

The Impact of Foreign Capital Inflows (FCIs) on Economic Growth in Sub-Saharan Africa (SSA)

Yemane Michael

Dissertation Submitted

to

The Department of Economics

Presented in fulfillment of the Requirements for the degree of

Doctor of

Philosophy in Economics

Addis Ababa University

Addis Ababa, Ethiopia

June 2019

Addis Ababa University

School of Graduate Studies

This is to certify that the dissertation prepared by Yemane Michael entitled:"

The Impacts of Foreign Capital Inflows (FCIs) on Economic Growth in Sub-Saharan Africa (SSA)" and submitted in fulfillment of the requirements for the Degree of Doctor of Philosophy (Economics) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the examining Committee:

Examiner _____	signature _____	Date _____
----------------	-----------------	------------

Examiner _____	signature _____	Date _____
----------------	-----------------	------------

Main-advisor Professor Almas Heshmati	signature _____	Date _____
---------------------------------------	-----------------	------------

Co-advisor Professor Andreas Stephan	signature _____	Date _____
--------------------------------------	-----------------	------------

Co-advisor Asst. Professor Adane Tuffa	signature _____	Date _____
--	-----------------	------------

Chair of Department or Graduate Program Coordinator

ACKNOWLEDGEMENTS

I had the privilege of getting support from many individuals in the successful completion of this PhD thesis and I owe them all my heartfelt gratitude.

First and foremost, my warmest gratitude goes to my main supervisor Professor Almas Heshmati for the immense burden he bore for more than four years nurturing me to become the person I am today. Personally, he was and still is a father figure. He is an indefatigable, hardworking, intelligent, kind and knowledgeable human being from whom I have learnt a lot. He is a source of inspiration for young academicians who aspire to reach his remarkable achievements. He was very compassionate to me in my bad times. Despite my procrastinations, he was kind enough to allow me to continue with my research and bring it to fruition. I am also grateful to him for his precious time and patience in guiding me through the rigors of the research. He was there to rescue me when I was almost over the precipice. I will never forget the profound and tremendous impact this great man has had on my life.

I also owe a great deal of gratitude to my co-supervisor Professor Andreas Stephan who encouraged me throughout my research. He diligently and thoroughly read my drafts and made helpful comments which have substantially improved the thesis. Like Professor Heshmati he urged me to work hard to achieve my goals and realize my dreams.

I would also like to thank my co-supervisor Dr Adane Tuffa for his forthright manner and sincerity. He diligently read the draft that I sent him. I am grateful for his invaluable and constructive comments. He was always there when I needed his help.

I would also like to extend my thanks and appreciation to the University of Gondar for granting me study leave and sponsoring my education. The university showed patience as I did not honor the terms of the contract about the duration of my study leave. Thanks are also due to the Department of Economics at the Addis Ababa University and its dedicated staff members at various levels who were of great help to me during my stay there as a student.

I was in a state of euphoria during my maiden visit to Jonkoping International Business School, Jonkoping University, Sweden, in the fall of 2014. I will not forget the generosity and hospitality that I was given then and on my subsequent visits to the city.

I appreciate the various valuable comments I got on the different chapters that I presented at various conferences in Sweden, Rwanda and Ethiopia during the course of the PhD program. A lot of friends also extended a helping hand for which they deserve enormous gratitude. In particular, I owe a great deal of gratitude to my friends Fikru Debele and Kahsay Berhane who helped me in a number of ways including reading the drafts of the chapters and suggesting better ways of doing things.

I would also like to extend my great appreciation to the external reviewer, Professor Jung Hur of Sogang University, South Korea for meticulously reading the first draft of my thesis. He gave me invaluable and constructive comments which helped me improve the quality of my work.

Finally, I would like to express my greatest gratitude to my caring wife Yeshihareg Wossen for her enduring patience, perseverance and endless encouragement. Without her support my study would have been much more difficult.

DEDICATION

This thesis is dedicated to
my beloved wife Yeshihareg Wossen, and
our kids Biruk, Natnael and Kidus

DECLARATION

I declare that, except where explicit reference is made to the contributions of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the Addis Ababa University or any other institution.

The Impact of Foreign Capital Inflows (FCIs) on Economic Growth in Sub-Saharan Africa (SSA)

ACKNOWLEDGEMENTS	II
DEDICATION	IV
DECLARATION	V
LIST OF TABLES.....	XI
LIST OF FIGURES	XIV
ACRONYMS AND ABBREVIATIONS	XV
GENERAL INTRODUCTION.....	1
<i>A. Background.....</i>	<i>1</i>
<i>B. Motivation for the Study</i>	<i>1</i>
<i>C. Research Objectives</i>	<i>4</i>
<i>D. Literature Review</i>	<i>4</i>
<i>E. Methodology</i>	<i>7</i>
<i>F. Summary of the Findings of the Chapters</i>	<i>8</i>
CHAPTER ONE	14
THE FDI AND ECONOMIC GROWTH CONTROVERSY IN SUB-SAHARAN AFRICA....	14
ABSTRACT.....	14
1.1. INTRODUCTION	15
1.2 MOTIVATION FOR THE STUDY	18
1.3. OBJECTIVES OF THE STUDY	19
1.4. RESEARCH QUESTIONS	19
1.5. LITERATURE REVIEW	20
<i>1.5.1 Theoretical Literature</i>	<i>20</i>
<i>1.5.1.1. Exponents of FDI</i>	<i>20</i>
<i>1.5.1.2. Dissidents of FDI</i>	<i>23</i>
<i>1.5.2 Empirical Literature</i>	<i>25</i>
<i>1. 5.2.1 Studies Supporting FDI's Positive Contribution to Economic Growth.....</i>	<i>25</i>

1.5.2.2 <i>Studies Supporting FDI's Negative Contribution to Economic Growth</i>	27
1.5.2.3. <i>Studies That Found No FDI Impact on Economic Growth</i>	28
1.5.3. <i>Recent Trends in FDI in SSA</i>	29
1.6. METHODOLOGY	31
1.6.1. <i>A Description of the Variables</i>	37
1.6.2. <i>Data Used in the Estimation and Its Sources</i>	42
1.7. MODEL ESTIMATION AND A DISCUSSION OF THE FINDINGS	42
1.7.1. <i>Descriptive Statistics</i>	42
1.7.2 <i>Estimation Results of the Econometric Model</i>	46
1.7.3 <i>Robustness Check of the Base Specification</i>	56
1.8 CONCLUSION AND POLICY IMPLICATIONS	61
1.8.1 <i>Conclusion</i>	61
1.8.2 <i>Policy Implications</i>	63
CHAPTER TWO	67
DETERMINANTS OF TFP'S LEVEL AND GROWTH IN SSA	67
ABSTRACT.....	67
2.1. INTRODUCTION	68
2.2. SUB-SAHARAN AFRICA'S GROWTH SLUMBER.....	68
2.3. THE RECENT UPSURGE IN ECONOMIC GROWTH IN SSA	71
2.4. GROWTH ACCOUNTING AND TOTAL FACTOR PRODUCTIVITY.....	72
2.4.1 <i>Production Function</i>	75
2.4.2 <i>TFP's Empirical Model</i>	81
2.5. DESCRIPTION OF VARIABLES	82
2.6. METHODOLOGY	85
2.7. DATA SOURCES	87
2.8. A DISCUSSION OF THE MAIN FINDINGS	87
2.8.1 <i>Descriptive Statistics</i>	87
2.8.2 <i>Estimation of the Econometric Model</i>	89
2.8.3 <i>Robustness Checks and Diagnostic Tests</i>	100

2.9. CONCLUSION AND POLICY IMPLICATIONS	104
2.9.1 <i>Conclusion</i>	104
2.9.2 <i>Policy Recommendations</i>	105
CHAPTER THREE	107
THE FDI-DOMESTIC INVESTMENT NEXUS IN SSA	107
ABSTRACT.....	107
3.1 INTRODUCTION.....	108
3.2. A REVIEW OF DIRECT AND INDIRECT LINKS BETWEEN FINANCIAL SOURCES AND ECONOMIC GROWTH.....	108
3.3 A MODEL OF THE NEXUS BETWEEN DOMESTIC INVESTMENTS AND FDI	115
3.4. PVAR MODEL OF THE RELATIONSHIP BETWEEN FDI, DI, FOREIGN AID AND ECONOMIC GROWTH IN SSA.....	121
3.5 DATA SOURCES AND METHODOLOGY	125
3.6 A DISCUSSION OF THE MAIN FINDINGS	127
3.6.1 <i>Descriptive Statistics</i>	127
3.6.2 <i>Main Findings of the Domestic Investment-FDI Nexus</i>	128
3.6.3 <i>Main Findings of the PVAR Model</i>	138
3.7 CONCLUSION AND POLICY IMPLICATIONS	142
3.7.1 <i>Conclusion</i>	142
3.7.2 <i>Policy Implications</i>	143
APPENDIX 3.....	144
CHAPTER FOUR.....	150
DO REMITTANCES REALLY PROMOTE ECONOMIC GROWTH? EMPIRICAL EVIDENCE FROM SSA	150
ABSTRACT.....	150
4.1 INTRODUCTION.....	151
4.2 MOTIVATION FOR THE STUDY	152
4.3 LITERATURE REVIEW	153

4.3.1 Motives for Remitting.....	153
4.3.2 The Impact of Remittances at the Micro-Level	157
4.3.3 The Macroeconomic Consequences of Remittance Inflows.....	159
4.3.4 Remittances, Financial Development and Economic Growth	160
4.3.5 Remittances, Institutions and Economic Growth.....	162
4.4 METHODOLOGY	163
4.5 DATA SOURCES	170
4.6 A DISCUSSION OF THE RESULTS	171
4.6. 1. Robustness Checks and Diagnostic Tests	180
4.7 CONCLUSION AND POLICY IMPLICATIONS	184
4.7.1 Conclusion	184
4.7.2 Policy Implications	185
APPENDIX 4.....	186
CHAPTER FIVE	187
THE IMPACT OF EXTERNAL DEBT ON ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM SSA	187
ABSTRACT.....	187
5.1 INTRODUCTION.....	188
5.2 MOTIVATION FOR THE STUDY	188
5.3 RESEARCH QUESTIONS	190
5.4 OBJECTIVES OF THE STUDY	190
5.5 LITERATURE REVIEW	190
5.6 METHODOLOGY.....	197
5.6.1 Constructing a Model of the Growth Equation.....	198
5.6.2 Investment Equation.....	201
5.7 DATA SOURCES	202
5. 8. A DISCUSSION OF THE MAIN FINDINGS.....	203
5.9 CONCLUSION AND POLICY IMPLICATIONS	210

5.9.1. <i>Conclusion</i>	210
5.9.3 <i>Policy Implications</i>	211
APPENDIX 5.....	212
CHAPTER SIX.....	216
GENERAL CONCLUSION AND SUGGESTED AREAS FOR FURTHER RESEARCH	216
6.1 GENERAL CONCLUSION.....	216
6.2 SUGGESTED AREAS FOR FURTHER RESEARCH.....	220
REFERENCES	221

List of Tables

Table 1. 1: FDI inflows as a Percentage of GDP to Various Regions on the Globe	30
Table 1. 2: Rotated components of the variables used in the study	43
Table 1. 3: Two-sample t-test of per capita GDP growth in resource-rich and resource-poor countries with unequal variance	44
Table 1. 4: A two-sample t-test of FDI inflows to resource-poor and resource-rich countries with unequal variance	45
Table 1. 5: Estimating the growth rate of per capita GDP using various forms of difference GMM	48
Table 1. 6: Estimation of the growth rate of per capita GDP using various forms of the system GMM	54
Table 1. 7: Growth rate of per capita GDP for SSA using various methods (2001-15)	55
Table 1. 8: 3-Year Average Estimation results of the growth rate of per capita GDP using various forms of static panel data models	59
Table 1. 9: Estimation results of the growth rate of per capita GDP using various forms of static panel data models	60
Table1A. 1: Correlation Matrix	65
Table1A. 2: Unrotated Principal Components	66
Table 2.1: Principal Component Analysis of the Various Variables	88
Table 2.2: Estimation results of the level of TFP using various forms of difference GMM	90
Table 2.3: Estimation results of the TFP level using various forms of the system GMM	96
Table 2.4: Estimation of TFP growth using a system GMM model with various lags of the dependent and explanatory variables as internal instruments (Dependent variable: TFP growth)	98
Table 2.5: Robustness check of the TFP level using deeper lags of the dependent and explanatory variables as internal instruments (Dependent variable: TFP level)	98

Table 2.6: Robustness check of TFP growth using deeper lags of the dependent and explanatory variables as internal instruments (Dependent variable: TFP growth)	99
Table 2.7: Estimation results of the TFP level using various methods (2001-15).....	101
Table 2.8: The impact of domestic investments and trade openness on TFP growth- Robustness check using various lags of the dependent and explanatory variables as internal instruments (TFP growth)	102
Table 2.9: The Impact of domestic investments and trade openness on TFP growth- Robustness check using deeper lags of the dependent and explanatory variables as internal instruments (TFP growth)	103
Table 3. 1:Summary Statistics	128
Table 3. 2: FDI's impact on domestic investments using the dynamic common correlated effects estimator models	129
Table 3. 3: FDI's impact on domestic investments using dynamic common correlated effects estimator model (Dependent variable: domestic investments)	132
Table 3. 4: FDI's impact on domestic investments using static common correlated effects.....	133
Table 3. 5: FDI's impact on domestic investments using the dynamic common correlated effects estimator models (Dependent variable: domestic investments).....	135
Table 3. 6: FDI's impact on domestic investments using system GMM.....	137
Table 3. 7: FDI's impact on domestic investments using various types of static panel data models (Dependent variable: domestic investments)	138
Table 3A. 1: Correlation Matrix	144
Table 3A. 2: Lag length selection order criteria of the PVAR model	144
Table 3A. 3: PVAR Granger Causality test.....	145
Table 3A. 4: PVAR forecast error-variance decomposition.....	149
Table 4. 1: Summary Statistics	172
Table 4. 2: The relationship between per capita GDP and remittances using static panel data models	175

Table 4. 3: Estimation results of per capita GDP growth rate and remittances using various econometric techniques (Dependent variable: per capita GDP growth rate)	176
Table 4. 4: The determinants of domestic investments.....	179
Table 4. 5: The impact of remittances on per capita GDP growth using the system GMM formulation	181
Table 4. 6: Estimation results of per capita GDP growth using various forms of the linear dynamic panel data.....	183
Table 5. 1: Summary Statistics	204
Table 5. 2: The impact of external debt on the per capita GDP growth rate using various forms of static panel data	205
Table 5. 3: An Empirical Test of the Debt-Laffer Curve (Dependent variable: per capita GDP growth rate)	207
Table 5. 4: External debt's impact on domestic investments.....	209
Table 5A. 1: Correlation Matrix	212
Table 5A. 2: Description of Variables and Data Sources	213

List of Figures

Figure 1. 1: Net FDI inflows as a Percentage of GDP to Various Regions in the world.....	31
Figure A3. 1: Panel VAR stability test	146
Figure A3. 2: Orthogonalized Impulse Response Functions	147
Figure A3. 3: Cumulative Orthogonalized Impulse Response Functions.....	148

ACRONYMS AND ABBREVIATIONS

ARDL	Autoregressive Distributed Lag Model
BE	Between Effect
BWI	Bretton Woods Institutions
CCE	Common Correlated Effect
CCEMG	Common Correlated Effect Mean Group
CCEP	Common Correlated Effect Pooled
CES	Constant Elasticity of Substitution
DCCE	Dynamic Common Correlated Effect
DCCEMG	Dynamic Common Correlated Effects Mean Group
DCCEPMG	Dynamic Common Correlated Effects Pooled Mean Group
DEA	Data Envelopment Analysis
DFE	Dynamic Fixed Effects
DI	Domestic Investments
diff GMM	difference GMM
DSA	Debt Sustainability Analysis
DSF	Debt Sustainability Framework
DSGE	Dynamic Stochastic General Equilibrium
FCIs	Foreign Capital Inflows
FDI	Foreign Direct Investments
FDRE	Federal Democratic Republic of Ethiopia
FE	Fixed Effects
FEVD	Forecast Error Variance Decomposition
GDP	Gross Domestic Product

GFCF	Gross Fixed Capital Formation
GLS	Generalized Least Squares
GMM	Generalized Method of Moments
HIPC	Highly Indebted Poor Countries
IDA	International Development Association
IMF	International Monetary Fund
IRF	Impulse-Response Function
LSDV	Least Squares Dummy Variable
MDRI	Multilateral Debt Relief Initiative
MG	Mean Group
MNCs	Multinational Corporations
ODA	Official Development Assistance
OLS	Ordinary Least Squares
PA	Population-averaged Effect
PCA	Principal Component Analysis
PIM	Perpetual Inventory Method
PMG	Pooled Mean Group
POLS	Pooled Ordinary Least Squares
PPG	Public and Publicly Guaranteed
PVAR	Panel Vector autoregression
RE	Random Effects
SDGs	Sustainable Development Goals
SSA	sub-Saharan Africa
sys GMM	system GMM

TAR	Threshold Autoregression
TFP	Total Factor Productivity
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
USD	United States Dollar
VAR	Vector Autoregression
WB	World Bank
WDI	World Development Indicators
WEF	World Economic Forum
WGI	World Governance Indicators

GENERAL INTRODUCTION

A. Background

This thesis investigates the impact of foreign capital inflows namely FDI, workers' remittances, external debt and foreign aid on economic growth and domestic investments in SSA for the period 2001-15. However, the data for studies on domestic investments (Chapter 3) and external debt (Chapter 5) goes back to 1986. The thesis uses the system GMM methodology to account for the inherent endogeneities that exist among the variables. It also examines the importance of institutions and financial development not only for growth but also the effect that the variables have when they are interacted with other sources of growth.

The thesis is a cross between a monograph and free-standing articles. It is a monograph in that its entire concept revolves around the impact of foreign capital inflows on economic growth in SSA using panel data for more or less the same countries under each scenario. It uses the same methodology (dynamic linear panel data model of a system GMM type) to analyze the main empirical findings. However, the thesis can also be regarded as a collection of independent articles in that each chapter can be read and understood on its own.

B. Motivation for the Study

A number of empirical results from cross-sectional, time series and panel data methods have indicated that foreign capital inflows (FCIs) play a pivotal role in enhancing growth in host countries though this result is far from conclusive. This thesis examines the impact of FDI, remittances, external debt and foreign aid on economic growth in SSA.

A number of theoretical and empirical studies maintain that a positive relationship between FCIs and economic growth exists. However, this relationship varies from one country to another and from one group of countries or regions to another (De Mello, 1999; Lipsey, 2002). Besides, the exact nature of the relationship between FCIs and economic growth is influenced by the type of

FCI used such as FDI, remittances, external debt or foreign aid (Fambon, 2013; Orji, Uche, & Ilori, 2014).

This thesis differs from the others in that it applies a panel study approach to study the impact of FCIs on economic growth and domestic investments using the four main types of FCIs -- FDI, remittances, external debt and foreign aid. It places special emphasis on these four forms because they constitute a significant portion of foreign capital inflows into the SSA region. Besides, extant studies on FCIs and economic growth mainly rely on cross-sectional and time series approaches with only a few of them relying on panel studies of a large number of countries over a period of time to arrive at their conclusions. Moreover, the few studies that exist concentrate on other developing regions and overlook SSA which has been one of the top recipients of FCIs in the last couple of decades. From a policy perspective, knowing the impact of FCIs on economic growth helps design and adopt policies that help in attracting external funding into the region where domestic investments are insufficient for achieving economic growth.

Developing countries have striven to obtain external capital to supplement domestic savings and investments for boosting growth for several decades now. There is a huge gap between domestic savings and domestic investments. This in turn, cements the need for external capital to enhance the performance of the domestic economy and for sustaining economic growth. The main forms of foreign capital emphasized in this study are foreign direct investments (FDI), remittances, external debt and foreign aid.

There is ample empirical evidence on foreign capital flows. Various studies have found a range of effects of capital flows on economic growth. Among many others, Bailliu (2000), Driffield and Jones (2013) and Blomstrom, Lipsey, and Zejan (1994) find positive effects while Levine, Loayza, and Beck (2000) and Mody and Murshid (2005) find negative effects of capital flows on economic growth. Some studies also claim that foreign capital does not have a significant effect on economic growth.

Empirical studies that focus on how foreign capital inflows affect economic growth over time come to inconclusive conclusions. Moreover, most of the studies on the subject pay attention to a specific type of foreign capital inflows.

In theory, foreign capital is presumed to supplement domestic capital. The neo-classical theory argues that foreign capital inflows stimulate growth. Literature shows how different forms of capital affect growth. For example, FDI contributes to growth via its impact on investments and spillover effects. On the other hand, debt could help boost growth by injecting the much-needed capital. Foreign aid is characterized by high volatility. Besides, it mainly finances consumption rather than investments (Arellano, Bulíř, Lane, & Lipschitz, 2009). When it comes to remittances it is argued that they lead to economic growth by smoothing household consumption thereby promoting private investments (Giuliano & Ruiz-Arranz, 2009).

Foreign capital not only supplements domestic savings and investments but it also helps mitigate foreign exchange and import constraints. This, in turn, smoothens national expenditure and increases efficiency of production by reducing the need for financial intermediation spreads and by providing technology and skills.

There is, however, a downside of foreign capital inflows in that they could lead to abrupt exchange rate appreciation. This can result in an increase in the current account deficit if the foreign exchange earnings are spent on imports. This discourages domestic savings and productive investments. If developing countries do not have adequate absorptive capacity and well developed financial markets, large external inflows by themselves do not improve intermediation efficiency (see King & Levine, 1993; Levine, 2005; Levine et al., 2000). Another strand of literature argues that foreign capital is destructive and has a deleterious effect on an economy through an over-valuation of the domestic currency. One consequence of the real appreciation of the domestic currency is that it makes the country's goods and services less competitive in international markets. Prasad, Rajan, and Subramanian (2007) argue that the over-valuation of the currency reduces the viability of investments far in excess of any constraints imposed by inadequate financial systems.

Addressing the impact of FCIs on economic growth is by no means a new venture in development and macroeconomic research. However, it is still a hotly debated topic and settling this controversy is what makes this research worth undertaking. It can also be reasonably argued that the topics that this thesis addresses are relevant for formulating policies. Moreover, most of the existing studies that focus on FCIs' impact on economic growth pay little attention to SSA.

The contribution of this dissertation lies in its focus on broader aspects of FCIs such as FDI, remittances and external debt. Besides, the sample includes a significantly large number of

countries in the SSA region -- 40 to 43 of the total 48 countries in the region. This is the case not only for the FDI-growth nexus and its attendant controversy but also for the other topics that the thesis discusses. With regard to time scope, the dramatic spike in FDI inflows to SSA countries, especially after the turn of the century forced the researcher to focus on the time span 2001-15. The thesis also focuses on a relatively neglected region when compared to other developing countries in Latin America and Asia especially on the issue of FCIs. The studies combine the institutional quality index, financial development, human capital and other control variables with FDI and remittances as interaction terms to see how the presence and/or absence of the absorptive capacity promotes or inhibits growth. Methodologically, as has been mentioned earlier, adopting the system GMM helps overcome a lot of the problems associated with static panel data models.

C. Research Objectives

This thesis mainly focuses on the impact of FCIs on economic growth and domestic investments. Some of the specific objectives that the different chapters have are:

- Nexus between FDI and economic growth in SSA
- FDI's impact on TFP
- FDI's impact on domestic investments
- The role of remittances in economic growth
- The relationship between external debt and economic growth

The research questions that help address these research objectives are presented in each chapter.

Chapter 1 addresses the first research objective with Chapter 2 focusing on the second objective. Chapter 3 deals with the third objective while Chapters 4 and 5 investigate the fourth and fifth research objectives respectively.

D. Literature Review

Most of the existing empirical literature focuses on only one form of FCI such as FDI, foreign portfolio investments (FPIs), foreign aid, remittances and external debt. It is rare to find an empirical study that encompasses all or most of them.

There was a tremendous boom in capital flows to developing countries between 1990 and 1997. However, the financial crises that followed increased skepticism about the importance of such flows. This skepticism was founded on studies that stated that only a weak relationship existed between capital flows and an economy's long-run growth. The huge enthusiasm regarding the importance of capital inflows for economic growth was tempered by such findings and eventually led to a reassessment of the policies that were meant to attract and manage foreign capital.

There is ample empirical evidence from middle-income developing countries that capital flows bolster a positive growth dynamic. Foreign capital tends to flow to countries that have a strong investment climate. Besides, FCIs' benefits over a long time horizon are highly pronounced in these environments. O'Rourke and Williamson. (1999) claim that middle-income countries have stronger investment climates than low-income countries which enables them to attract more foreign capital. They are of the opinion that this enormous disparity in the inflow of external capital has contributed to the widening of the income gap between the two groups of countries.

There is less controversy about the nexus between FDI and economic growth. Most of the theoretical models hypothesize that a positive relationship exists between the two. However, empirical evidence regarding FDI's role in economic growth is much more controversial and mixed. Some empirical findings show that FDI has a number of advantages for the host economy such as transfer of technology, know-how and skills. Some studies have found a positive relationship between FDI and economic growth (e.g. Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2006; Borensztein, de Gregorio, & Lee, 1998; Hansen & Rand, 2006; Wang, 2010) while many others have found a negative relationship between FDI and economic growth due to its crowding-out effect on domestic investments (see Alfaro, Chanda, S., & Sayek, 2004; Carkovic & Levine, 2002; Choe, 2003; Herzer, Klasen, & Nowak-Lehmann, 2008).

Scholars and development practitioners like Elfakhani and Matar (2007) and Chudnovsky and López (2008) argue that FDI alone does not have a significant impact on economic growth. They claim that FDI's positive effect on economic growth is conditional on the domestic socioeconomic factors in the host country which include financial development, human capital, institutional quality, infrastructure and others. They assert that the recipient country needs to attain a certain threshold in these areas for FDI to have a meaningful impact on economic growth.

Burnside and Dollar (2000) find that aid does not have any effect on economic growth on its own. It becomes effective in promoting growth only when it is interacted with the other variables. For aid to be effective, there needs to be a conducive and sound fiscal and monetary policy environment. For instance, Burnside and Dollar (2004) found aid to be effective in enhancing economic growth only when it was interacted with law and order.

Empirical literature on the link between remittances and economic growth is in its nascent stage. There is a huge debate on whether remittances are a form of capital transfer or income. For Adelman, Taylor, and Vogel (1988) and Durand, Kandel, Parrado, and Massey. (1996) remittances are like recurrent household expenditure. They conclude that the economic hardships that households experience constrain them from using remittances for productivity-enhancing activities. This argument, however, is strongly contested by Giuliano and Ruiz-Arranz (2009) and Woodruff and Zenteno (2001) who claim that remittances are used as a catalyst in development via domestic investments. Giuliano and Ruiz-Arranz (2009) found a significantly positive coefficient of remittances on domestic investments which is robust across various model specifications. On the other hand, Chami, Jahjah, and Fullenkamp (2003) found that remittances had a statistically significant negative impact on economic growth.

High indebtedness manifests itself not only by distorting the macroeconomic performance but it also affects the institutional and political aspects. Structural reforms that are meant to enhance economic growth and reducing poverty could be undermined by high debt. Generally, there is widespread consensus, both at the theoretical and empirical levels, that indebtedness significantly reduces economic growth.

According to Moss and Chiang. (2003) direct evidence between debt and economic growth is blurred because the econometric results lack robustness. It is possible that high debt affects economic growth through a number of channels. Hence, empirical studies should emphasize on investigating the real impacts of indebtedness on the performance of HIPCS' economies rather than on a whole host of LDCs. Further, to be able to reasonably and reliably estimate the effects of the debt dynamics on an economy's performance, the impact of debt on other aspects of the economy such as domestic investments also has to be studied. Besides, the impact of institutional factors and external debt on economic growth should be probed which is what this thesis does.

E. Methodology

This thesis uses the system GMM which helps mitigate the problem of endogeneity. This is unlike most other previous studies that rely heavily on pooled OLS, FE and other forms of linear static panel data modeling approaches. There is also an extension in terms of the time span that this thesis covers which runs from 2001 to 2015. This makes this study one of the few on the topic relying on up-to-date data. The thesis uses a range of additional control variables for each model which are described in each chapter. Either non-availability or inadequacy of data were the sole criterion for excluding any country from the study.

Drukker (2010) and Wooldridge (2003) argue that the system GMM is a more appropriate panel regression estimation technique because of the following points: (1) It resolves the endogeneity problem by the use of the lagged values of explanatory variables as instruments. (2) It allows the use of level and lagged values of the variables used in the equation under estimation. (3) The problem of information loss associated with cross-sectional regression is addressed since the system GMM makes use of multiple observations for each entity (country) across time. (4) The system GMM is able to produce consistent and unbiased estimates of parameters even with a small time period (T) and a large number of countries (N).

This thesis uses the GMM panel estimator popularized by Arellano and Bover (1995) and Blundell and Bond (1998a) to extract consistent and efficient estimates of the impact of FDI and other forms of capital flows on economic growth. Unlike other models, the GMM panel estimator has the advantage that it exploits the time-series variations in the data and accounts for unobserved country-specific effects. Moreover, it allows for the inclusion of lagged dependent variables as regressors and controls for the endogeneity of all the explanatory variables, including international capital flows. The use of the dynamic panel model also helps account for temporal serial correlation and minimizes the likelihood of estimating a spurious regression model.

Pooled OLS, FE, RE and other types of static panel data models do not address problems associated with endogeneity even by incorporating additional variables. Hence, the system GMM model is extensively used for addressing issues pertaining to endogeneity. However, the static panel data

models, despite their shortcomings, are used for checking for the robustness of the system GMM's estimation results.

This thesis uses the system GMM methodology to capture the inherent endogeneities among the various forms of FCI and economic growth. Further, it also analyzes the role that institutions play in growth and the interaction that possibly exists between institutions and other sources of growth.

In summary, this thesis contributes to the debate on the role of FCIs in economic growth and domestic investments using a sample of 40 to 43 SSA countries. The models are estimated using various econometric methods though the system GMM is the dominant one. These models take care of endogeneity, cross-sectional dependence and the non-stationarity of the variables; they also control the unobserved individual heterogeneity effects that influence the covariates. Chapter 3 in particular uses both homogeneous and heterogeneous parameter models as well as static and dynamic models. To the best of our knowledge, there are only a few studies that use heterogeneous panel data models to investigate FDI's effects on domestic investments.

The importance and background of the research, the main objectives of the study and its motivations are described in each chapter.

F. Summary of the Findings of the Chapters

This dissertation has six chapters excluding this general introduction. Chapters 1-5 were prepared as independent articles. Each chapter emphasizes the impact of a particular form of FCI on economic growth, TFP and domestic investments. Chapters 1 and 2 have been published in the book *Determinants of Growth in Africa* edited by Professor Almas Heshmati. Chapter 3 was accepted for a conference presentation in July 2017 hosted by the Ethiopian Economics Association and Chapter 4 was presented at the Addis Ababa International Research Conference held in December 2017 in collaboration with the College of Business and Economics of the Addis Ababa University and the Jonkoping International Business School, Jonkoping University, Sweden. Efforts are underway to send Chapter 5 to journals and book publishers for publication. Chapter 6 gives the general conclusions and the main points addressed in each chapter.

Chapter 1 focuses on the nexus between FDI and economic growth and the controversies that surround it. It reviews both theoretical and empirical literature and constructs an empirical model of the relationship between FDI and economic growth based on the production function. The chapter also gives some policy implications of its findings.

The main findings of Chapter 1 obtained using the system GMM method are that FDI has a negative and statistically significant impact on per capita GDP growth (income) in the 43 SSA counties included in the study between 2001 and 2015.

The empirical findings of this macro panel data based study do not support the exogenous positive effect of FDI on economic growth. Findings in literature indicate that a country's capacity to exploit the full benefits of FDI's spillover effects might be hampered by local conditions like the development of local financial markets or the level of educational attainments of its nationals. Literature on FDI terms these as absorptive capacities. Borensztein et al. (1998) find that for the technology that FDI brings to translate into higher growth, the country should have a minimum threshold of human capital stock. Alfaro et al. (2004) provide empirical evidence that FDI helps countries to grow significantly only when they have well-developed financial markets. This story seems to be unfolding in SSA because of its weak financial systems with a negative effect on economic growth and poor quality of human capital.

Chapter 2 studies the determinants of economic growth in SSA with special focus on total factor productivity (TFP) besides capital accumulation, human capital, institutions, governance and FDI. It parametrically estimates TFP based on a production function. Notwithstanding the persuasive theoretical arguments, the question as to whether FDI spurs productivity growth is ultimately an empirical one. While Chapter 1 estimates FDI's effects on economic growth, Chapter 2 estimates its impact on both the growth rate and level of TFP, which in effect is a way of assessing the technological spillover effects of FDI in the host country. The chapter focuses on 43 SSA countries based on balanced panel data for 2001-15. It uses the system GMM panel data method to estimate the models. The estimated coefficients show that FDI did not have any significant impact on TFP's growth rate and level.

Chapter 3 investigates the various dimensions of the relationship between FDI, domestic investments (DI), foreign aid and economic growth in SSA. The main focus of this chapter is

analyzing whether FDI crowds-out or crowds-in domestic investments in SSA. Besides, it also probes the impact of foreign aid on economic growth using domestic investments as a transmission mechanism. It uses the panel vector autoregressive (panel VAR) model to mitigate the limitations of traditional panel data estimators. In other words, it constructs and estimates FDI, domestic investments, foreign aid and economic growth models as a system with multi-ways causal relationships using a panel vector autoregressive (PVAR) model.

Using the flexible accelerator model of investments and the dynamic common correlated effects estimators and other types of dynamic and static estimation methods, the chapter finds that FDI crowds-out domestic investments in SSA countries. Specifically, by applying the dynamic common correlated effects estimator of Chudik and Pesaran (2015), it finds that a 1 percent increase in FDI inflows resulted in a reduction in domestic investments by 0.037 to 0.126 percent which is significant at the 1 percent significance level.

The results of the impulse-response function and forecast error variance decomposition seem to corroborate these findings but they are not as clear-cut.

The finding that FDI crowds-out domestic investments should not be misconstrued to mean that FDI is not important. The argument here is confined to mean that profitable investment opportunities are limited to foreign investors only. MNCs have a greater advantage over local investors in that they have better access to investment finance, technology, global markets and management skills.

Chapter 4 emphasizes the impact of remittances on economic growth in SSA. It mainly focuses on the effects of remittances on economic growth in a panel of 43 SSA countries over the period 2001-15 with special focus on the role of financial development and institutional quality in enhancing or retarding remittances' impact on economic growth. It also discusses the role of financial development and institutional quality as catalysts for enhancing remittances' impact on economic growth and domestic investments. To put it differently, the chapter studies how local financial development and institutional quality influence a country's capacity to take advantage of its remittances. It uses the system GMM method of estimation to attain this objective. The principal contribution of this chapter is that it studies the role of financial development and institutional quality in economic growth and domestic investments.

Chapter 4's findings suggest that decades of remittance transfers have contributed little to growth in remittance-receiving SSA countries. Once remittances are properly measured and the other relevant factors are accounted for, the chapter fails to find a robust and significant positive effect of remittances on economic growth. Though statistically insignificant, the relationship between remittances and economic growth is negative under most scenarios.

