1034.

- Hsiao, C. (2003). *Analysis of Panel Data*, Cambridge University Press.
- Huang, M. & Ren, P. (2013). A Study on the Employment Effect of Chinese Investment in South Africa (No. 5/2013). *Centre for Chinese Studies, Discussion Paper*, Stellenbosch University.
- Ianchovichina, E., Estache, A., Renaud Foucart, R., Garsous, G. & Tito Yepes, T. (2012). Job Creation through Infrastructure Investment in the Middle East and North Africa (No. 6164). World Bank Policy Research Working Paper.
- Inter-Agency Working Group (IWAG) (2012). *Promoting responsible investment for sustainable development and job creation* - Final report to the High-Level Development Working Group on the work of the Private Investment and Job Creation Pillar of the G20 multi-year action plan on development, Mexico Summit. Pp. 1-23. Accessed from <http://unctad.org/en/Pages/DIAE/G-20/Private-Investment-and-Job-Creation.aspx>.
- International Finance Corporation (2013). *IFC Jobs Study: Assessing Private Sector Contributions to Job Creation and Poverty Reduction*. IFC, Washington, D.C.
- International Monetary Fund (2013). *Regional Economic Outlook: Sub-Saharan Africa, Building momentum in a Multi-Speed World*. World Economic and Financial Survey.
- International Labour Organisation (2012). *Global Employment Trends 2012*. International Labor Office, Geneva.

- International Labour Organisation (ILO, 2013). *Global Employment Trends: Recovering from a second jobs dip*. International Labour Office, Geneva.
- International Labour Organisation (ILO, 2014). *Global Employment Trends 2014: Risk of a jobless recovery?* International Labour Office, Geneva.
- Jayaraman, T. K. & Singh, B. (2007, May). *Foreign Direct Investment and Employment Creation in Pacific Island Countries: An empirical study of Fiji* (No. 35). Asia-Pacific Research and Training Network on Trade Working Paper Series.
- Kaplinsky, R. & Morris, M. (2009). "Chinese FDI in Sub-Saharan Africa: engaging with large dragons." *European Journal of Development Research*, 21(4), 551-569. <http://dx.doi.org/doi:10.1057/ejdr.2009.24>.
- Karlsson, S., Lundin, N., Sjöholm, F. & He, P. (2007). *FDI and Job Creation in China* (No. 723). IFN Working Paper.
- Katsoulacos, Y. S. (1984). Product innovation and employment. *European Economic Review* 26, 83-108.
- Kessing, S. G. (2003). A note on the determinants of labour share movements. *Economics Letters*, 81, 9-12.
- Keynes, J.M. (1936). *The General Theory of Employment, Interest, and Money*, Harcourt.
- Klette, J. & Førre, S. E. (1998). Innovation and Job Creation In A Small open Economy Evidence From Norwegian Manufacturing Plants 1982-92. *Economics of Innovation and New Technology*, 5(2-4), 247-272. doi:10.1080/10438599800000007

- Köllo, J., Korösi, G. & Surányi, É. (2003). Labour – the Demand Side, in: Fazekas, K. and J. Koltay (szerk.). *The Hungarian Labour Market, Review and Analysis*, IEHAS, 91–131.
- Kutner, M., Nachtsheim, C. & Neter, J. (2004). *Applied Linear Regression Models*, (4th ed.). McGraw-Hill Irwin.
- Layard, R., Nickell, S. J. & Jackman, R. (1991). *Unemployment: Macroeconomic performance and the labour market*. Oxford: Oxford University Press.
- Lazear, E. P. (1990). Job Security Provisions and Employment. *Quarterly Journal of Economics CV*, 699 – 726.
- Lewis, P.E.T., & MacDonald, G. (2002). The elasticity of demand for labour in Australia. *Economic Record*, 78, 240 18–30.
- Lichter, A., Peichl, A. & Siegloch, S. (2013). *Labor Demand Elasticities in Europe: A Meta-Analysis* (No. D10.7). Neujobs Working Paper, pp. 1- 30.
- Loof H. (2003). *Dynamic optimal capital structure and technical change* (No. 03-06). ZEW Discussion Paper.
- Machin, S.J., A. Ryan & J. Van Reenen (1996). *Technology and changes in the skill structure: evidence from an international panel of industries*. Discussion Paper, Centre for Economic Policy Research.
- Mairesse, J. & Dormont, B. (1985). Labor and Investment Demand at the Firm Level: A Comparison of French, German and U.S. Manufacturing, 1970–79. *European Economic Review*, 28(1– 2), 201–231.

- Malik, S., Chaudhry, S. I. & Javed, H. I. (2011). Globalization and Employment: Evidence from Pakistan. *Pakistan Journal of Social Sciences (PJSS)*, 31(2), 215-226.
- Mankiw, G. N., Romer, D. & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics*, 107(2), 407- 437.
- Manning, A. (2013). *Lousy and Lovely Jobs*. London School of Economics (CEPCP398). Centre for Economic Performance, Paper.
- Masso, J., Varblane, U. & Vahter, P. (2007). *The Impact of Outward FDI on Home Country Employment in a Low-Cost Transition Economy* (No. 873). William Davidson Institute Working Paper.
- Manning, A. (2013). *Lousy and Lovely Jobs* (No. CEPCP398). London School of Economics. Centre for Economic Performance Paper.
- Mehmet M. and Demirsel, M. T. (2013). The Effect of Foreign Direct Investments on Unemployment: Evidence from Panel Data for Seven Developing Countries. *Journal of Business, Economics and Finance*, 2(3), 53 – 66.
- Michaillat, P. and Saez, E. (2013). *A Model of Aggregate Demand and Unemployment* (CEPDP1235). London School of Economics, Centre for Economic Performance Paper.
- Mileva, E. (2007). *Using Arellano – Bond Dynamic GMM Estimators in Stata: Tutorials with Examples using Stata 9.0*. (Retrieved from the internet on 2/9/2013).
- Mlambo, K., & Oshikoya, T. (2001). Macroeconomic factors and investment in Africa, *Journal of African Economies AERC*, 10(2), 12–47.

- Munthali, T. C. (2012). Interaction of public and private investment in Southern Africa: a dynamic panel analysis. *International Review of Applied Economics*, 26(5), 597-622. doi: 10.1080/02692171.2011.624500.
- Ndikumana, L. & Sher, V. (2008). *The linkages between FDI and domestic investment: unravelling the developmental impact of foreign investment in Sub Saharan Africa* (No. 3296). IZA Discussion Papers. <http://hdl.handle.net/10419/35246>.
- Neumark, D. & Wascher, W. (2006). Minimum Wages and Employment: A Review of Evidence from the New Minimum Wage Research (No. 12663). *National Bureau of Economic Research, Working Paper*. <http://www.nber.org/papers/w12663>.
- Neumark, D. & Wascher, W. L. (2007). Minimum Wages and Employment. *Foundations and Trends in Microeconomics*, 3(1–2), 1–182. doi:10.1561/07000000015
- Nickell, S. (1986). Dynamic Models of Labour Demand. In: Ashenfelter, O. – Layard, R. (ed): *Handbook of Labour Economics*. Volume I. Elsevier Science Publishers, Amsterdam-New York. pp. 473–522.
- Nickell, S. & Wadhvani, S. (1991). Employment Determination in British Industry: Investigations Using Micro- Data. *Review of Economic Studies*, 58(5), 329–345.
- Nickell, S. (2010). *The Unemployment Challenge in Europe*. CESifo Forum, Ifo Institute for Economic Research at the University of Munich, 11(1), 3-6, 04.
- ODI (2002). *Foreign Direct Investment: Who Benefits?* ODI Briefing Paper.

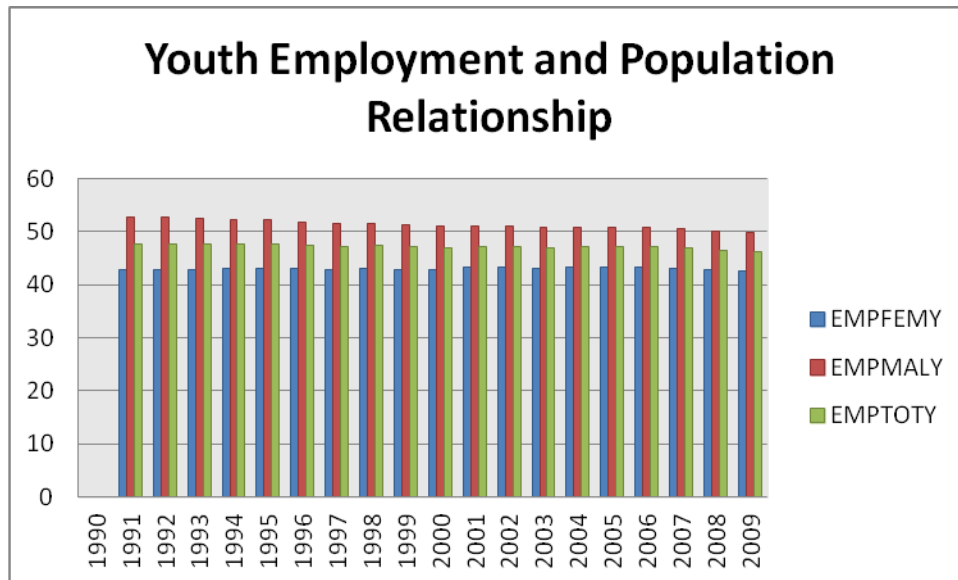
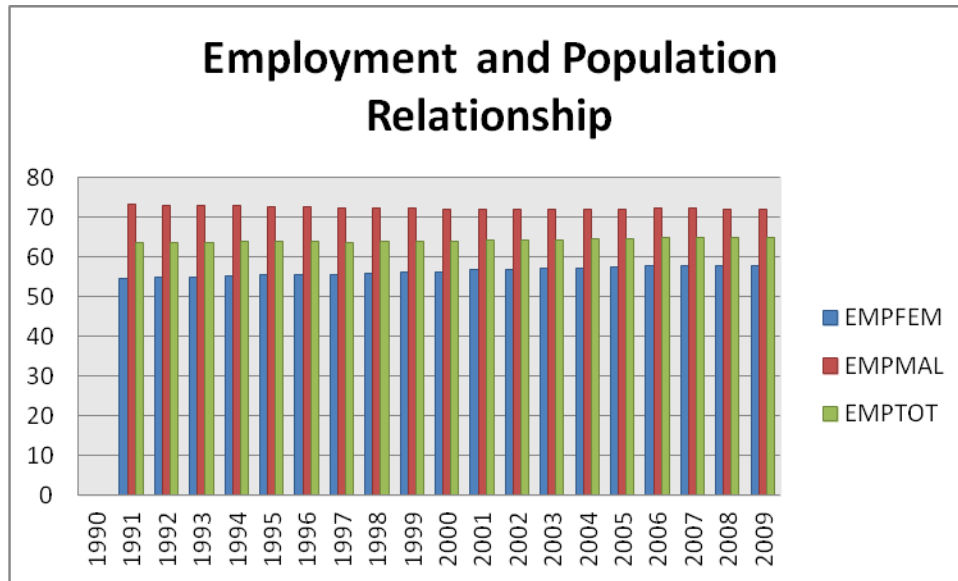
- OECD-ILO Report (2008). *Employment and Industrial Relations – Promoting responsible business conduct in a Globalising Economy*. Conference on Corporate Social Responsibility held in Paris on 23-24 June 2008.
- Oi, W. Y. (1962). Labor as a Quasi Fixed Factor. *Journal of Political Economy*, 70(6), 538–555.
- Oshikoya, T. W. (1994). Macroeconomic determinants of domestic private investment in Africa: An empirical analysis. *Economic Development and Cultural Change*, 42, 573-96.
- Peichl, A. & Siegloch, S. (2012). Accounting for labor demand effects in structural labor supply models. *Labour Economics*, 19(1), 129 -138.
- Pereira, A. M. & Andraz, J. M. (2012). On the Economic Effects of Investment in Railroad Infrastructures in Portugal. *Journal of Economic Development*, 37(2), 79 – 107.
- Pierluigi, B & Roma, M. (2008). *Labour cost and employment across euro area countries and sectors* (No. 912). European Central Bank Working Paper Series.
- Pryor, F. & Schaffer, D. (1999). *Who's Not Working and Why*. Cambridge, Massachusetts: Cambridge University Press.
- Psaltopoulos, D., Skuras, D. & Thomson, K. J. (2011). Employment effects of private investment initiatives in rural areas of southern Europe: a regional SAM approach. *Agricultural Economics Review*, 12(2), 50-61.
- Ramírez, D. (1994). Public and private investment in Mexico, 1950–90: An empirical analysis. *Southern Economic Journal*, 61(1), 1–17.

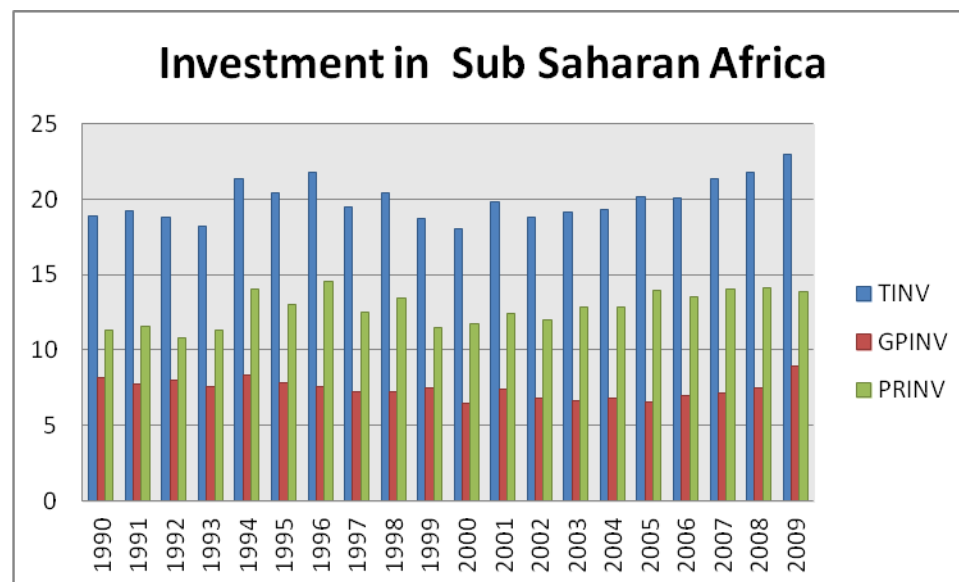
- Rosen, S. (1969). On the Inter-Industry Wage and Hours Structure. *Journal of Political Economy*, 77(2), 249–273.
- Rowthorn, R.E. (1999). Unemployment, wage bargaining and capital–labour substitution. *Cambridge Journal of Economics*, 23(4), 413–25.
- Sackey, H. A. (2007). *Private Investment for Structural Transformation and Growth in Africa: Where do Small and Medium-Sized Enterprises Stand?* Proceedings of the African Economic Conference, pp. 371-398.
- Sargan, J. D. (1958). The estimation of economic relationships using instrumental variables. *Econometrica*, 26, 393–415.
- Sargent, T.J. (1978). Estimation of Dynamic Labor Demand Schedules under Rational Expectations. *Journal of Political Economy*, 86, 1009-1044.
- Say, J-B (1834). *A Treatise on Political Economy* (sixth American ed.). Philadelphia: Grigg & Elliott. This is an English translation of Say's *Traité d'economie politique*, first published in 1803.
- Sevestre, P. & Trognon, A. (1985). A note on autoregressive error component models. *Journal of Econometrics*, 28, 231-245.
- Schumpeter, J.A. (1943). *Capitclism, socialism and democracy*. George Allen & Unwin Ltd., U.K.
- Sparrow, G. N., Ortmann, G. F., Lyne, M. C. & Darroch, M. A. G. (2008). Determinants of the demand for Regular Farm Labour in South Africa, 1960-2002. *Agrekon*, 47(1), 52-75.

- Symons. J.S.(1982). *Relative Prices and the Demand for Labour in British Manufacturing* (No. 137). London School of Economics, Centre for Labour Economics Discussion Paper.
- Symons, S. & Layard, R. (1984). Neoclassical Demand for Labour Functions for Economies. *The Economic Journal*, 94(376), 788-799. URL: <http://www.jstor.org/stable/2232295>
- Van Reenen, J. & Bond, Steve (2005). *Micro-economic models of investment and employment*. In: Heckman, Jim and Leamer, E, (eds.) Handbooks of econometrics volume VI. Elsevier Science Ltd, Amsterdam.
- Van Reenen, J. (1997). Employment and Technological Innovation: Evidence from U.K. Manufacturing Firms. *Journal of Labor Economics*, 15(2), 255 - 284.
- Wolman, H., Levy, A., Young, G. & Blumenthal, P. (2008). *Economic Competitiveness and the Determinants of Sub-national Area Economic Activity*. Washington, DC: Prepared for the Office of Revenue Analysis in the DC Office of the Chief Financial Officer.
- World Bank (2004) *MENA Development Report: Unlocking the Employment Potential in the Middle East and North Africa-Towards a New Social Contract*. No. 28815.
- World Bank. (2011). *World Development Indicators 2011*. Washington, DC: World Bank.
- World Bank (2013). *World Development Report 2013: Jobs* World Bank, Washington, D.C.

APPENDICES

Appendix 3.1





Appendix 3.2: Summary Statistics, Countries that recorded lowest and highest employment and investment levels over the study period

	Minimum (Country and Year)	Maximum (Country and Year)
Empfem	Mauritania (12.70% : 1991)	Rwanda (88.2% : 1991)
Empmal	South Africa (44.1% : 2003)	Ethiopia (88.6% : 2005)
Emptot	Mauritania (31.8% : 1991)	Rwanda (88.3% : 1991)
Empfemy	Mauritania (6.1% : 1991)	Rwanda (81.1% : 1991)
Empmal	South Africa (13.9% : 2003)	Baukina Faso (79.7% : 1991, 95)
Emptoty	Namibia (10.5% : 2009)	Rwanda (80% : 1991)
Total Inv.	Zimbabwe (2.00044% : 2005)	Equit. Guinea (113.578% : 1996)
GPINV	Congo Dem Rep (0.100101 : 1998)	Equit. Guinea (42.9755% : 2009)
PRINV	Liberia (-2.64039 : 2001)	Equit. Guinea (112.352% : 1996)

Source: Author's computation from data taken from World Bank (2012)

CHAPTER FOUR

PRIVATE INVESTMENT, EMPLOYMENT AND SOCIAL WELFARE IN SUB- SAHARAN AFRICA

Abstract

This chapter assesses the effect of private investment and employment on social welfare in Sub-Saharan Africa (SSA), after accounting for income inequality. We estimate a derived welfare model that builds on a proposed welfare function by Todaro and Smith (2012). This model allows for the inclusion of private investment, public investment, employment, initial poverty level and inequality. The results offer support for the growth-poverty-nexus by showing that growth components like investment and employment help explain social welfare dynamics. Also, poverty and inequality are harmful to social development. Consequently, SSA countries should intensify policies aimed at attracting and maintaining private investment and offering good jobs since they are conduits for improving the social wellbeing of the citizenry.

4.1.0 Introduction

Deliberations on improving social welfare and reducing poverty have taken centre stage in almost all major developmental discussions by the so-called unholy trinity (Peet, 2003); International Monetary Fund (IMF), the World Bank and the World Trade Organisation (WTO). A position largely criticized by Peet (2003) and Bøa°s and McNeill (2003), even though Cammack (2004) sees that the World Bank's view of poverty reduction is more deep seated and serious. Needless to say, poverty is not good for the world neither is it a recent phenomenon. Poor people lag behind non-

poor people in terms of educational achievement, employment opportunities, access to secure housing, outstanding payments, access to health care, portable water and skilled work (Milcher, 2006; Nguyen, Linh, & Nguyen, 2013). No matter how unacceptable it is, given the state of global development, poverty has and still is with us so the world has to deal with it. As the American economist Henry George remarked in the 1870s that ‘the association of poverty with progress is the greatest enigma of our times’ (as cited in Wade, 2004, p. 163). The current nature of this old statement is probably the main reason why the first Millennium Development Goal is to halve poverty by 2015.

Even though the world has made progress towards achieving the global target of reducing poverty by halve by 2015 (millennium Development Goal-MDG- 1), many countries in Sub-Saharan Africa (SSA) and Southeast Asia have not made significant progress (Kozak, Lombe, & Miller, 2012). Global extreme poverty level, people living on less than \$1.25 a day, has reduced by half from 1990 (36%) to 2010 (18%). But two (Nigeria and Congo DR) of the world’s five countries (including India, China and Bangladesh) that make up two-thirds of the world’s extreme poor are in Sub-Saharan Africa (SSA) (Word Bank, 2014). The report further states that five (Congo DR, 88%; Liberia, 84%; Burundi, 81%; Madagascar, 81% and Zambia, 75%) out of the high extreme poverty smaller countries are in SSA. A comparison of historical poverty records of SSA and South Asia (SAS) shows that the two sub-regions have recorded poverty reductions between 1981 and 2010 but SAS has made the most gains. SSA achieved a reduction of 5.83% in poverty levels while that of

SAS was 49.34%, based on headcount ratio using \$1.25 standard. Similar results were recorded when the \$2.50 poverty headcount ratio standard was used. While SAS recorded a reduction of 14.42% in poverty levels, SSA achieved a reduction of 1.76%. In addition, current poverty levels (as at 2010), using \$1.25 standard, show that poverty level in SAS is about 17.5% lower than SSA but on the basis of \$2.50 standard, SSA is about 1.4% lower than SAS (Appendix 4.1). Obviously, SSA appears to be less aggressive in pursuing the poverty reduction agenda.

In spite of these developments, studies in this millennium show that poverty level in Africa has moved from that of a worry to that of hope. Collier and Dollar (2001) espoused that if the world is to halve poverty by 2015, most of the reduction would come from Asia, while Africa would only witness a slight reduction. Subsequently, Cornell, Institute of Statistical Social and Economic Research (ISSER) and World Bank (2005) indicated that non achievement of MDGs in SSA was virtually certain, if nothing different was done. Three years later, the World Bank (2008) report still was of the view that Africa was far from reaching this target. In fact the report further projected that if nothing was done then, the poverty level in SSA could worsen to the extent that about half of the world's poor would be living in SSA. Earlier, Bigsten and Shimeles (2007) had argued that Africa can still achieve the MDG 1 if only the region could ensure a relatively modest growth in per capita household consumption given the existing level of inequality. Generally, ensuring growth in per capita consumption would require labour intensive investment that would eventually increase the purchasing power of the working class. But the dynamics in employment

levels in SSA make it difficult for one to conclude that increases in total employment levels, mainly driven by increases in female employment would lead to poverty reduction especially when male employment have reduced between 1990 - 2009.

Also, generally, all the SSA countries in this study have recorded increases in the level of human development (HD), even though the size of these increases is not homogenous (see Appendix 4.2). With the exception of Rwanda, it is also apparent that most countries (for instance South Africa, Seychelles, Botswana, Namibia, Swaziland, Gabon and Kenya) that have the highest levels of human development are not among the best gainers (Niger, Angola, Liberia and Sierra Leone) when the opening and closing levels of HD are compared. Countries that have low levels of initial HD are better motivated to make improvements than those that have a relatively higher level of development. This is probably due to the fact that countries have desired levels of HDs, so, as they move towards this level their additions to HD increases but a decreasing rate unlike those who are remote from their target levels. The improvements in the general level of social welfare (human development) in SSA have coincided not only with improvements in poverty reductions but also with a gradual shift from public investment to private investment and some interesting dynamics in the labour market.