Remittances have an insignificant and negative contemporaneous impact on economic growth in the sampled SSA countries over the study period under most estimation techniques except a few where it has a positive but insignificant impact on economic growth. The chapter implies that a large proportion of the remittances that flow into SSA is directed to economically unproductive uses. Moreover, the fact that the proportion of remittances that flow to SSA is low could be another reason for their negligible impact on economic growth.

Chapter 4's findings do not fully substantiate the widely held view that remittances deter growth in low-income developing countries like SSA countries which are characterized by a high marginal propensity to consume. This is the case because of the statistical insignificance of the coefficients though they are negative. Nonetheless, Barajas, Chami, Fullenkamp, Montiel, and Gapen (2009); Chami et al. (2003); Jongwanich (2007); and Karagöz (2009) decisively conclude that remittances inhibit economic growth in developing countries. Unlike previous studies such as those by Barajas et al. (2009) and Karagöz (2009) which analyze the impact of remittances on the logarithm of real per capita GDP, this chapter studies the impact of remittances on the growth rate of real per capita GDP.

Chapter 5 deals with the impact of external debt on economic growth. This chapter is motivated by the dearth of empirical literature on this topic in SSA. Some recent studies deal with the impact of debt on economic growth without addressing the threshold effects and the potential non-linearities that could exist between the two. Further, the main emphasis of existing literature is on the relationship between external debt and economic growth mainly in emerging market economies; they do not focus on SSA.

Though there are a lot of theoretical studies on external debt and economic growth, the empirical evidence is mixed and there is lack of agreement on the real effects that external debt has on

economic performance. Thus, this chapter exclusively focuses on the economic repercussions of external debt in SSA with the goal of re-examining the channels through which external debt affects economic growth and domestic investments.

The empirical findings obtained using the system GMM show that there is no evidence to support the existence of the highly popular hypothesis of an inverted-U shaped relationship between external debt and economic growth. If the inverted-U shaped relationship were to hold, the sign of the coefficient of external debt should be positive whereas that of external debt squared should be negative which is not the case here. The results also show that the coefficient of the square of external debt is positive and significant which contravenes the earlier hypothesis and suggests that there is no empirical finding to back the inverted-U shaped or concave type non-linear quadratic relationship between external debt and economic growth. This finding corroborates the empirical works of Presbitero (2006); Schclarek (2004); and Warner (1992).

Lack of evidence to support the Debt-Laffer curve could potentially be explained by the composition of the sample countries included in the study which are mostly poor and highly indebted. Due to their indebtedness, they are more likely to be located on the wrong side of the Debt-Laffer curve where external debt deters economic growth. The effect of external debt is positive on the left-side of the curve and that is more likely to be occupied by advanced and low indebted countries. On this side of the curve, increased debt leads to higher growth. Patillo, Poirson, and Ricci (2002) found that external debt promoted growth for the external debt to export ratio of approximately 160 percent and below. However, the ratio of external debt to exports in the sample SSA countries included in this study is staggeringly high and is well above double the figure indicated by their study. Besides, Patillo et al. (2002) also found that the marginal effect of external debt became negative when the debt ratio was close to 60 or 80 but in our sample the external debt to export ratio is in excess of 90 which implies that the countries fall on the negatively-sloped side of the inverted-U shaped curve. As Cochrane (2011) argues the negative impact of external debt on economic growth could also possibly occur due to the fact that higher external debt stocks lead to uncertainty or expectations of financial repression in the future. However, some authors claim that the negative relationship between external debt and economic growth is because of a decline in investments (see Iyoha, 1999b; Kutivadze, 2011; Sawada, 1994).

Lin and Sosin (2001) found that debt had a negative and significant relationship with economic growth in African countries.

Chapter 6 concludes the thesis. It gives a brief summary of the main findings of the empirical investigations in each chapter. It also gives suggestions for future research.

CHAPTER ONE

THE FDI AND ECONOMIC GROWTH CONTROVERSY IN SUB-SAHARAN AFRICA

Yemane Michael
Department of Economics
College of Business and Economics
Addis Ababa University
E-mail: yemanewj@yahoo.com
February 16, 2019

Abstract

This chapter analyzes FDI's impact on economic growth in SSA countries for which relevant macroeconomic data is available for the period 2001-15. To achieve this, it develops a dynamic system GMM model to capture FDI's impact on economic growth. It chooses the dynamic panel system GMM because of its superiority over other models in that it takes care of endogeneity problems and alleviates possible biases in the estimation. Besides, it also provides a solution to the problem associated with time-invariant individual heterogeneity, among others. The study includes 43 SSA countries for which data is available. The countries are categorized into 'resource-rich' and 'resource-poor' using data on their natural resource endowments and other important factors. The study found that there was no meaningful difference in the growth of per capita GDP and in these countries' ability to attract FDI inflows based on their resource endowments. These findings indicate that FDI had a negative and statistically significant effect on the per capita GDP growth rate in SSA countries in the study period. However, the own lagged value of the growth rate of per capita GDP and gross capital formation, which is used as a proxy for domestic investments and exports, had positive and statistically significant effects on the growth rate of per capita incomes. Though FDI is touted as a catalyst for growth, the empirical findings of this study do not support this claim in SSA. The study provides an explanation for the possible reasons for this divergence from the expected positive effects. It is clear that FDI is not a panacea for the economic malaise in the region and is not contributing to the betterment of lives and welfare. Hence, it is time for SSA governments and policymakers to find out where the problem lies and align policies in a way that make FDI have a more meaningful positive contribution in dragging millions of people out of poverty.

JEL Classification: C13, C23, E22, F21, F43.

Keywords: FDI, economic growth, SSA, dynamic system GMM

1.1. Introduction

This chapter focuses on the nexus between foreign direct investment (FDI) and economic growth and the controversies that surround it. It discusses existing theoretical and empirical literature in the literature review section. It constructs an empirical model of the relationship between FDI and economic growth based on the production function, the results of which are presented in the section that discusses the findings of the empirical model. The last section gives a conclusion and provides policy implications.

There is no unanimity among scholars and academicians when it comes to defining FDI. But several studies define FDI as follows:

“FDI is an investment made by a company or individual in one country in business interests in another country, in the form of either establishing business operations or acquiring business assets in the other country, such as ownership or controlling interest in a foreign company”. Foreign direct investments are distinguished from portfolio investments in which an investor merely purchases equities of foreign-based companies. The key feature of foreign direct investment is that it is an investment made that establishes either effective control of, or at least substantial influence over, the decision making of a foreign business (OECD, 2008).

UNCTAD (2014) in its World Investment Report, defines FDI as the net inflow of investments for acquiring a long-lasting management interest in an enterprise operating in an economy other than that of the investor.

The World Development Report (2016) asserts that global FDI flows increased by about 40 percent, to \$1.8 trillion in 2018, the highest level since the global economic and financial crisis started in 2008. However, this growth did not translate into a comparable expansion in the productive capacity of all the countries. The report goes on to say that such a scenario is troubling because of the huge investment requirements to meet the targets of the newly adopted Sustainable Development Goals (SDGs) and the ambitious action envisaged in the landmark Paris Agreement on climate change. To this end, the Addis Ababa Action Agenda demands the reorientation of national and international investment regimes towards achieving sustainable development.

Geographically, sub-Saharan Africa (SSA) is an area of the African continent that lies to the south of the Sahara Desert with a population in excess of 930 million in 48 countries. Despite

some similarities there are enormous variations among the SSA countries in terms of size, economic history and climate. Most of the countries in the region are small while a few of them like Nigeria and South Africa are giants.

The flow of private capital in the form of FDI was one of the remarkable features of globalization in the 1990s. FDI flows from advanced countries to developing countries like those found in SSA have a pivotal role to play. They help countries acquire improved technology and impart more knowledge. The growing importance of FDI as a form of external finance in developing countries reflects not only the fact that firms increasingly find benefits in expanding their production globally but also that host developing countries find potential advantages in FDI over other forms of investments like foreign portfolio investments for their economies.

FDI has both upsides and downsides though. Proponents in favor of FDI believe that it has a tremendous role in creating employment, enhancing competition and transferring skills through training. For these reasons, developing countries have been striving hard to attract FDI as a source of external finance. Cognizant of this, many governments have developed policies to encourage inward FDI flows. Further, FDI offers developing countries a chance to reduce their dependence on foreign aid, eventually helping them to move away from donor policies and conditionalities.

Those against FDI contend that it has many adverse consequences. They point out that FDI can ‘crowd-out’ domestic investments. Rather than supplementing domestic investments, FDI can supplant these investments. There is no unanimity when it comes to the role that FDI plays in a country or region’s economic growth. The debate on the effects of FDI on economic growth is very heated and highly contested especially among developing countries. A number of studies have been done both by FDI-optimists (who largely belong to the neo-classical school) and FDI-pessimists (most of them from the dependency school) with results that support their arguments. Interestingly, these conflicting results are based on much the same empirical data albeit with different methodologies.

The differences in findings regarding FDI’s impact on the host country’s economy are due to estimation methods and the type of data (cross-sectional, time series or panel data) used in the analysis, the unit of analysis (country, industry or firm) and the explanatory variables used in the models. For example, most cross-sectional studies usually report a positive nexus between FDI and economic growth. They also find FDI’s positive spillover effects on domestic firms.

However, panel data studies that account for cross-country differences in technology, institutions, geography, policies and other socioeconomic factors do not produce any robust evidence to support a positive relationship between FDI and growth. Nor do they find any strong evidence to justify any positive FDI spillovers to firms.

This chapter differs from other studies on the topic in some important ways. First, it applies the dynamic panel system GMM to assess FDI's impact on economic growth in SSA. The choice of a dynamic panel system GMM is not without a purpose. It is a model that is superior to the others in that it takes care of endogeneity, autocorrelation and heterogeneity problems and alleviates possible biases in the estimation. Besides, it provides a solution to the problem associated with time-invariant individual heterogeneity, among others.

This study's contribution is two-fold. Methodologically, it employs a dynamic panel system GMM which has been rarely used in an analysis of FDI's impact on economic growth. However, by no means does the author claim that he is a pioneer of the methodology. Practically, the research contributes to the small though increasing literature on FDI and economic growth in SSA.

This chapter's objective is empirically investigating FDI's impact on economic growth in SSA countries for which relevant macroeconomic data is available for the time period 2001-15. The choice of 2001 as the start of the study period is not arbitrary. Empirical evidence by Buckley (2003) and Kamara (2013) indicates that FDI inflows to SSA had an upsurge at the turn of the millennium. This tremendous increase was mainly caused by the improved macroeconomic environment on the continent which boosted FDI inflows. The *Economist* magazine that once dubbed Africa as a 'dark continent' did a U-turn and in 2011 called it a 'rising continent'. This change in fortune for SSA coincided with a surge in FDI flows to the continent.

Based on existing studies it is difficult to draw any robust conclusions on FDI's impact on economic growth. This was a motivating factor for doing this study. Specifically, this paper tries to contribute to the current debate on FDI and economic growth by undertaking an empirical investigation of the topic.

1.2 Motivation for the Study

There is a lot of empirical literature on FDI's impact on economic growth in the developed countries. However, this is in stark contrast to the story in third world countries.¹ The picture becomes blurred when it comes to an analysis of FDI's impact on economic growth in less developed countries. There is a dearth of empirical investigations on the pros and cons of FDI's impact on economic growth in developing countries. Even the studies that exist are methodologically suspect. For instance, Jugurnath, Chuckun, and Fauzel (2016) argue that they applied a dynamic panel model to address FDI's impact on economic growth without clearly articulating the estimable model. However, the macroeconomic model used in my study is based on a micro-foundation which is not the case in most existing studies.

There are a number of empirical studies on the relationship between FDI and economic growth. However, the debate on FDI's impact on economic growth is not settled. Thus, we are interested in delving into this debate through empirics. The question, 'does FDI promote economic growth?', has been there for over two decades, but no clear and unequivocal answers have been found to it. FDI is a buzzword in development literature because most developing countries rely on private foreign capital for their investments (Asiedu, 2006; Borensztein et al., 1998). When viewed from this perspective, research on FDI's impact on growth continues to be relevant.

The contradictions in most of the existing empirical studies might be due to methodological problems of using linear models for such a dynamic growth model and excluding some important explanatory variables. Linear models cannot capture unobserved country specific influences and thus may yield biased and inconsistent results. To address this issue, this chapter uses the dynamic GMM model, which systematically captures both random and fixed effects. Analyzing FDI's actual effect is vital for providing concrete information to policymakers, governments and developmental actors. Therefore, the purpose of this study is investigating FDI's impact on economic growth using the dynamic system GMM for SSA countries.

¹ It is believed that the phrase 'developing countries' is placatory and is an euphemism for third world countries. In this chapter, the phrases developing countries, less developed countries, poor countries and third world countries are used interchangeably.

Knowing the impact that FDI has on economic growth has important policy implications. After we control for endogeneity and other determinants of economic growth, if we find that FDI's impact on economic growth is positive, then there will be very little rationale for restricting FDI inflows. If, on the other hand, we find that FDI has a negative impact on economic growth, this will call for a reconsideration of the incentive systems put in place to attract FDI such as tax holidays, concessions and infrastructure subsidies.

The paradox here is that wide disagreements still exist on the FDI-growth relationship, despite the extensive nature of this relationship. As far as the SSA region is concerned, there are more questions than answers about the contribution of FDI to economic development in the region.

The motivation and rationale for undertaking this research comes from a desire to assess FDI's impact on economic growth in poor countries. By doing so, this study fills the knowledge gap that exists on the topic in SSA. Another motive for focusing on SSA comes from the fact that most of the countries in the region have abject poverty. Good quality FDI combined with national policies could be a catalyst in boosting growth by harnessing natural and human resources. Hence, it is imperative to study whether FDI flows combined with existing domestic factors promote growth in the region.

1.3. Objectives of the Study

This study investigates the nexus that possibly exists between FDI and economic growth in SSA empirically. Its specific objectives are:

- Figuring out the factors that affect economic growth in SSA with special emphasis on FDI,
- Assessing how the differences in resource endowments affect economic growth in the region, and
- Analyzing the role of institutional quality in economic growth.

1.4. Research Questions

This study finds answers to the following research questions:

- What factors, FDI included, affect economic growth in SSA?
- Is FDI's effect on economic growth linear or non-linear? In other words, are there threshold effects as far as FDI's impact on economic growth is concerned?
- Does institutional quality play a causal role in economic growth?

1.5. Literature Review

FDI's role in economic growth is highly contentious and controversial when viewed from both flanks of theoretical and empirical literature. This literature review takes into account these contending views and summarizes the fault lines that divide them. One thing that has to be kept in mind is that the distinction between theoretical and empirical literature on this topic is not as easy as it looks. The differences between them are blurred and murky but this study tries to make this contrast as clear as possible.

1.5.1 Theoretical Literature

This section deals with theoretical literature on FDI's role in economic growth. There are two main contesting views about the effect that FDI is likely to have on economic growth. On the one hand, some economic theorists argue that FDI can be a good catalyst in economic growth if harnessed properly whereas another group of theoretical economists has a negative view of FDI's effect on economic growth. Those who have a favorable view of FDI are termed exponents of FDI while its skeptics are called dissidents of FDI. These economic theorists base their arguments on economic theory, intuition and instinct when they substantiate their line of argument. They do not usually back their arguments with numbers and empirical findings. They simply make propositions and conjectures on the basis of the intricacies and interlinkages in the global macro-economy.

1.5.1.1. Exponents of FDI

Before the 1970s, FDI was generally viewed as an instrument of economic growth or development (Raguragavan, 2004). The perceptions about FDI were that it was a parasite which

retarded the development of domestic industries. Such views engendered hostility towards FDI and multinational enterprises (MNEs) which are the primary instruments of its transfer.

Governments in developing countries strive hard to attract FDI and are ready to offer a substantial amount of finance by making considerable concessions because of employment. MNCs' investments are a part of the stimulus for economic activities and creating employment. MNCs create employment both directly, that is, by hiring people in their new production facilities and indirectly through the effect that they have on local economic activities. MNCs play an important role in the domestic economy through taxation. They are required to pay taxes and thus contribute to public finances. They presumably operate in highly profitable and lucrative businesses and hence the level of tax revenues likely to be raised is significant.

Theories about FDI are mainly based on theoretical hypotheses of imperfect competition and increasing returns to scale (Xinzhong, 2004). On the basis of different theoretical frameworks of FDI inflows with regard to determinants associated with the investment environment and macroeconomic and investment costs some theories had a profound influence on later studies on FDI flows. These can mainly be summarized as the neo-classical theory, FDI theory based on industrial organization developed by Hymer (1960), the international product life cycle theory of FDI introduced by Raymond Vernon (1996), substitute theory of FDI for trade by Mundell (1968), complement theory of FDI on trade by Kojima and Ozawa (1975), eclectic or OLI theory (ownership, location and internalization advantage) developed by Dunning in 1977 and the macroeconomic theory (Xinzhong, 2004). All these theories try to explain the determinants of FDI inflows under different assumptions and frameworks.

The eclectic paradigm states that FDI is determined by the dynamics of three intertwined variables – firm specific ownership advantages (O), location specific advantages (L) and cross-border intermediate product and/or market internalization advantages (I) (Dunning, 2000). The first condition for international production is possession of ownership-specific advantages that are superior to those with indigenous firms (Dunning, 1977).

From the investors' perspective there are three main FDI types: Vertical, horizontal and conglomerate FDI (Caves, 1971). According to Kastrati (2013) vertical FDI involves a geographical decentralization of a firm's production chain, where foreign affiliates in poorer countries typically produce labor-intensive intermediates that are shipped back to countries with high-wages which very often happen to be the parent company itself. Vertical FDI is sometimes dubbed as 'efficiency seeking' FDI, since the main motive for the investment is

improving the cost effectiveness of the firm's production. Horizontal FDI, on the other hand, produces the same product in different plants and supplies it to local markets in the host country through partner production rather than through exports from the multinational enterprise's home country. This kind of FDI is sometimes known as 'market seeking' FDI. The conglomerate type of FDI is different from the others in that it is made up of a number of different, ostensibly disparate businesses. In a conglomerate, one company has an ownership right and a controlling stake in a variety of smaller companies that conduct businesses separately. Each one of the parent company's subordinate businesses operates autonomously. Nonetheless, the subsidiaries' managements report to the senior management at the parent company. There is also another type of FDI termed 'strategic asset seeking' FDI which aims to protect or expand the existing specific advantages of investing firms and/or reducing those of their competitors.

From the host country's point of view, FDI can be categorized into import substituting FDI, export promoting FDI and government initiated FDI. Besides, FDI may be classified into expansionary and defensive types. Expansionary FDI strives to exploit firm specific advantages in the host country. This kind of FDI helped MNCs increase their sales both in the host (recipient) and investing (home) countries. Defensive FDI looks for cheap labor or materials with the purpose of cutting down the cost of production (Chen, Chen, & Ku, 2004).²

FDI can also be categorized from a different perspective as green-field investments and brown-field investments. A green-field investment is a form of FDI where a parent company establishes its operations in another country from scratch. Besides creating new production facilities, the project can also encompass the building of new distribution lines, offices and accommodations. In green-field FDI investments a company builds all its activities in a foreign market starting from scratch, or a so-called green field. These projects are foreign direct investments that offer the highest degree of control to the sponsoring company. The company's plant is constructed as per its specifications, the employees are trained to meet company standards and the fabrication processes can also be tightly controlled. This type of involvement is entirely unrelated to indirect investments where companies may have very little or no

² For more on these and other types of FDI theories see Azizov (2007), Kastrati (2013), Nayak (2014) and Raguragavan (2004).

controlling right in operations, quality control, sales and training. In short, green-field FDI generates new capital assets and extra production capacities.

Brown-field investment, on the other hand, is a type of FDI in which a government organ or a company buys, contracts or leases already existing production facilities to commence a new production activity. The term brown-field connotes that the land itself may be tainted by prior activities on the site, whose side effects could be lack of vegetation. When a property owner has no intention of allowing further use of a vacant brown-field property, it is referred to as a mothballed brown field. Sites that are significantly and appreciably contaminated such as by hazardous and toxic waste are not regarded as brown-field properties. Mergers and acquisitions is one typical example of brown-field FDI.

1.5.1.2. Dissidents of FDI

Dependency theorists claim that FDI is less productive than domestic investments because more often than not it is not properly embedded in the economies of the host countries, thus displacing the more productive domestic investments (Dixon & Boswell., 1996). Further, FDI is said to contribute to unemployment because it promotes capital intensive production. Andre Gunder Frank (1925-2005), a German-American economic historian and sociologist is credited with promoting the dependency theory after 1970 and the world-systems theory after 1984. In addition to economists who by and large belong to the dependency school, many sociologists and political scientists consider FDI a bane and a manifestation of the exploitative capitalist world system (Amin, 1990; Bornschier & Chase-Dunn, 1985; Frank, 1969; Wallerstein, 1974).

MNCs' operations are associated with a number of uncertainties. They are highly erratic and dynamic in that they can shut down their businesses in the host countries and leave. This is more plausible with older plants that use outdated and relatively archaic technologies in host countries which require upgrading and renovation to remain in business. A country with a heavy presence of MNCs is susceptible to external shocks in the long term. This happens due to MNCs' precarious nature. Therefore, to appease the MNCs to stay and operate in the local economy, the host country could be tempted to give them a number of perks including subsidized land lease, tax holidays and other concessions all of which come at a cost to the tax payers in the host country.

MNCs can easily move production locations. This enables them to wield control over their host countries. Moreover, it gives them advantages in production and also economic flexibility. In a large number of developing countries, MNCs are major employers and prime wealth creators which helps them enjoy some advantages. Hence, any endeavors by host countries that are meant to improve the safety of workers and their welfare or enforcing pollution abatement policies could jeopardize MNCs' interests. These measures are likely to be opposed by MNCs. They can even threaten the host countries by making it clear that they would withdraw if the measures are not reversed, modified or revoked. Developing countries' heavy dependence on MNCs makes them vulnerable to economic fluctuations and outside shocks. MNCs also intervene in the political affairs of the host countries in which they invest capital. They are also accused of being involved and complicit in military coups to effect regime changes that favor them.

The dependency theory stipulates that shareowners own MNCs in an anticipation of higher annual returns and dividends that compensate them for making their funds available to enable firms to engage in production and sales activities. Managers vigorously search for the most efficient workers for the remunerations on offer to realize their ambition of paying dividends to shareholders. They also buy the least costly materials, produce in countries that impose the lowest profit taxes and sell in markets that yield the highest revenues after accounting for costs. In fact, this is not different from any individual who seeks employment with the highest emoluments that involves the least tedium or monotony, the most amiable work environment and location and the highest employment benefits (Ahiakpor, 1986a).

A number of MNCs are blamed for investing in natural resource endowed countries and extracting these resources without being sensitive to the environment. Due to FDI shortages and the need for foreign capital, developing countries allow MNCs to do this. Governments in developing countries are accused of being myopic as they excessively focus on short term gains despite the negative impact of their choices in the long run through depletion of valuable resources and the irreversible damage to the environment. Incumbent governments in the developing world often have a very short term focus. They are mainly preoccupied with ensuring that they remain in power through voting rather than prioritizing the long-term interests of their nations.

1.5.2 Empirical Literature

FDI's contribution to economic growth is mixed. Some empirical findings assert that FDI has a number of advantages for economic growth while some others refute this argument and claim that FDI adversely affects the growth of an economy. Another strand of literature argues that FDI's impact on economic growth is neither positive nor negative and that it is neutral. This section takes a closer look at each one of these strands in literature and summarizes the findings.

1. 5.2.1 Studies Supporting FDI's Positive Contribution to Economic Growth

Theoretically, there is widespread consensus about FDI's positive contribution to economic growth. However, the empirical findings of such studies are inconclusive and controversial. Some empirical evidence shows that FDI is crucial for economic growth. Others argue that FDI's effect depends on the degree of complementarity and substitutability between FDI and domestic investments, macroeconomic stability, the institutional and legal framework, knowledge and human capital, trade openness, and other socioeconomic and demographic characteristics (Abadi, 2011; Agrawal, 2011, 2015; Alege & Ogundipe, 2013; Beugelsdijk & Zwinkels, 2008; Lamine, 2010; Sala & Trivin, 2014; Zekarias, 2016). Generally, the results of these empirical studies contradict each other.

Suleiman, Kaliappan, and Ismail (2013) study using dynamic ordinary least squares for the Southern Africa Custom Union (SACU) countries of Botswana, Lesotho, Namibia, South Africa and Swaziland found that FDI's impact on economic growth was positive and significant. Stoneman (1975) analyzed FDI's power in economic growth in developing countries and found that foreign direct investments increased productivity levels due to higher capital stock and also improved the balance of payments positions of the host countries.

Jugurnath et al. (2016) applied both static panel regression techniques and dynamic panel estimates to assess the causal link between FDI and economic growth. Their evidence suggests that aggregate FDI did have a positive and significant impact on economic growth. On the contrary, using panel data and a time series regression analysis, De Mello (1997) found that the relationship between FDI and economic growth tended to be weak and conditional on the host country's characteristics that were taken into account by a country-specific term incorporated in the panel data procedure.

Among many others, Acemoglu and Robinson (2006) stress that FDI is crucial for economic growth in developing countries. This happens because FDI has several positive spillover effects

such as the transfer of technology, expertise and know-how, enhancing domestic production, reducing production costs, providing efficiency in management, restructuring domestic investments, increased competition through mergers and acquisitions and creation of employment opportunities.

Microeconomic evidence on FDI's role in economic growth is weak and fuzzy whereas macroeconomic studies using aggregate FDI flows for a broad cross-section of countries generally suggest a positive role for FDI in generating economic growth especially in particular environments (De Gregorio & Lee, 2003). Some such studies include Borensztein et al. (1998) who argue that FDI had a positive effect on economic growth provided that the country had a highly educated labor force that enabled it to exploit FDI spillovers. While Blomstrom et al. (1994) found no evidence that education was critical, they contend that FDI had a positive growth-effect when the country was sufficiently rich. Alfaro et al. (2004) found that FDI enhanced economic growth only when the economy under consideration had adequately well-developed financial markets and institutions, while Balasubramanyam, Salisu, and Sapsford (1996) stress that trade openness is crucial for attaining FDI's growth effects.

Numerous authors have concluded that MNCs are both a boon and a bane for emerging economies (Caves, 1996; Enderwick, 2005; Görg & Greenaway, 2004; Nunnenkamp & Spatz, 2004; Pearce, 2006) and that the key issue thus becomes when MNCs' FDI is beneficial for economic growth and when it is not. In this regard, literature identifies a number of factors that condition FDI's impact on economic growth including government policies (Dunning, 2000), MNCs' investment motives (Enderwick, 2005), MNCs' entry strategies (Görg & Greenaway, 2004), absorptive capacity of the local industry (Narula & Lall, 2004) and the extent to which MNCs link up with local firms and industries (Altenburg, 2000; Giroud & Scott-Kennel, 2006). Borensztein et al. (1998) conclude FDI's effect on economic growth depends on the level of human capital available in the host economy.

Soysa and Oneal (1999) assessed the effects of foreign and domestic capital on economic growth and found no evidence that FDI harmed the economic prospects of developing countries. They included the role of human capital in the process of economic development and claim that the flow of foreign capital spurred growth in per capita gross domestic product while the level of foreign stock, or 'foreign penetration' had no discernible effect from 1980 to 1991. They also contend that new foreign investments were more productive dollar for dollar than capital from domestic sources. Previous suggestions that foreign investment flows are less

beneficial than domestic ones were based on a misinterpretation. Further, FDI stimulates investments by domestic sources. Consequently, as dependency theorists urge developing countries have no reason to eschew foreign capital as dependency.

1.5.2.2 Studies Supporting FDI's Negative Contribution to Economic Growth

Relatively old studies by Boyd and Smith (1992) and Wheeler and Mody (1992) emphasize that FDI can affect resource allocations and growth negatively where there are price, financial, trade and other forms of distortions before the injection of FDI into the economy. Besides, Nunnenkamp and Spatz (2003) criticize the view that developing countries should rely on FDI to stimulate economic growth. They argue that FDI can result in 'crowding-out' investments which is a situation where parent foreign companies dominate local markets resulting in stifling competition and entrepreneurship. Here, foreign gigantic companies supplant local nascent firms rather than supplementing them.

Saqib, Masnoon, and Rafique (2013) found that FDI had a negative impact on Pakistan's economic growth. They ascribe this negative relationship to the dependency theory. According to Osvaldo (1969) dependency theory can be defined as 'economic development of a state in terms of the external influences-political, economic, and cultural on the national development policies ' (p.23). In other words, the dependency theory is a conception which stipulates that resources flow from a periphery of poor and underdeveloped states to a core of affluent states, which ultimately enrich the core states but have a deleterious effect on the periphery.

Empirical studies find that a strong FDI presence and export dependency contribute to sluggish economic growth and worsen the quality of life, including lower food supplies, higher infant mortality, higher inequalities, higher pollution and reduced access to clean potable water, doctors and education (Anderson, 2006). Moreover, reliance on foreign capital from MNCs perpetuates the low status of developing countries in the world system hierarchy (Bornschiefer & Chase-Dunn, 1985)

Wermberly and Bello (1992) claim that dependency on investments has a strong deleterious effect on food consumption. They argue that this dependency is even more detrimental than the impact of primary export dependency. Food security in the periphery host countries is compromised due to the penetration of MNCs for a number of reasons. For instance, consumer demand falls because of the promotion of luxury goods' markets by FDI. Besides, FDI and

MNCs use capital-intensive production techniques in labor-surplus areas eventually leading to a spike in unemployment and under-employment. Finally, MNCs aggravate poverty and play a role in immiserating by maintaining the current core-periphery economic order.

Despite empirical literature advocating FDI's positive effects on economic growth, there are several arguments why developing countries may not gain from FDI and have many things to lose. Krugman (2000) argues that the transfer of ownership from local to foreign firms may not always be beneficial for the host countries because of an adverse selection problem. The transfer of FDI ownership undertaken in a crisis situation could make the foreign firms less efficient and this in turn will have serious repercussions for the domestic economy. This concern is highly relevant in SSA countries where, as part of aggressive privatization, state owned enterprises were sold to foreign firms merely because they had more funds. Saltz (1992) and Agosin and Mayer (2000) also point out that FDI may crowd-out domestic firms through unfair competition. Besides, the secretive and isolated nature of many foreign owned firms and the poor linkages that they have with the rest of the economy could reduce the potential spillover effects to the national economy. Further, the fact that a big proportion of the earnings of foreign firms is sent back to their home countries results in a severe deterioration in the balance of payments in the host countries. It is also believed that some foreign corporations tend to produce luxurious goods that are meant to satisfy the interests of the wealthy segment of the host country's consumers which could exacerbate and worsen inequalities.

1.5.2.3. Studies That Found No FDI Impact on Economic Growth

There is paucity of empirical studies on this issue. Most authors who have undertaken research on FDI's role in economic growth have come to very cautious conclusions. Rather than making the bold claim that FDI does not have any impact on economic growth, they allege that FDI's effect on economic growth is conditional on the economic realities in the host country. One finding that is worth mentioning here is Carkovic and Levine (2002) who assert that the exogenous component of FDI does not exert a robust and positive impact on economic growth. By accounting for simultaneity, country-specific effects and lagged dependent variables as regressors, they reconciled the microeconomic and macroeconomic evidence. The authors argue that there is no reliable cross-country empirical evidence to support the claim that FDI per se accelerated economic growth.

1.5.3. Recent Trends in FDI in SSA

FDI inflows into developing countries have grown tremendously in recent years. Developing countries attracted \$334 billion in FDI 2005, or to put it into perspective, more than 36 percent of all inward FDI flows (UNCTAD, 2006). This figure reached a new high of \$778 or 54 percent of the global FDI flows by 2013. Moreover, FDI's importance for the economies of developing countries increased from an average of barely 1 percent of GDP in the 1970s to above 2 percent of GDP on average by 2006 (Table 1.1).

Though FDI as a percentage of GDP for SSA seems more or less on par with that of other developing countries, its share of the global FDI inflows to developing countries is extremely low. FDI inflows to North Africa declined by 15 percent to \$11.5 billion in 2014. Overall FDI in the region declined due to tensions and skirmishes in some countries, despite significant inflows to others. UNCTAD (2015) World Investment Report shows that FDI into Egypt grew by 14 percent to \$4.8 billion and to Morocco by 9 percent to \$3.6 billion in 2014

Generally, in sub-Saharan Africa, foreign investments increased by 5 percent, however, there was strong variance by sub-regions. FDI flows to West Africa fell by 10 percent to \$12.8 billion, because of the Ebola outbreak; security issues and falling commodity prices also adversely affected several countries when?. East Africa registered an increase in its FDI flows by 11 percent to \$6.8 billion when?. FDI increased substantially in the gas sector in the United Republic of Tanzania in 2014. Further, Ethiopia is becoming a focal point for transnational enterprises producing garments and textiles.

Central Africa got \$12.1 billion in FDI in 2014, which showed an increment of 33 percent from its 2013 level. FDI inflows to the Republic of the Congo almost doubled, reaching \$5.5 billion, in 2014, which made it the second largest recipient country in Africa next to South Africa with foreign investors unencumbered despite downward spiraling commodity prices. The Democratic Republic of the Congo continued to enjoy notable FDI flows.

The \$10.8 billion FDI inflows that southern Africa received in 2014 was 2.4 percent less than what it received in 2013. Though South Africa remained the country that received the most foreign investments in the region and on the whole continent (\$5.7 billion, down 31 percent from 2013), Mozambique which is the third largest recipient of FDI in Africa – also played a pivotal role in attracting \$4.9 billion.

FDI in SSA is increasingly being brought by multinational enterprises in developing countries such as those in China and India. Meanwhile, a number of firms from developed countries (in particular France, the United States and the United Kingdom) were large net divestors from SSA during 2014. There has been significant demand from developing-economy investors for the divested assets. Due to this, African mergers and acquisitions rose by 32 percent from \$3.8 billion in 2013 to \$5.1 billion in 2014, especially in the finance and oil and gas sectors.

The largest portion of inward FDI stock in Africa goes to services, despite its lower share as compared to the other regions. Moreover, it is concentrated in a relatively small number of countries such as Nigeria and South Africa. Services FDI nonetheless accounted for 45 percent of sub-Saharan Africa's total FDI, more than twice the share of manufacturing (20 percent) and significantly more than the primary sector (35 percent) in 2015.

Table 1. 1: FDI inflows as a Percentage of GDP to Various Regions on the Globe

Region	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
East Asia and Pacific	2.75	3.30	2.77	2.00	2.96	2.88	2.49	2.81	2.83	2.84
Latin America and Caribbean	2.91	3.45	3.30	2.21	3.35	3.56	3.48	3.22	3.49	3.78
Middle East and North Africa	6.18	6.00	4.37	3.52	3.15	1.97	1.76	1.68	1.52	1.82
OECD members	4.03	5.35	3.57	1.78	2.22	2.79	2.45	2.28	1.69	2.63
South Asia	2.12	2.18	3.38	2.38	1.55	1.79	1.21	1.42	1.56	1.85
Sub-Saharan Africa	2.07	3.25	3.70	3.63	2.10	2.68	2.28	2.27	2.51	2.61
World	4.17	5.23	3.76	2.17	2.74	3.03	2.73	2.57	2.19	2.87

Source: Own calculations based on the World Development Indicators Database (2016).

Figure 1.1 shows that FDI inflows into different regions reduced following the 2008 financial crisis. Albeit there are signs of recovery, the figures for most regions have not returned to the pre-crisis level. However, there are indications that cautious optimism is returning to global FDI. Global FDI started growing after the 2012 slump, with inflows rising 9 percent in 2013, to \$1.45 trillion.