Recent historical (1990 - 2009) analyses of the changes in investment and employment in the SSA region show some interesting results. Generally, the second decade (2000-2009) shows a marginal increase in employment to population ratio

from 63.77% (1990 – 1999) to 64.46%. Interestingly, while more females are joining the working populations (55.31% to 57.18%), the opposite can be said of their male counterparts (fell from 72.60% to 71.95%), when the two decades are compared. Meanwhile investment has seen some considerable improvement. Total investment in the second decade (2000 – 2009) showed a marginal increase from 19.72% (1990 – 1999) to 20.06% of GDP. There is also evidence of a gradual shift from government led investment to private sector controlled investment in the SSA. Public sector investment fell from 7.72% (1990 – 1999) to 7.10% (2000 – 2009) while private investment increased from 12.40% of GDP to 13.10% of GDP. It is clear that employment and private investment levels have improved during the study period (2000-2009) but what is yet to be ascertained, empirically, is whether these improvements can help explain improvements in the social welfare in SSA.

Generally, economic growth is considered the single most important factor that influences poverty reduction (Donaldson, 2008) even though not all growth benefits the poor (Thurlow & Wobst, 2006). In Africa, poverty studies have followed the global trend. Growth and poverty reduction has taken centre stage, even though growth and poverty are weakly linked, in Africa (Page & Shimeles, 2014) or at best give confusing results (Fosu, 2010). Fosu (2010) explains that economic growth is significant in poverty increases and decreases in developing economies even though a fairly distributed income could enhance the poverty reduction ability of economic growth. Adams (2004) argues that labour intensive economic growth can be an appropriate channel through which poor people in developing economies can get out

of poverty. A position that is largely supported by Page and Shimeles (2014) that insufficient jobs in the economic growth of Africa is the main reason for the weak link between economic growth and poverty reduction. Gradually, discussions on the growth- poverty-nexus are being shifted to the relationship between the structure of growth and poverty and not just growth per se.

In addition to pursuing labour intensive economic growth, Pfeffermann (2001) argues that very few people would disagree with the fact that, in the long run, economic development cannot occur without a dynamic private sector. Given that private investment enhances economic growth (Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2010; and Apergis, Lyroudia, & Vamvakidis, 2008), it follows almost naturally for one to conjecture that there could be a relationship between private investment and welfare (poverty reduction) assuming a perfectly positive correlation between economic growth and welfare. This assumption, though, will not suffice (Anand & Sen, 2000) especially in the presence of income inequality (Ravallion, 1997; Ravallion, 2001; Ravallion & Chen, 2007; Kalwij & Verschoor 2007; Ravallion, 2007; Fosu, 2008, 2010).

Apart from inculcating inequality in studies that link economic growth and welfare (poverty reduction), Nissanke and Thorbecke (2006) argue that knowledge of the structure and pattern of growth that best contributes to poverty alleviation should be known. Page and Shimeless (2014) follows that of MacMillan and Rodrik (2011) to study the linkage between employment in the agricultural services and industry

sectors in the African economy and poverty reduction. The study did not find that employment in those sectors reduce poverty for the African sample. Even though the study factors in the importance of inequality in explaining poverty behaviour, it does not consider that of investment. Gohou and Somoure (2012) tested the relationship between Foreign Direct Investment (FDI) and welfare (poverty reduction) in Africa and concluded that FDI net inflows have a significantly positive relationship with poverty reduction but with significant differences among Africa's economic and geographic regions. In spite of the important insights from this study, it did not consider the crucial role played by inequality in poverty behaviours, which Fosu (2010) believes should not be glossed over. Also, it did not consider the importance of employment in their poverty model neither did it study Sub-Saharan Africa (SSA) as a bloc.

Consequently, this study seeks to find out which aspect of growth in the economy (employment and/or investment) influences social welfare in SSA. We achieve this objective by using a derived welfare model that builds on a proposed welfare function by Todaro and Smith (2012). In fact, the model allows for the simultaneous testing of the relationship between private investment, public investment and employment on welfare after controlling for inequality and poverty level.

4.2.0 Literature Review

Theoretically, Dollar and Kraay (2002) argue that 'growth is good for the poor' after finding from their study that growth in national income was associated with growth

in the income of the poor. But, on the grounds that poverty goes beyond income to include disempowerment and insecurity and also has other social and political causes, Dollar and Kraay's findings have been challenged by many (Gore, 2007). This extended definition of poverty reduction means that a comprehensive poverty reduction strategy ensures social welfare. It also explains why these two terms are sometimes used interchangeably (Gohou & Somoure, 2012) even though Todaro and Smith (2012) believe that poverty level as well as per capita income and inequality influences social welfare.

According to Gore (2007), a theory that enables a good explanation of pro-poor growth by allowing for the inclusion of policy variables that can be implemented to enhance poverty reduction (social welfare) is appropriate for such studies. The model used for this study, relies on the principles of neoclassical growth theory to factor in economic (investment and employment) and institutional (political stability) variables that can be manipulated to achieve social welfare. The basic neoclassical economic growth theory shows how a steady state economic growth can be achieved through a careful combination of the amounts of capital and labour, in the presence of technological change.

Empirically, economic growth could either reduce or increase poverty, especially in an economy where inequality exists. Fosu (2010) reports that even though economic growth is significant in poverty increases or decreases in developing countries, the crucial role played by inequality in poverty behaviours cannot be glossed over. He

further argues that relatively fairly distributed income could enhance the poverty reduction ability of economic growth in developing countries. In other words, not all growth benefit the poor (Son, 2004), especially in the presence of income inequality (Fosu, 2010). Wodon (2007) corroborate this position, with a study on West Africa, that economic growth reduces poverty especially when attention is given to inequality which restricts growth impact on poverty. Extreme income inequality leads to economic inefficiency, undermine social stability and solidarity and is generally considered unfair (Todaro & Smith, 2012). Thus, United Nations Commission on Trade and Development-UNCTAD (2011) advocates that new poverty reduction strategies could be sustained if they operate in an environment of rapid and sustained economic growth and job creation and according to Ravallion (2007) and Wodon (2007), with less inequality.

Adams (2004) advanced, after controlling for income inequality, that the definition of economic growth determines the extent to which economic growth reduces poverty in developing economies. He says that even though growth in per capita income does not significantly reduce poverty, growth in survey mean income (expenditure) does. According to Martins (2013) the impressive record of Africa's growth has not been gainful in terms of reducing poverty partly because sufficient productive employment has not been part of it. Thus, labour intensive economic growth can be an appropriate channel through which poor people in developing economies can get out of poverty (Adams, 2004 and Taylor, 2009). But Marx (2007) argues that the exceptional employment growth achieved by Netherland in the 1980s and 1990s only led to small

reductions in absolute poverty and a rise in relative poverty because of the nature of the economic and social policies pursued. His results imply that poverty reduction and relatively equitable distribution of income cannot be deemed to be natural consequences of employment growth if they are not backed by appropriate economic and social policies.

Using data from some selected African countries, Christiaensen, Demery and Paternostro (2003a) and Fosu (2008) explain that income poverty is not homogeneous among selected African countries and also conclude that economic growth in Africa in the 1990s was pro-poor even though aggregate figures showed that some groups and regions have been left behind (see also Christiaensen, Demery & Paternostro, 2003b) . Fosu (2008) concluded in a comparative study of SSAs and non-SSAs that initial inequality reduces the impact of economic growth on poverty reduction for both regions, even though it is less for SSAs.

Investment is shown to affect poverty reduction mainly through the economic growth channel (Borensztein, De Gregorio & Lee, 1998; Jalilian & Weiss, 2002; and Kalirajan & Singh, 2009). Yahie (2000) explains that the search for a holistic solution for economic growth and poverty reduction in Africa should not leave out the private sector. Private investment is not just the engine of growth but is also crucial for increasing the pace of growth and the pattern of growth necessary for poverty reduction and economic development (Organisation for Economic Co-operation and Development – OECD- 2006 and Harvey, 2008). In testing for this effect, empirically

in Africa, studies have linked FDI to poverty reduction through its ability to facilitate technological transfers which leads to economic growth. Also, the effect of corporate social responsibility activities like provision of water, electricity, good roads and scholarship schemes undertaken by foreign direct investors cannot be underestimated (Klein, Aaron, & Hadjimichael, 2001). They stress that potentially desirable effects of FDI such as financial stability, good corporate governance, contribution to tax revenue and enhancement in labour conditions enhance the quality of economic growth for poverty reduction. Recently, Ucal, (2014) concluded using data from selected developing countries and panel data methodology that FDI reduces poverty. In Tanzania, Fan, Nyamge & Rao (2005) reveal that public investment in agricultural research, roads and education reduce poverty, as in Asia. Anderson, de Renzio and Levy (2006) adds that evidence exist, in developing countries, that support the fact that public investment in transport and communication, irrigation and agricultural research and development help reduce poverty.

Gohou and Soumare (2012) assess whether FDI reduces poverty in Africa and whether there are regional differences in this relationship. They conclude that FDI inflows and poverty reduction are significantly positively related but with significant regional differences. They also reveal that the effect of FDI on poorer regions (like Central and East Africa) is bigger than richer regions (like North and South Africa). They based their study on the assumption of perfect positive correlation between economic growth and welfare: an assumption which has been questioned (Anand & Sen, 2000) especially in the presence of inequality (Ravallion, 1997; Ravallion, 2007;

and Fosu, 2008, 2010). Earlier, Cornell/ISSER/World Bank (2005) concluded that shared growth would help Africa meet its MDGs.

Pages and Shimeles (2014) decomposes output but into sectors, akin to that of MacMillan and Rodrik (2011), and tests for whether employment amplifies the effect of aid on poverty. They conclude that insufficient jobs in the economic growth of Africa are the main reason for the weak link between economic growth and poverty reduction.

Studies linking economic growth to poverty are prolific in literature, what is scarce is empirical knowledge of the aspect of economic growth that drives poverty when inequality is accounted for. Consequently, this study contributes to the discussion on the growth structure and pattern that best contributes to poverty reduction by finding out which aspect of growth in the economy (employment and/or investment) influences social welfare.

4.3.0 Methodology

4.3.1 Theoretical Justification of the Model

The growth-poverty-nexus has received some attention from researchers using several approaches. Son (2004) proposes ‘poverty growth curve’ to assess which economic growth benefit the poor. Ravallion and Chen (1997) builds a panel model from household survey data to assess how inequality and growth affect poverty, while Agénor et al., (2008) uses constant elasticity of demand approach to estimate a welfare function that factors in aid, public investment and poverty. This study,

though related to that of Agénor et al., (2008) in terms of model derivation, builds on a welfare function proposed by Todaro and Smith (2012). Todaro and Smith (2012) advance that poverty level as well as per capita income and inequality influences social welfare.

$$W = f(y, I, P) \quad (1)$$

where W is welfare, y is income per capita, I is inequality, and P is absolute poverty. The model predicts that while income has a positive relationship with welfare, inequality and absolute poverty would exhibit a negative relationship with welfare.

Assuming that the function in (1) takes the following functional form

$$W_{it} = y_{it} I_{it} P_{it} X_{it} e^{\varepsilon_{it}} \quad (2)$$

Where X_{it} is a set of other important variables that have the potential to influence welfare, $e^{\varepsilon_{it}}$ represents the error term and the other variables are as explained above.