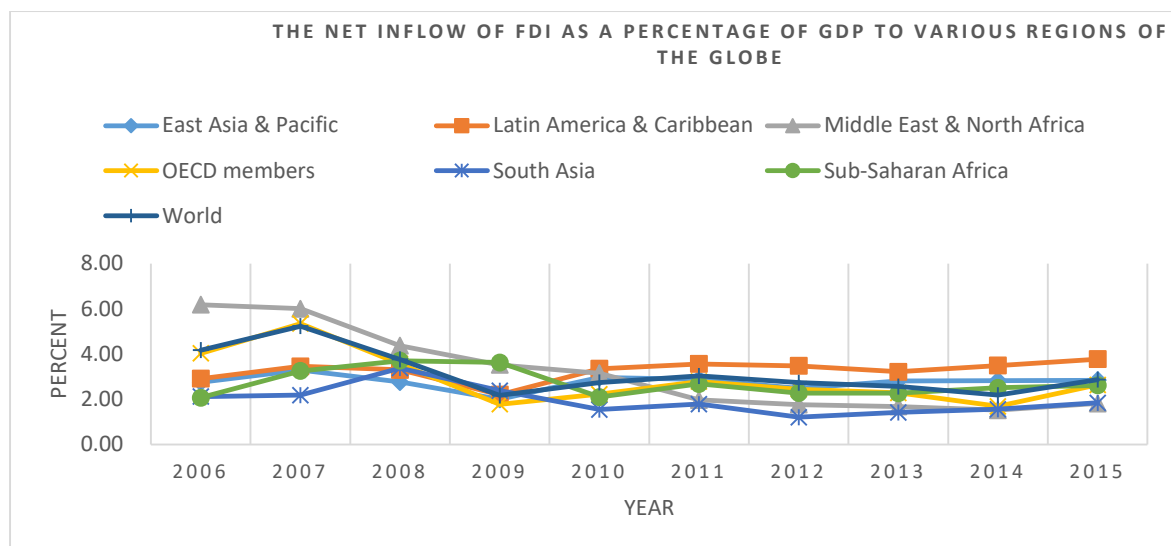


Figure 1. 1: Net FDI inflows as a Percentage of GDP to Various Regions in the world

Source: Constructed by the author based on the WDI (2016) Database.

FDI remained an essential stabilizer for emerging economies in the early stages of the crisis. Even though their net inflows of portfolio investments and bank lending were negative in 2008 (IMF, 2009), their FDI inflows increased, albeit at a slower pace than previous years; the outflows grew as well. However, as the credit crunch and recession spread more severely with serious repercussions for emerging markets in the second half of 2008, both their FDI outflows and inflows started declining and in 2009 the FDI recession became truly global in character as can be inferred from Table 1.1 and Figure 1.1. The decline was not limited to mergers and acquisitions (M&As) but was also reflected in green-field investments which are more important FDI sources in emerging markets than in developed economies. Green-field investments dropped by 15 percent in emerging economies from 2008 to 2009, however, FDI inflows have started recovering modestly, mainly driven by strong economic performance in Latin America, Asia and SSA.

1.6. Methodology

This study uses the GMM panel estimator popularized by Arellano and Bover (1995) and Blundell and Bond (1998a) to extract consistent and efficient estimates of FDI's impact on economic growth. Unlike other models, the GMM panel estimator exploits the time-series

variations in the data, accounts for unobserved country-specific effects, allows for the inclusion of lagged dependent variables as regressors and controls for endogeneity of all the explanatory variables including international capital flows. Using the dynamic panel model also helps account for temporal serial correlation and minimizes the likelihood of estimating a spurious regression model.

As explained earlier, this study uses the dynamic panel regression model for estimating FDI's effect on economic growth in SSA. The predetermined variables in the model include lagged values of the dependent variable (GDP growth rate) and independent variables which comprise of FDI, inflation, trade openness, human capital whose proxy variable is average years of schooling, capital stock and the institutional quality index. GDP's lagged value is incorporated in the model to capture the persistence of the variables.

A dynamic panel regression model can be specified as:

$$(1.1) \quad q_{it} = \alpha q_{it-1} + \beta x_{it} + \mu_i + v_{it}$$

where q represents output growth, x is the matrix of all the explanatory variables, μ_i denotes the unobserved country-specific time-invariant effect, v_{it} represents the stochastic error term, α, β are the parameters to be estimated, i is a particular country and t is time.

Biases exist in a panel regression analysis which may render the coefficient's estimates inconsistent in different techniques. The system GMM estimation technique is employed in estimating the dynamic panel model so as to deal with any possible biases.

The GMM technique uses lags of endogenous variables as instruments in which the endogenous variables are predetermined and are hence not correlated with the error term. In general, the GMM technique produces consistent and efficient estimates of parameters when the following characteristics exist in the data generating process: (1) When instruments employed to deal with the presence of endogeneity among some variables are lags of the explained regressors. However, the validity of the instruments depends on the source (variable) of endogeneity. (2) The data sample contains small time periods and large entities (countries). (3) There exist country-specific fixed effects which are randomly distributed. (4) There is country-specific autocorrelation and heteroskedasticity in the error term but no autocorrelation across countries. (5) When the lagged dependent variable influences the dependent variable.

Literature identifies two forms of GMM: the difference GMM and the system GMM. The difference GMM, developed by Arellano and Bond (1991) seeks to solve the problem of inconsistency as a result of endogeneity among some variables in the model by using the first difference of the equation being estimated.

Differencing Equation (1.1) would yield the functional relation of the form:

$$(1.2) \quad q_{it} - q_{it-1} = \alpha(q_{it-1} - q_{it-2}) + \beta(x_{it} - x_{it-1}) + v_{it} - v_{it-1}$$

Equation (1.2) resolves inconsistency and bias problems due to endogeneity by using lags of the endogenous variables as instruments but it has its own drawback in that it eliminates the country-specific effect.

The difference GMM technique centers on the idea of moment conditions with the assumption of weak exogeneity of the regressors and no serial correlation specified in the equations below:

$$(1.3) \quad E(y_{it-1}(v_{it} - v_{it-1})) = 0, t = 3, 4, \dots, T$$

$$(1.4) \quad E(x_{it-1}(v_{it} - v_{it-1})) = 0, t = 3, 4, \dots, T$$

Despite this advantage that the difference GMM has in solving the endogeneity problem among variables, it has a pitfall in that it immediately eliminates the time-invariant country-specific variables which may be of interest for the issue at hand.

However, the system GMM is considered a more appropriate approach in panel regression estimation techniques because: (1) It resolves the endogeneity problem by using the lagged values of the explanatory variables as instruments. (2) It allows the use of level and lagged values of the variables in the equation under estimation. (3) The problem of information loss associated with cross-sectional regression is tackled since the system GMM makes use of multiple observations for each entity (country) across time. (4) The system GMM is able to produce consistent and unbiased estimates of parameters even with a small time period (T) and large countries (N) (Drukker, 2010; Wooldridge, 2003).

A number of studies claim that the dynamic panel GMM estimator solves the problems of endogeneity, omitted variables bias and measurement errors (Bazzi & Clemens, 2009) Hauk and Wacziarg (2009). Kumar and Woo (2010) claim that system GMM is the most preferred technique to address dynamic panel data models though it sometimes suffers from the problem of weak instruments.

Since the consistency of the GMM estimator depends on the validity of the instruments, we considered two specification tests to address this issue. To ensure the validity of instruments within the system GMM, we did the Sargan test of over-identification to test the hypothesis of valid over-identifying restrictions. We also used the Arellano-Bond test for testing the hypothesis of no serial correlation.

Following Chukwu et al. (2012), De Mello (1997), Fedderke and Romm (2006) and Ramirez (2000) and more recently Alege and Ogundipe (2013) the analytical framework that links FDI to economic growth can be analyzed using the augmented Cobb-Douglas production function stated as:

$$(1.5) \quad Y = f[L, K_p, K_f, E] = AL^\alpha K_p^\beta K_f^\gamma E^{(1-\alpha-\beta-\gamma)}$$

where Y is the real GDP, K_p is domestic capital, K_f is foreign capital, L is labor and E refers to the externality or spillover effect generated by additions to the FDI stock. α , β and γ are the shares of domestic labor, domestic capital and foreign capital respectively while 'A' captures the total factor productivity or efficiency of production which is parametrically estimated in the next section. In our study, foreign capital is captured by FDI.

This empirical model is built in the spirit of Romer (1986a) using endogenous growth in a panel framework. It postulates that the relationship between economic development and its various determinants is an implicit function of the form:

$$(1.6) \quad Y_{it} = f(Y_{i,t-1}, INV_{it}, L_{it}, FDI, X_{it}') \\ \text{where } (X_{it}') = (HC_{it}, Inf_{it}, EXP_{it}, M_{it}, GOVEXP, ODA, IQI, Ifs, dumres_i)$$

(X_{it}') consists of fundamental determinants of growth such as human capital (HC), macroeconomic stability (proxied by inflation, inf), external trade, that is, exports (EXP) and financial development (M_2) or broad money which is a proxy for financial development, government expenditure (GOVEXP), official development assistance (ODA), infrastructure (ifs), the institutional quality index (IQI) and dumres which is a dummy variable for natural resource endowment. $Y_{i,t-1}$ is the lagged value of output (GDP) which is likely to affect current output.

Assuming that the relationship between the dependent variable and the independent variables is non-linear, the function, after adding an interaction term between human capital and FDI, and FDI and financial development (M2), can be written explicitly as:

$$(1.7) \quad Y_{it} = AY_{i,t-1}^{\beta_1} INV_{it}^{\beta_2} L_{it}^{\beta_3} FDI_{it}^{\beta_4} HC_{it}^{\beta_5} inf_{it}^{\beta_6} (HC.FDI)_{it}^{\beta_7} EXP_{it}^{\beta_8} M_{it}^{\beta_9} (FDI_{it}.M_{it})^{\beta_{10}} GOVEXP_{it}^{\beta_{11}} ODA_{it}^{\beta_{12}} IQI_{it}^{\beta_{13}} Ifs_{it}^{\beta_{14}} e^{\beta_{15}dumres}$$

Taking the natural logarithm on both sides of Equation (1.7) yields:

$$(1.8) \quad \ln Y_{it} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 \ln INV + \beta_3 \ln L_{it} + \beta_4 \ln FDI_{it} + \beta_5 \ln HC_{it} + \beta_6 \ln inf_{it} + \beta_7 \ln (HC_{it}.FDI_{it}) + \beta_8 \ln EXP_{it} + \\ + \beta_9 \ln M_{it} + \beta_{10} \ln (FDI_{it}.M_{it}) + \beta_{11} \ln GOVEXP_{it} + \beta_{12} \ln ODA_{it} + \beta_{13} \ln IQI_{it} + \beta_{14} \ln Ifs_{it} + \beta_{15} \ln dumres + \eta_i + \varepsilon_{it}$$

where Y_{it} is the GDP of country i at time t , L_{it} is the labor force in country i at time t , FDI_{it} is the foreign direct investment in country i at time t , K_{it} is the stock of capital in a country i at time t , HC_{it} is the human capital of country i at time t measured in average years of schooling, inf_{it} is inflation rate in country i at time t which is used to measure macroeconomic stability, INV_{it} is the domestic investment of country i at time t which is proxied by gross capital formation (GCF_{it}), EXP_{it} is export of country i at time t , M is the stock of broad money (M_2)³ of country i at time t , $GOVEXP_{it}$ represents government expenditure of country i at time t , ODA_{it} is official development assistance⁴ of country i at time t , while IQI stands for the institutional quality index which is constructed from the World Bank's Worldwide Governance Indicators (WGI) data. The six main indicators of governance are control of corruption, government effectiveness, political stability and absence of violence or terrorism, regulatory quality, rule of law and voice and accountability. Ifs_{it} stands for infrastructure of country i at time t which is proxied by the sum of fixed line and mobile subscribers out of 100 people and the dummy variable $dumres$ stands for resource abundance. ε_{it} is an 'idiosyncratic' component and η_i is an 'unobserved heterogeneity' component.

While all the variables are transformed into logarithmic values, inflation and ODA are not. Inflation (inf) is given as the annual growth rate of the consumer price index whereas ODA is given as a percentage of GDP. For most SSA countries the percentage of ODA from their national incomes constitutes so small a fraction that it falls below 1 and transforming that type

³ In this study, broad money and M2 are used interchangeably.

⁴ In this study, the terms official development assistance, foreign aid and aid are used interchangeably.

of a number would result in a negative value. Hence, ODA is simply given as a percentage of GDP and is not transformed into logarithmic form.

The variable (HC.FDI) is an interaction term between human capital and FDI. Li and Liu (2005) in a panel data analysis of 84 countries over the period 1970-99 found that FDI affected growth directly and also indirectly through its interaction with human capital. Accounting for human capital is important because of the support in ‘new growth’ or ‘endogenous growth’ theories. Contrary to Solow (1956), average incomes in developing countries converge on those in economically advanced nations only when human capital is considered. New growth theories reject two central assumptions of the older neo-classical model: 1) that technological changes are exogenous, and 2) that the same technological opportunities are available to all countries (Barro & Lee, 1994). Moreover, instead of diminishing returns to capital, new growth theorists expect constant returns on a broad range of investments including human capital and infrastructure (Lucas, 1993; Romer, 1986a). The other interaction term incorporated in Equation (1.8) is the one between FDI and financial development (proxied by M2, broad money). The presumption here is that lack of development in local financial markets can limit the economy’s ability to take advantage of potential FDI spillovers.

The other interaction term between FDI and M (FDI.M) captures the impact of FDI and financial development on economic growth. FDI could affect economic growth through a number of channels one of which is financial development. The main point that is being highlighted is whether the level of financial development in the host country has something to do with FDI’s impact on economic growth. To attain this goal, an interaction term between FDI and M₂ (a proxy for financial development) is used. A positive sign of the coefficient implies that FDI’s impact on economic growth would be greater when it is complemented by a well-developed financial system.

Based on Equation (1.8), the growth rate of per capita GDP can be written as:

$$(1.9) \quad \ln GDPPC_{it} = \beta_0 + \beta_1 \ln Y_{it-1} + \beta_2 \ln GCFG_{it} + \beta_3 \ln L_{it} + \beta_4 FDI_{it} + \beta_5 \ln HC_{it} + \beta_6 \ln f_{it} + \beta_7 \ln(HC_{it}) \ln FDI_{it} + \beta_8 \ln EXPG_{it} + \beta_9 \ln MG_{it} + \beta_{10} \ln(FDI_{it}) \ln MG_{it} + \beta_{11} \ln GOVEXPG_{it} + \beta_{12} ODAG_{it} + \beta_{13} \ln IQI_{it} + \beta_{14} \ln Ifs + \beta_{15} dumres + \mu_{it}$$

where

$$GDPPC = \frac{GDP}{N} \text{ is per capita GDP}$$

$EXPG = EXP/GDP$ is the ratio of exports to GDP

$GCFG = GCF/GDP$ is the ratio of gross capital formation to GDP

$FDIG = FDI/GDP$ is the ratio of FDI to GDP

$MG = M_2/GDP$ is the ratio of M_2 (broad money) to GDP, which is a measure of financial development or financial deepening

$GOVEXPG = GOVEXP/GDP$ is the ratio of government expenditure to GDP

$ODAG = ODA/GDP$ is the ratio of ODA to GDP

$N = \text{Population}$

The error term μ_{it} consists of two components, ε_{it} which is an ‘idiosyncratic’ component and an ‘unobserved heterogeneity’ component which is denoted by η_i (this is a time-invariant but individual-variant variable). The caveat one should be aware of here is that since Y stands for GDP, GDP/N yields GDPPC (per capita GDP).

Equation (1.9) can be more compactly written as:

$$(1.9a) \ln GDPPC_{it} = \beta_0 + \beta_1 \ln Y_{it-1} + \beta_2 FDIG_{it} + \beta_3 \ln FDIG_{it} * \ln HC_{it} + \beta_4 \ln FDIG_{it} * \ln MG_{it} + \beta_5 X_{it} + \mu_{it}$$

where X_{it} includes all the other control variables from Equation (1.9) excluding those mentioned in equation (1.9a).

1.6.1. Description of the Variables

GDPPC: Per capita GDP is used as a dependent variable. The growth of per capita GDP is explained as a function of other covariates which are discussed later.

Investment: Shorthand for ‘gross domestic investment’ which measures the expenses on additions to the fixed assets of the economy plus net changes in the level of inventories. This variable is proxied by gross capital formation.

Labor force: It is common knowledge that labor force is one of the most essential factors of production. Labor is the *sine qua non* of production. It can be unskilled, semi-skilled or skilled. According to Solow (1956), a larger population will result in a larger labor supply. However, he argues that labor stimulates growth in the short run until a steady-state is reached. Empirical studies have shown both positive and negative impacts of labor on economic growth. We used the total labor force obtained from the WDI (2016) database.

FDI: Net FDI inflows measure the net investment inflows to obtain a long-term management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. In the balance of payments, FDI is shown as the aggregate of equity capital, reinvestment of earnings, other long-term capital and short-term capital. FDI as a percentage of GDP is the variable of interest here.

Human capital: Lucas (1998) found that human capital is an important factor for shoring up economic growth. Starting with him, a number of empirical studies such as Romer (1990), Barro (1991, 1998, 2001), Barro and Lee (1993), de la Fuente Angel and Doménech (2006), Glomm and Ravikumar (1992) and many others have come up with similar findings. Empirical studies also reveal that human capital is a crucial vehicle for the diffusion of technology (Barro, 2001). Borensztein et al. (1998) conclude that FDI's effect on growth is conditional on the level of human capital in the host country. Therefore, human capital promotes economic growth both directly and indirectly through its effects on other factors. As a result, this study investigates the role of human capital using average years of schooling as a proxy in the FDI-growth nexus in SSA.

Inflation: A country which has a stable macroeconomic environment with high and sustained growth rates is more likely to attract more FDI inflows than one with a more volatile economy. Inflation is taken as proxy to capture that level of economic stability. Inflation, as often measured by the consumer price index, indicates the annual percentage change in the expenditure for an average consumer acquiring a fixed basket of goods and services.

EXP: Exports of goods and services as a ratio of GDP. A number of explanations are put forward on the mechanism by which exports affects economic growth. One argument is related to the impact of exports on total factor productivity. This argues that exports can stimulate total factor productivity through a positive impact on a higher rate of capital formation. The other line of argument claims that growth in exports helps relax the foreign exchange constraints thereby facilitating the import of capital goods that are meant to promote growth. Besides,

competition from overseas ensures an efficient price mechanism that fosters the optimal allocation of resources and increases the pressure on industries that export goods to keep costs low and make technological changes to increase their pace of growth. Exports as a percentage of GDP is applied in the FDI-growth nexus model.

Financial development: A number of studies claim that financial development promotes economic growth, while others question the direction of causation between the two. Some of the prominent studies on this issue include King and Levine (1993), Khan and Senhadji (2000), Levine (2005), Pagano (1993), Stiglitz (1989, 1998).

The assumption here is that by allocating capital efficiently, a well-developed financial system allocates FDI to the most lucrative and productive sectors of the economy, thereby boosting growth. It is believed that a developed financial system can serve as a catalyst for economic activities by facilitating the smooth flow of transactions and acting as an intermediary between savers (depositors) and borrowers (investors). In our study, M2 (broad money) as a percentage of GDP is used as an indicator of financial development.

Government expenditure: This represents the total expenditure of the central government as a share of GDP. Both the current and capital (development) expenditure are included but lending minus repayments are excluded. This variable too is taken as a percentage of GDP.

ODA: The OECD Development Assistance Committee (DAC) defines ODA as flows of official financing administered with the promotion of economic development and welfare in developing countries as the main objective with a grant element of at least 25 percent (using a fixed 10 percent rate of discount) which makes them concessional in character. ODA flows comprise contributions by donor government agencies at all levels to developing countries which is a form of bilateral ODA and to multilateral institutions. ODA receipts consist of disbursements by bilateral donors and multilateral institutions. Lending by export credit agencies with the purpose of export promotion is excluded from ODA and so is military assistance. We use ODA as a percentage of GDP in our model.

Institutions: North (1990) defines institutions as: ‘Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction.’ He goes on to emphasize the institutions’ key implications since, ‘In consequence they structure incentives in human exchange, whether political, social, or economic.’

Society needs to have economic institutions such as the structure of property rights and the presence and perfection of markets which are of paramount importance for economic outcomes. Besides, economic institutions are also important because they influence the structure of economic incentives. Where property rights do not exist, individuals do not have the incentive to invest in physical and human capital or in adopting more efficient technologies. Since economic institutions help us allocate resources to their most efficient uses, they are very essential. Economic institutions determine who gets profits, revenues and residual rights of control. Acemoglu and Robinson (2006) argue that when markets are missing or ignored, as they were in the Soviet Union, gains from trade go unexploited and resources are misallocated. Societies prosper when they have strong economic institutions that facilitate and encourage factor accumulation, innovation and the efficient allocation of resources. They argue that differences in economic institutions are a fundamental cause of cross-country differences in prosperity.

Empirical literature is full of the positive role that good institutions play in promoting economic growth. For example, using cross-country data, Knack and Keefer (1995) found a positive and significant relationship between institutional indicators such as the quality of the bureaucracy, property rights and political stability and economic growth. Mauro (1995) found that countries with a higher corruption index tended to have persistently lower economic growth. Rodrik (2000) found that an index of institutional quality did exceptionally well in rank-ordering East Asian countries according to their growth performance. Pistor and Xu (2002) point out that law and legal systems were important in promoting Asian economic growth, even though they have been largely ignored by literature. The institutional quality index is developed by calculating the average of the six worldwide governance indicators (WGI 2016 database) -- control of corruption, government effectiveness, political stability and absence of violence /terrorism, regulatory quality, rule of law and voice and accountability⁵.

Infrastructure: Infrastructure has a broad meaning. It is a foundation on which all the other factors are built. Infrastructure comprises transportation and communication systems, energy and electricity and water and sewage systems. Moreover, infrastructure could include government bureaucracy and economic, social and cultural infrastructure. It is presumed that a country with a weak infrastructure is more likely to have a weak foundation for its growth and

⁵ The institutional quality indicators can also be named as governance indicators.

will languish in poverty. However, like other factors, there is a disagreement among scholars on whether infrastructural development leads to economic prosperity. Using data from the United States for the period 1971-86, Holtz-Eakin (1994) found that increasing infrastructure investments would not have a meaningful impact on the productivity of the US economy. On the other hand, Addison and Heshmati (2004), Gholami, Lee, and Heshmati (2006) and Heshmati and Davis (2007) found that infrastructure in its various forms, especially ICT, played a vital role in attracting FDI and hence promoting economic growth. We use the number of mobile and fixed line subscribers per 100 people as a proxy for infrastructure.

dumres: This is a dummy variable for natural resource endowments. Countries that are resource endowed take a value of 1 and those that are not endowed take a value of 0. Sachs and Warner (1997) found that higher initial endowments of natural resources were correlated with slower growth. Specifically, they assert that an increase in the initial share of natural resource exports in GDP from 0.1 to 0.2 (10 to 20 percent) is predicted to reduce subsequent growth by 0.33 percentage points per annum. They attribute this negative association mainly to a combination of dynamic Dutch-Disease effects and greater incentives for rent-seeking in resource-abundant economies. This issue is popularly known as the natural resource curse. However, the idea of a resource curse is highly disputed and has come under severe attack in recent times. For example, Asiedu (2002) and Onyeiwu and Shrestha (2004) found that natural resource endowed SSA countries received more extractive FDI, while Asiedu (2013) contradicts his own earlier findings and suggests that a natural resource curse in oil-rich SSA countries exacerbates political instability and promotes corruption which dissuade increased FDI inflows.

IMF (2013) defines a country to be ‘resource-rich’, if exports of non-renewable natural resources like oil, minerals and metals constitute more than 25 percent of the value of the country’s total exports. Based on this criterion, IMF has categorized 20 countries in sub-Saharan Africa as being resource-rich. It used data for 2005-2010 for this classification and the countries included were Angola, Equatorial Guinea, Congo Dem. Republic, Nigeria, Guinea, Gabon, Congo Rep., Chad, Botswana, Zambia, Sierra Leone, Mali, Namibia, Niger, Cameroon, Zimbabwe, Tanzania, Ghana, Central African Republic and South Africa.

1.6.2. Data Used in the Estimation and Its Sources

The data for this study is obtained from the World Bank's World Development Indicators (2016b), International Financial Statistics and the IMF World Economic Outlook (2016) database. Data on FDI comes from the United Nations Conference on Trade and Development (UNCTAD, 2016) database. Sub-Saharan Africa comprises 48 countries, however, due to data unavailability for some important variables for some countries, we use annual data for 43 SSA countries. Moreover, the study covers 15 years (2001-15). Hence, because of lack of complete data for the stated variables for the required time period in executing the dynamic panel system GMM approach based regressions some of the countries could not make it into the detailed econometric analyses of the FDI-growth nexus. Based on natural resource endowments the countries in the region are categorized as 'resource-rich' and 'resource-poor'.

1.7. Model Estimation and Discussion of the Findings

1.7.1. Descriptive Statistics

The brief descriptive results given now rely on the principal component analysis (PCA). PCA as a statistical tool enables us to change a set of observations of conceivably correlated variables into a linearly uncorrelated set of variables known as principal components using an orthogonal transformation. The number of principal components should not exceed the number of original variables. The transformation process should result in a way that the first principal component yields the largest possible variance. In other words, the first principal component should account for much of the variability in the data. Thereafter each subsequent component should yield the highest variance possible without violating the restriction of being orthogonal to the previous components. The vectors that result from such a process are an uncorrelated basic set. One pitfall of using PCA is that it is delicate because it is sensitive to the relative scaling of the original variables.

To show a simple association between per capita GDP and the other variables and identifying potential combinations of macro, human capital and institutional factors that are highly linked with per capita incomes, we use cross-correlations between variables, plots of cross-country and PCA.

The correlation matrix given in Table 1A.1 in the Appendix suggests that there is a fairly strong correlation among the variables of interest and hence we are justified in using PCA. Though we should be cautious not to put too much emphasis on the unrotated components, a cursory look shows that the first five components explain nearly 66 percent of the variation in per capita GDP (see Table 1A.2 in the Appendix). The rule of thumb is to keep components with an eigenvalue of 1 or more. Based on this, five components are retained here as indicated in Table 1.2. In other words, PCA extracts five components which represent around 66 percent of the total variance. Squaring the component loadings which are analogous to correlation coefficients gives us the amount of explained variations (Table 1A.2 in the Appendix). Therefore, how much of the variation in a variable is explained by the component is captured by the component loadings.

PCA can also be used for reducing the dimension of the variables. However, we keep the original dimension of the variables intact because PCA does not yield a discernible pattern as to which variables to keep and which ones to drop.

As Table 1.2 illustrates the first component is mainly related to FDI as a percentage of per capita GDP growth rate, the interaction of FDI and human capital which is represented by FDIHC and the interaction between broad money and FDI which is designated MFDIG. All variables are given in logarithmic terms as indicated by the *ln* sign.

The second component loads highly on the per capita GDP growth rate (GDPPCannualg), human capital (HC), exports as a percentage of GDP (EXPG), official development assistance as a percentage of GDP (ODAG) and the dummy variable that captures resource abundance (dumres). This second component captures positive co-movements between per capita GDP, human capital, exports and resource abundance and negative co-movements between these variables and official development assistance. Similarly, the third component loads highly on broad money as a percentage of GDP (MG), government expenditure as a percentage of GDP (GOVEXPG) and the institutional quality index (IQI). The fourth component mostly captures a negative movement in gross capital formation as a percentage of GDP (GCFG) and a positive movement in inflation. The fifth and last component captures a positive co-movement between labor force and infrastructure.

Table 1. 2: Rotated components of the variables used in the study

Rotated components (blanks are $\text{abs}(\text{loading}) < .3$)

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Unexplained
GDPPCannualg				0.5524		.449
lnGCFG				0.4027		.4053
lnlaborforce					0.7841	.2225
FDIG	0.5264					.2477
lnHC			0.4650			.3056
inflation				-0.6148		.4125
lnFDIHC	0.4979					.149
lnEXPG			0.3514		-0.3966	.2683
lnMG		0.5190				.3015
lnMFDIG	0.5380					.1762
lnGOVEXPG		0.4544				.4214
ODAG			-0.5752			.3451
lnIQI		0.4976				.3176
lnIfs		0.3494				.4504
dumres			0.4482			.4555

Another important point that should be emphasized here is that the average growth rate of GDP and per capita GDP in ‘resource-rich’ countries is not much better than that in ‘resource-poor’ countries. The countries that are highly endowed with resources have not fared better than those that are resource constrained. The difference in the growth rate of per capita GDP between the two groups of countries is not statistically significant (Table 1.3).

Table 1. 3: Two-sample t-test of per capita GDP growth in resource-rich and resource-poor countries with unequal variance

Group	Obs	Mean	Std. Err.	Std.Dev.	[95%Conf.Interval]	
0	345	2.028	0.211	3.923	1.613	2.444
1	300	2.484	0.398	6.894	1.700	3.267
combined	645	2.240	0.217	5.508	1.814	2.666
diff		-0.456	0.451		-1.34	0.430
Diff=mean(0)-mean(1)		t=-1.011		Satterthwaite's degrees of freedom = 459.458		
H ₀ :diff=0		Ha:diff<0		Ha:diff!=0		
		Pr(T<t)=0.156		Pr(T > t =0.312 ⁶		
				Pr(T>t)=0.843		

Note: diff is the difference in mean between resource-poor countries represented by 0 and resource-rich countries represented by 1. H₀ is the null hypothesis and Ha is the alternative hypothesis. Mean(0) is the mean growth rate of resource-poor countries while mean(1) is that of resource-rich countries.

⁶ The decision rule is that if the p-value is less than the pre-specified alpha level (usually .05 or .01) we will conclude that the mean is statistically and significantly greater or less than the null hypothetical value.

Contrary to a widely held view, average FDI inflows as a percentage of GDP for the resource-rich countries are not statistically different from their resource-poor counterparts which coincides with Chika (2014) findings. This contradicts the popular view that FDI inflows into SSA are resource-seeking in nature. Asiedu and Lien (2011) found that natural resources which are measured as the sum of minerals and oil in total merchandise exports have a negative impact on FDI.⁷

There has been a tremendous increase in FDI inflows and other forms of capital into SSA in recent decades. However, their impact on economic growth in the region is unsatisfactory (Asiedu, 2002). For example, FDI inflows into SSA are marked by volatility. Besides, they are concentrated in a few resource endowed and abundant countries which are inclined towards the extractive sectors of the economy (Ndikumana & Verick, 2008). The empirical finding here confirms Lim's (2001) argument who says that FDI in the extractive sectors has a limited positive effect on economic growth because FDI is spent for a few mega projects that are capital-intensive and hence do not employ much labor and locally produced intermediate inputs.

Table 1. 4: A two-sample t-test of FDI inflows to resource-poor and resource-rich countries with unequal variance

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	345	5.442	.527	9.791	4.405	6.479
1	300	5.077	.421	7.293	4.249	5.906
combined	645	5.272	.343	8.714	4.599	5.946
diff		.365	.674		-.960	1.689
Diff=mean(0)-mean(1)		t=	.54	Satterthwaite's degrees of freedom = 628.602		
H ₀ :diff=0	Ha:diff<0	Ha:diff!=0	Ha:diff>0			

⁷ A strand of empirical literature argues that resource dependence could potentially undermine FDI flows. The exponents of the FDI natural resource curse contend that natural resources attract resource-based FDI but inhibit and crowd-out non-resource FDI. Hence, total FDI in resource-endowed countries will reduce when the effect of the fall in non-resource FDI offsets the increase in resource-motivated FDI. Asiedu and Lien (2011) maintain that this mainly occurs because a boom in natural resources results in currency appreciation which leads to the loss of export competitiveness that eventually crowds-out investments in the non-natural resource tradable sectors.

$$\Pr(T < t) = 0.705 \quad \Pr(|T| > |t|) = 0.589 \quad \Pr(T > t) = 0.294$$

Note: diff is the difference in mean between resource-poor countries represented by 0 and resource-rich countries represented by 1. H_0 is null-hypothesis and H_a the alternative hypothesis. Mean(0) is the mean inflow of FDI as a percentage of GDP to the resource-poor countries while mean(1) is for that of resource-rich countries.

1.7.2 Estimation Results of the Econometric Model

We estimate the equation using the system GMM (Generalized Method of Moments) dynamic panel estimator (Blundell and Bond, 1998). By imposing the restriction that the coefficients in the level and differenced equation are equal, this method jointly estimates the equation in levels and in first difference. The instruments used in the level equation are the lagged first-differences of the variables. GMM-type instruments for the differenced equation are the lagged levels of the variables. The large cross-country variations in the variables are exploited by the equation in levels, whereas in the differenced equation, time-invariant and country-specific sources of heterogeneity are removed. In addition, the use of appropriate lags of the right-hand side variables as instruments allows one to address measurement errors, omitted variables and endogeneity (Dollar & Kraay, 2004). The Hansen J statistic of over-identifying restrictions helps us test the validity of the GMM instruments.

To reiterate, the system GMM performs better than the difference GMM in estimating empirical growth models when the time dimension of the panel dataset is short and the outcome variable shows persistence (Roodman, 2009a) which is the case in this study. Difference GMM estimators are weak and may lead to problematic statistical inferences. Using lagged differences of the regressors as instruments for the equation in level along with the conventional use of the lagged levels of regressors for the equation in first differences help overcome the weak instrument problem and perform well in terms of precision and bias (Blundell & Bond, 1998a).

We chose the two-step system GMM estimator which provides more efficient estimators over the one-step system GMM to estimate the parameters of the model. The two-step GMM yields a covariance matrix that is robust to heteroskedasticity and autocorrelation. However, the standard errors show a downward bias. Hence, using robust standard errors gives us consistent estimates in the presence of panel heteroskedasticity and autocorrelation (Mileva, 2007). This issue has been taken care of in this study and all the final results of the model are corrected for heteroskedasticity. Moreover, the two-step GMM, unlike the one-step system GMM, gives a

robust Hansen J test for over-identification. Thus, the two-step system GMM procedure with robust standard errors is chosen to estimate our model.

Table 1.5 shows the results of the dynamic panel data estimated using various forms of difference GMM. Though we give an interpretation of the coefficients and their significance when we address the system GMM model, a cursory look reveals that if the regression model does not account for the heteroskedasticity problem, several variables turn out to be significantly associated with the growth of per capita GDP. However, once we correct the dispersion in variance using the ‘robust’ option in Stata, a number of the variables that were earlier significant now become insignificant. The first and the second columns use the second lags of the endogenous variables as instruments for the difference GMM model while the third and fourth columns use the third lags of the endogenous variables in the estimation of the difference GMM model. Besides, the standard errors given in the first and third columns are not corrected for heteroskedasticity while those given in the second and fourth columns take care of the heteroskedasticity problem that seems to exist in the models.⁸

Though the various forms of the difference GMM model presented in Table 1.5 pass the diagnostic tests, none of the variables is significant after we correct them for heteroskedasticity (see columns 2 and 4) except for the institutional quality index which is significant at the 10 percent significance level. Given the lack of good governance in SSA, this result is bizarre and should be taken with a pinch of salt.

Coviello and Islam (2006) empirical results show that if the time series are persistent, for example, growth of per capita GDP, the difference GMM estimator can behave poorly because the lagged levels of the series only provide weak instruments. Further, these authors also indicate that the difference GMM estimates of the coefficient on the lagged dependent variable tend to lie below the corresponding within-group (fixed effects) estimates which suggests that the difference GMM estimates are seriously biased (see the coefficients of the lagged dependent variable in Table 1.7). To this end, we deploy the system GMM estimators and rely on its results to interpret the coefficients and their significance.

⁸ Compare the results in column 1 and column 2 as well as column 3 and column 4 to appreciate the impact that uncorrected standard errors have on the significance of the coefficients.

Table 1. 5: Estimating the growth rate of per capita GDP using various forms of difference GMM

	diffGMM1	diffGMM2	diffGMM3	diffGMM4
Explanatory variables	1	2	3	4
Lag of GDP per capita growth	-0.156*** (0.01)	-0.156 (0.10)	-0.057** (0.02)	-0.057 (0.12)
gross capital formation	2.491*** (0.86)	2.491 (2.73)	3.515*** (0.72)	3.515 (2.17)
labor force	0.221 (5.54)	0.221 (17.25)	-11.617* (5.94)	-11.617 (19.18)
FDI	-0.118** (0.05)	-0.118 (0.12)	-0.133*** (0.03)	-0.133 (0.11)
human capital	-25.257** (10.53)	-25.257 (23.51)	-4.667 (10.91)	-4.667 (33.29)
Inflation	-0.001 (0.00)	-0.001 (0.00)	-0.001** (0.00)	-0.001 (0.00)
FDI*human capital	-3.810*** (1.02)	-3.810 (3.07)	-6.091*** (1.05)	-6.091 (4.12)
Exports	7.563*** (1.91)	7.563 (5.29)	6.278*** (1.35)	6.278 (3.92)
broad money	-5.003*** (1.74)	-5.003 (4.91)	-4.601*** (1.56)	-4.601 (3.11)
broad money*FDI	0.133 (0.27)	0.133 (0.52)	1.001*** (0.27)	1.001 (0.86)
government expenditure	-4.983*** (0.87)	-4.983 (4.15)	0.435 (1.01)	0.435 (6.72)
ODA	2.655 (2.05)	2.655 (5.46)	-4.234** (1.92)	-4.234 (5.76)
institutional quality index	4.871*** (0.87)	4.871* (2.83)	3.430*** (0.93)	3.430 (2.87)
Infrastructure	1.712*** (0.55)	1.712 (1.46)	1.314*** (0.35)	1.314 (0.83)
Observations	505	505	505	505
No. of countries	43	43	43	43
F-test (P-value)	0.000	0.000	0.000	0.000
Hansen P-value	0.934	0.934	0.967	0.967
AR(1) P-value	0.010	0.042	0.003	0.016
AR(2) P-value	0.154	0.363	0.592	0.683

Notes: All variables except human capital, inflation, infrastructure, the institutional quality index and dummy of resource abundance are given as a percentage of GDP. Moreover, all variables except FDI, inflation, ODA and the dummy for resource endowments are given in logarithmic values for ease of interpretation though a logarithmic transformation also has other additional benefits. FDI and ODA are given as a percentage of GDP. The first and second columns use only the second of the endogenous variables as instruments whereas the third and fourth columns use the third lag of the endogenous variables as instruments. The standard errors of the first and third columns are not robust while those of the second and fourth columns are. The standard errors are given in parenthesis. * p < 0.10, ** p < 0.05, *** p < 0.01.

Table 1.6 presents the regression results obtained by using various forms of the system GMM. The interpretation of the model is mainly based on the coefficients of the variables in column

2 which like column 1 uses the second lag of the endogenous variables as instruments but it is an improvement over column 1 since the standard errors are robust and pass the different diagnostic tests. Columns 1 and 2 use fewer instruments as compared to columns 3 and 4. Thus, they offer more degrees of freedom which makes them preferable over the others that use deeper lags and consume more degrees of freedom.

As is the case in all dynamic panel data models, the lagged value in the growth of per capita GDP is incorporated in the model to capture persistence and feedback effects over time. *Ceteris paribus*, a 1 percent increase in the growth rate of per capita GDP in the previous year brings about an increase in the growth rate of per capita GDP by 0.101 percent at the 5 percent significance level. Moreover, the fact that the lagged dependent variable is significant in all the models implies that we are justified in using a dynamic model.

Gross capital formation is another variable that has a significant and positive effect on the growth of per capita GDP. In virtually all alternative models and scenarios formulated, this variable is consistent in having a positive and significant effect on the growth rate of per capita GDP at the 1 percent significance level. An increase of 1 percent in gross capital formation brings about an increase in the growth of per capita income of 3.67 percent, *ceteris paribus*.

The growth of the labor force has a positive but statistically insignificant effect on the growth of per capita GDP. Given the poor productivity performance of the labor force in SSA countries, this result is not a big surprise. Of course, labor force is only marginally insignificant at the 10 percent significance level.

FDI as a percentage of GDP, the main variable of interest in this study, has a negative and significant effect on economic growth in SSA in the period under discussion. This result is similar to Haddad and Harrison (1993), Alfaro et al. (2004), Carkovic and Levine (2002), and Ang (2009) findings.

For scholars like Carkovic and Levine (2002) local conditions in host countries do not have a noticeably significant impact on the nexus that is supposed to exist between FDI and economic growth. They applied the system GMM and found that both FDI and the interaction terms between FDI and other macro-variables were statistically insignificant. Based on their findings, they caution that previous studies that showed the existence of a positive relationship between FDI and economic growth should be viewed with skepticism because they suffer from endogeneity problems.

A common trait in much of the empirical FDI-growth literature is that they take a cautious stand that FDI in its own right does not immediately foster growth. For FDI to thrive and have a positive effect on economic growth, there are conditionalities that need to be fulfilled such as the presence of a well-developed financial sector, a skilled and well-trained labor force and other institutional and infrastructural factors. FDI-growth literature calls these conditions the ‘absorptive capacity’ of the host country.

Proponents of FDI argue that it has a positive impact on aggregate demand in the host country in the short-run via productivity improvements and technology transfers while critics raise concerns about these supposed benefits. Their rationale is that the long-run balance of payments position of the host country is detrimentally affected after the initial financial outlays made by the investors. Once the initial investments start turning profitable, it is inevitable that capital will return to the country it originated from which negatively affects the growth prospects in the host country. Moreover, policies that offer preferential tax treatment and other incentives to induce inward FDI may introduce a distortion in the economy affecting domestic investments which eventually leads to FDI having a negative effect on economic growth. If the distortion between the returns on foreign and domestic capital are of a huge magnitude, it will have a large negative effect on growth.

Based on the findings of this study, a unit increase in FDI as a percentage of GDP results in a decline in the growth of per capita income by 0.138 percent. This result is troubling given the hype and attention that SSA governments paid for attracting FDI. To put this result into perspective, an additional increase in FDI as a percentage of GDP by 10 units leads to a further deterioration in the growth of per capita income (GDP) by 1.38 percent.

Human capital has an insignificant direct effect on the growth of per capita income even at the 10 percent significance level. Given the well-documented poor record of SSA countries in educational attainments and other measures of human capital development, this finding is not surprising. However, it can also partly be explained by the poor proxy variable used for human capital which is the average years of schooling. Many other previous studies have also used this proxy and complain about its strength in representing human capital. Others have also used secondary-school enrolment as a proxy but the result is not any better. This result confirms Islam’s (1995) result who found that human capital did not significantly affect output growth but claimed that it should affect growth through its impact on TFP growth. However, Miller and Upadhyay (2000) did find a positive and significant effect of human capital on income

growth at the 10 percent significance level but failed to find any direct positive effect of human capital on TFP. Borensztein et al. (1998) also found a positive effect of the interaction between human capital and FDI on economic growth whereas the interaction between the two in our study is negative but insignificant. The negative outcome seems to have been driven by FDI rather than human capital as their respective individual effects imply.

There exists a negative association between inflation and growth but this association is not statistically significant. High and erratically volatile inflation can reduce the returns on capital and hence decrease investments in capital, which reduces growth (Gillman, Harris, & Mátyás, 2004).

Borensztein et al. (1998) found that FDI's direct effect on growth was not significant, although it was positive. But when FDI was interacted with human capital, the interaction term was positive and significant which implies that FDI's positive impact depends on the level of human capital. The estimation result in our study is, however, diametrically opposite to their finding since human capital in itself has a positive and significant effect whereas the interaction between the two is negative because the individual effect of FDI on the growth of per capita GDP is negative and significant which makes the multiplicative interaction term negative but insignificant even at the 10 percent significance level. This is difficult to fathom and puzzling to explain. One plausible reason could be that the sectors in which FDI is heavily concentrated might siphon off the skilled and educated labor force from the domestic investment sector which is more productive and has a more positive contribution to the growth of per capita income. This seems true as gross capital formation which is a proxy for domestic investments has a positive and significant effect on growth while FDI has an adverse effect.

Alfaro et al. (2004) studied the interlinkages between FDI, financial markets and economic growth using cross-country data for more than 70 developed and developing countries over the period 1975-95. Their findings suggest that FDI played a pivotal role in economic growth but this happened only when complemented with a well-developed local financial market which is badly missing in much of SSA. The proxy measure used for financial development (broad money) has a consistent negative coefficient under different model formulations used for the robustness check. It is highly possible that this lack of financial development is dragging down the other variables from having a meaningful impact on the growth in per capita income. A well-developed financial system stimulates growth by channeling savings to the most productive investment projects. Contrarily, financial repression results in a poorly functioning

financial system that in turn depresses growth. This can happen as a consequence of excessive government interference in the financial system through activities such as higher bank reserve requirements, interest rate ceilings and direct credit programs for preferential sectors.

Exports have a significantly positive effect on growth as they represent the openness of the economy. SSA countries' imports constitute petroleum products and other consumer items that do not have an appreciable contribution in further production. This is empirically corroborated in the next chapter that deals with TFP growth. The *a priori* expected sign that exports have a positive contribution to economic growth is maintained and substantiated by the findings. Not only do exports have a positive impact they also have an enormous contribution. A 1 percent increase in exports increases growth by nearly 2.78 percent.

Financial development's role in economic growth is captured by broad money. Using broad money as a proxy for financial development might make the whole essence of financial development narrow. But no matter how that characterization narrows the idea of financial development, it is difficult to discern and explain a situation where financial development affects growth negatively at a time when most SSA countries have liberalized their financial systems and markets. Keeping all else equal, an increase in broad money by 1 percent drags down growth by 3.18 as indicated in column 2 in Table 1.6.

The interaction between FDI and broad money has a positive but insignificant effect on the growth rate of per capita GDP but this seems to be due to the multiplicative outcome of their respective negative signs rather than because of anything else.

The government's role in an economy is one of the most controversial aspects. There is no unanimity on what role the government should play in an economy. One strand of literature emphasizes free operations of market forces and dissuades the government from interfering in their operations. This kind of economic structure is popularly known as a capitalist system which is mostly advocated by classical and new classical economists. The other polar view rests on the idea that the market is inept and inefficient in allocating resources and hence the government replaces the market system as is the case in centrally planned (command) economies.

After the East Asian growth miracle and the 2008 financial crisis the pivotal role that governments could play in their economies has gained more credence. A fair share of the remarkable growth in East Asia is credited to sound policies formulated by the governments of

the time in the respective states, which in effect, brought the developmental state thinking into prominence. The whole debate regarding the government's place in an economy can be reduced to this simplistic argument. But when we come back to the main point, our empirical findings show that governments in SSA are destabilizing the markets and retarding growth possibly through distortionary policies creating a situation where government failure surpasses market failure. Governments could introduce inefficiencies, rent-seeking behavior, corruption and malpractices if they are not accountable to the electorate.

ODA is another variable which has a positive but insignificant effect on the growth of per capita income. This result is similar to Ogundipe, Ojeaga, and Ogundipe (2014) result who found that foreign aid did not significantly influence the growth of real per capita GDP in SSA.

Institutional quality index has the expected positive sign but it is not significant which coincides with the widespread perception about the poor quality of institutions in SSA. Infrastructure which is proxied by the sum of the number of fixed line and mobile cell subscribers out of 100 people has a negative sign that is unexpected on *a priori* grounds. This could partly be due to the poor measurement of infrastructure only through access to telephones while infrastructure is very broad and should not be boiled down to a single variable like the case here.

The other variable that should be emphasized here is natural resource endowments and its impact on economic growth. The dummy variable is set at 1 for those 'resource-rich' countries on the basis of IMF's (2013) classification. The categorization was done depending on the data on natural resources' contribution to the respective countries' economies between 2005 and 2010. The result is not significant though it is negative. This is an indication that the much maligned 'resource curse' hypothesis might be at work. A separate growth regression for the resource-rich countries which are supposed to attract more FDI does not yield a statistically different result. When an independent regression is run for the resource-rich countries, FDI's sign still remains negative.

The diagnostic tests towards the end of Table 1.6 suggest that the performance of the estimators is satisfactory. The F-test rejects the hypothesis that all the coefficients are zero, while the Hansen tests do not reject the hypothesis that the instruments are not correlated with the residual. This finding makes the instruments valid. We also detect first-order autocorrelation, AR(1) which is expected for the system GMM estimators. However, detection of second-order autocorrelation will cause problems as it makes it invalid to use the second lag of the

independent variables as instruments. Finally, the AR(2) test results indicate no second-order autocorrelation in the residuals.

Table 1. 6: Estimation of the growth rate of per capita GDP using various forms of the system GMM

Explanatory variables	sysGMM1 1	sysGMM2 2	sysGMM3 3	sysGMM4 4
Lag of GDP per capita growth	0.101*** (0.01)	0.101** (0.04)	0.143*** (0.01)	0.143 (0.09)
gross capital formation	3.670*** (0.30)	3.670*** (1.03)	3.584*** (0.22)	3.584*** (1.15)
labor force	0.741*** (0.20)	0.741 (0.54)	0.721*** (0.20)	0.721* (0.42)
FDI	-0.138*** (0.02)	-0.138** (0.07)	-0.099*** (0.02)	-0.099 (0.08)
human capital	2.874* (1.63)	2.874 (4.05)	3.619* (2.08)	3.619 (3.94)
inflation	-0.000*** (0.00)	-0.000 (0.00)	-0.000* (0.00)	-0.000 (0.00)
FDI*human capital	-1.365** (0.59)	-1.365 (1.74)	-1.539*** (0.50)	-1.539 (1.74)
exports	2.796*** (0.49)	2.796** (1.37)	2.534*** (0.74)	2.534 (1.63)
broad money	-3.182*** (0.24)	-3.182** (1.38)	-1.767*** (0.33)	-1.767 (1.51)
broad money*FDI	0.287 (0.18)	0.287 (0.38)	0.229 (0.17)	0.229 (0.40)
government expenditure	-2.203*** (0.40)	-2.203 (2.51)	-1.842*** (0.44)	-1.842 (3.28)
ODA	8.080** (3.98)	8.080 (7.47)	5.192*** (1.74)	5.192 (5.09)
institutional quality index	1.315*** (0.27)	1.315 (0.98)	0.698*** (0.17)	0.698 (1.12)
infrastructure	-0.131 (0.16)	-0.131 (0.52)	-0.433** (0.17)	-0.433 (0.38)
dummy for resource endowment	-0.907 (0.63)	-0.907 (1.68)	-2.414*** (0.70)	-2.414 (1.63)
constant	-18.373*** (4.26)	-18.373 (11.92)	-19.196*** (5.44)	-19.196 (11.62)
Observations	561	561	561	561
No. of Countries	43	43	43	43
F-test (P-value)	0.000	0.000	0.000	0.000
Hansen P-value	0.969	0.946	0.978	0.984
AR(1) P-value	0.020	0.032	0.002	0.019
AR(2) P-value	0.173	0.391	0.402	0.241

Notes: All variables except human capital, inflation, infrastructure, the institutional quality index and dummy of resource abundance are given as a percentage of GDP. Moreover, all variables except FDI, inflation, ODA and the dummy for resource endowment are given in logarithmic values for ease of interpretation though a logarithmic transformation also has other additional benefits. FDI and ODA are given as a percentage of GDP. The first and second columns use only the second lag of the endogenous variables as instruments whereas the third and fourth columns use the third lag of the endogenous variables as instruments. The standard errors of the first and third columns are not robust while those of the second and the fourth columns are. The standard errors are given in

parenthesis. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ signify that the coefficients are significant at 10 percent, 5 percent and 1 percent respectively.

On top of the unobserved panel-level effects which could be fixed or random, linear dynamic panel data consists of p lags of the dependent variable as covariates. Using the standard estimators to estimate linear dynamic panel data models makes them inconsistent because by construction the lagged dependent variables are correlated with the unobserved panel level effects.

The dynamic fixed-effects model could suffer from the so-called Nickell (1981) bias; that is, the correlation between the fixed effects and the lagged dependent variable could bias the coefficient on the lagged dependent variable towards zero. If the explanatory variables are correlated with the lagged dependent variable, then the estimated coefficients of the explanatory variables may inherit this Nickell bias. It is well known that the bias decreases with T and becomes small when T is about 20 or more.

Our main estimation method is a two-step system GMM with dynamics. However, we also consider a two-step difference GMM method and other static set-ups to check if the findings remain robust (Table 1.7). The static linear panel data models such as pooled-OLS, fixed-effects and random-effects are inconsistent in the presence of the lagged dependent variable which persists over time. Though the results of the pooled-OLS and random effects estimators signal that the lagged value of the dependent variable is significant at the 1 percent significance level, we should be cautious in interpreting these results as the very existence of the lagged value of the dependent variable in the list of covariates renders these models irrelevant.

From the results in column 5 of Table 1.7 we can see that the lagged value of the growth of per capita income significantly affects the current growth rate of per capita income at the 5 percent significance level. To be specific, a 1 percent increase in the growth of per capita income the previous year affects the growth of current per capita income by around 0.10 percent.

Table 1. 7: Growth rate of per capita GDP for SSA using various methods (2001-15)

Explanatory variables	Pooled OLS	RE	FE	diffGMM	sysGMM
	1	2	3	4	5
Lag of GDP per capita growth	0.180*** (0.04)	0.180*** (0.04)	0.045 (0.05)	-0.057 (0.12)	0.101** (0.04)
gross capital formation	2.383*** (0.69)	2.383*** (0.67)	4.079*** (0.98)	3.515 (2.17)	3.670*** (1.03)

labor force	0.455*** (0.16)	0.455** (0.19)	-2.907 (6.74)	-11.617 (19.18)	0.741 (0.54)
FDI	-0.170* (0.09)	-0.170*** (0.05)	-0.182*** (0.05)	-0.133 (0.11)	-0.138** (0.07)
human capital	0.254 (1.06)	0.254 (1.29)	-24.409** (9.85)	-4.667 (33.29)	2.874 (4.05)
inflation	-0.000 (0.00)	-0.000*** (0.00)	-0.000** (0.00)	-0.001 (0.00)	-0.000 (0.00)
FDI*human capital	0.613 (0.59)	0.613 (0.58)	1.775* (0.89)	-6.091 (4.12)	-1.365 (1.74)
exports	0.925* (0.55)	0.925* (0.51)	2.228** (1.10)	6.278 (3.92)	2.796** (1.37)
broad money	-0.554 (0.41)	-0.554 (0.46)	-0.846 (0.68)	-4.601 (3.11)	-3.182** (1.38)
broad money*FDI	0.163 (0.15)	0.163 (0.14)	0.066 (0.21)	1.001 (0.86)	0.287 (0.38)
government expenditure	-0.382 (0.88)	-0.382 (1.13)	-1.473 (2.07)	0.435 (6.72)	-2.203 (2.51)
ODA	4.944** (2.50)	4.944*** (1.73)	7.240*** (2.53)	-4.234 (5.76)	8.080 (7.47)
institutional quality index	0.346 (0.40)	0.346 (0.43)	2.538 (1.98)	3.430 (2.87)	1.315 (0.98)
infrastructure	-0.439* (0.23)	-0.439* (0.26)	0.362 (0.68)	1.314 (0.83)	-0.131 (0.52)
Resource endowment	-0.389 (0.49)	-0.389 (0.51)	0.000 (.)		-0.907 (1.68)
constant	-12.580*** (3.93)	-12.580*** (4.08)	35.372 (100.67)		-18.373 (11.92)
Observations	561	561	561	505	561
Number of Countries	43	43	43	43	43
F-test (P-value)	0.000	0.000	0.000	0.000	0.000
Hansen P-value				0.934	0.984
AR(1) P-value				0.052	0.019
AR(2) P-value				0.113	0.241
R-squared	0.194				
Overall R-squared		0.194	0.015		

Notes: Gross capital formation, FDI, foreign aid, government expenditure, broad money and imports are given as a percentage of GDP whereas the other variables, except the dummy for resource endowment, are transformed into logarithmic values for ease of interpretation, not to mention the other benefits of logarithmic transformations. Columns 4 and 5 use the second lag of the endogenous variables as instruments. All standard errors are robust. The standard errors are given in parenthesis. * p < 0.10, ** p < 0.05, *** p < 0.01 show the level of significance of the coefficients at 10 percent, 5 percent and 1 percent respectively.

1.7.3 Robustness Check of the Base Specification

Since the dynamic panel data estimators are instrumental variable methods, it is particularly important to evaluate the Hansen test's results.

As far as heteroscedasticity is concerned, in a two-step estimation the standard covariance matrix is already robust but the reported two-step standard errors tend to be severely downward

biased (Arellano and Bond, 1991; Blundell and Bond, 1998) which is exactly the case in our study. Performing the Sargan test after the two-step estimator is an alternative, but Arellano and Bond (1991) found that this test had a tendency to under-reject in the presence of heteroskedasticity.

In the one-step estimation we used the robust option to calculate the robust estimator of the covariance matrix of the parameter's estimates. In the presence of any pattern of heteroskedasticity and autocorrelation within panels, the resulting estimates are consistent and robust. When it comes to the two-step estimation, the standard covariance matrix typically yields standard errors that are downward biased though theoretically they are supposed to be robust. The two-step robust test requests Windmeijer's finite-sample correction for the two-step covariance matrix which is already implemented in the models adopted in this paper.

Whether the instruments, as a group, appear exogenous or not is captured by the *xtabond2*⁹ tests of over-identifying restrictions. For one-step, the Sargan statistic reports the minimized value of the one-step GMM criterion function which is a non-robust estimation. That is, the Sargan statistic is not robust and reliable in the presence of heteroskedasticity or autocorrelation. Therefore, for *xtabond2* which reports the Hansen J statistic, the minimized value of the two-step GMM criterion function is used for one-step and two-step robust estimations (Roodman, 2009a). Most of the coefficients that are significant when the robust option is not used become insignificant once the respective models are adjusted for heteroskedasticity.

To ensure the robustness of the results, we used the Blundell and Bond (1998) difference GMM estimator. Moreover, to overcome any possible Nickell bias, we not only used the GMM estimator, but we also estimated static panel data regression models.

The model is checked for robustness using the user-written add-on command 'checkrob' with different combinations of the supposed 'core variables' (the variables to be retained in the regression) such as the lagged value of the growth of per capita GDP, FDI, gross capital formation, labor force, human capital and other 'testing variables' (the variables to be

⁹ *xtabond2* is a user-written Stata add-on command developed by Roodman (2009a) which helps find the difference GMM and system GMM of a linear dynamic panel data model. It is more flexible and has more functions not present in the *xtabond*, *xtdpdsys* and *xtdpd* commands available in the Stata package.

systematically included/excluded). The outcome of the robustness check indicates that the baseline model consistently performed better than the other alternatives.

To check for robustness, we calculated domestic investment by subtracting FDI from gross fixed capital formation (GFCF). We adopted this procedure because GFCF includes FDI as well as domestic investments. Many empirical studies, however, use either gross capital formation (GCF) or GFCF in lieu of domestic investments (Mileva, 2008; Mody & Murshid, 2005; Wang, 2010).

A closer inspection of the data for the FDI variable reveals that out of the 645 observations for the 43 countries, in 146 (22.6 percent) of the cases the value of FDI as a percentage of GDP is less than 1. Roughly translated this means that in nearly 10 of the 43 countries included in the study the value of FDI as a percentage of GDP is less than 1 percent. The implication of this is that transforming this value into a logarithmic form will result in so many negative values that they will eventually change the nature of the relationship and the impact of FDI on economic growth. However, the robustness check undertaken in our study does not support this line of argument. Whether we take FDI as a percentage of GDP or transform it into a natural logarithmic, the value does not change the sign and significance of the variable.

Table 1.8 presents the results of the 3-year average values for various variables. In the baseline regressions and extensions, we used annual data for applying the GMM methods. However, to check robustness, we averaged all the variables over non-overlapping 3-year periods and used the averaged data. The reason for averaging is justified as follows. It dampens the influence of short-term shocks and business cycles and allows us to focus on the long-term relationship between FDI and the growth of per capita GDP. In empirical literature, 3, 5 and 10-year averages are widely used. We consider 3-year averages for the following reasons. First, the 3-year averages give us more observations on each variable and preserve the time series dimension of the data. Second, we include some variables for which only short series data are available (for example, Worldwide Governance Indicators and data on human capital).

One of the surprising results in Table 1.8 from the various regressions using the 3-year average data is that the more resource endowed countries are growing at a slower pace as opposed to their less resource endowed counterparts.

Table 1. 8: 3-Year Average Estimation results of the growth rate of per capita GDP using various forms of static panel data models

Explanatory variables	POLS 1	RE 2	FE 3	BE 4	PA 5
Lagged GPD/capita growth	0.281*** (0.09)	0.281*** (0.09)	0.063 (0.14)	0.578*** (0.08)	0.359*** (0.06)
broad money	0.020 (0.71)	0.020 (0.67)	-3.415* (2.00)	0.579 (0.54)	0.277 (0.57)
exports	1.514*** (0.55)	1.514*** (0.50)	4.010** (1.49)	1.368** (0.54)	1.432*** (0.45)
FDI	0.065 (0.05)	0.065 (0.05)	0.103 (0.06)	-0.007 (0.06)	0.051 (0.04)
inflation	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000 (0.00)	-0.000*** (0.00)
government expenditure	-0.089 (0.88)	-0.089 (0.88)	-2.918 (2.18)	1.091 (0.67)	0.445 (0.70)
Gross fixed capital formation	0.703 (0.73)	0.703 (0.84)	2.666 (1.99)	-0.346 (0.60)	0.297 (0.65)
labor force	0.365 (0.63)	0.365 (0.42)	11.019 (19.28)	0.287 (0.50)	0.272 (0.36)
population	0.205 (0.62)	0.205 (0.36)	-9.605 (19.17)	0.287 (0.47)	0.285 (0.33)
ODA	-4.663 (3.81)	-4.663 (4.14)	-3.814 (8.08)	1.845 (3.89)	-3.626 (3.34)
institutional quality index	0.453 (0.61)	0.453 (0.53)	3.995* (2.14)	-0.024 (0.39)	0.264 (0.41)
human capital	0.701 (1.15)	0.701 (0.87)	-20.567* (11.76)	0.974 (1.06)	0.982 (0.71)
infrastructure	-1.000*** (0.27)	-1.000*** (0.26)	-0.135 (0.83)	-0.458 (0.53)	-0.992*** (0.26)
resource endowment	-0.879 (0.57)	-0.879* (0.53)	0.000 (.)	-0.776* (0.41)	-0.841* (0.43)
constant	-12.690*** (3.92)	-12.690*** (3.68)	-15.015 (129.75)	-16.562*** (4.06)	-13.362*** (3.23)
Observations	172	172	172	172	172
F-statistic(p-value)	0.000		0.000	0.000	
R-squared	0.354				
Overall R-squared		0.354	0.191	0.254	
Wald-chi-squared		4622.29	22.65		2984.83
Wald-chi-square test (p-value)		0.000			0.000

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 1.9 gives the results of the robustness check when openness and domestic investments are used in lieu of exports and gross capital formation respectively. Besides, we also add population to the model.

The type of measurement used for FDI could have a bearing on its impact on economic growth. FDI is measured as the share of inward FDI flows in GDP rather than the stock in most of the cross-country studies. FDI flows can be volatile due to business cycles. Measuring FDI in stock instead of flow can yield different results about a country's growth. The justification for using FDI stock is that it captures already established multinationals in the host country, the benefits of whose presence might trickle down to local firms through different spillover effects identified in theory as well as via backward (vertical) linkages.

Table 1. 9: Estimation results of the growth rate of per capita GDP using various forms of static panel data models.

Explanatory variables	POLS 1	RE 2	FE 3	BE 4	PA 5
Lagged growth GDP/capita	0.225*** (0.04)	0.225*** (0.04)	0.109** (0.05)	0.830*** (0.05)	0.210*** (0.04)
broad money	-0.861* (0.47)	-0.861* (0.49)	-1.285 (0.98)	0.224 (0.32)	-0.927* (0.51)
openness	2.346*** (0.76)	2.346*** (0.84)	4.033*** (1.45)	0.109 (0.41)	2.490*** (0.84)
FDI	-0.026 (0.06)	-0.026 (0.05)	-0.008 (0.04)	-0.020 (0.03)	-0.026 (0.04)
inflation	-0.000 (0.00)	-0.000*** (0.00)	-0.000 (0.00)	-0.000* (0.00)	-0.000*** (0.00)
government expenditure	-0.426 (0.75)	-0.426 (0.97)	-1.291 (2.21)	0.496 (0.38)	-0.497 (1.04)
domestic investment	0.086** (0.04)	0.086*** (0.02)	0.111*** (0.03)	-0.035* (0.02)	0.090*** (0.02)
labor force	0.552 (0.54)	0.552 (0.45)	-1.401 (9.70)	0.086 (0.28)	0.567 (0.46)
population	0.022 (0.55)	0.022 (0.38)	-7.232 (11.42)	0.124 (0.26)	0.023 (0.40)
ODA	3.463 (2.55)	3.463* (1.95)	4.533** (2.18)	-1.427 (2.35)	3.713** (1.82)
institutional quality index	0.808* (0.42)	0.808 (0.54)	2.747 (1.81)	0.076 (0.22)	0.893 (0.55)
human capital	0.074 (0.92)	0.074 (1.08)	-11.106 (11.41)	0.624 (0.62)	-0.049 (1.13)
infrastructure	-0.152 (0.22)	-0.152 (0.23)	0.912 (0.77)	-0.142 (0.27)	-0.156 (0.24)
Resource endowment	-0.104 (0.50)	-0.104 (0.56)	0.000 (.)	-0.288 (0.23)	-0.085 (0.58)
constant	-16.653*** (5.35)	-16.653*** (5.05)	120.216 (147.68)	-4.661* (2.74)	-17.359*** (5.09)
Observations	602	602	602	602	602
F-statistic(p-value)	0.000		0.000	0.000	
R-squared	0.177				
Overall R-squared		0.177	0.191	0.107	

Wald-chi-squared	5334.70	5796.09
Wald-chi-square-test(p-value)	0.000	0.000

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Some studies argue that FDI's effect on growth is ambiguous because it indirectly works through TFP and factor accumulation. Whether FDI crowds domestic factor accumulation in or crowds it out is not theoretically clear. However, we found FDI to have a negative relationship with domestic investments even though this negative association is not statistically significant (see Chapter 3). This means, FDI seems to crowd-out domestic investments and capital accumulation more than crowding them in.

An increase in the size of the population influenced the growth rate of per capita GDP positively. This is in line with the tenet of the new growth theory which stipulates that an increase in the size of the population leads to more ideas and innovations which influence the growth of per capita GDP and TFP positively. The finding here also backs the thinking of the new growth theorists (see Table 1.9).

Trade openness which is measured as a percentage of GDP had a significantly positive effect on the growth rate of per capita GDP.

In Table 1.8, when we use the 3-year average data for FDI which in effect is the stock of FDI, we see that the coefficient of FDI is positive in four out of the five models, even though they are all statistically insignificant. However, in Table 1.9 using annual FDI inflows, we find that the coefficient of FDI is negative in all five models despite their insignificance. This result could give us a clue to answer the question that some studies advance claiming that it is FDI stock and not the FDI flows, that have a positive impact on economic growth.

1.8 Conclusion and Policy Implications

1.8.1 Conclusion

The objective of this paper was to study the FDI-growth controversy through empirical research thus contributing to the not so large literature on the topic for SSA. The main objective of the study was analyzing FDI's impact on the economies of SSA countries.

A debate on the nexus between FDI and growth has been going on both at the theoretical and empirical levels both of which address, at length, the controversies that are unravelling. As indicated in the introduction to the literature review section, there is no water-tight compartmentalization between these theoretical and empirical aspects. The distinction is fuzzy. Taking this into account this study made a distinction between them as clear as possible.

Theoretical literature is divided into two streams: that which advocates FDI's role in an economy termed (advocates or proponents of FDI), and the skeptics (dissidents of FDI). The exponents of FDI assert that FDI has a pivotal role to play in any economy and hence should be promoted. While the dissenters view this with suspicion and dismiss its role in boosting growth and improving welfare.

There is a third category which is neutral in that the findings of these studies are inconclusive and do not claim that FDI plays either a positive or a negative role in improving economic growth.

This study used the GMM panel estimator popularized by Arellano and Bover (1995) and Blundell and Bond (1998a) to extract consistent and efficient estimates of FDI's impact on economic growth. This methodology has several advantages over the difference GMM.

Almost all the data was obtained from the World Bank's WDI (2016) online database. Average years of schooling, the variable meant to proxy human capital, was got from the Penn World Tables (version 9.0). The data for this variable for 2015 was extrapolated using the linear extrapolation method. Institutional quality index is another variable whose raw data was collected from the WGI (2016) online database. The index was developed using a simple unweighted average of the six governance indicators -- control of corruption, governance effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law and voice and accountability.

The study gave descriptive results with the help of a principal component analysis; it also gave the rotated components and their interpretations. Moreover, a simple t-test was used for comparing the difference in growth and FDI inflows between resource-rich and resource-poor countries. A comparison between the two groups showed that there was no statistically significant difference between them.

The main finding of the paper obtained using the system GMM is that FDI had a negative and statistically significant impact on the growth of per capita GDP (income) for the 43 SSA

countries included in the study between 2001 and 2015. The other variables with a positive and significant contribution to the growth of per capita GDP include the lagged value of the growth rate of per capita GDP itself, gross capital formation which is used as a proxy for domestic investments and exports.

Empirical findings in literature do not support the exogenous positive effect of FDI on economic growth. These findings indicate that a country's capacity to exploit the full benefits of FDI spillover effects might be hampered by local conditions like the development of local financial markets or the level of educational attainments of its nationals. These are termed absorptive capacities in literature.

1.8.2 Policy Implications

Based on the findings, this paper forwards the following policy recommendations:

It can be opined that most of the FDI inflows into SSA during the period under discussion might have been spurred by speculative motives targeting non-priority sectors with a chunk of the investments channeled to businesses with short gestation periods that have very little forward and backward linkages with the other sectors of the economy. Thus, policies should be tailored in such a way that they attract FDI that is geared towards the productive sectors of the economy.

FDI is a buzzword among development practitioners and MNCs and its positive impact on economic growth is highly acclaimed. This study did not find a positive effect of FDI on economic growth. It instead found a negative effect. There are various reasons for this but these are outside of the purview of this research. What this study would like to cautiously indicate is that FDI is not the panacea for all economic malaises in SSA.