We explain per capita income by using the standard aggregate production function (APF). The APF may allow for the inclusion of “unconventional inputs” like trade, political stability and agricultural productivity index in addition to “conventional inputs” like labour and capital, as used in neoclassical production function, when assessing their effects on economic growth (Feder, 1983; Herzer, Nowak-Lehmann & Siliverstovs, 2006; and Frimpong & Oteng-Abayie, 2006). Consider a Harrod-neutral (deemed to be consistent with the existence of steady state - Barro and Sala-i-Martin, 2004) two-factor Cobb-Douglas (1928) production function as follows:

$$Y_{it} = f(K, L) = K_{it}^{\alpha} (A_{it} L_{it})^{1-\alpha}, \quad 0 < \alpha < 1 \quad (3)$$

where K_{it} is physical capital stock, A_{it} is labour augmenting technological progress, L_{it} is raw labour stock and Y_{it} is aggregate production. i and t represent country and time respectively, while α and $1 - \alpha$ are the physical capital and labour elasticities respectively.

From equation (3), income per capita can be written as

$$Y_{it} / (A_{it} L_{it})^{1-\alpha} = K_{it}^{\alpha} / (A_{it} L_{it})^{1-\alpha} \quad (4)$$

$$y_{it} = k_{it}^{\alpha} \quad (5)$$

Because we are interested in the effect of private capital stock on welfare, we decompose total per capita stock into private and public per capita stock.

$$\text{Let } k_{it}^{\alpha} = k_{git}^{a\lambda} k_{pit}^{a\psi}, \quad \forall k_{git}^{a\lambda}, k_{pit}^{a\psi} > 0, \quad 0 < \alpha\lambda + \alpha\psi < 1 \quad (6)$$

where:

$k_{git}^{a\lambda}$ = is public capital stock per capita

$k_{pit}^{a\psi}$ = is private capital stock per capita

The evolution of the private and public capital stocks takes the following standard forms;

$$I_{pit} = (K_{pit} - K_{pit-1}) + \delta K_{pit-1} \quad (6A)$$

$$I_{git} = (K_{git} - K_{git-1}) + \delta K_{git-1} \quad (6B)$$

where I_{pit} and I_{git} are the per capita private and public investments, respectively; δ is the depreciation rate of investment, assumed to be the same for both private and public. As a result of the difficulty in getting depreciation rates for the countries in the study,

the study used an arbitrarily chosen value of 0 based on studies by Blejer and Khan (1984) and Ramirez (1994). Their studies show that sensitivity analysis using depreciation values between 0 and 5 show no significant differences in results for developing economies. Similar results were also reported by Erden and Holcombe (2005) and Muthali (2012).

When equation 6 is substituted in 5, it leads to

$$y_{it} = k_{it}^{a\lambda} k_{it}^{\alpha\psi} \quad (7)$$

$$W_{it} = k_{it}^{a\lambda} k_{it}^{\alpha\psi} I_{it}^{\phi} P_{it}^{\sigma} X_{it}^{\theta} e^{\varepsilon_{it}} \quad (8)$$

Other Welfare Determinants

Policies and institutional reforms play a major role to facilitate the achievement of economic development objectives like social welfare. In view of this, we control for political stability, trade openness (World Bank, 2000a, p. 48; Collier & Dollar 2001; UNCTAD, 2002; Wade, 2004; Sindzingre, 2005; Nissanke & Sindzingre, 2006; Basu, 2006; Nissanke & Theobcke, 2006 and; Gohou & Soumare, 2012). Gohou and Soumare (2012) controls for economic and policy variables (such as total debt ratio, government spending, trade openness, infrastructure, education and inflation), business environment and institutional quality (like rule of law, corruption and financial market development) and political risk. Also, Pelizzo and Stapenhurst (2013) argue that the benefits of governance, especially reduction in corruption, has a significant effect on the socio-economic development of a country (see also Salvatore, 2007; Minogue, 2008; and Canavesio, 2014).

Other studies reveal that the way to reduce poverty is by investing in agricultural water (world bank, 2008); simultaneously investing in agricultural water, education and markets (Hanjra, Ferede, & Gutta, 2009); ensuring research-led technological change in agriculture (Thirtle, Lin and Piesse, 2003); making aid responsive to policy improvements (Collier and Dollar, 2001; and Agénor, Bayraktar, & Aynaoui, 2008); fostering agricultural research Alene and Coulibaly (2009); deepening the financial sector (Odhiambo, 2009, 2010; Uddin, Shahbaz, Arouri, & Teulon, 2014); migration (Adams and Page, 2005; Ravallion and Chen, 2007 and; Ackah and Medvedev, 2010); ensuring agricultural productivity and growth (Kalirajan & Singh, 2009; and Minten & Barret, 2008)); giving attention to artisanal mining (Canavesio, 2014) and improving infrastructure (Kalirajan & Singh, 2009; and Afeikhena, 2011).

Thus, we explain the set of the other relevant factors that are likely to influence the state of social welfare of a developing economy like SSA to include employment, trade openness, political stability, agricultural productivity public health expenditure as shown below.

$$X_{it}^o = EMP_{it}^{o1} TOPEN_{it}^{o2} POL_{it}^{o3} API_{it}^{o4} PHE_{it}^{o5} \quad (9)$$

Where *EMP* is employment, *TOPEN* is trade openness, *POL* is political stability, *API* is agricultural productivity index and *PHE* is public health expenditure.

We then substitute equation (9) in (8)

$$W_{it} = k_{it}^{a\lambda} k_{it}^{a\psi} I_{it}^{\varphi} P_{it}^{\sigma} EMP_{it}^{o1} TOPEN_{it}^{o2} POL_{it}^{o3} API_{it}^{o4} PHE_{it}^{o5} e^{\varepsilon_{it}} \quad (10)$$

When the logarithm of equation (10) is taken, it leads to

$$\begin{aligned} \ln W_{it} = & \alpha\lambda \ln k_{git} + \alpha\psi k_{pit} + \varphi \ln I_{it} + \sigma \ln P_{it} + o1 \ln EMP_{it} \\ & + o2 \ln TOPEN_{it} + o3 \ln POL_{it} + o4 \ln API_{it} + o5 \ln PHE_{it} + \varepsilon_{it} \end{aligned} \quad (11)$$

Equation 11 can also be re-written as

$$\begin{aligned} \ln W_{it} = & \beta_0 \ln k_{git} + \beta_1 \ln k_{pit} + \beta_2 \ln I_{it} + \beta_3 \ln P_{it} + \beta_4 \ln EMP_{it} + \\ & \beta_5 \ln TOPEN_{it} + \beta_6 \ln POL_{it} + \beta_7 \ln API_{it} + \beta_8 \ln PHE_{it} + \varepsilon_{it} \end{aligned} \quad (12)$$

where $\alpha\lambda = \beta_0$, $\alpha\psi = \beta_1$, $\varphi = \beta_2$, $\delta = \beta_3$, $(o1) = \beta_4$, $(o2) = \beta_5$,

$(o3) = \beta_6$, $(o4) = \beta_7$ and $(o5) = \beta_8$

Effecting the change in equation (12) leads to:

$$\begin{aligned} \Delta \ln W_{it} = & \beta_0 \Delta \ln k_{git} + \beta_1 \Delta \ln k_{pit} + \beta_2 \Delta \ln I_{it} + \beta_3 \Delta \ln P_{it} + \beta_4 \Delta \ln EMP_{it} + \\ & \beta_5 \Delta \ln TOPEN_{it} + \beta_6 \Delta \ln POL_{it} + \beta_7 \Delta \ln API_{it} + \beta_8 \Delta \ln PHE_{it} + \varepsilon_{it} \end{aligned} \quad (13)$$

Where Δ is the difference operator. Equation (13) says that changes in welfare are influenced by public investment, private investment, inequality and absolute poverty after controlling for employment, political instability, trade openness, productivity of the agricultural sector and public health expenditure.

4.3.2 Panel Data Methodology

The study used unbalanced data from 42 SSAs over a ten-year period (2000-2009). It excludes Zimbabwe, Somalia, Mauritius, Eritrea, Equatoria Guinea and South Sudan based on unavailability of data. The World Bank data on Africa's Development Indicators provide data on two key variables for measuring human development, Ibrahim index of human development (HD) and the United Nations Development Programme's (UNDP) human development index (HDI). The former (HD) was used

as welfare variable in this study because of its consistent availability for most SSAs from 1990 to 2009, even though the later has gained popularity in recent times. Other studies used per capita income (Buss, 2010; Soumare & Gohou, 2012) household expenditures (Milcher, 2006) and human development index by UNDP (HDI, Soumare & Gohou, 2012) as proxies for social welfare or poverty reduction. The HD is based on two indicators; (a) Health and Welfare and (b) education. All data was taken from the World Bank, except trade openness from UNCTAD and political stability index (POL) from Henisz (2010).

The study used panel data methodology within the random effects framework for the analysis. The panel model estimated factors in the assumption that investments may have delayed effects on welfare and thus uses one year lags of the investment variables. All the variables are presented in the natural log form except agricultural productivity and political stability indexes. The estimated panel model is as follows:

$$\begin{aligned} \ln HD_{it} = & \beta_0 \ln GPINV_{it-1} + \beta_1 \ln PRINV_{it-1} + \beta_2 \ln EMPTOT_{it} + \beta_3 \ln INE_{it} + \beta_4 \ln POV_{it} + \\ & \beta_5 \ln TOPEN_{it} + \beta_6 \ln API_{it} + \beta_7 \ln POL_{it} + \beta_8 \ln PHE_{it} + \mu_i + \lambda_t + v_{it} \end{aligned}$$

(14)

The variables have been explained in Table 4.1 below.

Table 4.1: Variable names, measurement and expected signs

Variables	Measurement	Expected Sign
HD_{it}	Is the welfare of country i at time t . HD is Ibrahim index of human development reported by the World Bank.	
$GPINVPC_{it}$	Gross Public Investment = Gross public investment (see definition below) scaled by population. Public sectors' gross domestic fixed investment (gross fixed capital formation) comprises all additions to the stocks of fixed assets (purchases and own-account capital formation), less any sales of second-hand and scrapped fixed assets measured at constant prices, done by government units and non-financial public enterprises. Most outlays by government on military equipment are excluded. It is calculated for country i in time t ;	Positive
$PRINVPC_{it}$	Private Investment per capita = Gross Fixed Capital Formation by the Private Sector scaled by population of country i in time t . Private investment covers gross outlays by the private sector (including private non-	Positive

profit agencies) on additions to its fixed domestic assets.

<i>EMPTOT_{it}</i>	Total Employment = Total Employment to Total Population ratio is the proportion of a country's population that is employed. Ages 15 and older are generally considered the working-age population. This is calculated for country <i>i</i> in time <i>t</i> ;	Positive
<i>INE_{it}</i>	Inequality is measured using the Gini index. Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality. This is calculated for country <i>i</i> in time <i>t</i> ;	Negative
<i>POV_{it}</i>	Poverty Measure: Measured as population below \$1.25 a day. It is the percentage of the population living on less than \$1.25 a day at 2005 international prices. This is calculated for country <i>i</i> in time <i>t</i> ;	Negative
<i>TOPEN_{it}</i>	Trade openness = This shows exports, imports and sum/average of exports and imports of goods and services as percentage of nominal gross domestic product (GDP) for country <i>i</i> in time <i>t</i> . The data is taken from	Positive

UNCTAD Database

API_{it} Agriculture Production Index = Positive

The FAO indices of agricultural production show the relative level of the aggregate volume of agricultural production for each year in comparison with the base period 1999-2001. They are based on the sum of price-weighted quantities of different agricultural commodities produced after deductions of quantities used as seed and feed weighted in a similar manner. The resulting aggregate represents, therefore, disposable production for any use except as seed and feed. This is calculated for country *i* in time *t*;

PHEGDP_{it} Public health expenditure consists of recurrent Positive

and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds. This is scaled by GDP and calculated for country *i*

in time t ;

μ_i, λ_t, v_{it} Are the country specific, time specific and white noise variables, respectively

From equation 12, the subscript i denotes SSA countries in the study (equal to 1.....42), and t represents the time-series dimension (1 to 10 years) β s represent the coefficients to be estimated. The rest of the variables are as explained in Table 1. The model is deemed to be fixed effect if μ_i and λ_t denote fixed parameters to be estimated. But if μ_i and λ_t are random variables with zero means and constant variances σ_μ^2 and σ_λ^2 and also based on the assumption that the two error components are independent from each other (Baltagi, 2005 and Hsiao, 2003) then the model is a random effects model.