Given the negative relationship between FDI and economic growth, it is time for leaders of SSA countries to revisit their policies and identify the areas that need more scrutiny. They should look into their domestic taxes and incentives and other investment policies and find out where the problem lies.

Governments, policymakers and development practitioners can play a role by designing more appropriate FDI policies so that countries have necessary conditions to leverage FDI's positive effects and mitigate the negative ones.

This study also calls for more studies on the reasons for the negative relationship between the two. Since this study covers financial, human and infrastructural issues future research should look into the incentives and taxes aspects of government policy.

Although the findings of this study suggest a negative effect of FDI on economic growth, these results should be interpreted with caution. This finding might purely be due to different measures of the dependent variable, estimation method, sample and composition of countries selected as well as the FDI measure. For instance, the result is positive though insignificant when FDI stock of a longer duration is used in place of FDI flows. This necessitates further analysis by incorporating more countries as data becomes available not only for FDI but also for the other concomitant variables.

Foreign firms could positively affect domestic investments through knowledge spillovers, influencing factor costs downwards and by promoting collateral benefits. But, to reap these benefits governments should devise appropriate domestic policies and improve their administrative capabilities so that they can screen and select FDI projects that suit their economies. Governments should make sure that foreign firms do not displace local firms. Rather they should complement the activities of local firms and should have backward and forward linkages with them. If this happens, FDI could promote domestic investments.

Governments, policymakers and development practitioners in SSA should examine the local conditions and make them favorable for FDI to have a positive impact on growth.

Appendix 1

Table1A. 1: Correlation Matrix

	GDPPCg	M	EXP	FDI	GOVEXP	GCF	IMP	inflation	LF	Ifs	ODA	IQI	HC
GDPPCg	1.00												
Broad money	-0.00 (0.98)	1.00											
Exports	0.20 (0.00)	-0.02 (0.65)	1.00										
FDI	0.09 (0.02)	0.00 (0.98)	0.29 (0.00)	1.00									
Government expenditure	-0.04 (0.37)	0.01 (0.79)	0.19 (0.00)	0.06 (0.11)	1.00								
Gross capital formation	0.34 (0.00)	-0.03 (0.47)	0.30 (0.00)	0.43 (0.00)	0.11 (0.01)	1.00							
Imports	0.20 (0.00)	-0.01 (0.84)	0.62 (0.00)	0.54 (0.00)	0.21 (0.00)	0.41 (0.00)	1.00						
inflation	-0.11 (0.00)	-0.00 (0.95)	-0.00 (0.96)	-0.03 (0.42)	-0.11 (0.01)	-0.08 (0.05)	0.02 (0.59)	1.00					
Labor force	0.13 (0.00)	-0.02 (0.66)	-0.22 (0.00)	-0.14 (0.00)	-0.14 (0.00)	-0.20 (0.00)	-0.26 (0.00)	-0.00 (0.94)	1.00				
Infrastructure	-0.02 (0.66)	-0.04 (0.26)	0.32 (0.00)	0.09 (0.03)	0.29 (0.00)	0.26 (0.00)	0.18 (0.00)	-0.04 (0.30)	-0.10 (0.01)	1.00			
ODA	-0.03 (0.47)	0.00 (0.94)	-0.27 (0.00)	0.25 (0.00)	0.00 (0.92)	-0.11 (0.01)	0.29 (0.00)	-0.01 (0.76)	-0.08 (0.04)	-0.26 (0.00)	1.00		
Institutional quality index	0.07 (0.09)	0.01 (0.73)	0.12 (0.00)	-0.01 (0.78)	0.39 (0.00)	0.25 (0.00)	0.11 (0.01)	-0.09 (0.02)	-0.17 (0.00)	0.43 (0.00)	-0.14 (0.00)	1.00	
Human Capital	0.02 (0.61)	0.06 (0.16)	0.44 (0.00)	0.05 (0.19)	0.20 (0.00)	0.24 (0.00)	0.19 (0.00)	0.10 (0.02)	-0.07 (0.07)	0.57 (0.00)	-0.36 (0.00)	0.49 (0.00)	1.00

Where

GDPPCg Refers to the annual growth of GDP Per capita, M stands for broad money

EXP stands for exports, FDI represents foreign direct investment

GOVEXP refers to government expenditure, GCF represents gross capital formation

IMP refers to imports, LF is a short-hand representation of labor force

Ifs is a short-hand representation of infrastructure, ODA stands for official development assistance

IQI represents institutional quality index, HC refers to human capital

Table1A. 2: Unrotated Principal Components

Component	Eigenvalue	Difference	Proportion	Cumulative
-----+-----				
Comp1	3.61488	1.44338	0.2259	0.2259
Comp2	2.1715	.179121	0.1357	0.3616
Comp3	1.99237	.433832	0.1245	0.4862
Comp4	1.55854	.239914	0.0974	0.5836
Comp5	1.31863	.339537	0.0824	0.6660
Comp6	.979092	.0560018	0.0612	0.7272
Comp7	.92309	.0907143	0.0577	0.7849
Comp8	.832376	.172996	0.0520	0.8369
Comp9	.65938	.0909043	0.0412	0.8781
Comp10	.568475	.0905271	0.0355	0.9136
Comp11	.477948	.0380834	0.0299	0.9435
Comp12	.439865	.149608	0.0275	0.9710
Comp13	.290257	.132822	0.0181	0.9892
Comp14	.157435	.141529	0.0098	0.9990
Comp15	.0159058	.0156489	0.0010	1.0000
Comp16	.000256983	.	0.0000	1.0000

Chapter Two

Determinants of TFP's level and growth in SSA

Yemane Michael

Department of Economics

College of Business and Economics

Addis Ababa University

E-mail: yemanewj@yahoo.com

February 16, 2019

Abstract

The main objective of this study is finding out TFP's determinants for 43 SSA countries during 2001-15 for which data is available. It uses a host of determinants on the basis of *a priori* theoretical and empirical findings. The study closely looks at existing literature to understand what explains sub-Saharan Africa's growth slumber and conundrum. It uses a linear dynamic panel data model of the system GMM to estimate the model's results. Its empirical findings show that the lagged value of TFP, gross capital formation and macroeconomic stability positively and significantly affect TFP while FDI and imports affect TFP negatively and insignificantly. The study also incorporates other variables like FDI and imports into the model with varying signs; however, their individual effects on TFP turn out to be insignificant. Much more needs to be done to boost TFP's growth which at the moment is very low. An improvement in TFP will put SSA on a trajectory of sustained growth.

JEL Classification Codes: C23, C51, O43, O47, O55.

Keywords: TFP, SSA, economic growth, system GMM.

2.1. Introduction

This chapter studies the determinants of economic growth in sub-Saharan Africa (SSA) with special focus on total factor productivity (TFP) besides discussing capital accumulation, human capital, institutions, governance and foreign direct investment (FDI). It parametrically estimates TFP based on a production function. It uses a principal component analysis (PCA) to describe the main variables that affect TFP's growth. It estimates the main model using a system GMM linear dynamic panel model. Moreover, it also looks at growth literature to understand the factors that explain sub-Saharan Africa's growth slumber,¹⁰ especially in per capita income terms for more than three decades starting from the 1960s till the second half of the 1990s. It should be noted that theoretical literature claims that FDI is an important for technology transfers and improving TFP. However, despite persuasive theoretical arguments, the question whether FDI promotes productivity growth is eventually an empirical one.

The recent upsurge in economic growth in SSA is another area of investigation that warrants a closer scrutiny. Hence, this study also analyzes some of the factors that have contributed to growth in SSA in recent times.

2.2. Sub-Saharan Africa's Growth Slumber

Over the last five decades or so, issues pertaining to economic growth have attracted the attention of both theoretical and empirical research. Despite this, what explains economic growth is poorly understood (Easterly, 2001). This is partly because of the lack of a unifying and coherent economic theory and the reductionist way that mainstream economics approaches the topic (Artelaris, Arvanitidis, & Petrakos, 2006).

Literature differentiates between medium- and long-term determinants of growth. Long-term determinants can be viewed as so-called deep determinants and include issues related to integration or trade, institutions and geography. Growth literature refers to other determinants of the medium-term as proximate determinants.

However, no matter how hard they try, these studies cannot come up with the whole list of factors that explain SSA's under-development. While literature on SSA's under-development does exist but the studies focus on a given set of factors. This list includes colonial legacy,

¹⁰ Slumber here is defined as negligible or negative growth extending over many years.

slave trade, low savings, weak and inefficient institutions, an inadequate skilled and educated labor force (human capital), secular stagnation in terms of trade, physical capital, financial capital, infrastructure, governance problems and corruption, ethnic tensions and conflicts, geography and poor property rights.¹¹

Africa's colonial history, its ethnic and tribal divisions and its climate and geography are some of the issues that recur in literature in explaining the continent's slow growth during the three decades of the 1960s up to the 1990s.¹² According to Sachs and Warner (1997) Africa's sluggish growth can be explained using the same variables that are used for measuring economic policy, initial conditions, demography and physical geography; these are also used for studying the growth performance in other parts of the developing world. They are of the opinion that we do not need a special 'Africa theory' when it comes to proximate causes of economic growth.

Ndulu (2007) argue that slower productivity growth rather than lower levels of investments explain and distinguish Africa's slower growth performance from that of the rest of the world. Easterly (2001) maintains that worldwide factors like the increase in world interest rates, the increased debt burden of developing countries, the growth slowdown in the industrial world and skill-biased technical changes may have contributed to the developing countries' stagnation, especially in SSA countries.

In terms of economic development, SSA experienced two decades of stagnation in the 1980s and 1990s. Economic growth was only 1.7 percent per annum in the 1980s and only 2.1 percent on average over the two decades. Growth rates reached higher levels of 5.8 and 6.3 percent for the whole region only in 2004. Hence, between 2006 and 2008 SSA achieved remarkable growth and grew faster than Latin America. The earlier stagnation was mainly because of the poor performance of the agricultural sector. In the 1980s growth recovery in much of SSA was slow and both in academic and popular perceptions the growth outlook for the region's economies turned increasingly pessimistic.

Africa remains a continent plunged in the quagmire of abject poverty despite recent successes in terms of an increase in economic growth, reduced conflicts, expanded political liberalization

¹¹ See Acemoglu, Johnson, and Robinson (2001), Collier (2000), Collier and Gunning (1999), (Easterly & Levine, 1997, 1998), Fosu (2012), Ndulu (2007) and Sachs and Warner (1997, 1999, 2001).

¹² The terms 'Africa' and 'sub-Saharan Africa, SSA' are used interchangeably.

and substantial improvements in governance. Fosu and O'Connell (2005) substantiate the argument that 'policy syndromes'¹³ have substantially contributed to the generally poor growth in SSA economies during the post-independence period. Had SSA not had these problems, its per capita GDP growth could have averaged approximately 2 percentage points higher during the post-independence period.

Real income growth in SSA failed to keep pace with population growth between 1970 and 2000. The average annual growth rate in real per capital income registered a modest around 0.7 percent growth during the 1970s but this was followed by negative rates of -1.0 percent and -0.5 percent during the 1980s and 1990s respectively. SSA countries have had improved growth rates since 2000 largely because of commodity-driven recoveries. However, real per capita income is still barely higher than the level that prevailed in 1970. To make a bad situation worse, this weak and erratic growth performance has been accompanied by regressive trends in income distribution Alemayehu (2006), with a significantly marked drop in the average per capita income for the poorest quantile. This adverse scenario is not only likely to undermine efforts for developing human resources and efforts at strengthening political cohesion in SSA but it is also likely to restrict future growth prospects.

Sachs and Warner (1997) argue that geography affects growth independently from institutions through its impact on public health and transport costs, though Rodrik (2004b) challenges this view and maintains that it is more possible that geography affects growth through institutions.

In 1960-90, SSA countries under-performed in growth as compared to other developing countries. Growth literature gives a number of factors as possible reasons of SSA's poor economic performance ranging from external shocks to domestic policies. During the 1980s, the over-valued exchange rate, deteriorating terms of trade and tight trade policies were seen as the reasons for the growth slumber. In the 1990s, the exchange rate and trade policies were reversed. Domestic policies also played a role in retarding growth in SSA. Some of the domestic factors which are important in explaining this poor growth performance include poor quality education, political instability, lack of economic infrastructure, bad institutions and under-developed financial intermediaries.

¹³ 'Policy syndromes' comprise of 'state controls', 'adverse redistribution', 'sub-optimal inter-temporal resource allocation' and 'state breakdown'. Note that the 'classification is based on policies, not growth outcomes' (Fosu, 2009).

2.3. The Recent Upsurge in Economic Growth in SSA

The African continent has registered sustained economic growth since the turn of the millennium. This economic boom followed two decades of economic stagnation in most SSA countries. In many of the countries, the economic slumber was marked by military conflicts, civil wars, economic mismanagement and unsustainable external debt. The fact that the recent boom is shared by all SSA countries, barring a few which are still prone to conflicts, makes it fascinating. This new growth has been appreciated and acknowledged and it has inspired optimism among journalists, economists, business people and investors over the fate of a region which not so long ago seemed destined to failure.

The World Economic Forum (2015) in its 'The African Competitiveness Report' states that for 15 years, growth rates on the continent averaged over 5 percent. It considers rapid population growth as a good omen as it holds the promise of a large emerging consumer market as well as an unprecedented labor force which, if properly harnessed, can provide major growth opportunities.

Castellano (2015) posits that the power sector in SSA offers an exclusive combination of transformative potential and lucrative investment opportunities. He indicates that there is widespread shortage in electricity in nearly every sub-Saharan country. In addition, he stresses that in most countries electricity is provided by costly diesel generators whose prices range between three to six times that of the price paid by grid consumers across the world. This exposes many Africa-based industries and manufacturing sectors to inefficiencies and reduces their competitiveness. It also makes them sluggish and slow in creating jobs and inhibits their growth eventually reducing annual GDP's growth between 1 to 3 percentage points. On the other hand, the pervasiveness of generators in recent times shows that African consumers and businesses are desirous to pay for electricity. This, in turn, generates enormous opportunities for the power sector value chain in the region at a time when growth in other regions is stagnant.

The World Bank Group (2013) in its *Global Economic Prospects* states that in 2012, GDP growth in SSA was 4.6 percent notwithstanding the global economy. Growth in SSA was at 5.8 percent in 2012 when South Africa, which has a highly integrated economy with the global system, is excluded. One-third of the countries were growing by at least 6 percent. Strong domestic demand, stable remittance flows, high commodity prices and improved export prices helped the region grow in 2012. However, despite these upsides, a combination of a weaker global economy and distorted domestic policies like the monetary policy's contraction as was

the case in Kenya and Uganda, prolonged labor disputes like the one in South Africa and political upheavals as witnessed in Mali and Guinea Bissau retarded growth in many countries in the region.

More recently the World Bank Group (2016) in its *Global Economic Prospects* explains that GDP growth in SSA slowed markedly in 2015 to an estimated 3.0 percent, down from 4.5 percent in 2014. The report attributes this decline to a number of factors such as low commodity prices, rising borrowing costs and adverse domestic developments in several countries.

2.4. Growth Accounting and Total Factor Productivity

One of the stylized facts in empirical macroeconomics is that a typical worker in a rich country such as Switzerland or the United States is 20 or 30 times more productive and, hence, more affluent than a typical worker in a poor country such as Niger or Chad. These between-country differences in worker productivities are several times bigger than differences in worker productivities within a country. A frequently asked question in growth literature is: Why are there such large differences in productivities and, therefore, incomes across countries?

A difference in natural resource endowments is one factor that explains international income differences. Some countries are rich because they have a large per capita endowment of oil, but such countries are small in number and do not have large populations. A much more important determinant of international income differences is differences in capital per worker. Capital per worker is exceedingly higher in rich countries and is an important reason why workers in rich countries are more productive than their counterparts in poor countries. However, capital per worker is not the whole story. There is more to this enormous difference in per capita income than capital per worker and that is total factor productivity (Prescott, 1998).

The large differences in output per worker that cannot be accounted for by differences in capital per worker constitute differences in TFP. Because TFP is high in rich countries, capital per worker is also high in these countries. Differences in savings rates also affect capital stocks, but these effects are relatively small. TFP determines labor productivity not only directly but also indirectly by determining capital per worker.

Economic growth literature in recent times emphasizes the importance of productivity growth¹⁴ as the engine of sustained per capita growth (Hall & Jones, 1999). A great deal of literature has examined the factors that account for cross-country differences in productivity growth. This literature stresses the key role of macroeconomic and institutional factors, trade openness, and human capital in aggrandizing productivity growth (Acemoglu et al., 2001; Edwards, 1992). However, there is still a heated debate on the factors that enhance productivity growth. TFP growth creates ample opportunities for improving welfare. Hence, it is worth asking: What determinants should policy give due attention to for boosting TFP's performance?

This study contributes something positive to this debate. It uses PCA to overcome the multiplicity of potential determinants of growth thus reducing the dimensions of the variables that plausibly affect productivity growth. The PCA statistical technique enables us to find out a key combination of macroeconomic policy, human capital and institutional and governance aspects correlated with productivity growth. Moreover, we also use a dynamic panel data model to investigate the nexus between productivity growth and several other variables that are used in empirical literature including education, health, infrastructure, imports, institutions, openness, competition, financial development, geographical predicaments and absorptive capacity (including capital intensity) which are termed as determinants of productivity growth. The determinants of TFP growth can be studied at the micro, sectoral and macro levels. TFP can also be measured using TFP index measures and the data envelopment analysis (DEA) which is non-parametric in nature. It can also be measured using parametric approaches for estimation like Cobb-Douglas and transcendental logarithmic (translog), constant elasticity of substitution (CES) production function employing GMM and other semi-parametric estimation approaches like those by Olley and Pake (1996) and Levinsohn and Petrin (2003). Another strand of literature also distinguishes TFP measures based on the types of data used -- cross-sectional data, time series data and panel data.

Hence, a number of measures and methods can be used for assessing TFP. However, this study focuses on macro cross-country measures since its scope is SSA countries.

Today, there is widespread consensus among academicians, growth theorists and development practitioners that factor accumulation (including human capital) and technological changes alone cannot adequately explain the differences in growth performance across countries.

¹⁴ Unless otherwise stated, productivity and total factor productivity are used interchangeably.

Demetriades and Law (2004) contend that institutions and finance are emerging separately in literature as the key fundamental determinants of economic growth.

TFP can be influenced by both external shocks and domestic policies through different ways. For example, when a government controls access to foreign exchange, preferential treatment is given to the import of investment goods which could foster TFP growth. Besides, greater openness facilitates the adoption of more efficient techniques of production which contribute to TFP's enhancement (Isaksson, 2007). Miller and Upadhyay (2000) maintain that the main bottleneck which hinders the adoption of new technology in SSA is lack of human capital. Further, poor infrastructure makes the supply of inputs unreliable and this too could impede growth by depressing the marginal product of private investments. Excessive regulation of financial markets and institutions might also have a negative impact on TFP growth.

An analysis of the sources of growth in the framework of growth accounting has been a contentious issue for the East Asian countries. The core point of the debate is whether the East Asian growth miracle was driven primarily by factor accumulation such as capital and labor or total factor productivity. Krugman (1994) argues that growth in East Asian economies was unsustainable because it was largely driven by capital accumulation and increasing the quantity of labor rather than gains in productivity. This signifies that identifying the sources of growth is crucial for a country's long-term economic prospects.

Not many studies in SSA analyze sources of growth from a growth accounting perspective. A bulk of the existing studies point to factor accumulation as the main source of growth in SSA, while the contribution of TFP is deemed negligible. However, Fosu (2012) study based on (Bosworth & Collins, 2003) decomposition claims that the growth in GDP in the 1960s through the mid-1970s was caused equally by both investment and TFP growth.

Abramovitz (1986), Devarajan, Easterly, and Pack (2003), Durlauf, Johnson, and Temple (2005), Easterly and Levine (2001b), Klenow and Rodríguez-Clare (2005), Nelson and Pack (1999), Romer (1990), Temple (1999a) who are proponents of total factor productivity as the major reason for the enormous gap in per capita incomes between economies, believe that it is low productivity rather than the level of investment that has been a reason for SSA's growth conundrum. They hold the view that reasons for the low productivity should be addressed before we start talking about increasing investments for boosting growth.

2.4.1 Production Function

We need to express a production function with respect to inputs as explanatory variables to estimate the production frontiers. The production function is expressed as: $y = f(x_1, x_2, \dots, x_n)$ where y is output and the x_i 's are inputs with $i=1, \dots, n$ ¹⁵. A variety of mathematical forms of the production function are proposed in literature including Cobb-Douglas, translog, normalized quadratic, constant elasticity of substitution and generalized Leontief. Of all these, the most common functional form in applied economics literature is the linear Cobb-Douglas function. This form is also supported by the standard neo-classical production function $Y = f(L, K)$ where L denotes labor and K denotes capital stock. If we want to use a linear regression framework, the parameters of the production function must be in linear form. Implementing the Cobb-Douglas function requires taking the logarithms of both sides of the function. This mathematical transformation yields:

$$(2.1) \quad \ln Y = \ln A + \sum_{i=1}^N \beta_i \ln(x_i)$$

where x_i is expressed as L-labor and K-capital inputs and A is a measure of productivity which is popularly known in macroeconomics literature as the Solow residual.

To estimate productivity, the output measure can be defined in two ways: as gross output or as gross value-added. In the Cobb-Douglas framework, there is a gross-output base production function which includes the parameters of material inputs (M), labor (L) and capital stock (K). The value-added base production function includes the two parameters labor and capital stock (see Bruno, 1984; Eberhardt & Helmers, 2010; Sulimierska). The value-added base production function is described as:

$$(2.2) \quad Y = AK^{\beta_K} L^{\beta_L}$$

where Y is value added, A is the Hicksian neutral efficiency level¹⁶ which is unobservable to the researcher, K is the capital stock, L is labor, β_K is the proportion (share) of capital used in

¹⁵ Inputs can be classified into five main categories: capital (K), labor (L), energy (E), material inputs (M) and purchased services (S).

¹⁶ Hicks-neutral technical change is a change in the production function of a business or industry which satisfies certain economic neutrality conditions. The concept of Hicks neutrality was first coined by John Hicks in his book *The Theory of Wages*. A change is considered to be Hicks neutral if it does not affect the balance of labor and capital in a product's production function.

production and β_L is the proportion (share) of labor used in production. To obtain the linear estimation equation, a logarithmic transformation must be made thus:

$$(2.3) \quad \ln(Y_{it}) = \ln(A_{it}) + \beta_K \ln(K_{it}) + \beta_L \ln(L_{it})$$

where the subscript i indicates an individual unit (for example, country, firm, industry and sector), and t = 1,..., T, indicate the time period.

Beveren (2012) and Eberhardt and Helmers (2010) discuss output size (Y_{it}), capital stock (K_{it}) and labor (L_{it}). Researchers do not observe productivity term (ω_{it}) compared to a firm's managers in estimating the equation as:

$$(2.4) \quad \ln(Y_{it}) = \alpha_0 + \beta_K \ln(K_{it}) + \beta_L \ln(L_{it}) + \omega_{it} + \varepsilon_{it}$$

where $\varepsilon_{it} + \omega_{it} + \alpha_0$ is equal to $\ln(A_{it})$. α_0 measures the mean efficiency levels across countries, ε_{it} captures the measurement error and a random idiosyncratic error term while ω_{it} is a total factor productivity term.

Both the terms ω_{it} and ε_{it} are part of the estimation residual. Therefore, to find the value of the TFP parameter, it is necessary to estimate the empirical Equation (2.1) to obtain the values of β_K and β_L (respectively $\hat{\beta}_K$ and $\hat{\beta}_L$), where the 'hats' over the parameters indicate that they are estimated values:

$$(2.5) \quad \hat{\omega}_{it} = \ln(Y_{it}) - \hat{\beta}_K \ln(K_{it}) - \hat{\beta}_L \ln(L_{it})$$

The same holds while estimating TFP from the gross-output base production function to that of the value-added base production function, the only exception being the addition of a variable that captures material inputs (M_{it}).

Thus, the estimable equation becomes:

$$(2.6) \quad \ln(Y_{it}) = \alpha_0 + \beta_K \ln(K_{it}) + \beta_L \ln(L_{it}) + \beta_M \ln(M_{it}) + \omega_{it} + \varepsilon_{it}$$

and the estimated value of TFP ($\hat{\omega}_{it}$) becomes:

$$(2.7) \quad \hat{\omega}_{it} = \ln(Y_{it}) - \hat{\alpha}_0 - \hat{\beta}_K \ln(K_{it}) - \hat{\beta}_L \ln(L_{it}) - \hat{\beta}_M \ln(M_{it})$$

The productivity shock (ω_{it}), can be split into three elements: a common shock for all countries (ν_t), a country-specific shock (η_i) and (ω_{it}^*) the actual productivity shock (see Beveren, 2012; Eberhardt, Helmers, & Strauss, 2011).

A slightly different and crude way of estimating TFP is given in subsequent paragraphs. The virtue of this approach is that it explicitly disentangles the factor shares.

As explained earlier, both the neo-classical and endogenous growth models make use of the aggregate production function for which a specific example of a Cobb-Douglas production function is given as:

$$(2.8) \quad Y_t = A_0 e^{\varphi t} K_t^\alpha L_t^{1-\alpha}$$

where t is a time index, total aggregate output is measured as Y . L is an index of aggregate labor inputs. K is an index of aggregate capital, α is the contribution of capital to output, $1-\alpha$ is the contribution of labor and the expression $A_0 e^{\varphi t}$ is TFP. TFP measures the shift in the production function at given levels of capital and labor resulting from technological progress and other elements that affect the efficiency of the production process. The fixed component of TFP is assumed to grow at a rate φ (Nachega & Fontaine, 2006). Dividing both sides of Equation (2.8) by L and taking the natural logarithms of the left and right sides yields:

$$(2.9) \quad y_t = \alpha_0 + \varphi t + \alpha k_t$$

where the natural logarithms of output and physical capital in per capita terms are denoted by the lowercase variables y and k respectively. α_0 which is the natural logarithm of A_0 is unobservable and is captured through the residuals of Equation (2.9). This type of a Cobb-Douglas production function is frequently used for approximating the production possibilities for an economy because it has several properties that ease calculation and avoid complications such as the assumption of perfect competition, constant returns to scale (CRS) and constant factor income shares.

If we are given a more general type of Cobb-Douglas production function of the form $Y = AL^\beta K^\alpha$, the geometric index version of TFP is calculated by dividing both sides of the production function by $L^\beta K^\alpha$, to produce a measure of TFP as:

$$TFP = A = \frac{Y}{L^\beta K^\alpha}.$$

TFP's growth rate measure is then calculated as an arithmetic index generated by taking time derivatives of the logarithms on both sides of the TFP expression.

Typically, Y , L and K are measured independently while A , α and β are statistical estimations. The index of the aggregate state of technology is represented by 'A' which is also known as total factor productivity. 'A' in itself does not carry any interesting information as it is not a pure number. However, shifts in the relations between the measured aggregate inputs and outputs are indicated by the change in the numbers. Technological changes as well as changes in efficiency and/or in the scale of firms' operations lead to a change in the combination of inputs that are required to produce a given level of outputs:

$$(2.10) \quad \frac{\dot{A}}{A} = \frac{\dot{Y}}{Y} - \beta \frac{\dot{L}}{L} - \alpha \frac{\dot{K}}{K}$$

The dot superscript denotes the time derivative (growth rates). α and β are the shares of output/income accruing to capital and labor respectively, that is:

$$\beta = \frac{wL}{Y}, \quad \text{and} \quad \alpha = \frac{\pi}{Y} = \frac{rK}{Y}$$

where w is wages paid to labor, π is total profits and r is the real rental rate of capital. These shares imply that:

$$\frac{wL}{Y} + \frac{\pi}{Y} = 1 \quad \text{or} \quad \frac{wL}{Y} + \frac{rK}{Y} = 1$$

Provided we have measures of the physical inputs of labor and capital, Equation (2.10) defines a Divisia index of inputs which is the percentage change in each input weighted by its relative share in input costs.

Once we estimate the parameter α in Equation (2.9), we can decompose output growth into contributions of the increases in labor and capital and TFP's contribution. Assuming that the production function exhibits constant returns to scale (CRS), and that goods and factor markets are competitive, we can write the growth rate of output $\left(\frac{\Delta Y}{Y}\right)$ as:

$$(2.11) \quad \left(\frac{\Delta Y}{Y} \right) = \alpha \left(\frac{\Delta K}{K} \right) + \beta \left(\frac{\Delta L}{L} \right) + \frac{\Delta A}{A}$$

where $\beta=1-\alpha$

TFP $\left(\frac{\Delta A}{A} \right)$ is the only term that cannot be measured directly in Equation (2.11). Instead it is measured indirectly by reorganizing Equation (2.11) which yields:

$$(2.12) \quad \left(\frac{\Delta A}{A} \right) = \left(\frac{\Delta Y}{Y} \right) - \alpha \left(\frac{\Delta K}{K} \right) - \beta \left(\frac{\Delta L}{L} \right)$$

Hence, TFP growth is a residual—a ‘measure of our ignorance’ (Abramovitz, 1956). It is also popularly known as ‘Solow residual’ in macroeconomics literature.

TFP is the remnant that is left after subtracting the weighted rate of growth of factor inputs from income growth, where the weights are the corresponding input shares. The decomposition of growth into inputs and TFP’s contribution is a crude measure and masks important information as it does not give a clue about policy implications because this kind of decomposition fails to provide information regarding the factors behind the estimated TFP growth rates. Cognizant of this downside of growth accounting framework, most studies complement growth accounting exercises with growth regressions for a country or a group of countries (Nachega & Fontaine, 2006).

One aspect of the neo-classical model is that steady-state growth and improvements in the standard of living over time are made possible due to TFP growth. Suppose that the key parameter (α) of the Solow-Swan model is stable over time which can be tested and confirmed through a recursive estimation of Equation (2.9), for sustained increases in real wage (W/P) and hence standard of living, labor productivity (Y/L) should increase. Since the growth rate of capital per unit of labor is zero in the steady state (Solow, 1956),¹⁷ the growth accounting formula in Equation (2.12) can be written simply in terms of the labor productivity growth rate as:

¹⁷ In the Solow growth model, steady-state income is a function of total factor productivity.

$$(2.13) \quad \frac{\left(\frac{\Delta Y}{\Delta L}\right)}{\left(\frac{Y}{L}\right)} = \frac{\Delta A}{A}$$

The point here is that in equilibrium, TFP growth equals the productivity of labor. Probing the determinants of TFP growth is very crucial for identifying ways of boosting growth and improving living standards over time. Equation (2.13) holds in the steady state.

Finally, calculating the initial levels/starting points of the domestic and foreign capital series required for the analysis in the present model is done using the perpetual inventory method (PIM). PIM is applied to its own component characteristics of the capital series.

The following Solow model steady-state relationship is used for constructing/calculating the initial level of the capital stock:

$$(2.13a) \quad K_0 = \frac{I_0}{\delta + g}$$

where the level of initial investments/gross fixed capital formation is denoted by I_0 . δ_t is the depreciation rate and is taken as the consumption of capital series from WDI for the period 2001-15, real investment's average geometric growth over the period 2001-15 is denoted by g . The domestic capital stock for the following years is estimated using the perpetual inventory method as is indicated in the following accumulation process/equation once the initial level of K_0 is known:

$$(2.13b) \quad K_{it} = (1 - \delta_t)K_{it-1} + I_{it}$$

The following accumulation process/equation is used for constructing the foreign capital series over the period 2001-15:

$$(2.13c) \quad Z_{t+1} = (1 - \delta_t)Z_t + J_t$$

where the inflows series of foreign direct investments are denoted by J_t and are retrieved from WDI for the period 2001-15. As stated earlier, δ_t is the depreciation rate and is taken from the consumption of capital series from WDI for the period 2001-15.

The ratio of the gross fixed capital formation (gross domestic investments) in 2001 to the sum of the average growth rate of the gross fixed capital formation series for the first three years of the analysis (2001-03) and the depreciation rate in 2001 are used for obtaining the initial level of the domestic capital stock in 2001. In other words:

$$(2.13d) \quad K_{2001} = \frac{GFCF_{2001}}{\delta_{2001} + g_{2001-2003}^{GFCF}}$$

Existing empirical and theoretical literature identifies a number of potential determinants of productivity growth including inflation, trade openness, the level of education and FDI which are explained in the sub-section on the description of variables.

2.4.2 TFP's Empirical Model

Following a modified version of Shiu and Heshmati (2006) and Loko and Diouf (2009) TFP growth is modeled as a function of several determinants including economic policy factors, human capital, institutional quality, foreign aid, inflation, imports, FDI, investments, financial development and government expenditure. The regression equation is formulated as:

$$(2.14) \quad \ln TFP_{it} = \eta_0 + \eta \ln TFP_{it-1} + \delta FDI_{it} + \beta \ln GCF_{it} + \alpha INF_{it} + \phi FAID_{it} + \varphi \ln GOVEXP_{it} + \theta \ln BM_{it} + \gamma \ln IMP_{it} + \kappa \ln HC_{it} + \lambda \ln IQI_{it} + \mu_i + \nu_t + \varepsilon_{it}$$

or Equation (2.14) can be more compactly written as:

$$(2.14a) \quad \ln TFP_{it} = \eta_0 + \eta_1 \ln TFP_{it-1} + \delta FDI_{it} + \beta X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

where TFP represents the growth rate of total factor productivity; GCF (gross capital formation) is a proxy of the investment rate; INF, the average inflation; FDI, the ratio of foreign direct investments to GDP; FAID, foreign aid; GOVEXP, government consumption expenditure which is a proxy for government size; BM, broad money which is a proxy for financial development; IMP, imports; HC, the level of education which is a proxy for human capital; IQI, institutional quality index; μ_i , a country-specific effect; ν_t , a time-specific effect; and $\varepsilon_{i,t}$, is the common error term. For each indicator, i represents the country and t the period. The dynamic process related to productivity growth is captured by the dynamic panel data model. Besides, dynamic panel data also helps alleviate omitted variables and serial correlation problems.

This study hypothesizes that these variables are determinants of TFP growth rather than physical capital accumulation which is captured by gross capital formation. If they were primarily influencing growth through their impact on physical capital accumulation, one should not expect them to appear significant in Equation (2.14), which already incorporates the rate of physical capital accumulation as an explanatory variable (Benhabib & Spiegel, 2002).

Moreover, we should expect the coefficient β to be numerically very close to α in Equation (2.9). All the variables except FDI, inflation and foreign aid (FAID) are transformed into logarithmic values. Inflation is given as the annual growth rate of the consumer price index. Transforming the values of the foreign aid variable will end up yielding negative values since the ratio of foreign aid as a percentage of GDP is a fractional value, a number below 1, for most SSA countries.

2.5. Description of Variables

Lagged value of TFP: The inclusion of the lagged TFP variable helps capture the dynamic productivity growth process. Moreover, it enables us to control for the omission of relevant variables and mitigates the problem of serial correlation.

Financial development: Alfaro et al. (2004) probed the pivotal intermediary role played by local financial institutions in funneling FDI to economic growth. Specifically, they argue that the lack of development of local financial markets can limit the economy's ability to take advantage of potential FDI spillovers. They used the ratio of broad money to GDP as a proxy in their research.