The fixed effect model assumes that only one true effect size underlies all the studies in the specified area as against the random effects model that assumes that the true effects may change from study to study (Borenstein, Hedges, Higgins, & Rothstein, 2009). Intuitively, the fixed effect assumption implies that virtually all relevant variables and data are factored in the analysis of the model while the random effects model implies that this is not the case and that studies are likely not to be the same because of the different kinds of variables used, their mixes and other interventions. Thus, theoretically, if the population is used for the study, the fixed effect would be preferred to the random effects model while the random effects model should be preferred when a sample is used.

According to Clark and Linzer (2012) the choice between fixed and random should be based on the researcher's preference in the trade-off between bias and variance in the estimates generated under each model. Even though the fixed effect model produces unbiased estimates, the probability that the estimates would differ from sample to sample is high especially when there are few observations per unit or the changes in the independent variable is not as large as the changes in the dependent variable. On the contrary, the random effects model would reduce the variance in the estimates but, in most cases, introduce bias. Normally, to deal with this bias, the random effects model assumes that there is no correlation between the independent variable and the unobserved variables (as captured in the intercept).

In addition, the size and characteristics of the available dataset can influence the quality of inferences made on the estimates. The nature of the data used for the study means that theoretically, the random effects model should be preferred. Data in SSA are purely unbalanced especially that of measures for inequality (like GINI Index) and poverty (poverty head count ratio). Also, the study excluded six countries from the analysis because they did not have enough data. Finally, the choice of random effects model was settled on because the Hausman (1978) specification test preferred the random model to the fixed model. In the Hausman test the null hypothesis is that the preferred model is random-effects. In other words, the unique errors (u_i) are not correlated with the regressors (Greene, 2008). The Hausman test subjects this assumption underlying the random effects model to examination to detect if there are violations. If there are no violations in this assumption then the coefficient estimates

of the model under the random effects model ($\hat{\beta}_{RE}$) should not deviate significantly from that of the fixed effects model ($\hat{\beta}_{FE}$). The following equation is used for the Hausman (1978) test.

$$H = (\hat{\beta}_{RE} - \hat{\beta}_{FE})' \left[\text{Var}(\hat{\beta}_{FE}) - \text{Var}(\hat{\beta}_{RE}) \right]^{-1} (\hat{\beta}_{RE} - \hat{\beta}_{FE}). \quad (15)$$

Where H is the Hausman test statistic and is also the distributed chi-square with degrees of freedom equal to the number of regressors in the model. This is used to test the null hypothesis of orthogonality. If the probability value is less than 0.05, we reject the null hypothesis and conclude that the two coefficients are different enough. This implies that the fixed effect model is preferred to the random effects model. This notwithstanding, failure to reject the null hypothesis in the Hausman test does not imply that there is no bias in the random effects model (Clark & Linzer, 2012). Thus, the random effects model was used because it addresses the problems of variable omission bias and the use of unbalanced panels with unequally spaced data, which is the case with the SSA data used for the study (Baltagi, 2005; and Asiedu, 2004). Also, the Hausman (1978) test preferred the random effects estimation.

4.4.0 Discussion of Empirical Results

4.4.1 Descriptive Statistics

Table 4.2A and 4.2B gives the descriptive statistics of the variables used in the study. The statistics indicate that average welfare level in SSA is 49.59 with wide disparities. The minimum level of welfare of 22.93 (in 2003) was recorded by Chad

whiles the maximum level of 89.44 (in 2008) was made by Seychelles. Also, 18 countries out of the sample could not achieve the average level of development recorded and most (11) of these countries are in West Africa. In SSA, total employment stands at about 65%, over the study period. Mauritania (in 2000) recorded the least level of employment while the highest level was achieved by Rwanda (in 2000). Fifteen (15) countries had their employment levels below the average, with virtually half of them in West Africa. Investment on the continent was dominated by the private sector. Private sector investment averaged at about 13% of GDP while that of public sector was about 7%. Once again, the disparities were wide even though the number of countries (10) that could not achieve an above average investment by private sector was higher than that of public investment (4). The bigger size of the per capita private investment over public investment also confirms the dominance of private investment over public investment in SSA. Also, countries over the study period, spent on average, 3% of their GDP on public health. Meanwhile, eight of the below average private investment countries also fell below the average human development level. In all, Cote d'Ivoire's performance fell short of the average investment, employment and human development indicators for the sample.

Table 4.2A: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	max
HD	420	49.5915	13.6481	22.9276	89.4437
PINV	376	6.897715	3.549085	0.106569	25.0075
PINVPC	363	17227.72	2904.25	14.7296	209405.8
PRINV	375	12.84296	7.073195	-2.64039	52.1407
PRINVPC	362	48138.83	114946.1	-224.7604	888314.1
EMPTOT	390	64.34538	12.40506	33.6	85.4
INE	63	44.98873	8.571104	29.83	67.4
POV	62	47.30113	21.54817	0.25	87.72
TOPEN	386	33.41574	21.12421	4.37152	131.006
API	420	96.59095	12.47474	52.11	148.14
PHE	420	2.649261	1.27104	0.1463853	7.633346

Table 4.2B: Regional Distribution of Countries with below average Performance

REGION	HD	EMPTOT	PRINV	PINV
West Africa	11	7	3	3
Southern Africa	2	5	1	0
Eastern Africa	2	2	4	1
Central Africa	3	1	2	0
TOTALS	18	15	10	4

4.4.2 Multicollinearity Test

The results of the pairwise correlations (Table 4.3B) among the various variables indicate a moderate association among the regressors. The results of the variance inflation factor (VIF) analysis, as reported in Table 4.3A and based on the general rule of thumb of 5, supports this position with an overall mean of 2.44.

The correlation matrix also indicates a significantly positive association between social welfare on one hand and inequality, trade openness and productivity of the agric sector and public health spending. Meanwhile, poverty level and employment have a negative and significant association with social welfare.

Table 4.3A: Variance Inflation factor Analysis

Model		
Variable	VIF	1/VIF
LNPRINVPC _{t-1}	5.75	0.175913
LNPINVPC _{t-1}	5.57	0.179634
LNPOV	1.58	0.632484
LNEMPTOT	1.54	0.650745
LNTOPEN	1.49	0.669236
LNPHEGDP	1.39	0.716917
LNINE	1.10	0.912746
LNAPI	1.07	0.931524
Mean VIF	2.44	

Table 4.3B: Correlation Matrix

	LNHD	LNGPINV _{t-1}	LNPRINV _{t-1}	LNEMPTOT	LNINE	LNPOV	LNTOPEN	LNAPI	LNPHEGDP
LNHD	1.000								
LNGPINV_{t-1}	-0.0455	1.000							
LNPRINV_{t-1}	-0.0120	0.909***	1.000						
LNEMPTOT	-0.284***	0.1219**	0.0696	1.000					
LNINE	0.4623***	0.0382	0.0545	-0.2951**	1.000				
LNPOV	-0.499***	-0.2629*	-0.2363**	0.4821***	-0.270**	1.000			
LNTOPEN	0.2510***	-0.1070*	0.0145	-0.4544***	0.2249*	-0.371***	1.000		
LNAPI	0.2269***	0.1307***	0.1591***	-0.0031	0.0139	-0.0917	0.1582***	1.000	
LNPHEGDP	0.4744***	-0.1597***	-0.2421***	0.0859*	0.1347	0.0997	0.0026	0.1613***	1.000

*** = 1%, ** =5% and * = 10%

4.4.3 Discussion of Regression Results

The main thrust of this study was to find out the relationship between private investment per capita, employment and social welfare. Based on the results from the Hausman test, as shown in Table 4.4, the random effects model was used for the analysis. The results indicate that private investment per capita, public health expenditure and productivity of the agric sector have a significantly positive relationship with social welfare (human development). On the contrary, public investment per capita, poverty level, and inequality have a significantly negative relationship with social welfare.

The results indicate that private investment per capita helps improve on human development through the direct channel of engaging in numerous corporate social responsibility activities and the indirect channel of offering employment, paying taxes to government and spillovers. Most private investors engage in other non core activities like the construction of schools, hospitals, roads and portable water to communities in which they operate. These actions help to improve on the living standards of the communities in which they operate. Also, investment in most non-governmental organisations (NGOs) has the primary aim of reducing poverty in deprived communities by empowering the citizenry and ensuring quality community health. Moreover, private investors compliment government efforts in the provision of employment and also provide financial resources to government through the payment of taxes and other levies to help fund government's social intervention programmes. Thus, the results indicate that these efforts are a source of significant

improvement to the level of human development in SSA as was found in similar studies by Klein et al., 2001, Yahie, 2000 and Gohou & Soumare, 2012). Specifically, a 1 percent increase in per capita private investment results in a 0.039 percent increase in welfare, at the conventional 1% significant level.

Table 4.4: Regression Results - Dependent Variable HD

Variables	MODEL 1
LN _{GP} IN _{VPC} _{t-1}	-0.0736562*** (0.0197175)
LN _{PR} IN _{VPC} _{t-1}	0.0386506*** (0.0105465)
LNEMPTOT	-0.2481134 (0.2155576)
LNINE	-0.1020429** (0.533996)
LNPOV	-0.2717055*** (0.0596275)
LNTOPEN	0.0058365 (0.0295626)
LNAPI	0.1656339*** (0.0541113)
LNPHEGDP	0.0776032** (0.0345295)

R-sq	0.9545
Wald Chi2(8)	126.14
Prob.	0.0000
Hausman Chi2 (8)	7.35
Prob.	0.4992
Breusch Pagan Test:	
Chi2	15.20
Prob.	0.000

*** = 1%, ** =5% and * = 10%

Source: Author's computation from data taken from World Bank (2012)

Also, public spending geared towards improving health facilities or defraying recurrent health cost is another sure way of lifting SSA to higher social developmental level. Governments in SSA should, therefore, prioritize their developmental agenda and devote much attention to areas where developments are needed most. It is obvious that if the region targets solving its health and education problems and commits the needed resources to it, it would be able to achieve the global developmental agenda such as the MDGs. The region can record significant improvement in health education and social inclusion if it works assiduously towards that through cost saving, reducing corruption and securing the commitment of competent leaders. The source of funding these health expenditures appears not to be of essence. Funding of these important social developmental expenditures form

central or local government, development agencies or NGOs or even through borrowing still facilitate social development.

Surprisingly per capita public investment exhibits a significantly negative relationship with welfare. By measuring public investment as per capita we are assessing the benefit of public investment to a citizen in terms of social welfare improvement. Thus, the results though counter-intuitive offer some insight. First of all, because of the poor state of the existing public facilities, they are less beneficial to the citizens, in terms of social welfare improvements. In other words, provision of inferior goods and services by the state may worsen the social welfare of the citizens. It is also possible that inequality in public infrastructure which may be fuelled by corruption could thwart the social welfare implications of public investment. In other words, where social interventions do not go to the needy, it affects social welfare in SSA. Thus, the size of government investment per person is woefully inadequate- as reflected by the fact that public investment per capita is about 2.79 times lower than private investment per capita- to meet the social needs of the individual citizens in SSA. Also, in a capitalist economy, the development of the citizens mostly is in their own hands and so reduces the citizens' reliance on public investment. In effect the results reinforce the need for SSA to not only bridge the huge infrastructural deficit but also ensure the proper functioning and equitable distribution of existing facilities. Improvement in agricultural sector productivity is a major source of welfare improvement. The agric sector is a major source of employment for the people of SSA so any effort that improves the sector does not only enhance employment but

also offers other employment-linked benefits like social welfare (poverty reduction) through economic empowerment.

The results also offer support for the expectations of Todaro and Smith (2012) that poverty and inequality are harmful to social development. Poor people lack basic needs like food clothing, shelter, access to good health care and social pride. This is partially as a result of their inability to generate enough resources to meet these basic needs of life. When people live on less than \$1.25 cents a day, it is hard to imagine how that sum would be shared among the basic necessities of life, in a region that seems to lack even the basic things they produce themselves and are expected to have in abundance. The results further state that this condition is aggravated when the little wealth that exists in the SSA sub-region is concentrated among the few. Generally, rich people are attracted by things that do not lead to the benefit of the majority of the citizenry like buying expensive personal effects, going on luxurious holidays acquiring huge mansions and keeping their monies in safe havens abroad. Also, the rich save a smaller portion of their marginal income invested. Inequality may lead to inefficient allocation of assets such as emphasising on higher education at the expense of quality universal basic education (Todaro & Smith, 2012).

4.5.0 Conclusion

The study analyses the relationship between private investment, employment and welfare in SSA using panel data from 42 countries over a 10-year period, within the random effects framework. We estimate a derived model, based on a proposed

function by Todaro and Smith (2012), which allows for the inclusion of inequality, poverty level, trade openness, agric sector productivity and public health expenditure. The results show that private investment per capita, public health expenditure and productivity of the agric sector have a significantly positive relationship with social welfare (human development). On the contrary, public investment per capita, poverty, and inequality have a significantly negative relationship with social welfare.

In all, the results offer partial support for the growth-poverty-nexus by showing that while growth component like private per capita investment facilitates social welfare, public per capita investment reduces social welfare because it is probably inefficient or insufficient. The result from employment is inconclusive. Consequently, SSA countries should intensify policies aimed at attracting and maintaining private investment per capita, improve on the level of public investment per capita. Also improvement in agricultural sector productivity, reduction in poverty levels and enduring equitable distribution of the limited national income are also appropriate conduits for enhancing social welfare development in the sub-region. Specifically, SSA countries should target reducing cost of doing business through measures like keeping the policy rate low to motivate manufacturing, agricultural and other sectors that have linkages with the entire economy and encourage private investors to employ more through tax incentives linked to employment.

References to Chapter Four

- Ackah, C. & Medvedev, D. (2010). *Internal migration in Ghana; Determinants and welfare impacts* (WPS5273). Policy Research Working Paper, The World Bank Africa Region, West Africa Poverty Reduction and Economic Management Unit.
- Adams Jr., Richard H., & Page, J. (2005). Do international migration and remittances reduce poverty in Developing Countries? *World Development*, 33(10), 1645–1669.
- Adams, R. Jr. (2004). Economic growth, inequality and poverty: Estimating the growth elasticity of poverty. *World Development*, 32(12), 1989–2014. doi:10.1016/j.worlddev.2004.08.006.
- Afeikhen, J (2011). Infrastructure, economic growth and poverty reduction in Africa. *Journal of Infrastructure Development*. 3(2) 127–151. doi: 10.1177/097493061100300203.
- Agénor P. R., Bayraktar, N., & Aynaoui K. E. (2008). Roads out of poverty? Assessing the links between aid, public investment, growth, and poverty reduction. *Journal of Development Economics*, 86, 277–295.
- Alene, A. D. & Coulibaly, O. (2009). The impact of agricultural research on productivity and poverty in sub-Saharan Africa. *Food Policy*, 34, 198–209.
- Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2010). Does foreign direct investment promote growth? Exploring the role of financial markets on linkages. *Journal of Development Economics*, 91(2), 242–256.

- Anderson, E., de Renzio P. & Levy, S. (2006). *The Role of Public Investment in Poverty Reduction: Theories, Evidence and Methods* (263). ODI Working Paper, 263.
- Anand, S. & Sen, A. (2000). Human Development and Economic Sustainability. *World Development* , 28(12), 2029-2049.
- Apergis, N., Lyroudia, K., & Vamvakidis, A. (2008). The relationship between foreign direct investment and economic growth: Evidence from transitional countries. *Transition Studies Review*, 15(1), 37–51.
- Asiedu, E. (2004). The Determinants of Employment of Affiliates of US Multinational Enterprises in Africa. *Development Policy Review*, 22(4), 371-379.
- Baltagi, B. H. (2005). *Econometric analysis of panel data*. John Wiley & Sons, Ltd.
- Basu, K. (2006). Globalization, poverty, and inequality: What is the relationship? What Can be done? *World Development*, 34(8), 1361–1373. doi:10.1016/j.worlddev.2005.10.009.
- Bigsten, A. & Shimeles, A. (2007). Can Africa Reduce Poverty by half by 2015? *Development Policy Review*, 25(2), 147-166. DOI: 10.1111/j.14677679.2007.00364.x
- Bøås, M. and McNeill, D. (2003). *Multilateral institutions: A critical introduction*. pp. 47 and 71–2.
- Borenstein, M., Hedges, L. V., Higgins, J. P. T. & Rothstein, H. R. (2009). *Introduction to meta-analysis*. John Wiley & Sons, Ltd.

- Borensztein, E., De Gregorio, J. & Lee, J-W (1998) How does foreign direct investment affect economic growth? *Journal of International Economics*, 45, 115–135.
- Buss, J. A. (2010). Have the Poor Gotten Poorer?: The American Experience from 1987 to 2007. *Journal of Poverty*, 14(2), 183-196. doi: 10.1080/10875541003711813.
- Cammack, P. (2004). What the World Bank means by poverty reduction, and why it matters. *New Political Economy*, 9(2), 189-211.
- Canavesio, R. (2014). Formal mining investments and artisanal mining in southern Madagascar: Effects of spontaneous reactions and adjustment policies on poverty alleviation. *Land Use Policy*, 36, 145–154. <http://dx.doi.org/10.1016/j.landusepol.2013.08.001>
- Christiaensen, L., Demery, L. & Paternostro, S. (2003a). Macro and micro perspectives of growth and overtly in Africa. *The World Bank Economic Review*, 17(3), 317-347. doi: 10.1093/wber/Ihg025
- Christiaensen, L., Demery, L. & Paternostro, S. (2003b). *Reforms, remoteness and risk in Africa: Understanding inequality and poverty during the 1990s* (No. 2003/70). WIDER Discussion Papers // World Institute for Development Economics (UNU-WIDER).
- Collier, P. & Dollar, D. (2002) Aid allocation and poverty reduction. *European Economic Review*, 46, 1475–1500.

- Collier, P. & Dollar, D. (2001). Can the world cut poverty by half? How Policy Reforms and Effective Aid Can Meet International Development Goals. *World Development*, 29 (11), 1787-1802.
- Cornell/ISSER/World Bank (2005) *International Conference on Shared Growth in Africa*. Held in Accra, Ghana, on July 21-22, 2005.
- Dollar, D. & Kraay A. (2002). Growth is Good for the Poor. *Journal of Economic Growth*, 7(3), 195–225. <http://ideas.repec.org/a/kap/jecgro/v7y2002i3p195-225.html>.
- Donaldson, J. A. (2008). Growth is Good for Whom, When, How? Economic Growth and Poverty Reduction in Exceptional Cases. *World Development*, 36(11), 2127–2143.
- Fan, S., Nyange D. & Rao, N. (2005). *Public Investment and Poverty Reduction in Tanzania: evidence from Household Survey Data* (No. 18). DSDG Discussion Paper, Development and Strategy and Governance Division, International Food Policy Research Institute.
- Feder, G. (1983). On exports and economic growth. *Journal of Development Economics*, 12, 59-73.
- Fosu, A. K. (2008). *Inequality and the impact of growth on poverty: Comparative evidence for Sub-Saharan Africa* (No.2008.107). Research paper / UNU-WIDER.
- Fosu, A. K. (2010). Does inequality constrain poverty reduction programs? Evidence from Africa. *Journal of Policy Modeling*, 32, 818–827. <http://dx.doi.org/10.1016/j.jpolmod.2010.08.007>.

- Fosu, A. K. (2014). *Growth, Inequality, and Poverty in Sub-Saharan Africa: Recent Progress in a Global Context* (WPS/2014-17). Centre for the Study of African Economies (CSAE) Working Paper.
- Frimpong, J. M. and Oteng-Abayie, E. F. (2006). Bounds testing approach to cointegration: An examination of foreign direct investment, trade and growth Relationships. *American Journal of Applied Sciences*, 3(11), 2079-2085.
- Gore, C. (2007). Which growth theory is good for the poor? *The European Journal of Development Research*. 19(1), 30–48. doi: 10.1080/09578810601144269.
- Hanjra, M. A., Ferede, T. & Gutta, D. G. (2009). Pathways to breaking the poverty trap in Ethiopia: Investments in agricultural water, education, and markets. *Agricultural Water Management*, 96, 1596–1604.
- Harvey, P. (2008). Poverty Reduction Strategies: opportunities and threats for sustainable rural water services in sub-Saharan Africa. *Progress in Development Studies*. 8(1), 115–128.
- Hausman, J. A. 1978. Specification tests in econometrics. *Econometrica*, 46, 1251–1271. Hennisz, W. J. (2010). *POLCON 2010 codebook*. Manuscript, University of Pennsylvania.
- Herzer, D., Nowak-Lehmann, D.F. & Siliverstovs, B.(2006). Export-led growth in Chile: Assessing the role of export composition in productivity growth. *The Developing Economy*, 44 (3), 306-328.
<http://ideas.repec.org/a/eee/ecolet/v82y2004i3p307-314.html>

- Hsiao, C. (2003), *Analysis of Panel Data*, (2nd ed.) Econometric Society Monograph 36, New York: Cambridge University Press.
- Jalilian, H. & Weiss, J. (2002). Foreign direct investment and poverty in the ASEAN Region. *ASEAN Economic Bulletin*, 19(3), 231-253.
- Kalirajan, K. & Singh, K. (2009). The pace of poverty reduction across the globe: An exploratory analysis. *International Journal of Social Economics*, 36(6), 692-705. doi: 10.1108/03068290910956921.
- Kalwij, A. & Verschoor, A. (2007). Not by growth alone: The role of the distribution of income in regional diversity in poverty reduction. *European Economic Review*, 51, 805–829.
- Klein, M., Aaron, C. & Hadjimichael, B. (2001), *Foreign Direct Investment and Poverty Reduction*. Paper presented at the OECD Conference on New Horizons and Policy Challenges for Foreign Direct Investment in the 21st Century, 26–27 November (Mexico City).
- Kozak R., S., Lombe, M. & Miller, K. (2012). Global Poverty and Hunger: An Assessment of Millennium Development Goal #1. *Journal of Poverty*, 16(4), 469-485. doi: 10.1080/10875549.2012.720661
- Martins, P. (2013). *Growth, Employment and Poverty in Africa: Tales of Lions and Cheetahs*. Background Paper prepared for the World Development Report.
- Marx, I. (2007). The Dutch ‘Miracle’ revisited: The impact of employment growth on poverty. *Journal of Social Policy*, 36, 383-397. doi:10.1017/S0047279407001092

- McMillan, M., & Rodrik, D. (2011). *Globalization, structural change and productivity growth* (No. 17/143). NBER Working Paper. Cambridge: National Bureau of Economic Research.
- Milcher, S. (2006). Poverty and the determinants of welfare for Roma and other vulnerable groups in Southeastern Europe. *Comparative Economic Studies*, 48, 20-35. doi:10.1057/palgrave.ces.8100148
- Minogue, M. (2008). What connects regulatory governance to poverty? *The Quarterly Review of Economics and Finance*, 48, 189–201.
- Minten, B. & Barrett, C. B. (2008). Agricultural technology, productivity, and poverty in Madagascar". *World Development*, 36(5), 797–822. doi:10.1016/j.worlddev.2007.05.004
- Nguyen, C., Linh, V & Nguyen T. (2013). Urban poverty in Vietnam: Determinants and policy implications. *International Journal of Development Issues*, 12(2), 110-139. doi: 10.1108/IJDI-08-2012-0049
- Nissanke, M. and Thorbecke, E. (2006). Channels and policy debate in the globalization–inequality–poverty nexus. *World Development*, 34(8), 1338–1360, doi:10.1016/j.worlddev.2005.10.008
- Nissanke, M. & Sindzingre, A. (2006). *Institutional foundations for shared growth in Sub-Saharan Africa*. Journal Compilation African Development Bank. 353-391 Blackwell Publishing Ltd, Oxford.
- Odhiambo, N. M. (2009). Finance-Growth-Poverty nexus in South Africa: A dynamic causality linkage. *The Journal of Socio-Economics*, 38, 320–325.