Inflation: High and volatile inflation undermines growth by reducing long-term investments and the productivity of capital. Many authors have argued that greater macroeconomic instability, particularly high inflation affects a country's economic performance adversely. A stable monetary environment is a recipe for the efficient operations of a market economy. On the other hand, monetary and price instability make both the price levels and relative prices unpredictable, generate uncertainty and undermine the security of contracts. Barro (2003) claims that for countries where inflation surpasses 15 percent, a 10 percent increase in inflation leads to a decline in GDP growth per annum between 0.2 and 0.3 percent and a fall in the investment-to-GDP ratio between 0.4 and 0.6 percent per year. Thus, inflation is used as an indicator of macroeconomic stability.

Investments: Technological progress can be positively impacted through investments in capital goods and research and development. Investment ventures is one means of learning-by-doing. As a result, it could boost TFP growth. In particular, physical investments have a direct effect on growth by increasing the economy's capital stock. Because investments tend to embody

transfers of technology, they also determine TFP growth (DeLong & Summers, 1991; Romer, 1986a). The growth rate of gross capital formation is used as a proxy for investment.

Institutions: Institutions are the bedrock of a well-functioning and dynamic market economy. Institutions should ensure the existence of secure property rights and political stability, promote the rule of law, enforce contracts and limit the power of the rulers. If well-defined and secure property rights do not exist, prospects of the accumulation of physical and human capital as well as investments in research and development become bleak. Hence, an institutional quality index (IQI) is developed based on data from the World Governance Indicators from the World Bank's WDI dataset. The clichéd though crucial question in the area of economic growth and development is: Why are some countries much poorer than others? Traditional neo-classical growth models, following the seminal work of Cass (1965), Koopmans (1965) and Solow (1956) explain differences in per capita incomes in terms of different paths of factor accumulation.

In these models, differences in cross-country incomes or factor accumulation are due to either variation in the saving rates (Solow), differences in preferences (Cass-Koopmans) or other extraneous and exogenous parameters like TFP growth. Economic institutions exist in these models. Agents have clearly articulated and well-defined property rights. Moreover, they exchange their goods and services in markets. Paradoxically, however, variations in institutions do not explain the differences in incomes (Acemoglu & Robinson, 2006).

Human capital accumulation: Empirical findings on the role of human capital in TFP growth are not conclusive possibly due to measurement errors and the use of wrong and poor proxy variables. But there is overwhelming evidence that a well-educated and healthy labor force has both a direct and an indirect effect on economic growth. The presence of more human knowledge paves the way for a speedy dissemination and diffusion of ideas and also helps in innovating new ideas. This in turn boosts TFP and economic growth. Human capital is a facilitator of both technology adoption from abroad and the creation of appropriate domestic technologies (Benhabib & Spiegel, 2002). The average number of years of schooling of the labor force (retrieved from the dataset of Barro & Lee, 2011) as well as from the Penn World Tables 9.0 is used as a proxy for human capital accumulation.

Foreign aid: The impact of foreign aid on economic growth is a highly contentious issue in literature on macroeconomic growth. The debate is still on and there are no easy answers. Many scholars and development practitioners argue that foreign aid could lead to an 'aid dependency

syndrome’ and hence should be cut if not halted altogether. But, the line of argument that this study uses is that foreign aid may induce growth if it finances productive investments rather than consumption. Due to this, investments financed by foreign aid could raise TFP by limiting the strains on the domestic tax base, thereby preventing costly distortions in financing infrastructure projects such as roads, hydropower and irrigation projects and human capital (education and healthcare) for which the private rate of returns is generally lower than the social rate of returns. The ratio of official development assistance-to-GDP (ODA-to-GDP) is used as a proxy variable for foreign aid. Burnside and Dollar (2000) argue that aid raises economic growth if it is provided to countries with good policies. Some empirical studies find that for every 1 percent of GDP received in aid, countries with good policies grow by 0.5 percent more.

Government expenditure: The relationship between the size of the government, that is, the ratio of public expenditure to GDP and productivity growth is not clear-cut and unambiguous. Some studies expound that government spending has a positive effect on productivity growth because it generates beneficial externalities stemming from a variety of factors including the development of administrative and legal institutions, development and expansion of economic infrastructure and a range of interventions to correct market failures (Ghali, 1998). On the other hand, there are also those who contend that a government with high expenditure as a percentage of GDP must collect high revenues by taxing households and firms, which in turn detrimentally affects the efficiency of economic activities. Besides, the direct deleterious impact of expenditure and taxes and the fiscal policy stance as measured by the fiscal deficit-to-GDP ratio, can have a bearing on TFP growth through its impact on inflation and macroeconomic stability. Excessively large government spending can retard productivity growth because of government inefficiencies, the burden of taxation and distortions caused by interventions in the operations of free markets (see Barro, 1991; Sal & Dar, 2012).

There is consensus that some government spending, particularly on public goods, is necessary for promoting productivity growth. Therefore, it is not clear whether the overall impact of government size on productivity growth is positive or negative and whether that relationship is monotonic. This study uses government consumption expenditure as a percentage of GDP to represent government expenditure.

FDI: FDI is viewed as being a key channel for the transfer of advanced technologies and superior organizational forms from industrialized to developing countries. Further, as stated earlier, FDI is purported to generate positive externalities in the form of knowledge spillovers

to the domestic economy through linkages with local suppliers and clients (backward and forward linkages), learning from foreign firms and employee training programs. FDI's spillover effects, however, can also be negative. Negative externalities could emanate from increased barriers to accessing technology and competition. But the overt assumption in literature is that often positive externalities exceed the negative ones, which makes attracting FDI to the domestic economy a rational decision. Shiu and Heshmati (2006) used a panel data econometrics approach for estimating the production function and doing a parametric estimation of the rate of technical changes in China. Besides, they parametrically estimated TFP using panel data for provinces in China and found that the FDI and information and communication technology (ICT) variables significantly explained the differences in TFP in the various provinces. Following them, this study investigates whether the effect of FDI on economic growth operates through factor accumulation and/or improvements in total factor productivity (TFP). FDI may flow to rich countries with high productivity which could result in a positive correlation between FDI and TFP. Alternatively, FDI could be driven by international factor price differences. Hence, FDI may go to poor countries with low productivity and low wages resulting in a negative correlation between FDI and TFP (Hong & Sun, 2011). To control for this endogeneity problem, the FDI variables are treated as endogenous in the GMM estimation procedure.

Imports: A strand of literature argues that trade is a carrier of knowledge and focuses on imports as a way of incorporating foreign technologies which are relatively advanced in domestic production which in turn has a positive effect on TFP. Certain kinds of imports like machinery and equipment relating to foreign research and development (R&D), are expected to generate more technology transfers than others. Isaksson (2001) used data from 73 countries between 1960 and 1994 to argue that trade can be viewed as a significant carrier of knowledge which enhances technology transfers, but this happens only when the recipient countries have the necessary level of human capital, if not, this knowledge will bypass potential recipients. We use imports as a share of GDP as the variable of interest in our study.

2.6. Methodology

We use the system GMM method developed by Holtz-Eakin, Newey, and Rosen (1988) and further improved and modified by Arellano and Bover (1995) and Blundell and Bond (1998a) to estimate Equation (2.14a). The main advantage of the system GMM is that it addresses the

endogeneity problem by generating instruments using the lagged values of the covariates. The other advantages of the system GMM method over other estimation methods is:

- i) When there is heteroskedasticity in error variance, system GMM yields more efficient estimates over other models including least squares. This mainly happens when it is unknown what form the heteroskedasticity takes (Baum, Schaffer, & Stillman, 2003). Thus, Equation (2.13) can be consistently estimated using the two-stage least squares (2SLS) but the presence of heteroskedasticity makes it an inefficient estimator.
- ii) The lagged values of TFP, gross capital formation, imports, FDI, government expenditure and broad money in Equation (2.13) are presumed to be endogenous meaning that there is a correlation between these series and the error term which varies over time and across countries. By using the lagged values of the endogenous variables as the explanatory variables, the system GMM helps avoid the problem of a dynamic panel bias. When the endogenous variables are instrumented on their own lagged values, they become exogenous which helps satisfy the identifying moment conditions $E(X_{it}\varepsilon_{it+j}) = 0$ and $E(Z_{it}\varepsilon_{it+j}) = 0$ for $j > 0$. The Hansen test for over-identification can be used to check the validity of instruments.
- iii) Roodman (2009b) argues that the system GMM performs better than the difference GMM in estimating empirical growth models when the time dimension of the panel dataset is short and the outcome variable shows persistence.

All these factors lead to a situation where the difference GMM estimators become inapplicable in making a statistical inference. The equation in levels uses lagged differences of the regressors as instruments while the equation in first differences uses the lagged levels of the regressors as instruments and thus helps us mitigate the problem of weak instruments. Further, this approach performs better in terms of precision and bias (Blundell & Bond, 1998a).

There are two options within the system GMM: the one-step system GMM and the two-step system GMM. The two-step system GMM yields more efficient estimators than the one-step system GMM, even though both are asymptotically equivalent when the disturbances are spherical (Blundell & Bond, 1998b). The two-step system GMM gives us a covariance matrix which is robust to heteroskedasticity and autocorrelation but the standard errors show a downward bias. Hence, the presence of panel heteroskedasticity and autocorrelation

necessitates the use of robust standard errors that generate consistent estimates (Mileva, 2007). Finally, contrary to the one-step system GMM, the two-step system GMM provides a robust Hansen J test for over-identification. By taking all these issues into consideration, the two-step GMM method with its robust standard errors is chosen to estimate Equation (2.13).

2.7. Data Sources

Output is measured by real GDP (in 2010 US\$) from the World Development Indicators' (WDI) 2016 online database; the gross capital formation (in 2010 US\$) which is used as a proxy for domestic investments is obtained from the WDI (2016) online database and the labor input is represented by the labor force (the number of people of working age, defined as being from 15 to 64 years old) from the WDI 2016 online database. A better measurement tool for the labor input could be employment time average hours worked but data for this is difficult to come by. Hence, we follow the usual practice of using labor force as a measure of labor input.

Broad money, gross capital (fixed) formation, FDI, imports, government expenditure and foreign aid as a percentage of GDP are retrieved from the WDI (2016) online database.

Inflation rate and the sum of fixed line and mobile cell subscribers out of 100 people (a proxy for infrastructure) are also retrieved from the same online database. The institutional quality index is constructed using a simple and unweighted index from the six main indicators of governance from the Worldwide Governance Indicators (WGI, 2016) online database. Human capital is proxied by the average years of schooling; the data for this is from the Penn World Tables (version 9.0). The data for this variable is available only up to 2014 and hence linear extrapolation is used to get the data for 2015.

2.8. A Discussion of the Main Findings

This section presents the main findings both through a descriptive approach with the help of a principal component analysis and by using an econometric model of linear dynamic panel data of the system GMM type.

2.8.1 Descriptive Statistics

A descriptive presentation of the results heavily relies on the principal component analysis.

Finding a strong correlation between variables and each component is the basis for the interpretation of the principal components, that is, which of these numbers are large in magnitude the farthest that one moves from zero in either a positive or negative direction. Which numbers we consider to be large or small is of course a subjective decision. One needs to determine at what level the correlation value will be of importance. Here a correlation value above 0.3 is considered to be important. Only those numbers that exceed 0.3 in absolute value are retained and those that are below it are dropped.

Table 2.1: Principal Component Analysis of the Various Variables

Rotated components (blanks are $\text{abs}(\text{loading}) < .3$)

Variable	Comp1	Comp2	Comp3	Comp4	Unexplained
lnTFP	0.5631				.07964
lglnTFP	0.5621				.08233
lnGCFG			0.4411		.3662
inflation				0.8068	.2098
FDIG			0.6548		.2656
FAID	-0.4199				.3633
lnGOVEXP		0.5431			.3262
lnMG		0.5888			.2466
lnIMPG			0.5453		.2811
lnHC	0.3580				.3348
lnIQI		0.5190			.3276

The first principal component is strongly correlated with four of the original variables. The first principal component increases with increasing TFP, its lagged value and human capital but decreases with an increase in foreign aid. This component captures the positive co-movement between the three variables -- TFP, the lagged value of TFP and human capital -- on the one hand and a negative co-movement between these variables and foreign aid on the other.

The second component which loads heavily on government expenditure, broad money and the institutional quality index captures positive co-movement between these variables and the second principal component.

The third principal component increases with an increase in gross capital formation, FDI and imports. This suggests that these three variables vary together. If one increases, then the remaining ones also tend to increase. This component can be taken as a measure of gross capital formation, FDI and imports.

The fourth component increases with an increase in only one variable which is inflation, a variable that is intended to capture macroeconomic stability. In fact, this component can be termed as a measure of the impact of inflation on TFP growth.

2.8.2 Estimation of the Econometric Model

A sole combination of inputs such as labor, capital and other intermediate inputs does not entirely explain output creation. The remaining share of output variations which cannot be explained by such endowments of inputs is a measurement of technical efficiency and provides insights on aggregate economic growth.

As stated in the introductory part, the focus of this study is on the macro aspect of TFP mainly for two reasons. First, overall or macro TFP is the main driver of economic growth in the long-run (Easterly & Levine, 2001a) and it is assumed that FDI affects TFP, and hence long-run growth via the introduction of new and cutting-edge technologies, acquisition of skills and spillover effects to local firms. Therefore, by focusing on TFP we gain valuable insights as to how FDI may or may not affect economic growth. Second, the FDI-productivity literature consists mainly of firm-level studies. Despite the fact that these studies fail to capture the macroeconomic productivity effect in a holistic manner they do provide important insights regarding the productivity of multinational firms and likely externality effects of productivity on domestic firms.

Since there is no database that provides information on the level of TFP,¹⁸ we can construct it in two ways. One method of constructing TFP is given by $TFP = \frac{Y}{K^\alpha L^\beta}$ where $\beta=1-\alpha$. Y denotes output, K stands for capital stock and L denotes labor input. α is the output share of capital and $\beta=1-\alpha$ is the labor share of output.

Though Karabarbounis and Neiman (2014), Piketty (2014) and Piketty and Zucman (2014) have documented a pervasive decline in the labor's share of income since 1975 and highlighted its co-movement with the decreasing relative price of investment goods, it is a common practice in literature to assume and use a constant labor share of two-third of the income. However, we

¹⁸ The Penn World Tables (version 9.0) report TFP growth rates and relative TFP levels (relative to the US). This database contains no data on the absolute level of TFP. Besides, it is limited to a handful of SSA countries.

have increased the share of labor in total income to 0.7 in this study to better reflect the realities of developing regions like SSA.

The other method is to find the TFP as a residual after regressing output on capital and labor (see Equation 2.12). This approach's flaw is that it attributes all the remaining or unexplained parts of the regression on TFP while in effect some portion of it could be due to idiosyncratic shocks. In fact, both methods yield similar results.

A closer look at the results of the various difference GMM methods given in Table 2.2 shows some interesting patterns. Under all the four scenarios the lagged values of TFP, gross capital formation and human capital have a positive and statistically significant effect on TFP while FDI has a statistically significant negative effect on the TFP level.¹⁹

The other variables with varying signs which are statistically insignificant can be explained analogously. However, the interpretations should be taken with a pinch of salt as the models fail to pass the first-order autoregressive test, AR(1) of the error term. The models fail to reject the null hypothesis of 'no autocorrelation' of the first-order which implies that we need to think about specifying our model differently.

Table 2.2: Estimation results of the level of TFP using various forms of difference GMM

Expl. Variables	diffGMM1 1	diffGMM2 2	diffGMM3 3	diffGMM4 4
Lagged value of TFP	0.238*** (0.02)	0.238** (0.11)	0.229*** (0.02)	0.229* (0.12)
gross capital formation	0.241*** (0.02)	0.241*** (0.04)	0.245*** (0.01)	0.245*** (0.04)
inflation	-0.000*** (0.00)	-0.000 (0.00)	-0.000*** (0.00)	-0.000 (0.00)
FDI	-0.004*** (0.00)	-0.004** (0.00)	-0.002*** (0.00)	-0.002 (0.00)
foreign aid	0.010 (0.01)	0.010 (0.04)	0.046*** (0.01)	0.046 (0.05)
government expenditure	-0.030*** (0.01)	-0.030 (0.03)	-0.016*** (0.00)	-0.016 (0.02)
broad money	-0.006** (0.00)	-0.006 (0.02)	-0.007** (0.00)	-0.007 (0.01)
imports	-0.006 (0.01)	-0.006 (0.03)	-0.022*** (0.01)	-0.022 (0.03)

¹⁹ The caveat here is that we should not spend much time interpreting the coefficients of the models and their significance since they consistently fail some of the essential diagnostic tests especially the AR(1) test.

human capital	2.215*** (0.16)	2.215*** (0.51)	2.118*** (0.15)	2.118*** (0.47)
institutional quality index	0.054*** (0.01)	0.054 (0.03)	0.077*** (0.01)	0.077** (0.04)
Observations	549	549	549	549
Number of countries	43	43	43	43
F-test (P-value)	0.000	0.000	0.000	0.000
Hansen P-value	0.912	0.912	0.799	0.799
AR(1) P-value	0.065	0.314	0.295	0.600
AR(2) P-value	0.257	0.349	0.065	0.118

Notes: Gross capital formation, FDI, foreign aid, government expenditure, broad money and imports are given as a percentage of GDP. Moreover, all the variables except FDI, inflation and foreign aid are transformed into ‘log’ form to ease interpretation. The first and second columns use only the second lag of the endogenous variables as instruments whereas the third and fourth columns use the third lag of the endogenous variables as instruments. The standard errors of the first and third columns are not robust while those of the second and the fourth columns are. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ show the level of significance of the coefficients at 10 percent, 5 percent and 1 percent respectively.

We now examine FDI and other covariates’ effects on total factor productivity using different forms of system GMM with the second and third lags of the endogenous variables as instruments. The second and third lags are not correlated with the current error term while the first lag is highly correlated with the current error term.

The results of the model (given in column 2 in Table 2.3) confirm that only the lagged value of TFP, gross (fixed) capital formation and macroeconomic stability as proxied by inflation positively and significantly affect the TFP level in SSA.

The negative association between FDI and the TFP level can be attributed to lack of absorptive capacities of the host countries. The fact that a number of SSA countries have low absorptive capacities manifested by poor educational attainments (despite the sometimes positive but insignificant effect here) and under-developed financial systems may inhibit the spillover effects of knowledge from MNCs. If domestic firms cannot make adequate investments which enable them to absorb foreign technologies, knowledge spillovers will be highly restricted. It is also possible that there may be no spillover effects. There is another possibility that MNCs may not apply modern technologies in a host country with low quality human capital. There is a real danger as foreign firms take stringent measures to protect the leakage of technology to local firms. By offering excessively high wages relative to those by local firms, MNCs may prevent labor turnover to domestic firms thereby restricting the diffusion of technology. The effects of unfair competition may also push local firms out of the market. Due to these reasons,

knowledge spillover effects may have a very limited scope in technology diffusion to local firms.

Other variables included in the model are human capital, broad money and imports which affect TFP growth negatively but their effects are not significant whereas foreign aid, government expenditure and the institutional quality index have a positive but insignificant effect on TFP. Given, SSA's abysmal record with regard to TFP, these results are not surprising. The TFP conundrum in SSA is expounded, among others, by Devarajan et al. (2003) and Durlauf et al. (2005).

Some of our results are at odds with Ssozi (2015) findings that there is a positive and significant effect of FDI, foreign aid, openness and remittances on TFP even though his model does not pass the instrument over-identifying tests and the first-order autocorrelation test as indicated by a very high p-value (0.374).

TFP's lagged value which captures its persistence and dynamism over time has a significant and positive association with its current value. In all the four scenarios of the system GMM models, gross (fixed) capital formation has a positive and significant impact on TFP. All else being equal, a 1 percent increase in gross capital formation increases TFP by 0.078 percent.

Krugman (1994) argues that growth in East Asian economies was unsustainable because it was largely driven by capital accumulation and increasing the quantity of labor rather than by gains in productivity. A similar situation seems to have unfolded in SSA countries in the period under discussion. Gross (fixed) capital formation is the only variable that is reliable in terms of having a positive and significant effect under the various circumstances of the static and dynamic panel data estimation approaches except the own lagged value of TFP. All other factors remaining constant, a 1 percent increase in gross capital formation increases TFP by around 0.078 percent as stated earlier (see column 2 in Table 2).

The fact that inflation has a positive impact can be taken as an indicator of the prevalence of macroeconomic stability in the region during the study period. A high, erratic and volatile inflation plausibly stifles businesses and innovations, but its absence is likely to boost confidence and hence innovations and entrepreneurship. On the basis of the Tobin-Mundell model, Ghura and Goodwin (2000) argue that an increase in the inflation rate reduces the real interest rate which encourages investments by lowering money balances. The increase in investments can boost productivity. Bitros and Panas (2001) argue that inflation can make prices a less efficient coordination mechanism thus reducing the information content of prices

and hindering the gains in productivity without articulating the threshold level of inflation above which its impact on TFP becomes deleterious.

In most alternative models provided in Table 2.3 and Table 2.7, FDI has a negative but statistically insignificant effect on TFP. This finding does not cement the widely held view that FDI strengthens competition and enhances productivity of local firms and industries through knowledge and technology transfers because of the negative sign it bears in its relation with TFP though that is statistically insignificant. The results here imply that all is not well with FDI.

Some authors argue that FDI's role in technology transfers and hence TFP growth is unambiguous but I contend that this claim is not settled as my findings and those of some others indicate that the result is not conclusive. Of course, theoretically FDI might be expected to increase productivity in the host country through the transfer of up-to-date technology and managerial knowledge as proposed by Caves (1974) and De Mello (1997). FDI is also assumed to create stiff and cut-throat competition, that is, foreign firms put pressure on domestic firms. However, Aghion, Akcigit, and Howitt (2008) dispute this assertion using a Schumpeterian growth model for explaining why more FDI could have positive growth effects only where local production is relatively close to the technological frontier, whereas growth is unchanged or it even reduces where local producers lack absorptive capacities since they lag too far behind the technological frontier. Findlay (1978) argues that if developing host countries are to take advantage of FDI-related technology transfers, the gap in technology should not be extremely wide. Aitken and Harrison (1999) assert that if the entry of foreign firms supplants domestic competitors, FDI could reduce productivity.

Government size as captured by government expenditure does not have a statistically significant effect on TFP levels. The coefficient of government size is a mixture of positive and negative signs but they are statistically insignificant suggesting that government spending could be productive and enhance productivity growth especially when it does not distort the market and complements the private sector.

A heated debate is going on regarding the effectiveness of foreign aid for economic growth and productivity both at a theoretical and empirical level. On the one hand, there are those who claim that aid is 'dead' and 'ineffective'. Skeptics of the positive association between aid and economic growth argue that aid could hurt growth because it displaces domestic savings, finances consumption, leads to the over-valuation of the real exchange rate (Dutch-Disease)

and weakens the recipient country's institutions (see Devarajan et al., 2003; Rajan & Subramanian, 2007).

On the other hand, some economists and development practitioners fervently advocate aid and say that aid can be effective in promoting growth and dragging millions of people out of the quagmire of poverty provided the right institutions exist. My findings are more inclined towards supporting this line of argument. Foreign aid has a positive but an insignificant effect on the level of TFP which casts a doubt on the argument propounded by the dissidents of aid. Foreign aid has a positive but insignificant impact on TFP.

It might be said cautiously that aid, especially development aid, can be used for improving productivity if properly harnessed and if the right institutional set-up exists. One possible explanation for the perverse effect of foreign aid on TFP, as its exponents argue, is attributed to aid weakening and distorting institutions. For example, if aid is associated with weak governance and increased rent-seeking activities, it might reduce the efficiency and profitability of investments that will ultimately limit growth (Rajan & Subramanian, 2007).

Broad money which is meant to capture the impact of financial development on TFP has a negative but an insignificant effect. Financially repressed economies could affect the health of an economy by damaging economic efficiency, slowing job creation and distorting the country's economic structure. Empirical findings suggest that development of the financial sector that facilitates the channeling of money to unproductive and wasteful investment ventures may have a deleterious impact on TFP.

Contrarily, financial development theories suggest that financial development can promote technological progress and long-term economic growth. When firms increase their monetary deposits, these holdings have an opportunity cost, that is, allocating firm financial capital to monetary deposits means that investments in real assets are reduced which could eventually affect TFP adversely. However, in the Schumpeter model's framework, King and Levine (1993) suggest that financial development lowers agency costs (due to the economies of scale) and then promotes technological innovations and economic growth. They also indicate that the financial system diversifies the risks of innovation activities which will also improve technological innovations. My study surmises that the variable used as a proxy for financial development, which in this case is M2 or broad money, is a narrow measure and incorporating additional measures such as private sector credit to GDP, financial institutions' assets to GDP and deposits to GDP might yield better results.

Many empirical findings suggest that well-functioning financial institutions strongly augment technological innovations and capital accumulation and help in fostering entrepreneurial activities that finally lead to economic development. McKinnon (1974) argues that the development of capital markets is a necessary and sufficient condition for fostering the ‘adoption of best-practice technologies and learning-by-doing’. In other words, limited access to credit markets inhibits entrepreneurial development.

We found that the financial sector’s development had a negative impact on the level of TFP. If the development of the financial sector facilitates channeling credit to unproductive investments and wasteful activities, it may have an adverse impact on TFP. Empirical findings suggest that there is a threshold effect in the finance–growth relationship. Financial development is beneficial to growth only up to a certain point and beyond this threshold level further development of the financial sector affects growth negatively. However, this does not seem to be the case in SSA given the weak and undeveloped financial systems in the area. It is more appropriate to argue that this negative effect is due to inefficiencies on the part of the financial system in allocating resources rather than exceeding a certain threshold level.

Imports of goods and services have a positive coefficient which is also statistically significant. Though petroleum and other consumer items form a bulk of SSA’s imports this result suggests that the countries in the region import technologically cutting-edge products which could be used for further production.

Human capital which is proxied by the average years of schooling has an unexpected negative coefficient but it is statistically insignificant. SSA countries are languishing at the bottom of the human development rankings. Human capital achievements in almost all the SSA countries barring Mauritius and Seychelles are well below average. UNDP’s (2015) Human Development Report shows that except these two nations which stood 63rd and 64th respectively, all other SSA countries ranked below 100 out of 188 countries included in the study. Hence, one can deduce that the human capital of the continent has a long way to go before it starts contributing significantly to productivity and growth. On *a priori* theoretical grounds, human capital is supposed to be an important determinant of both economic and TFP growth. However, empirical findings on the topic are mixed. For example, Klenow and Rodríguez-Clare (2005) and Prichett (2001) did not find any relation between schooling and economic growth. Further, one cannot rule out measurement errors and the ‘poor’ proxy used for human capital.

The other variable of interest in this study is the institutional quality index which is supposed to capture the quality of economic and social institutions and their role in boosting productivity. We developed this index based on a simple and unweighted average of the six governance indicators retrieved from the WGI (2016) online database. This variable too has a positive coefficient as *a priori* expected. And yet again its effect is not statistically significant. Our empirical findings substantiate that productivity is low in countries with poor institutions (see Daniele and Marani, 2011).

The models pass all the diagnostic tests as illustrated in the bottom-halves of Tables 2.3 and Table 2.7. The small F-test values signify that all the variables included in the model are jointly significant. The Hansen over-identifying test of instrument restrictions indicates that the restrictions being made on the instruments are valid. By construction, this type of a system GMM dynamic model suffers from first-order autocorrelation of the error terms which is validated by the small p-value of AR(1) while the p-value of AR(2) attests the null hypothesis that there is no second-order autocorrelation between the error terms.

Table 2.3: Estimation results of the TFP level using various forms of the system GMM

Explanatory variables	sysGMM1 1	sysGMM2 2	sysGMM3 3	sysGMM4 4
Lagged value of TFP	0.993*** (0.00)	0.993*** (0.01)	0.985*** (0.00)	0.985*** (0.01)
gross capital formation	0.078*** (0.01)	0.078** (0.03)	0.064*** (0.01)	0.064** (0.03)
Inflation	0.000*** (0.00)	0.000*** (0.00)	0.000*** (0.00)	0.000*** (0.00)
FDI	-0.000 (0.00)	-0.000 (0.00)	-0.001*** (0.00)	-0.001 (0.00)
foreign aid	0.056*** (0.02)	0.056 (0.06)	0.058*** (0.02)	0.058 (0.06)
government expenditure	0.002 (0.00)	0.002 (0.02)	-0.003 (0.00)	-0.003 (0.02)
broad money	-0.012*** (0.00)	-0.012 (0.01)	-0.016*** (0.00)	-0.016 (0.01)
Imports	0.008 (0.01)	0.008 (0.02)	0.003 (0.00)	0.003 (0.02)
human capital	-0.018 (0.02)	-0.018 (0.07)	0.013 (0.02)	0.013 (0.05)
institutional quality index	0.007** (0.00)	0.007 (0.01)	0.007** (0.00)	0.007 (0.01)
Constant	-0.060 (0.06)	-0.060 (0.18)	0.073 (0.07)	0.073 (0.17)

Observations	592	560	560	560
Number of countries	43	43	43	43
F-test (P-value)	0.000	0.000	0.000	0.000
Hansen P-value	0.976	0.976	0.989	0.989
AR(1) P-value	0.001	0.001	0.001	0.001
AR(2) P-value	0.118	0.119	0.126	0.126

Notes: Gross capital formation, FDI, foreign aid, government expenditure, broad money and imports are given as a percentage of GDP. Moreover, all the variables except FDI, inflation and foreign aid are transformed into ‘log’ form to ease interpretation. The first and second columns use only the second lag of the endogenous variables as instruments whereas the third and fourth columns use the third lag of the endogenous variables as instruments. The standard errors of the first and third columns are not robust while those of the second and the fourth columns are. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ signify the level of significance.

We assume that all the variables except foreign aid and the institutional quality index are endogenous in this system GMM model of TFP growth. We used the various lags of the endogenous variables as internal instruments to check the robustness of the model for different lags applied as internal instruments. Roodman (2009b) warns that instrument proliferation might lead to biased standard errors, biased estimated parameters as well as a weak over-identification test. To overcome this hurdle, we used the ‘collapse’ option in ‘xtabond2’ which is a Stata routine to limit the number of instruments in addition to restricting the number of lagged instruments of the endogenous variables.

The *collapse* option asks ‘xtabond2’ to create an instrument for each variable and lag distance, rather than one for each time period, variable and lag distance. In large samples, collapse reduces statistical efficiency but in small samples it can mitigate and completely avoid the bias that emanates from the number of instruments climbing towards the number of observations. Having too many instruments tends to overfit the instrumented variables and as a result biases the outcomes/outputs towards those of OLS/GLS. Though there is no hard-and-fast rule or widely accepted rule of thumb as to what to do to limit instrument proliferation which yields an implausibly high Hansen’s p-value, it is recommended that one should make sure that the number of instruments do not exceed the number of cross-section units.

In addition to the level of TFP, it is also helpful to see TFP growth because it measures technological change. Table 2.4 gives the impact of the explanatory variables on TFP growth.

Table 2.4: Estimation of TFP growth using a system GMM model with various lags of the dependent and explanatory variables as internal instruments (Dependent variable: TFP growth)

Explanatory variables	Model22 1	Model23 2	Model24 3	Model25 4	Model33 5
Lag of TFP growth	-0.024 (0.11)	-0.079 (0.11)	-0.083 (0.10)	-0.083 (0.09)	-0.127 (0.37)
gross capital formation	-0.007 (0.01)	0.002 (0.01)	-0.001 (0.01)	-0.003 (0.01)	0.000 (0.01)
Inflation	-0.000** (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000* (0.00)
FDI	-0.008 (0.01)	-0.005 (0.00)	-0.002 (0.00)	-0.003 (0.00)	-0.001 (0.01)
foreign aid	-0.033 (0.02)	-0.029 (0.03)	-0.036 (0.03)	-0.034 (0.02)	-0.006 (0.02)
government expenditure	-0.035* (0.02)	-0.003 (0.02)	-0.001 (0.01)	-0.000 (0.01)	-0.009 (0.03)
broad money	-0.035*** (0.01)	-0.037*** (0.01)	-0.034*** (0.01)	-0.036*** (0.01)	-0.042*** (0.02)
Imports	0.039*** (0.01)	0.022*** (0.01)	0.019** (0.01)	0.023** (0.01)	0.017 (0.01)
human capital	-0.048** (0.02)	-0.039 (0.03)	-0.044* (0.02)	-0.038 (0.02)	-0.016 (0.03)
institutional quality index	0.030*** (0.01)	0.018** (0.01)	0.016** (0.01)	0.017** (0.01)	0.023** (0.01)
Constant	0.076** (0.04)	0.062** (0.03)	0.072** (0.03)	0.064** (0.03)	0.089 (0.06)
Observations	521	521	521	521	521
Number of countries	43	43	43	43	43
Number of instruments	21	29	37	45	21
F-test (P-value)	0.000	0.000	0.000	0.000	0.000
Hansen P-value	0.643	0.236	0.357	0.710	0.360
AR(1) P-value	0.051	0.008	0.024	0.021	0.382
AR(2) P-value	0.409	0.455	0.464	0.490	0.515

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2.5: Robustness check of the TFP level using deeper lags of the dependent and explanatory variables as internal instruments (Dependent variable: TFP level)

Explanatory variables	Model34 1	Model35 2	Model44 3	Model45 4	Model55 5
Lag of TFP	1.079*** (0.04)	1.060*** (0.03)	1.042*** (0.10)	1.019*** (0.05)	0.968*** (0.07)
gross capital formation	-0.054 (0.11)	-0.007 (0.08)	0.008 (0.19)	0.064 (0.08)	0.073 (0.09)
Inflation	0.000*** (0.00)	0.000*** (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
FDI	-0.012	-0.014	-0.011	-0.019	0.011

	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
foreign aid	0.246*	0.221**	0.115	0.114	-0.006
	(0.13)	(0.10)	(0.17)	(0.13)	(0.13)
government expenditure	0.037	0.034	0.010	-0.019	-0.191
	(0.09)	(0.07)	(0.17)	(0.08)	(0.15)
broad money	-0.069*	-0.070	-0.123**	-0.116**	-0.021
	(0.04)	(0.04)	(0.05)	(0.05)	(0.06)
Imports	0.060	0.044	0.057	0.047	0.003
	(0.05)	(0.04)	(0.05)	(0.04)	(0.06)
human capital	-0.239	-0.156	-0.174	-0.051	0.048
	(0.19)	(0.13)	(0.37)	(0.21)	(0.20)
institutional quality index	0.050	0.040	0.072	0.057	0.067
	(0.04)	(0.03)	(0.07)	(0.04)	(0.05)
Constant	-0.982**	-0.809**	-0.515	-0.305	0.529
	(0.44)	(0.38)	(1.33)	(0.66)	(0.83)
Observations	541	541	541	541	541
Number of countries	43	43	43	43	43
Number of instruments	29	37	21	29	21
F-test (P-value)	0.000	0.000	0.000	0.000	0.000
Hansen P-value	0.328	0.388	0.411	0.434	0.506
AR(1) P-value	0.002	0.003	0.005	0.005	0.014
AR(2) P-value	0.251	0.248	0.357	0.208	0.712

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The sign of human capital is negative but it is insignificant. This suggests that human capital as measured by the average years of schooling of the population over 25 years of age does not affect TFP growth. There is ample empirical evidence that high levels of human capital facilitate technology adoption but SSA's low educational attainments and the poor quality of its education, which is well-documented, does not fit this narration. Besides, from Table 2.6 we can observe that in three of the five models, financial development which is proxied by broad money negatively affects TFP growth at the 1 percent significance level. FDI, foreign aid and government expenditure which is a proxy for the size of the government have negative signs but they are not significant.

However, trade openness measured by the ratio of the sum of exports and imports to GDP has a positive and significant effect on TFP growth. Moreover, the institutional quality index positively and significantly affects TFP growth. The same is true of the inflation rate when deeper lags of the dependent and explanatory variables are used as internal instruments.

Table 2.6: Robustness check of TFP growth using deeper lags of the dependent and explanatory variables as internal instruments (Dependent variable: TFP growth)

	Model34	Model35	Model44	Model45	Model55
Explanatory variables	1	2	3	4	5
Lag of TFP growth	0.142 (0.20)	-0.001 (0.20)	0.177 (0.23)	0.135 (0.23)	0.141 (0.39)
gross capital formation	-0.002 (0.01)	-0.003 (0.01)	-0.019 (0.02)	-0.015 (0.02)	-0.011 (0.02)
Inflation	0.000*** (0.00)	0.000* (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
FDI	-0.003 (0.00)	-0.003 (0.00)	-0.004 (0.01)	-0.005 (0.00)	-0.004 (0.01)
foreign aid	-0.022 (0.02)	-0.014 (0.02)	-0.027* (0.01)	-0.018 (0.02)	0.000 (0.02)
government expenditure	0.007 (0.02)	-0.000 (0.02)	-0.020 (0.06)	-0.012 (0.03)	-0.034 (0.03)
broad money	-0.036*** (0.01)	-0.035*** (0.01)	-0.029* (0.01)	-0.034*** (0.01)	-0.021 (0.01)
Imports	0.018** (0.01)	0.016* (0.01)	0.029 (0.02)	0.027** (0.01)	0.020 (0.02)
human capital	-0.020 (0.02)	-0.015 (0.03)	-0.027 (0.03)	-0.014 (0.02)	-0.008 (0.03)
institutional quality index	0.015** (0.01)	0.016** (0.01)	0.024* (0.01)	0.023*** (0.01)	0.022** (0.01)
Constant	0.048 (0.03)	0.069* (0.04)	0.077 (0.06)	0.072* (0.04)	0.095 (0.08)
Observations	521	521	521	521	521
Number of countries	43	43	43	43	43
Number of instruments	29	37	21	29	21
F-test (P-value)	0.000	0.000	0.001	0.004	0.016
Hansen P-value	0.219	0.327	0.122	0.223	0.066
AR(1) P-value	0.035	0.065	0.026	0.003	0.137
AR(2) P-value	0.801	0.593	0.635	0.266	0.924

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

2.8.3 Robustness Checks and Diagnostic Tests

The models in Table 2.7 are meant to check the robustness of the system GMM model for the TFP level when viewed in light of the other models.

A common practice in empirical economic studies is doing a robustness check or a sensitivity analysis where the researcher examines how the regression coefficients of certain ‘core variables’ behave when the regression specification is modified by adding or removing some regressors. The model is interpreted as structurally valid if the coefficients are plausible and robust. However, its critics argue that this approach has its own pitfalls and is flawed when not applied properly. Further, skeptics also claim that robustness checks do not give necessary nor sufficient evidence of structural validity.

One of the approaches for a robustness check that we performed was by keeping the significant variables of the lagged value of TFP, gross capital formation and inflation as the ‘core variables’ and the remaining ones as ‘testing variables’. The results show that the model is robust.

The model’s diagnostic tests show that the system GMM model given in column 2 of Table 2.3 and column 5 of Table 2.7 is well specified and satisfies all the tests. However, the difference GMM model given in column 4 of Table 2.7 fails to pass the AR(1) test, the test of first-order error autocorrelation implying that the model is not adequate enough for its coefficients to have interpretable values.

We can further check the robustness of the TFP model in level and its growth rate using deeper lags of the dependent variable and the covariates. However, care should be taken as taking deeper lags may result in weak instruments in addition to consuming degrees of freedom. Tables 2.5 and 2.6 show the results of the models for various lags of internal instruments. Table 2.5 presents the results for the TFP level while Table 2.8 gives those of the TFP growth model. In both the models, the original variables are kept intact. We only used additional deeper lags of the variables to see if the results were still robust to further lags.

Tables 2.8 and 2.9 present the coefficients of the results of the robustness checks of TFP growth with the same data but with some of variables changed. For example, domestic investments are used instead of gross capital formation. In addition, the imports variable is replaced by trade openness which is given by the sum of exports and imports as a percentage of GDP. From the results, we learn that domestic investments do not affect TFP growth while trade openness affects it positively and significantly. This result conforms with that of the baseline regression of the TFP growth model given in Table 2.4.

Table 2.7: Estimation results of the TFP level using various methods (2001-15)

Expl. variables	Pooled OLS 1	Random Effects 2	Fixed Effects 3	difference GMM 4	System GMM 5
Lagged value of TFP	0.992*** (0.01)	0.984*** (0.01)	0.587*** (0.04)	0.238** (0.11)	0.983*** (0.01)
gross capital formation	0.071*** (0.01)	0.090*** (0.02)	0.227*** (0.02)	0.241*** (0.04)	0.078** (0.03)
Inflation	0.000 (0.00)	0.000*** (0.00)	0.000 (0.00)	-0.000 (0.00)	0.000*** (0.00)
FDI	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.004** (0.00)	-0.000 (0.00)

foreign aid	0.046 (0.04)	0.047 (0.04)	-0.088 (0.08)	0.010 (0.04)	0.056 (0.06)
government expenditure	0.002 (0.01)	-0.001 (0.02)	-0.007 (0.02)	-0.030 (0.03)	0.002 (0.02)
broad money	-0.009 (0.01)	-0.010 (0.01)	0.004 (0.01)	-0.006 (0.02)	-0.012 (0.01)
Imports	-0.007 (0.01)	-0.006 (0.01)	-0.042** (0.02)	-0.006 (0.03)	0.008 (0.02)
human capital	-0.012 (0.02)	-0.004 (0.03)	0.701*** (0.11)	2.215*** (0.51)	-0.018 (0.07)
Institutionalquality index	0.003 (0.01)	0.004 (0.01)	0.079*** (0.03)	0.054 (0.03)	0.007 (0.01)
Constant	-0.033 (0.09)	0.021 (0.13)	4.375*** (0.49)		-0.060 (0.18)
Observations	592	592	592	549	592
No. of countries	43	43	43	43	43
F-test (P-value)	0.000	0.000	0.000	0.000	0.000
Hansen P-value				0.912	0.976
AR(1) P-value				0.314	0.001
AR(2) P-value				0.349	0.119
R-squared	0.993				
Overall R-squared		0.993	0.937		

Notes: Gross capital formation, FDI, foreign aid, government expenditure, broad money and imports are given as a percentage of GDP. Moreover, all the variables except FDI, inflation and foreign aid are transformed into ‘log’ form to ease interpretation. Columns 4 and 5 use the second lag of the endogenous variables as instruments.

The standard errors of the first and third columns are not robust while those of the second and the fourth columns are. The standard errors are given in parenthesis. * p < 0.05, ** p < 0.01, *** p < 0.001 show the significance level at 10 percent, 5 percent and 1 percent respectively.

Table 2.8: The impact of domestic investments and trade openness on TFP growth- Robustness check using various lags of the dependent and explanatory variables as internal instruments (TFP growth)

Explanatory variables	Model22 1	Model23 2	Model24 3	Model25 4	Model33 5
Lag of TFP growth	-0.012 (0.09)	-0.044 (0.12)	-0.029 (0.07)	-0.029 (0.07)	-0.097 (0.26)
domestic investments	0.001 (0.00)	0.004 (0.01)	0.005 (0.01)	0.005 (0.01)	0.006 (0.01)
Inflation	-0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000*** (0.00)
FDI	-0.004 (0.00)	-0.001 (0.00)	-0.003 (0.00)	-0.002 (0.00)	-0.003 (0.01)
foreign aid	-0.020 (0.02)	-0.020 (0.03)	-0.018 (0.03)	-0.022 (0.03)	-0.007 (0.03)
government expenditure	-0.009 (0.02)	0.006 (0.02)	0.005 (0.02)	0.006 (0.01)	-0.001 (0.02)
broad money	-0.029***	-0.028***	-0.025***	-0.025***	-0.029**

	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Trade openness	0.025***	0.017**	0.015**	0.015**	0.018**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
human capital	-0.048**	-0.040	-0.035	-0.034*	-0.030
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)
institutional quality index	0.018**	0.013	0.010	0.009	0.013
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.028	0.024	0.030	0.030	0.030
	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
Observations	541	541	541	541	541
Number of countries	43	43	43	43	43
Number of instruments	21	29	37	45	21
F-test (P-value)	0.000	0.000	0.000	0.000	0.000
Hansen P-value	0.595	0.662	0.211	0.413	0.515
AR(1) P-value	0.004	0.002	0.003	0.003	0.002
AR(2) P-value	0.458	0.277	0.255	0.266	0.263

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2.9: The Impact of domestic investments and trade openness on TFP growth- Robustness check using deeper lags of the dependent and explanatory variables as internal instruments (TFP growth)

	Model34	Model35	Model44	Model45	Model55
Explanatory variables	1	2	3	4	5
Lag of TFP growth	0.033 (0.17)	-0.011 (0.15)	0.184 (0.24)	0.119 (0.19)	0.963 (0.83)
domestic investments	0.003 (0.01)	0.006 (0.01)	0.004 (0.01)	0.006 (0.01)	-0.016 (0.03)
Inflation	0.000*** (0.00)	0.000*** (0.00)	0.000* (0.00)	0.000 (0.00)	0.000 (0.00)
FDI	-0.005 (0.00)	-0.005 (0.00)	-0.006 (0.00)	-0.004 (0.00)	-0.010 (0.01)
foreign aid	-0.013 (0.03)	-0.008 (0.02)	-0.021 (0.03)	-0.002 (0.03)	0.021 (0.04)
government expenditure	0.005 (0.02)	0.004 (0.01)	0.016 (0.03)	0.008 (0.02)	-0.035 (0.02)
broad money	-0.025*** (0.01)	-0.027*** (0.01)	-0.025*** (0.01)	-0.024*** (0.01)	-0.003 (0.02)
Trade openness	0.015** (0.01)	0.017** (0.01)	0.013 (0.01)	0.014 (0.01)	0.016 (0.01)
human capital	-0.023 (0.02)	-0.022 (0.01)	-0.030 (0.03)	-0.018 (0.02)	0.003 (0.04)
institutional quality index	0.010 (0.01)	0.010 (0.01)	0.008 (0.00)	0.008 (0.01)	0.019** (0.01)
Constant	0.030 (0.04)	0.023 (0.03)	0.007 (0.05)	0.011 (0.03)	0.021 (0.07)
Observations	504	504	504	504	504
Number of countries	43	43	43	43	43
Number of instruments	29	37	21	29	21

F-test (P-value)	0.000	0.000	0.011	0.005	0.457
Hansen P-value	0.144	0.298	0.053	0.078	0.012
AR(1) P-value	0.035	0.043	0.072	0.034	0.123
AR(2) P-value	0.554	0.462	0.523	0.687	0.428

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

2.9. Conclusion and Policy Implications

2.9.1 Conclusion

There is not enough empirical evidence on what causes sluggish TFP growth in SSA especially at the macro-level. Hence, this chapter sought out the macro-determinants of TFP.

TFP is a variable which accounts for the effects of total output growth relative to the growth in traditionally measured inputs of labor and capital. While capital and labor inputs are tangible, TFP is more intangible as it can range from technology to workers' knowledge (human capital). Provided all the inputs are accounted for, TFP can be taken as a measure of an economy's long-term technological changes or dynamism. TFP is often seen as the real driver of growth in an economy and studies reveal that whilst labor and investments are important contributors, TFP may account for up to 60 percent of the growth within economies (Easterly & Levine, 2001a). Technology growth and efficiency are regarded as two of the biggest components of TFP, the former possessing 'special' inherent features such as positive externalities and non-rivalriness which enhance its position as a driver of economic growth.

TFP at the macro level can be estimated by either of two methods. The first method assigns the labor share of income between two-third and 0.7 with the remaining share going to capital under the assumption of a Cobb-Douglas type of production function of the form $Y = AK^\alpha L^\beta$. This production function further assumes constant returns to scale and a perfectly competitive market where factors of production are remunerated an amount of income that is commensurate with their marginal contribution/productivity. Given this, the Cobb-Douglas production function can be rewritten to express 'A', the parameter that captures TFP in terms of the others as: $A = \frac{Y}{K^\alpha L^\beta}$ where $\beta=1-\alpha$. Using a simple log-linearization, the growth of 'A' which is also

popularly known as the 'Solow residual' can be rewritten as $g_A = g_Y - \alpha * g_K - (1 - \alpha) * g_L$

where g_Y denotes the growth rate of aggregate output, g_K the growth of aggregate capital, g_L the growth of aggregate labor and α the capital share of output while $\beta=1-\alpha$ is the labor share of output.

This in effect is the other approach that involves regressing output (GDP) growth on the growth in labor force and capital and predicting TFP as a residual. This is done by subtracting the growth in the labor force and the growth in capital from the growth in GDP (see Equation 2.12).

The first chapter estimated FDI's effect on economic growth and this chapter estimated FDI's impact on both the growth rate and level of TFP, which in effect is a means of assessing the technological spillover effects of FDI in the host country. The study focused on 43 SSA countries based on a balanced panel data for the period 2001-15. It applied the system GMM panel data method to estimate the models. The estimated coefficients show that FDI did not have any significant impact on TFP's growth rate and level.

Using the system GMM estimation technique for the linear dynamic panel data model of TFP developed here, the study found that the lagged value of TFP, gross capital formation and inflation had a positive and significant effect on TFP growth. On the other hand, foreign aid, government expenditure and the institutional quality index had a positive but insignificant effect on TFP growth. There is another group of variables that comprises foreign aid and human capital that had an insignificant negative effect on TFP growth.

There is a view in policy circles that FDI enhances productivity and economic development in host countries. This notion emanates from the perception that FDI not only provides direct capital financing but also positive spillover effects via the adoption of improved foreign technologies and know-how. However, empirical evidence on the existence of such positive productivity spillover effects is far from being conclusive.

2.9.2 Policy Recommendations

This study shows that the disappointing performance of TFP in SSA can be attributed to the poor performance of a range of macroeconomic variables including FDI, imports and human capital. Therefore, policymakers and governments in SSA need to figure out the areas that need major improvements so as to boost TFP and attain a growth path that sustains into the future. Besides, economists working in the region have the added burden of identifying and understanding what actually drives the growth in total factor productivity

Poor TFP in SSA indicates that the region can climb up the value chain by focusing on higher productivity activities through technological changes and innovations. Relying on technology, in particular, could maximize efficiency gains. This could be done through either maximizing

the benefits of information technology or playing technological catch-up by combining different existing technologies and adapting them in a way that boosts growth and productivity in the region.

Chapter Three

The FDI-Domestic Investment Nexus in SSA

Yemane Michael

Department of Economics
College of Business and Economics
Addis Ababa University
E-mail: yemanewj@yahoo.com

[February 16, 2019](#)

Abstract

This study empirically investigates the nexus between foreign direct investments and domestic investments (DI) in sub-Saharan African (SSA) countries for the period 1986-2015. The study uses panel data for 40 SSA countries. Using the flexible accelerator model of investment and the dynamic common correlated effects estimators and other types of dynamic and static estimation methods, the study finds that FDI crowds-out domestic investments in SSA countries. Specifically, by applying Chudik and Pesaran (2015), dynamic common correlated effects estimator it finds that a 1 percent increase in FDI inflows results in a reduction of domestic investments by 0.037 to 0.126 percent.

Keywords: FDI, domestic investment, SSA, dynamic common correlated effects estimator.

JEL Classification: C51; C52; F21; O11; O55

3.1 Introduction

This study investigates the various dimensions of the relationship between foreign direct investments (FDI), domestic investments (DI), foreign aid and economic growth in sub-Saharan Africa (SSA). The main focus of this chapter is analyzing whether FDI crowds-out or crowds-in domestic investments in SSA. It also probes the impact of foreign aid on economic growth using domestic investments as a transmission mechanism. It applies the panel vector autoregressive (panel VAR) model to mitigate the limitations of traditional panel data estimators related to biases, inconsistencies and endogeneity. In other words, it constructs and estimates models of FDI, domestic investments, foreign aid and economic growth with multi-way causal relationships using a panel vector autoregressive (PVAR) model.

The study presumes that FDI influences economic growth by promoting domestic investments and exports and by developing human capital, infrastructure and institutions. Of all these channels, domestic investments are probably the most important through which economic growth in the host country is influenced by FDI because FDI influences employment and incomes more directly through this mechanism than through other channels. This is the main reason why FDI's impact on domestic investments is addressed as a separate chapter in this thesis.

3.2. A Review of Direct and Indirect links between Financial Sources and Economic Growth

The amount of FDI flows to developing countries grew steadily in the 1990s and reached \$583 billion in 2009 in current US dollar terms (World Bank Group, 2010). However, UNCTAD (2015) World Investment Report puts the figure at 681 billion US dollars with a 2 percent rise. It also stresses that developing countries had extended their lead in global inflows. China had become the world's leading recipient of FDI. Five of the world's ten top recipients of FDI were developing countries.

The tremendous rise in FDI inflows happened mainly due to the policies that those countries adopted such as the reduction in FDI barriers and offering tax incentives and subsidies for attracting FDI. The increasing importance of FDI flows as a source of external funding for recipient countries has encouraged research on the channels through which FDI might promote economic growth. The key point in evaluating the FDI-growth nexus is captured by the link

between foreign and domestic investments. As a result, a number of studies have investigated whether FDI and domestic investments complement each other or are substitutes in recipient countries.

Colen, Maertens, and Swinnen (2008) state that FDI has a more advanced level of technology, managerial capacity, skills and know-how which result in higher levels of efficiency and productivity. Hence, FDI contributes directly and more strongly than domestic investments to accelerating the level of growth in the host economy.

However, some scholars refute the argument that foreign firms are more productive than domestic firms. For example, Mutenyo (2008) investigated FDI's impact on economic growth in 32 sub-Saharan African countries by applying cross-sectional and dynamic panel data for the period 1990-2003. He found consistent results that FDI had a positive impact on economic growth but it was less efficient than domestic investments. The bone of contention here is that FDI inflows might not be accompanied by improved technological and managerial capacities or organizational structures all the time especially when FDI takes the form of mergers and acquisitions (M&A).

Various developing countries have offered special treatment to foreign enterprises and multinational corporations (MNCs) believing that FDI could create positive externalities and spillover effects in the form of technology transfers to their economies (Aitken & Harrison, 1999). They have invited MNCs to invest in their economies thinking that this would enable them to access technologies that cannot be produced by domestic firms (Blomström, Globerman, & Kokko, 1999).

FDI is regarded as the primary channel through which technological transfers take place. The effect of FDI on domestic economic growth depends on the diffusion of best practices through the local economy (Ajayi, 2006). MNCs produce different spillover effects and there are different channels through which these effects occur.²⁰

Host countries are tempted to attract MNCs and FDI with the expectation that this will boost the productivity of domestic firms. Developing countries presume that foreign enterprises own intangible assets and cutting-edge technology that can be passed on to domestic firms which will eventually improve their productivity levels. Productivity distribution is related to

²⁰ For more information on the various types of spillover effects of FDI see Blomström et al. (1999).

externalities which are often referred to as productivity spillovers (Crespo, Proença, & Fontoura, 2008).

The crowding-in and crowding-out effects of FDI on DI work as follows: FDI's crowding-in effects happen when FDI by foreign firms builds new investments in downstream or upstream production that would not have happened if they were not there, particularly when investments are made in undeveloped sectors of the economy. Conversely, FDI's crowding-out effects happen when FDI firms distort domestic firms and other foreign affiliates from undertaking investments by driving them out of business (Bende-Nabende & Slater, 2003). De Mello (1997) and Apergis, Katrakilidis, and Tabakis (20006) argue that FDI can affect DI through its effect on the profitability of domestic investors which leads to the crowding-out effect of DI. But on the other hand, FDI can have an impact on the adjustments in the ownership structures of the total investments in the host country; this offers additional financial support to DI. This effect leads to crowding-in of domestic investments in the receiving countries.

To put it differently, if FDI has no effect on domestic investments, any increase in FDI ought to be reflected in a dollar-for-dollar increase in total investments. If FDI crowds-out or supplants investments by domestic firms, the increase in *total investments* should be *smaller* than the increase in FDI. Finally, if there is crowding-in or a complementarity effect, *total investments* should increase by *more* than the increase in FDI.

The entry of MNCs may create competition that crowds-out investments by domestic firms. But it is also possible that FDI might stimulate DI and lead to the crowding-in effect of investments by domestic firms (Colen et al., 2008). However, Borensztein et al. (1998) argue that the effects of FDI on domestic investments can be different: MNCs that compete in product and financial markets may crowd-out investments by domestic firms. There is still another avenue whereby FDI could support the expansion of domestic firms -- complementarity in production or by increasing productivity through the spillover of advanced technologies.

Policies that offer special tax treatment and other incentives such as export free zones and tax exemptions to attract FDI inflows may introduce distortions that affect domestic investments. These distortions, in turn, could have a greater deleterious impact on domestic investments which limits the growth spillover effects that are meant to be generated through FDI's crowding-in effects (Borensztein et al., 1998; Colen et al., 2008).

The positive influence of FDI on DI is realized when FDI introduces new industries to the host country Lipsey (2002), offers new investment prospects for local firms through the provision

of machinery and technology (Sun (1998), and generates new demand for local inputs (Cardoso & Dornbusch, 1989).

Foreign and domestic investments are also likely to be substitutes if foreign firms compete with domestic firms for the use of domestic resources as this will inhibit investment opportunities for domestic investors (Agosin & Mayer, 2000; Fry, 1992; Jansen & Stokman, 2004). In this case, FDI's effect on economic growth can be dampened and its role in the economies of recipient countries can be ambiguous.

One thing that has to be known for analyzing the relationship between FDI and domestic investments is the linkages between FDI, public investments and private investments which help identify the policy implications that can be drawn to maximize FDI's gains. A strong private investment climate which acts as a signal of high returns to capital as well as improved public infrastructure via public investments that cut down the cost of doing business are crucial for attracting foreign capital. It is also possible that FDI may supplant or complement different types of domestic investments. Ndikumana and Verick (2008) studied sub-Saharan African countries and found a two-way relation between FDI and private investments. But they also noted that public investments were not a driver of FDI. Ang (2009) found that both public investments and FDI were complementary with private investments in Malaysia.

MNCs could affect domestic investments in host economies in two ways: directly through their own investment activities and indirectly by affecting investments in the host country's firms (UNCTAD, 1999). Herzer et al. (2008) argue that positive knowledge spillovers, as endogenous growth theory depicts, cannot run from FDI to DI, especially in developing countries. Görg and Greenaway (2004) assert that there is a positive spillover from FDI to DI only in developed countries and not in developing countries.

Borensztein et al. (1998) found a crowding-in effect of FDI in a sample of 69 developing countries. A one-dollar increase in the net FDI inflows led to an increase in DI in the host country by more than one dollar. Moreover, their findings suggest that the complementarity between FDI and DI is not sensitive to FDI's productivity.

Some studies have also found evidence of negative spillover effects from FDI to domestic firms in developing and transition economies by using firm level panel data from manufacturing industries. For example, Haddad and Harrison (1993) used data for Moroccan manufacturing industries and found that horizontal spillovers did not take place in all the industrial sectors. Aitken and Harrison (1999) probed the impact of MNCs on domestic firms in Venezuela and

Djankov and Hoekman (2000) in the Czech Republic. They found that the MNCs shifted the demand for intermediate inputs from domestic to foreign producers thereby reducing the scale of output and productivity in local production and causing negative spillover effects rather than positive ones.

Generally speaking, FDI's positive contribution to economic growth occurs when FDI crowds-in DI. Contrarily, FDI can decrease DI when it takes away investment opportunities through licenses, skilled labor and credit facilities. This shows the dominance of FDI over DI (Herzer et al., 2008). However, some studies on this relation have concluded that there is a strong relationship between FDI inflows and DI over time (Lipsey, 2004).

However, the relationship between FDI and DI is not necessarily unidirectional only running from FDI to DI. It is highly plausible that DI can also affect FDI in several ways. For example, increased investments in physical and human infrastructure can lead to increased FDI profitability thus further enhancing FDI's efficiency (Apergis et al., 20006). In addition, DI can act as a signal about the state of the investment climate if the information regarding investment opportunities and threats is unavailable or incomplete in the host country.

Agosin and Mayer (2000) developed a theoretical model of investments based on the neo-classical investment model to test whether FDI crowds-in/out DI in three groups of developing countries (Africa, Asia and Latin America) from 1970 to 1996. They found strong crowding-in effects for DI in Asia and lower effects in Africa, whilst there were strong crowding-out effects in Latin America. Their study mainly focused FDI's impact on DI and did not consider the dynamic interaction between FDI, DI and economic growth.

Growth-driven FDI occurs when the growth of the host economy attracts FDI. Economic theory gives us different fundamental reasons about MNCs' decisions to invest in advanced or developing countries. Growth-driven FDI has been strongly supported by the empirical findings of Balamoune-Lutz (2004) based on data from developed economies and Asian countries. The strong links between FDI and growth are a result of either growth-driven FDI or FDI-led growth; this could make it possible for the two variables to move together through feedback or bidirectional causality (Zhang, 2005).

Using panel cointegration techniques and a sample of 38 developing countries spanning 1975-2000, Nonnemberg and Cardoso de Mendonça (2004) found that the causality ran from GDP to FDI but not the other way round. Basu, Chakraborty, and Reagle (2003) used data from 23 developing economies from 1978 to 1996 and arrived at a similar conclusion. However, Basu

et al. (2003) emphasized trade openness as a crucial determinant of FDI's impact on growth and found two-way causality in open economies both in the short and long run whereas long-run causality was unidirectional moving from growth to FDI in relatively closed economies.

The argument that aid contributes to economic growth in recipient countries is a testable hypothesis which can be verified using empirical data. Burnside and Dollar (2000) argue that once other determinants of growth, especially economic policy indicators are controlled for, aid has no effect on growth. Aid's contribution to economic growth is marginally positive in countries which have high values of economic policy indicators. The kind of policies in these countries encompass maintaining small, if any, budget shortfalls, curbing inflation and trade openness and globalization. However, if the policy is poor, aid becomes ineffective because the recipient countries with poor policies siphon off and divert aid for government consumption spending rather than using it for financing growth-enhancing investment ventures. On the other hand, using the same data for the same sample but with different specifications and estimators Hansen and Tarp (2001) found that aid had a positive effect on economic growth. They, however, maintain that this result was not conditional on policy.

Amusa, Monkam, and Viegi (2016) examined the role of foreign aid in enhancing FDI inflows to 31 SSA countries for the period 1995-2012 using panel data estimation techniques. They found that productive infrastructure aid (agriculture and forestry, industry, mining and construction and tourism) were complementary to FDI inflows while socioeconomic aid (education and health aid, energy, transport and communication) had no significant impact on FDI inflows.

Bhavan, Xu., and Zhong (2011) stress that foreign aid which is meant for human capital and infrastructural development helps improve not only physical infrastructure but also results in increased knowledge and allows for improved production methods and higher output which encourage investors. They point out that foreign aid for human capital and infrastructure development is complementary with FDI inflows. But the authors did not find evidence of a crowding-out effect of foreign aid for physical capital on FDI inflows. Selaya and Sunesen (2012) examined the nexus between foreign aid and FDI for a panel of 99 developing countries between 1970 and 2001. They concluded that foreign aid invested in physical capital accumulation crowded-out FDI while foreign aid invested in complementary inputs (human capital, infrastructure aid) crowded-in FDI.

Gomanee, Girma, and Morrissey (2002) studied the nexus between aid, investments and growth using pooled panel results for a sample of 25 sub-Saharan African countries over the period 1970-97 using investments as the most important transmission mechanism from foreign aid to economic growth. They point out that there existed a significant positive effect of foreign aid on growth, *ceteris paribus*. They also found that, on average, a 1 percentage point rise in the aid/GNP ratio contributed a quarter of a percentage point to the growth rate. This signals that it is inappropriate to attribute Africa's poor growth solely to aid ineffectiveness.

Ogundipe et al. (2014) examined the relationship between foreign aid and economic development in SSA. They adopted a theoretical framework in the spirit of the endogenous or new growth theories and applied the generalized method of moments (GMM) estimation technique to examine the effectiveness of aid in SSA countries. They found that foreign aid did not significantly influence the growth of real per capita GDP in SSA.

The conceptual underpinning of the link between aid and growth remains rooted in the two-gap model pioneered by Harrod (1939) and Domar (1946) and further developed by Chenery and Strout (1966). The two-gap model has two important attributes: (i) investment requirements to achieve a given growth rate are commensurate with the growth rate by a given constant known as the Incremental Capital Output Ratio (ICOR), and (ii) aid requirements are given by the 'financing gap' between an economy's investment requirements and the financing available from private financing sources and domestic savings. Poor countries do not have sufficient resources to finance investments and face a big hurdle in fulfilling the requirements for importing capital goods and technology. Aid which is meant to finance investments can directly fill the savings-investment gap and since it is in the form of hard currency it can also indirectly fill the foreign exchange gap. As official aid is normally issued to the government, it can be used for funding government spending and compensating for a small domestic tax base (Gomanee et al., 2002).

The question that can be asked here is: Why is foreign aid crucial for FDI inflows? It is presumed that foreign aid is provided to developing countries to help them improve their infrastructure, human capital development and governance and for fostering macroeconomic stability. If all these conditions are satisfied, it could serve as an incentive for attracting further FDI as has been witnessed by some empirical findings.

3.3 A Model of the Nexus between Domestic Investments and FDI

This section develops a model of domestic investments placing FDI at the center of the analysis. The model is empirically estimated to see whether FDI crowds-in or crowds-out domestic investments in SSA.

Empirical literature focuses on four approaches for modeling investments in developing countries -- the accelerator model, the expected profits model, the neo-classical model and the Tobin's Q model. Of all these models, the flexible accelerator model is more widely used due to data unavailability for some of the variables especially for capital stock and the returns on investments. The model assumes that the speed of adjustment parameter is influenced by a number of variables for which data is available.

The empirical model used in this study is based on the flexible accelerator model, which assumes that the desired capital stock is proportional to the level of expected output (Abdullah, 2017; Blejer & Khan, 1984; Mody & Murshid, 2005; Ramirez, 1994) expressed as:

$$(3.1) \quad K_t^* = \alpha Y_t^e$$

where K_t^* denotes the desired capital stock in period t and Y_t^e is the expected level of output in period t . The expected level of output can also be considered as future aggregate demand.

This model assumes that the actual stock of capital adjusts to the difference between the desired stock in period t and the actual stock in the preceding period ($t-1$). The relationship is given by:

$$(3.2) \quad K_t - K_{t-1} = \Delta K_t = \beta(K_t^* - K_{t-1})$$

where β is the coefficient of adjustment. Equation (3.2) implies that the extent of adjustment per period in the current actual capital stock is fraction β of the difference between the desired stock in the current period and the actual stock in the previous period. If $\beta=1$, the actual capital stock adjusts fully to the desired level immediately within one period. On the other hand, a value of $\beta=0$ signifies that there is no adjustment. However, due to technical and capital cost constraints and time required to plan, build and install new capital and other adjustment costs, instantaneous adjustment to the desired level of capital ($\beta=1$) is less plausible and it is commonly assumed that β lies between 0 and 1.

In most developing countries, data on investments (capital flows) is more readily available than that on capital stock. Hence, we use gross investment which is defined as:

$$(3.3) \quad I_t = (K_t - K_{t-1}) + \delta K_{t-1}$$

where δ is the depreciation rate of capital stock and I_t is gross investment. Using the lag-operator, we can rewrite Equation (3.3) as:

$$(3.3a) \quad I_t = [1 - (1 - \delta)L]K_t$$

where L denotes the one-period lag operator defined as $LK = K_{t-1}$.

For all practical purposes, the partial adjustment mechanism of investment can be expressed as:

$$(3.4) \quad I_t - I_{t-1} = \beta(I^* - I_{t-1})$$

Following Blejer and Khan (1984), Ramirez (1994), Erden and Holcombe (2006) and Abdullah (2017), we assume that the speed of adjustment coefficient which defines the gap between the actual and the desired investments is influenced by FDI and other relevant macroeconomic variables. This helps us incorporate more dynamism into our empirical model. Hence, β can be defined as a linear function as:

$$(3.5) \quad \beta = \alpha_0 + \left[\frac{1}{I_t^* - I_{t-1}} \right] (\phi_1 FDI_t + \phi_2 X_t)$$

where α_0 is the intercept, X_t is a vector of the other determinants of investment and FDI is the usual FDI. The coefficient of adjustment captures the impact of FDI's current and lagged values and other determinants on domestic investments. If FDI complements or supplements domestic investments, an increase in FDI speeds up the adjustment coefficient and closes the gap between the actual and desired investments. On the other hand, if FDI supplants domestic investments, an increase in FDI slows down the adjustment coefficient and widens the gap between the actual and the desired investments.

Subsuming the value of β from Equation (3.5) into Equation (3.4) and after some small simplifications, yields:

$$(3.6) \quad I_t - I_{t-1} = \alpha_0(I_t^* - I_{t-1}) + (\phi_1 FDI_t + \phi_2 X_t)$$

The steady-state value of investments can be expressed from Equation (3.3a) as:

$$(3.7) \quad I_t^* = [1 - (1 - \delta)L]K_t^*$$

We now surrogate the expression for K_t^* from Equation (3.1) into Equation (3.7) to get $I_t^* = [1 - (1 - \delta)L] \alpha Y_t^e$. Finally, we plug this expression for I_t^* in Equation (3.6) which gives us:

$$I_t - I_{t-1} = \alpha_0 \{ [1 - (1 - \delta)L] \alpha Y_t^e - I_{t-1} \} + (\phi_1 FDI_t + \phi_2 X_t).$$

Rearranging this expression and adding the subscript i to give it a panel dimension and the composite error term, yields:

$$(3.8) \quad I_{it} = \alpha_0 \alpha [1 - (1 - \delta)L] Y_{it}^e + (1 - \alpha) I_{it-1} + (\phi_1 FDI_{it} + \phi_2 X_{it}) + \mu_{it}$$

where $i=1, 2, \dots, N$ represents cross-sectional units, $t=1, 2, \dots, T$ denotes the time dimension of the panel data and μ_{it} is the composite error term.

By letting $(1 - \alpha_0) = \varphi_1$, $\alpha_0 \alpha [1 - (1 - \delta)L] = \varphi_2$, $\phi_1 = \varphi_3$, and $\phi_2 = \varphi_4$, the flexible accelerator the model of DI from Equation (3.8) can be written as:

$$(3.9) \quad I_{it} = \varphi_1 I_{it-1} + \varphi_2 Y_{it}^e + \varphi_3 FDI_{it} + \varphi_4 X_{it} + \mu_{it}$$

Here, domestic investments are considered as a partial adjustment process between the current actually existing and the desired capital stock due to the presence of liquidity constraints, adjustment costs and the considerable time that elapses before full adjustment takes place. Besides, since investments are a structural component of the economy, they are expected to show strong autoregressive behavior. Thus, we incorporate the lagged value of domestic investments (I_{it-1}) in our empirical equation. This allows us to take into consideration the persistence of the domestic investment rate. It also highlights the dynamic nature of the domestic investments framework by manipulating long-term coefficients.