- Odhiambo, N. M. (2010). Financial deepening and poverty reduction in Zambia: an empirical investigation. *International Journal of Social Economics*, 37(1), 41-53. doi: 10.1108/03068291011006166
- OECD (2006). *Promoting pro-poor growth: Private sector development*. An extract from the publication *Promoting Pro-Poor Growth: Policy Guidance for Donors*.
- Page, J. & Shimeles, A. (2014). *Aid, employment, and poverty reduction in Africa* (No. 2014/043). WIDER Working Paper.
- Peet, R. (2003). *Unholy Trinity: The IMF, World Bank and WTO*, 200, 222–3.
- Pelizzo, R. & Stapenhurst, F. (2013). The dividends of good governance. *Poverty and Public Policy*, 5(4), 370-384.
- Pfeffermann, G. (2001). Poverty Reduction in Developing Countries: the role of the Private Sector. *Finance and Development*, A quarterly magazine of the IMF. 38 (2).
- Ravallion, M. (1997). Can high-inequality developing countries escape poverty? *Economics Letters*. 56, 51-57.
- Ravallion, M. (2007). *Economic growth and poverty reduction: Do poor countries need to worry about inequality?* 2020 focus brief on the world's poor and hungry people. Washington, DC: International Food Policy Research Institute.
- Ravallion, M., & Chen. S. (2007). China's (Uneven) Progress against Poverty. *Journal of Development Economics*, 82(1), 1-42.

- Ravallion, M. & Chen, S. (1997). What can new survey data tell us about recent changes in Distribution and Poverty. *World Bank Economic Review*. 11(2), 357-382.
- Ravallion, M. (2001). Growth, Inequality and Poverty: Looking Beyond Averages. *World Development*, 29(11), 1803 – 1815.
- Salvatore, D. (2007). Growth, international inequalities, and poverty in a globalizing world. *Journal of Policy Modeling*, 29, 635–641.
- Sindzingre, A. (2005). *Explaining threshold effects on globalization on poverty: An institutional perspective* (No. 2005/53). WIDER Research Paper. Helsinki: UNU-WIDER.
- Taylor, L. (2009). *Growth, development policy, job creation and poverty reduction* (No. 90ST/ESA/2009/DWP/90). DESA Working Paper
- Thirtle, C., Lin L. & Piesse, J. (2003) The Impact of Research-Led Agricultural Productivity Growth on Poverty Reduction in Africa, Asia and Latin America. *World Development*, 31(12), 1959–1975.
doi:10.1016/j.worlddev.2003.07.001
- Thurlow, J. & Wobst, P. (2006). Not all growth is equally good for the poor: The case of Zambia.” *Journal of African Economies*, 15(4), 603–625.
doi:10.1093/jae/ejk012
- Todaro, M. P. & Smith, S. C. (2012). *Economic Development*, 11th ed. Pearson.
- Ucal, M. S. (2014). Panel data analysis of foreign direct investment and poverty from the perspective of Developing Countries. *Procedia - Social and Behavioral Sciences*, 109, 1101 – 1105.

- Uddin G. S., Shahbaz, M., Arouri M., & Teulon, F. (2014). Financial development and poverty reduction nexus: A cointegration and causality analysis in Bangladesh. *Economic Modelling*, 36, 405–412.
- UNCTAD (2002). *Economic Development in Africa From Adjustment to Poverty Reduction: What is New?* UNCTAD/GDS/AFRICA/2.
- UNCTAD (2011). *Development of productive capacities and trade: the key to inclusive and sustainable growth*. Fourth United Nations Conference on the Least Developed Countries (LDC-IV) Special Event of the UN-CEB Cluster on Trade and Productive Capacity held at Istanbul on 9 May 2011. UNCTAD/TC/2011/1
- Wade, R. H. (2004). On the causes of increasing world poverty and inequality, or why the Matthew effect prevails. *New Political Economy*, 9(2), 163-188. doi: 10.1080/1356346042000218050
- Wodon, Q. (2007). *Growth and poverty reduction in West Africa: A brief overview* (No. 11086). MPRA Paper. <http://mpa.ub.uni-muenchen.de/11086/>
- World Bank (2000). *Can Africa Claim the 21st Century?* Washington, DC.
- World Bank (2014). *Prosperity for all-ending extreme poverty*. A note for the World Bank Group spring meetings.
- World Bank (2008). *Investment in agricultural water for poverty reduction and economic growth in Sub-Saharan Africa*. Synthesis Report A collaborative programme of the AFDB, FAO, IFAD, IWMI and the World Bank.

Yahie, A. M. (2000). *Poverty reduction in sub-Saharan Africa: Is there a role for the private sector?* (No. 52). African Development Bank Economic Research Papers.

Appendices to Chapter Four

Appendix 4.1: Historical Poverty Record (Headcount Ratio, %): Sub-Saharan

Africa (SSA) vs. South Asia (SAS)

A. \$1.25 Standard

	1981	1996	2005	2010
SSA	51.5	58.1	52.3	48.5
SAS	61.1	48.6	39.4	31.0

B. \$2.50 Standard

	1981	1996	2005	2010
SSA	79.5	84.0	81.6	78.1
SAS	92.9	89.1	84.0	79.5

Source: World Bank (2014) as adopted from Fosu (2014)

Appendix 4.2: Human Development Performance of Countries in the Study

COUNTRY	OPENING	CLOSING	%	RANKING –	RANKING -
	HD -2000	HD -2010	CHANGE	BASED ON 2010 HD	BASED ON % CHANGE
Niger	23.59	39.77	68.58838	37th	1st
Angola	29.08	42.42	45.87345	35th	2nd
Liberia	31.07	45.2	45.47795	33rd	3rd
Rwanda	45.23	64.06	41.63166	8th	4th
Sierra Leone	26.33	36.91	40.1823	40th	5th

Mali	33.2	46.28	39.39759	27th	6th
Mozambique	35.14	46.33	31.84405	26th	7th
Senegal	42.79	56.31	31.59617	18th	8th
Ethiopia	37.83	49.41	30.61063	24th	9th
Zambia	46.29	59.88	29.35839	13th	10th
Malawi	39.69	51.27	29.17611	23rd	11th
Tanzania	44.17	56.67	28.29975	17th	12th
Chad	23.43	29.86	27.44345	42nd	13th
Guinea Bissau	30.76	39.11	27.14564	38th	14th
Baukina Faso	35.71	45.36	27.02324	32nd	15th
Zambia	36.04	45.67	26.72031	29th	16th
Guinea	32.15	40.73	26.6874	36th	17th
Uganda	46.5	58.5	25.80645	15th	18th
Benin	41.73	52.1	24.85023	21st	19th
Nigeria	37.51	46.5	23.96694	25th	20th
Comoros	48.48	59.45	22.62789	14th	21st
Togo	37.99	46.21	21.63727	28th	22nd
Cent. Afr. Rep.	25.9	31.36	21.08108	41st	23rd
Cameroon	43.51	52.49	20.63893	20th	24th
Gambia, The	50.55	60.98	20.63304	11th	25th
Lesotho	48.53	58.25	20.02885	16th	26th
Ghana	55.93	67.13	20.02503	6th	27th
Botswana	66.79	79.86	19.5688	3rd	28th

Cote d'Ivoire	37.98	45.41	19.56293	30th	29th
Congo DR	32	38	18.75	39th	30th
Djibouti	46.85	55.54	18.54856	19th	31st
Sao Tome	50.99	60.1	17.86625	12th	32nd
Cape Verde	68.15	80.08	17.5055	2nd	33rd
Swaziland	55.38	64.56	16.57638	7th	34th
Congo Rep.	39	45.4	16.41026	31st	35th
Kenya	54.59	62.07	13.70214	10th	36th
Seychelles	78.34	89.06	13.68394	1st	37th
Namibia	61.66	68.96	11.83912	5th	38th
Gabon	57	63.09	10.68421	9th	39th
Madagascar	48.05	51.94	8.095734	22nd	40th
Mauritania	42.46	44.86	5.652379	34th	41st
South Africa	71.77	75.5	5.197158	4th	42nd

Source: Author's computation from data taken from World Bank (2012)

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary, conclusion and recommendations for the three empirical works undertaken in the Private Investment, Labour Demand and Social Welfare thematic area. The chapter begins with the summary of the entire work, followed by the conclusion and then recommendations.

5.1 Summary of key findings

Private investment, labour demand and social welfare are key socio-economic development policy variables of many a developing nation. Over the two decades (1990-2009) that this study covered, Sub-Saharan Africa has experienced interesting dynamics in these policy variables. Key among them is a dwindling public sector investment and a marginally increasing private investment coupled with an increase in employment levels mostly driven by a surge in female employment as against a dip in male employment. These interesting dynamics have coincided with improvements in the social welfare of the citizens of SSA with initial poor performers being the most gainers.

In the wake of these stylised facts, empirical results on a key factor that drives private investment in SSA and globally seems to be divided along the lines of crowding-in-out conclusions. Also, the sub-region has not been endowed with empirical findings on the employment benefits of private investment, neither is there evidence on the

pattern and structure of economic growth that enhances social welfare even though the relationship between growth and welfare is well documented in the literature.

In view of the above, the general objective of this study was to ascertain the relationship between private investment, labour demand and social welfare in Sub-Saharan Africa. Specifically, the study tested for: 1) whether public investment crowds in or crowds out private investment; 2) the possibility of a bi-causal relationship between private and public investment; 3) whether increased labour demand is one of the benefits that the sub-region can derive from private investment and; 4) the relationship among private investment, employment and social welfare when income inequality has been accounted for. The first three specific objectives were estimated using an augmented Erden & Holcombe, (2005) private investment model, a derived public investment model and a derived neoclassical labour demand model respectively within the Arellano Bond Dynamic General Methods of Moments technique. In the fourth objective, the researcher estimated a derived welfare model that builds on a proposed welfare function by Todaro and Smith (2012) within the framework of random effects panel methodology.

Chapter 'one' offered an introduction to the study. It discussed the background to the study including stylised facts about some key variables, the problem statement, objectives of the study hypotheses and the scope and limitations. Chapter 'two' was an empirical paper that assesses whether public investment crowds in or crowds out private investment and whether there exists a bi-causal relationship between public

and private investment. Next, the researcher presented another empirical paper in chapter ‘three’ on the relationship between private investment and labour demand in SSA while chapter ‘four’ covered the last empirical paper on the relationship between private investment, labour demand and social welfare in SSA. In this chapter, chapter ‘five’, the researcher presents the summary, conclusion and recommendations for the entire study.

5.2 Conclusions of the study

The researcher set out with the aim of achieving four objectives from this study on the thematic area: Private Investment, Labour Demand and Social Welfare in SSA. The following are the key results from the study, as organized according to the objectives.

5.2.1 Specific Objective 1: Does Public Investment Crowd out Private Investment?

1. Apart from the fact that total investment in the second decade (2000 – 2009) showed a marginal increase from 20.12% (1990 – 1999) to 20.27% of GDP, there is also evidence of a dwindling public investment component of a rising total investment in SSA apparently driven by private sector investments.
2. In assessing the possibility of a reverse causality, it is evident that private and public investments are mutually dependent and that public physical capital compliments private physical capital.

3. But, it is also evident that public investment crowds out private investment in SSA, when they compete for financial resources.
4. Meanwhile, key factors that enhance private investment in SSA include a political system that offers enough executive discretion, more trade and a financial system that channels enough funds to the private sector.
5. These, notwithstanding, high real interest rate and unfavourable overall budget balance are detrimental to private investment.

5.2.2 Specific Objective 2: Is there a bi-causal relationship between Public and Private Investments?

1. The results reveal that private investment exerts a substitutive effect on public investment, based on a significantly negative relationship between the two variables.
2. Also, improvements in public sector investment are revealed to emanate from economic and infrastructural aid, discipline from external borrowing, previous level of economic growth and more trade.
3. But fiscal indiscipline thwarts public investment.

5.2.3 Specific Objective 3: Do the benefits from Private Investment include an enhanced Labour Demand?

1. Generally, the second decade (2000-2009) shows a marginal increase in employment to population ratio from 63.77% (1990 – 1999) to 64.46%. This

increase was propelled by increase in female employment than male employment.

2. The results suggest that private investment exerts a substitutive effect on total, male, female and female youth labour demands while public investment enhances total, male and female labour demands with no significant results for youth labour demands.
3. Another important factor that can help SSA to improve on its employment condition is enhancing the productivity of the agricultural sector.
4. Increase in real wage rate, human capital, trade and the recent economic crunch affect labour demand in SSA, badly.

5.2.4 Specific Objective 4: what relationship exists between Private Investment, Employment and Social Welfare in SSA?

1. Generally, all the SSA countries in the study have recorded increases in the level of social welfare, even though the size of these increases is not homogenous. With the exception of Rwanda, it is also apparent that most countries (for instance South Africa, Seychelles, Botswana, Namibia, Swaziland, Gabon and Kenya) that had the highest levels of human development were not among the best gainers (Niger, Angola, Liberia and Sierra Leone) when the opening and closing levels of HD are compared.
2. From the results, it is evident that increase in per capita private investment help increase social welfare in SSA.

3. Additionally, public health spending and increase in agricultural sector productivity are appropriate conduits for securing enhancement in social welfare in SSA.
4. Surprisingly, the results suggest that public investment per capita does not support social welfare probably because of its inefficiency or insufficiency.
5. The result on the relationship between employment and social welfare in SSA was inconclusive.
6. The study offers support for the fact that increase in poverty level and income inequality reduces the social welfare of SSA citizens.

5.3 Recommendations

Based on the above findings, the following recommendations have been advanced:

1. ATTRACTING MORE PRIVATE INVESTMENT INTO KEY SECTORS OF THE SSA ECONOMY

In view of the fact that private investment in SSA help reduce the burden on the state in the provision of some public goods and services and also facilitate improvement in social welfare, encouraging their activities and attracting more would not be out of place. Specifically, SSA countries should target reducing cost of doing business, through measures like keeping the policy rate low to motivate manufacturing, agricultural and other sectors that have linkages with the entire economy. It also implies that the benefits of inflation targeted monetary policy, pursued by some SSA countries, need to

be assessed and evaluated since it may be detrimental to the course of fostering private investment especially in high inflationary periods.

Meanwhile, the results also show that high private investment brings with it the cost of reduced employment levels. The sub-region could mitigate this effect and encourage private investors to employ more through tax incentives linked to employment and diverting private investment effort to more labour intensive sectors like farming and manufacturing other than trading and hunt for resources.

2. EVALUATION OF THE IMPACT OF PRIVATE INVESTMENT ON SSA

In view of the significant role played by the private sector in the socio-economic development of SSA, it is important that their activities are periodically assessed in order to facilitate revision of policies designed for them and formulation of new policies to meet emerging trends. This private investment impact assessment should include their impact on economic activities like trade, employment, economic growth and the dynamics of their activities in the manufacturing, farming, service and social services. The assessment should be done at both the regional level and country level. It should also be handled by an independent body separate from that which grants permission to do business.

3. ENSURING LABOUR INTENSIVE ECONOMIC GROWTH

Economic growth is good for the poor when that growth empowers most citizens to be able to afford the basic necessities of life. If these necessities of life are not bequeathed to us by the state, Non-governmental Organisations and development agencies, one needs to acquire them with economic resources generated, probably from employment. Unfortunately, however, the results from the study indicate that employment is not a reliable source of improving access to education, health and fostering social recognition. This is quite intriguing but possible in SSA because the employment content of economic growth has been found to be low and also most of the jobs in the region do not offer good compensation as the size of working poor is quite significant. SSA should pursue upgrade of skills of the citizens to meet the current technological needs. Policies to encourage entrepreneurial activities and ensure growth of the manufacturing sector, that is more labour intensive, while simultaneously expanding the economy to offer opportunities for these developments should be pursued. These would help harness the social welfare benefits of employment in SSA.

4. ALIGNING LABOUR PRODUCTIVITY WITH LABOUR COST

Since real labour cost reduces employment of all kinds it is imperative that employers get the maximum benefit from the amount of money spent on labour. Citizens of SSAs should be willing to not only accept moderate wages but eschew laziness. Governments, through appropriate agencies,

should sensitize the public on developing the right attitude to work. Appropriate measures should be put in place to ensure the proper measurement of labour output in order not to worsen the already deteriorating unemployment problem with unnecessary wage increase demands. Firms should take the lead in this.

5. FACILITATING GROWTH IN FEMALE EMPLOYMENT AND ARRESTING THE DECLINE IN MALE EMPLOYMENT

The SSA region needs to encourage the growth in female employment. Interestingly, one of the significant dynamics of the labour market of SSA is a gradual increase in the level of female employment while their male counterparts witness a reduction in their levels. Similar observations are made for female youth employment and male youth employment. The region could facilitate this growth by reducing discrimination against females in the labour market, eliminating all forms of harassment on female and encouraging more females in less physically intensive jobs. Improvement in the productivity of the agric sector and other physical intensive activities like construction and mining would help arrest the situation.

An investigation into the causes of the fall in male employment would help in designing other policies to help arrest the situation. This investigation should cover discrimination against men on employment issues, changing attitudes of men towards work, aging pattern of men and certain affirmative

actions like promoting girl-child education. Similarly, an assessment of the socio-economic impact of this changing trend in the labour market would also be useful.

6. IMPROVING THE PRODUCTIVITY OF PER CAPITA PUBLIC INVESTMENT

SSA needs to embark on serious infrastructural investment, as the existing per capita investment does not address the health, education and social inclusion needs of the sub region. Each country should set up an infrastructural development fund funded through taxation. In order to gauge the level of improvement in per capita public investment in SSA, a base year could be chosen (such as 2010) and each year's addition compared to it. The results also imply that it is not only the level of public investment that should be of grave concern to SSA but also the extent to which existing levels are useful to the citizens. It appears that due to inefficiencies and probably inadequate maintenance, the productivity of existing private investment is low culminating in the significantly inverse relationship between public investment per capita and social welfare.

Also, a constant assessment of the developmental impact of public investment in SSA, at both country and regional level, could facilitate revision and/or alignment of public investment policies. In addition, more trade, discipline from external borrowing, previous level of economic

growth and attracting economic and infrastructural aid while reducing fiscal indiscipline could help improve on the level of public investment per capita, assuming that population growth is controlled.

7. ENSURING FISCAL DISCIPLINE

Government of SSA should maintain adequate control over their finances to keep their spending within budget. Fiscal indiscipline increases governments' activities in the financial market. Given that governments are deemed to be risk-free borrowers, most financial institutions would prefer doing business with them than private corporate entities and individuals. In effect, it is either the cost of borrowing that increases or credit availability to the private sector is squeezed. Any of these, has the potential for reducing private investment and public investment as well. Reduced private investment also has the potential for slowing economic growth and social welfare and putting pressure on public investment.

To ensure fiscal discipline, every country in the sub-region should have a comprehensive development agenda handed down to executives to implement. The implementation of this development agenda should be supervised by a team of eminent citizens who will publish the achievement level the executive half-yearly. This is to help reduce the pressure to pursue or complete projects in election years for short-term political gains. The activities of this team should be properly backed by law.

Also, each country should have clearly defined fiscal rules covering specific limits on fiscal indicators such as budgetary balance, debt levels, government spending, taxation and other government revenues. All these may be enshrined in a Fiscal Responsibility Law (FRL) as pioneered by New Zealand. Again, the commitment of the executive arm of government to allowing institutions to check fiscal indiscipline and ensuring fiscal discipline itself is paramount to ensuring fiscal discipline. The basic advice is that nations in the SSA sub-region should learn how to live within their means, at all times.

8. GETTING THE BEST OUT OF OPENNESS TO TRADE

Trade is good or bad depending on whether a country is a net importer or a net exporter. At one breath, trade openness facilitates SSA region's private capital formation and public investment. It appears that the region's high level of dependence on imports leads to more private sector investment in capital assets that facilitate importation of goods and services than exports. Thus, openness to trade facilitates private investments in warehouses and distribution vehicles and equipments. Also, the less likely reason may be the fact that trade improves on private investment because of the importation of more capital equipments.

At another breath, trade reduces employment because by being a net importer, the SSA region ends up increasing the demand of products that are

not produced in the region and therefore does not require the labour or skills of their citizenry. In view of the above, it is pertinent that the region gets adequate information on which aspect of trade it is promoting at any point in time so that an appropriate strategy could be designed to correct any anomaly. Policies to encourage exports should be reinvigorated just as policies to encourage importation of productive equipments that can help expand the region's manufacturing base. Alternatively, the region could also strategise to get the best from importation of consumable goods through increase in taxes.

9. UNDERTAKING STRATEGIC TAX REFORMS

Governments in the SSA region can achieve a lot in facilitating private investment and encouraging employment or even social welfare by refocusing their tax policies. Private investors can be enticed into employing more by offering them additional tax reliefs based on the wage/salary cost of new recruits or on the growth in their level employment. Taxes on imports and exports should be carefully designed. Blanket tax reforms that discourage all forms of imports and encourage all forms of exports may not be entirely beneficial. For instance, tax policies should encourage importation of capital goods and discourage export of technical knowledge.

10. INSTITUTING PROPER GOVERNANCE STRUCTURES

SSA countries should ensure that their governance structures are devoid of unnecessary procedures that limit or delay decisions on private investment. Also, unnecessary interference by opinion leaders, hindering the work of institutions, should be discouraged. Discipline, rule of law and respect for institutions should be part of the early stages of the sub-region's educational system. Policies to name and shame corrupt officials as well as those to recognise and reward leaders who practice good governance should be encouraged.

Major Contributions of the study

- To the best of the researcher's knowledge, this is the first time a welfare model that enables the testing of the effect of growth components on welfare, when inequality has been factored in the model, has been derived and tested.
- This is the first study that test the crowding-in crowding-out hypothesis from the point of view of both the private and public investment