The coefficient of Y^e which captures the accelerator effect is expected to be positive. Since, Y^e the expected output is not observable and hence cannot be measured directly, we need to use a proxy for it. To this end, we estimate a first-order autoregressive model, AR(1) of real GDP for every country in the sample and calculate the predicted values. We then use these predicted values as a proxy for the expected output (see Blejer & Khan, 1984; Erden & Holcombe, 2006; Ramirez, 1994).

Variables which are supposed to influence the adjustment coefficient β and are included in the baseline regression model include inflation rate, official exchange rate, openness, lending interest rate, financial development whose proxy is broad money and foreign aid. The other

variables included in the baseline regression are the ones for which sufficiently long panel data series exist. The rationale for adding each of these regressors in the baseline model is given as:

A hike in the lending interest rate increases the cost of borrowing and results in a reduction in investment demand. Therefore, the lending interest rate is expected to have a negative influence on domestic investments. The lending interest rate is used as a proxy for the cost of capital.

Inflation rate reduces the real return on investment and hence dissuades investors from undertaking more investments, *ceteris paribus*. Moreover, the inflation rate can be taken as an indicator of macroeconomic instability. Higher inflation, especially above a certain threshold, causes jitters in the economy and reduces the returns on investments. A combination of lower expected returns and higher uncertainty caused by a panic due to excessive inflation discourages investments. But, from a different perspective the Tobin-Mundell model predicts that an increase in the inflation rate reduces the real interest rate and encourages investments. Thus, the final impact of inflation on investments is uncertain.

An increase in the official exchange rate (measured by units of local currency per US dollar) could raise the price of tradables relative to non-tradables. This, in turn, may lead to an increase in investments in tradable-goods producing sectors and a decline in investments in the sectors that produce non-tradable goods. Thus, the depreciation of the domestic currency may result in an increase in overall investments. On the flip-side, depreciation of the local currency may lower the real value of income and assets which could lower the demand for investments. In addition, depreciation may also increase the real cost of imported capital goods and machines that are destined for investment purposes thus discouraging investments. It is also possible that depreciation increases the burden of foreign debt which may influence investments negatively. Therefore, whether depreciation stimulates or retards domestic investments is not clear on *a priori* grounds and is an empirical question.

Trade openness: This bolsters greater utilization of capacity, realization of economies of scale and technological improvements due to competition in foreign markets (Helpman & Krugman, 1985). Moreover, trade openness mitigates foreign exchange constraints and facilitates import of capital goods and machinery which promotes domestic capital formation. This, in turn, enhances countries' capacity to export more which likely promotes economic growth in the long-run by speeding-up the learning process from abroad and improving technological innovations.

A high degree of trade openness is expected to boost investments especially in export-oriented sectors. Thus, we use openness measured by the sum of exports and imports of goods and services as a percentage of GDP in the baseline regression model. However, later we use exports as a percentage of GDP to check for robustness.

When it comes to FDI, if the coefficient of FDI is positive, it will be deemed that complementarity exists between FDI and domestic investments. That is, a dollar of inward FDI adds more than a dollar to gross fixed capital formation (GFCF) and induces more domestic investments to take place. This scenario is referred to as crowding-in of domestic investments. On the other hand, when crowding-out occurs, a dollar of FDI inflows adds less than a dollar to GFCF and domestic investments decrease. Therefore, there is substitutability between FDI and domestic investments. Here, the coefficient of FDI is expected to be negative. The third and final scenario is a situation in which there is a dollar-for-dollar increase in GFCF from FDI whose impact on domestic investments is neutral. FDI has neither a positive nor a negative spillover effect on domestic investments.

Other variables used in the robustness check, some of which could crowd-out domestic investment include:

Another variable that could influence investment decisions is *uncertainty*. If investors are uncertain about the future course of events and the macroeconomic climate, they may be reluctant to invest. Hence, an increase in uncertainty is presumed to have a deleterious effect on investments and investment decisions. A number of methods can be used for measuring uncertainty such as volatility of inflation, exchange rate, output growth, terms of trade and institutional quality. We measure uncertainty by a 3-year rolling window standard deviation of inflation following Mody and Murshid (2005), Wang (2010) and Lee, Syed, and Xueyan (2012). This variable is addressed as an extension of the study.

Institutions: There is ample empirical evidence that countries with better institutions attract more FDI than those with poor institutions (Busse & Hefeker, 2007; Daude & Stein, 2007; Globerman & Shapiro, 2002). There are many reasons to justify this argument. Wei (2000) asserts that poor institutions increase the cost of operations. Moreover, poor institutions increase uncertainty (Daude & Stein, 2007). And finally, productivity is lower in countries with poor institutions as evidenced by Daniele and Marani (2011). All these factors motivate MNCs to prefer countries with better institutions as their investment destinations.

A country that attracts more FDI is likely to have a thriving DI due to backward and forward linkages. But when viewed from a different perspective, countries with better institutions are more likely to have a stronger and stricter property rights system which limits the scope of spillover of knowledge and technology. When this happens, more FDI inflows triggered by better institutions could intensify competition in domestic markets and dampen or crowd-out domestic investments. Therefore, FDI's impact on domestic investments triggered by institutional factors is ambiguous. This variable is added to the model in the section that deals with robustness checks and sensitivity analysis.

Human capital: MNCs' have a tendency to choose host countries and investment destinations on the basis of the availability of a more skilled, educated labor since the MNCs mostly produce knowledge and technology-intensive goods and services. Gao (2005), and Du, Lu, and Tao (2008) found a positive association between human capital and FDI inflows. Sometimes, MNCs train local workers to enhance their skills. The moment these workers move to local firms by leaving the foreign firms, knowledge flows take place into these local firms. Hence, labor turnover from MNCs can lead to technological spillovers which promote domestic investments.

Infrastructure: This is another important variable that could have a bearing on MNCs' investment decisions. MNCs prefer to invest in countries with an adequate and reliable supply of physical infrastructure such as electricity, networks, highways, ports and roads. In an attempt to attract more FDI, host countries engage in more investments in this type of infrastructure. Kose, Prasad, Rogoff, and Wei (2006) calls these indirect impacts 'collateral benefits'. In their endeavor to attract FDI, governments in developing countries are tempted to implement sound macroeconomic policies and creating a conducive environment for doing business including developing institutions and improving governance. The availability of this infrastructure boosts productivity and increases returns on investment, which also leads to the promotion of more domestic investments.

Financial development: A well-developed financial system helps promote domestic investments through MNCs' backward linkages. On the other hand, if the financial sector is poor and the local entrepreneurs face credit constraints, demand for inputs created by the presence of MNCs alone does not achieve the desired and intended targets.

A financial system helps the smooth functioning of an economy in many ways. First, a strong and well-developed financial system disseminates more information in a more efficient way

than individuals do. This results in reducing the costs of investing in firms and facilitates more efficient allocation of capital (King & Levine, 1993). Second, a financial system improves corporate governance which promotes investments. Financial intermediaries serve as a balancing act by monitoring the way firms' agents and managers use the funds of the corporate businesses that they run on behalf of the shareholders. This helps shareholders and creditors and reduces the cost of monitoring which reduces credit rationing and promotes investments (Bencivenga & Smith, 1993). Third, a financial system creates a conducive environment for investors to diversify their investment portfolios which reduces risks. This in turn is likely to promote investments in riskier projects whose returns are higher than those of safer projects. Besides these benefits a financial system helps reduce liquidity risks and promotes investments in projects with long gestation periods which usually yield higher returns (Levine, 1997). Financial systems also mobilize a larger pool of savings and mobilize it more cheaply than individuals due to economies of scale which lead to higher investments and a faster rate of capital accumulation (Levine, 2005).

3.4. PVAR Model of the relationship between FDI, DI, Foreign Aid and Economic Growth in SSA

There are two ways of examining economic agents in interdependent economies. One is by building multi-market and multi-country dynamic stochastic general equilibrium (DSGE) models, where economic agents are assumed to be optimizers and preferences and technology including the constraints are fully specified. Canova and Ciccarelli (2013) say that structures like these are now extensively used in the policy arena (see, for example, the SIGMA model at the Federal Reserve Board; the global projection model at IMF; and the EAGLE model at the European Central Bank). DSGE models are useful because they offer sharp answers to important policy prescriptions and provide easy-to-comprehend welfare solutions because they are tightly parameterized.

The other approach for addressing the intricacies inherent in interdependent economies is by building panel VAR (PVAR) models. These models shun most of the explicit micro-structures present in DSGE models and capture the dynamic interdependencies in the data by minimizing the set of restrictions. These reduced models can be transformed into structural models through a shock transformation. Structural panel VAR models allow us to do typical exercises such as impulse-response analyses or other types of policy counterfactuals which can be fairly

constructed in a clearer and straightforward way. One thing that cannot be disputed is that structural panel VAR models are subject to the same criticism that structural VAR models are which implies that they should be considered with caution. However, the information they produce can be a good complement to analyses done with DSGE models. They can also help point out the dimensions where DSGE models fail and provide stylized facts and predictions that can improve the realism of DSGE models.

Interest in using PVAR models in applied macroeconomic analyses has been growing over time. This increasing interest is partly attributed to the availability of higher quality data for a large number of countries and the advances in computer technology which make estimating large scale models feasible in a reasonably short time. The PVAR approach inherits the advantages of the traditional VAR model that treats all the variables in the system as endogenous. In other words, the PVAR model combines the traditional vector autoregression (VAR) approach (which treats all the variables in the system as endogenous) with a panel data approach which allows unobserved individual heterogeneity by introducing fixed effects thus enhancing the consistency of the estimation.

We use the PVAR modeling approach to analyze the relationship between FDI, DI, foreign aid and economic growth in SSA. PVAR has clear practical advantages of explicitly modeling dynamic systems that are often used for investigating macroeconomic dynamics. Rather than being driven by a particular macroeconomic concept, PVAR imposes a statistical model on the contemporary movements of the variables. Besides, PVAR does not distinguish between exogenous and endogenous variables. Rather it treats all variables as jointly endogenous. Moreover, in the PVAR model, each variable depends on its past realizations and on all other variables, suggesting that a true simultaneity exists among them and they are treated on an equal footing. More importantly, PVAR permits the modeling of both endogenous and exogenous shocks.

The PVAR model is specified as:

$$(3.10) \quad Y_{it} = \Gamma_0 + \Gamma(L)Y_{it} + \nu_i + d_{ct} + \varepsilon_{it}, \quad i = 1, \dots, N \quad t = 1, \dots, T$$

where Y_{it} is a 4×1 vector of endogenous variables, Γ_0 is a 4×1 vector of constants, $\Gamma(L)$ is a matrix polynomial in the lag operator (4×4 matrix of estimable coefficients), ν_i is a 4×1 vector of country-specific fixed effects, d_{ct} is a 4×1 vector of time-effects which are time-

variant but individual-invariant and ε_{it} is a 4×1 vector of error terms. The vector of endogenous variables consists of $FDI_{it}, DI_{it}, FAID_{it}$ ²¹ and $GDPPCannualg_{it}$ of which DI as a percentage of GDP is given in logarithmic form while FDI and FAID are given as a percentage of GDP. The model also allows for country-specific time dummies, d_{ct} , which are added to Equation (3.10) to capture aggregate, country-specific macro-shocks. $GDPPCannualg$ stands for the annual growth rate of per capita GDP.

The specific form of the empirical panel VAR model used in this study which follows a modified version of Addison and Heshmati (2004), is specified as:

$$\begin{aligned}
 (3.11) \quad & FAID_{it} = \eta_0 + \sum_{k=1}^K \alpha_{1i} FAID_{it-k} + \sum_{l=1}^L \beta_{1i} FDI_{it-l} + \sum_{m=1}^M \delta_{1i} \ln DI_{it-m} + \sum_{p=1}^P \gamma_{1i} GDPPCannualg_{it-p} + \gamma_i + \theta_t + \varepsilon_{1it} \\
 & FDI_{it} = \mu_0 + \sum_{k=1}^K \alpha_{2i} FAID_{it-k} + \sum_{l=1}^L \beta_{2i} FDI_{it-l} + \sum_{m=1}^M \delta_{2i} \ln DI_{it-m} + \sum_{p=1}^P \gamma_{2i} GDPPCannualg_{it-p} + \omega_i + \phi_t + \varepsilon_{2it} \\
 & \ln DI_{it} = \phi_0 + \sum_{k=1}^K \alpha_{3i} FAID_{it-k} + \sum_{l=1}^L \beta_{3i} FDI_{it-l} + \sum_{m=1}^M \delta_{3i} \ln DI_{it-m} + \sum_{p=1}^P \gamma_{3i} GDPPCannualg_{it-p} + \kappa_i + \varsigma_t + \varepsilon_{3it} \\
 & GDPPCannualg_{it} = \alpha_0 + \sum_{j=1}^N \beta_{4i} FAID_{it-j} + \sum_{k=1}^K \beta_{4i} FDI_{it-k} + \sum_{m=1}^M \delta_{4i} \ln DI_{it-m} + \sum_{p=1}^P \gamma_{4i} GDPPCannualg_{it-p} + \mu_i + \lambda_t + \varepsilon_{4it}
 \end{aligned}$$

The panel VAR framework requires that restrictions be imposed to ensure that the underlying structure is the same for all the cross-sectional members. However, it is possible to relax those restrictions on the parameters by adding fixed effects denoted by V_i to allow for individual heterogeneity in all the variables. But the problem here is that the conventional mean-differencing approach that is popularly employed to get rid of the fixed effects could result in biased coefficients because the fixed effects assume that the individual specific effects are correlated with the independent variables. One possible method for avoiding this problem is by using the forward mean-differencing or ‘Helmert transformation’ which is also termed forward orthogonal deviation. The Helmert transformation procedure helps remove the forward mean which preserves the orthogonality condition between the transformed variables and lagged independent variables (Love & Zicchino, 2006). Besides, a simultaneity problem might arise due to differencing since lagged regressors are correlated with the differenced error term. Heteroskedasticity may also exist due to the presence of heterogeneous errors with different cross-sectional members in the panel data. Therefore, once the fixed effects are eliminated by

²¹ FAID stands for foreign aid.

differencing, lagged regressors are used as instruments to estimate the coefficients more consistently. This is done by using the panel GMM estimator.

The PVAR model also allows for country-specific time dummies that are denoted by d_{ct} for capturing aggregate macroeconomic shocks such as the global financial crisis that may influence all countries in the same way. It is possible to remove the country time dummy variables by subtracting the means of each variable calculated for each country-year. However, no such global shocks are included in our empirical model.

The vector ε_{it} captures the error terms which are assumed to be independently and identically distributed. However, this assumption fails in practice since it is implausible for the actual variance-covariance matrix of the residuals to be diagonal. This means that the innovations in the impulse-response functions could be contemporaneously correlated. To estimate the shocks to one of the variables in the system independently we need to decompose the errors so that they become orthogonal (uncorrelated). Sims (1980) proposed a contemporaneous recursive causal ordering of the variables in the VAR model based on their degree of exogeneity for addressing this issue. The approach is based on the Cholesky decomposition of the variance-covariance matrix of residuals to ensure orthogonalization of the shocks. Specifically, the variables that precede others in the ordering are assumed to be more exogenous which will affect the variables that follow them contemporaneously or even with a lag, while the variables that come later in the system are more endogenous and only affect the previous variables with a lag.

Finally, we need to estimate the confidence intervals of the impulse-response functions (IRF) for analyzing their values. We used the Monte Carlo simulations to generate confidence intervals on the basis of the estimated coefficients and the standard errors because the impulse-response functions are constructed from the estimated VAR coefficients and their standard errors. The impulse-response function explains the effect of a typical shock within the sample on the system and hence can be used for economically interpreting the behavior of the system. Impulse-response functions are applied to describe how the economy reacts to impulses over time, which are popularly known as shocks in economics and are often modeled in the context of vector autoregression models.

Moreover, we used the forecast error variance decompositions (FEVD) for measuring the portion of the forecast-error variance of a dependent or endogenous variable that could be ascribed to orthogonalized shocks to itself or to another endogenous variable. IRF measures

the effect of a shock to an endogenous variable on itself or on another endogenous variable while the variance decomposition measures the extent or magnitude of the overall effect. Whereas IRF demonstrates the trend or direction of the variables following a shock, the variance decomposition gauges the importance of different shocks by determining the relative share of variance that each of the structural shocks contributes to the total variation of each variable.

3.5 Data Sources and Methodology

The data used for this study was retrieved from the WB (2016) online database for 40 SSA countries for the period 1986-2015. There are very few missing values. The main variables for which data was retrieved include gross fixed capital formation, official exchange rate, lending interest rate, personal remittances, GDP, broad money (which proxies financial development), mobile cellular and fixed line subscribers out of 100 people (the sum of which is used as a proxy for infrastructure), inflation rate, openness (the sum of exports and imports of goods and services as a percentage of GDP), foreign aid, FDIG and total population.

We use two dynamic common correlated effects estimators (DCCE): dynamic common correlated effects mean group estimator (DCCMG) and dynamic common correlated effects pooled estimator (DCCEP) and two static common correlated effects estimators (CCE): common correlated effects mean group estimator (CCMG) and common correlated effects pooled estimator (CCEP) to find the results of our baseline regression for analyzing the relationship between domestic investments and FDI. The common correlated effects estimator models' unobserved common factors are controlled for by incorporating cross-section averages of the explanatory variables and the dependent variables in the regression models.

The method for common correlated effects' estimators: We use Chudik and Pesaran (2015) dynamic common correlated effects estimator (DCCE) and the static version of this estimator, namely the common correlated effects mean group (CCMG) to study the relationship between DI and FDI. These estimators allow parameter heterogeneity and control for unobserved non-stationary common factors and endogeneity that arises due to the presence of such common factors and is robust to cross-sectional dependence, absence of cointegration and presence of structural breaks. It can cautiously be claimed that this study is the first of its kind in applying these methods to study the relationship between domestic investments and FDI.

The common correlated effects estimator is based on:

$$(3.12) \quad y_{it} = \beta_i x_{it} + u_{it}$$

$$(3.13) \quad u_{it} = v_i + \gamma_i' f_t + e_{it}$$

The first term v_i in Equation (3.13) represents time-invariant, country-fixed effects, f_t is a vector of unobserved common factors and γ_i is country specific heterogeneous factor loading. The heterogeneous coefficients are randomly distributed around a common mean, such that $\beta_i = \beta + v_i$, $v_i \sim IID(0, \Omega_v)$ (Pesaran & Smith, 1995). Pesaran (2006) shows that Equation (3.12) can be consistently estimated by approximating the unobserved common factors with cross-sectional means $\bar{x}_t$ and $\bar{y}_t$ under strict exogeneity. The estimated equation becomes:

$$(3.14) \quad y_{it} = \beta_i x_{it} + \delta_i \bar{x}_t + \eta_i \bar{y}_t + e_{it}$$

where $\bar{x}_t = \frac{1}{N} \sum_{i=1}^N x_{it}$ is the cross-section average of the regressor(s) and $\bar{y}_t = \frac{1}{N} \sum_{i=1}^N y_{it}$ is the cross-sectional average of the dependent variable.

Chudik and Pesaran (2015) and Everaert and De Groote (2016) show that the common correlated effects (CCE) estimator is consistent only in static panels. The dynamic version of the model should incorporate the lagged dependent variable as a regressor. As this regressor is not strictly exogenous, the CCE estimator becomes inconsistent. Chudik and Pesaran (2015) show that the efficiency of the CCE estimator improves when $\sqrt[3]{T}$ lags of the cross-section means of the dependent and explanatory variables are included in the model. Once this is included in Equation (3.14), the new model becomes:

$$(3.15) \quad y_{it} = \alpha_i y_{it-1} + \beta_i x_{it} + \sum_{p=0}^{PT} \delta_{i,p} \bar{x}_{t-p} + \sum_{p=0}^{PT} \eta_{i,p} \bar{y}_{t-p} + e_{it}$$

where PT is the number of lags. The model given in Equation (3.15) is known as the dynamic common correlated effects estimator (DCCE). To estimate the mean group, a separate regression is run for each cross-sectional unit and the α_i and β_i estimators are derived by averaging them while in the estimation of the pooled mean group the estimated coefficients are constrained to be equal across all cross-sectional units.

We used the dynamic fixed-effects (DFE) estimation approach by pooling each group's time-series data and allowing the intercepts to differ across groups. The DFE estimator, however, produces inconsistent and potentially misleading results if the slope coefficients are not

identical. On the other hand, the model can be fitted separately to each group and a simple arithmetic average of the coefficients can be calculated. This approach is that of the mean group (MG) estimator proposed by Pesaran and Smith (1995). With the MG estimator, the intercepts, the slope coefficients and error variances are allowed to differ across groups (Blackburne & Frank, 2007).

Pesaran, Shin, and Smith (1997, 1999) also propose a pooled mean group (PMG) estimator which combines both pooling and averaging. This intermediate estimator allows the intercept, short-run coefficients and error variances to differ across groups (as is the case with the MG estimator) but it imposes a constraint that the long-run coefficients be equal across groups (as is the case with the DFE estimator). For this kind of a non-linear model in parameters, Pesaran et al. (1999) constructed a maximum likelihood estimation method to estimate the parameters. We used PMG, DFE and the system GMM methods to check the robustness of our findings.

3.6 A Discussion of the Main Findings

3.6.1 Descriptive Statistics

This sub-section presents descriptive statistics of the variables used in the GMM estimation. Table 3.1 gives the summary statistics of the variables while Table 3A.1 in the Appendix gives the correlation matrix. The summary statistics form the basis of the quantitative analysis of the data in the empirical investigation.

From Table 3.1 we can observe that the values of the Jarque-Bera test statistics for some of the variables falls around three signifying that the null hypothesis of the normal distribution of the residuals of the variables cannot be rejected. However, the kurtosis for each variable is very far off from 3 which indicates that the variables are not normally distributed. The skewness values of all the variables are positive implying that the variables are more tilted to the right. The standard deviation is high when compared to the mean which indicates a high coefficient of variation. But the ratio of the mean over the median is closely equal to one, representing the normality of the distribution.

A normal distribution is supposed to be symmetric with a skewness value close to zero. However, the extremely high skewness and kurtosis values for some of the variables can be attributed to their heavy tails. Extreme values in the tails can distort the mean and standard deviations. This is also true for skewness and kurtosis. Statistical literature recommends taking

the log of a dataset of a variable that exhibits moderate skewness to the right. We apply this transformation.

Table 3. 1:Summary Statistics

Variables	N	sum	mean	sd	kurtosis	skewness	J.Bera
Domestic investments	1,200	21,197	17.66	13.38	28.08	2.423	2.423
Domestic investment lag	1,160	20,435	17.62	13.49	28.11	2.465	2.465
Uncertainty	1,200	61,261	51.05	656.5	363.0	18.66	18.66
FDI	1,200	4,821	4.018	10.23	74.65	5.973	5.973
Openness	1,146	87,139	76.04	48.12	23.42	3.484	3.484
Broad money	1,200	69,510	57.92	737.9	597.7	24.42	24.42
Inflation	1,200	62,368	51.97	727.1	948.3	29.50	29.50
Lending interest rate	1,200	22,733	18.94	16.64	66.59	6.548	6.548
Official exchange rate	1,193	470,524	394.4	685.1	47.34	5.644	5.644
Infrastructure	1,200	27,821	23.18	36.90	6.758	2.004	2.004
Institutionalqualityindex	600	18,387	30.64	19.42	2.421	0.612	0.612

Note: sd refers to standard deviation and J.Bera is Jarque-Bera.

As indicated in Table 3A.1 in the Appendix, there is no high correlation among the variables. This is backed by the insignificance of most of the variables in the econometric model's estimation. The correlation results show that the relationship between most of the variables is low. Some correlation coefficients are negative while others are positive. For example, the correlation coefficient 0.441 in Table 3A.1 indicates that domestic investments, the dependent variable, and openness, one of the explanatory variables, are positively related. Besides, the coefficient implies that when openness increases by 1 percent, domestic investments increase by 0.441 percent *ceteris paribus*. The other results can be interpreted analogously.

3.6.2 Main Findings of the Domestic Investment-FDI Nexus

Table 3.2 presents the coefficients of our regression models obtained from the dynamic common correlated effects mean group (DCCMG) and the dynamic common correlated effects pooled mean group (DCCEPMG) estimation methods. FDI's coefficients are negative in three out of the four specifications of which two are significant. The other specification yields a positive coefficient but it is not statistically significant.

As stated earlier, two of the four models produce statistically significant evidence that FDI crowds-out DI between 0.037 percent and 0.126 percent, that is, a 1 percent increase in FDI

inflows is associated with a reduction in domestic investments by 0.037 to 0.126 percent. The other model shows that FDI inflows actually increase domestic investments, but this does not have any statistically significant effect. Thus we can say that the estimated coefficients of the regression models in Table 3.2 support the argument that FDI crowds-out domestic investments. Morrissey and Udomkerdmongkol (2012); Mutenyo, Asmah, and Kalio (2010); and Titarenko (2006) also found that FDI crowded-out domestic investments.

The lagged value of domestic investments, trade openness, expected output (a proxy for future aggregate demand) and uncertainty have a positive and statistically significant effect on domestic investments. Uncertainty is expected to have a negative effect on domestic investments and the sign of the coefficient of uncertainty in two of the four models is as expected on *a priori* grounds. But the significance of the positive effect of uncertainty in one of the four models is an unexpected one and it is counterintuitive.

Inflation has a significant negative effect on domestic investments. The signs of the other variables are more or less in line with what is expected *a priori* but they are insignificant.

Table 3. 2: FDI's impact on domestic investments using the dynamic common correlated effects estimator models

Explanatory variables	DCCEMG 1	DCCEMG0 2	DCCEPMG 3	DCCEPMG0 4
lag of domestic investments	0.144*** (0.05)	-0.088 (0.18)	0.801*** (0.02)	0.103 (0.12)
trade openness	0.541*** (0.14)	0.054 (0.39)	0.114*** (0.03)	-4.405 (6.53)
FDI	-0.126*** (0.04)	-0.047 (0.07)	-0.037*** (0.01)	0.580 (0.80)
Uncertainty	-0.001 (0.01)	0.093 (0.09)	0.003*** (0.00)	-0.026 (0.03)
expected output	0.607 (0.46)	1.341* (0.78)	0.002 (0.00)	-0.833 (1.90)
official exchange rate	-0.003 (0.17)	1.014 (1.74)	-0.005 (0.00)	0.018 (0.28)
Infrastructure	-0.007 (0.01)	-0.028 (0.03)	0.000 (0.00)	0.029 (0.04)
Inflation	-0.002 (0.00)	-0.032 (0.02)	-0.001*** (0.00)	0.015 (0.02)
lending interest rate	0.079 (0.08)	0.059 (0.05)	0.001 (0.00)	0.058 (0.09)
Observations	1031	1031	1031	1031
R-squared	0.72	0.76	0.98	0.11

Number of groups	40	40	40	40
Residual stationarity	I(0)/I(1)	I(0)	I(0)	I(0)
Residual CD test	0.47	-1.17	0.36	-0.04
CD test p-value	0.636	0.241	0.719	0.968

Notes: CD is cross-sectional dependence. I(0) means integrated of order 0, that is, stationary. DCCEMG is dynamic common correlated effects mean group. DCCEPMG is dynamic common correlated effects pooled mean group. The suffixes to DCCEPMG show the cross-sectional lags used in estimating the models. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ show that the coefficients are significant at 10 percent, 5 percent and 1 percent respectively. Standard errors are given in parentheses.

Table 3.3 gives a combination of short-run and long-run impacts of various variables on domestic investments. The table shows that trade openness has a statistically significant positive impact on domestic investments in one of the four specifications. Moreover, it has a positive but insignificant effect in two specifications in the long-run. The coefficient of the model with a significant effect indicates that for a 1 percent increase in trade openness, domestic investments increase by 0.44 percent which seems a high figure. In each of the specific models given in Table 3.3 which are combinations of short-run and long-run effects, the lagged value of domestic investments captures the error correction term. The value and sign of the error correction coefficient is significant and as expected lies between 0 and -1 in each of the two DCCEPMG estimators. However, in the other two models related to DCCEMG estimators, the value or the sign deviates from what is expected *a priori*. For example, the first model has an expected negative sign of the error adjustment coefficient but its value is less than -1 whereas the second model has a positive fractional value that lies between 0 and 1 instead of -1 implying that the model diverges and long-run convergence is unlikely to occur.

Official exchange rate, FDI and uncertainty all have a negative and significant impact on domestic investments in the long-run. Regarding the official exchange rate, depreciation/devaluation seems to affect domestic investments by increasing the real cost of imported capital machines which discourage domestic investments and increase the burden of foreign debt which in turn could influence investments negatively. The coefficients of the FDI variable indicate that for each dollar increase in FDI, domestic investments decline between 14 and 19 cents confirming FDI's crowding-out effect on domestic investments. This result is in line with Morrissey and Udomkerdmongkol (2012) who in their study of 46 low- and middle-income countries documented a negative relationship between FDI and domestic investments. Abdullah (2017) also claims that there is unambiguous support for the hypothesis that FDI crowds-out DI. His regression results suggest that countries that have weak institutions, less

developed financial systems, less human capital, less developed infrastructure or economies that are more open, are more likely to experience crowding-out effects of FDI. The negative and significant impact of uncertainty shows that investors become reluctant and are hesitant to invest in the face of a political, social and economic environment in the future.

Inflation, the lending interest rate and infrastructure are the other variables that have a positive and significant effect on domestic investments. The positive significant effect of inflation looks counterintuitive but it can be argued that inflation becomes harmful and destabilizing only when it surpasses a certain threshold level. The lending interest rate can positively affect domestic investments. Stiglitz and Weiss (1981) and Stiglitz (1994) argue that a moderate increase in lending interest rates leads to a higher volume of lending. However, an additional increase in rates beyond a certain level would prompt a lower level of lending by adversely changing the pool of quality borrowers in favor of the errant and unsafe ones. Infrastructure which is proxied by the sum of the number of fixed line and mobile cellular users per 100 people has a positive and significant effect on domestic investments. The availability of communication networks as a part of the broader infrastructure increases productivity which increases the returns on investment and this in turn eventually boosts domestic investments.

We also observe that the differenced value of domestic investments has a statistically significant positive impact on domestic investments in the short-run. Uncertainty, inflation and the lending interest rates also have a positive and significant impact on domestic investments in the short-run while the official exchange rate has a significantly negative effect on domestic investments. However, the other variables included in the short-run regressions are found to have a neutral impact on domestic investments.

The diagnostic tests for the evaluation of the empirical models are reported in the bottom half of Table 3.3. We applied the Maddala and Wu (1999) panel unit root test, the Pesaran (2007) CIPS of panel unit root test in the presence of cross-sectional dependence and the Pesaran (2003) CADF test used for identifying the stationarity of the test residual series. The results show that the residual series obtained from the dynamic common correlated effects pooled mean group (DCCEPMG) and the dynamic common correlated effects mean group (DCCEMG) estimation methods are stationary. The diagnostic tests' results show that the models are well specified and the empirical specifications capture the long-run equilibrium relationship. The results of the residual cross-sectional dependence test for all the models suggest that there is weak cross-sectional dependence in each of them as indicated by the high

p-value of the cross-sectional dependence (CD) test. The null hypothesis here is that the residuals of the models exhibit weak cross-sectional dependence.

Table 3. 3: FDI's impact on domestic investments using dynamic common correlated effects estimator model (Dependent variable: domestic investments)

	DCCEMG1	DCCEMG2	DCCEPMG1	DCCEPMG2
Explanatory variables	1	2	3	4
D.domestic investments	0.278* (0.17)	-0.912 (0.66)	-0.095 (0.26)	0.313 (0.22)
D.trade openness	0.203 (0.31)	-0.317 (1.01)	0.173 (0.66)	-0.198 (0.52)
D.FDI	0.085 (0.12)	-0.152 (0.17)	-0.023 (0.04)	-0.677 (0.85)
D.uncertainty	0.005 (0.04)	0.090* (0.04)	0.045 (0.05)	0.011 (0.02)
D.official exchange rate	-0.621 (0.59)	-0.981 (1.41)	-0.814 (0.69)	-0.926* (0.51)
D.inflation	-0.027 (0.02)	0.099* (0.05)	0.047 (0.04)	0.003 (0.01)
D.lending interest rate	-0.193 (0.15)	0.274* (0.15)	0.002 (0.02)	-0.066 (0.11)
lagof domestic investments	-1.327*** (0.29)	0.201 (0.83)	-0.217*** (0.03)	-0.641*** (0.23)
trade openness	-1.644 (3.10)	2.531 (1.84)	0.442* (0.25)	0.078 (0.34)
official exchange rate	-0.247 (0.91)	0.127 (0.43)	-0.127*** (0.05)	0.076 (0.08)
FDI	-0.512 (0.42)	0.243 (0.20)	-0.194*** (0.07)	-0.145** (0.07)
expected output	0.053 (0.62)	-0.398 (0.33)	0.051 (0.05)	0.080 (0.05)
Inflation	-0.115 (0.15)	0.060 (0.09)	0.014*** (0.00)	0.017 (0.02)
Uncertainty	0.294 (0.27)	-0.035 (0.11)	-0.005* (0.00)	-0.008 (0.03)
lending interest rate	0.461* (0.26)	-0.080 (0.13)	0.027*** (0.01)	0.009 (0.01)
Infrastructure	- (0.00)	- (0.00)	0.005** (0.00)	0.005** (0.00)
Observations	933	933	933	933
R-squared	0.86	0.96	0.48	0.71
Number of groups	40	40	40	40
Residual stationarity	I(0)	I(0)	I(0)	I(0)
Residual CD test	2.23	0.22	1.05	2.35
CD test p-value	0.025	0.827	0.294	0.018

Notes: CD is cross-sectional dependence. I(0) is integrated of order 0, that is, stationary. DCCEMG is dynamic common correlated effects mean group. DCCEPMG is dynamic common correlated effects pooled mean group. The suffixes to DCCEPMG show the cross-sectional lags

used in estimating the models. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ show that the coefficients are significant at 10 percent, 5 percent and 1 percent respectively. Standard errors are given in parentheses. The prefix 'D' for the variables preceding 'lag of domestic investments' stands for differenced. These variables are meant to capture short-run impacts on domestic investments.

From the results of the various regression models of static common correlated effects estimations presented in Table 3.4, we can observe that the lending interest rate is the only variable that has a significantly negative impact on domestic investments in the short run. All the other variables have a neutral impact on domestic investments in the short run.

In the long run, uncertainty has a significantly positive impact on domestic investments at the 10 percent significance level, a result which is difficult to justify. Expected output on the other hand, is positively and statistically significant in explaining domestic investments at the 1 percent significance level. The other variables incorporated in the model do not have a statistically significant effect on domestic investments.

When we compare the outcomes of the regressions of the various models of the dynamic and static common correlated effects estimators, the dynamic models seem to fare better than the static ones in terms of explaining domestic investments in SSA countries.

Stationary/ $I(0)$ estimated residual series indicate that a co-integrating relationship exists among the variables meaning that the empirical specification captures the long-run equilibrium relationship and the model is well specified. However, if the residual series is non-stationary/ $I(1)$, there is a possibility of the existence of a spurious relationship among the variables. We observe that the residual series obtained from all models estimated by the CCEMG and CCEPMG methods are stationary. We apply the Maddala and Wu (1999) panel unit root test (MW), the Pesaran (2007) CIPS test and the Pesaran (2003) CADF test to test the stationarity of the residual series obtained from different models.

One of the main differences between the static forms of common correlated effects (CCE) estimators reported in Tables 3.4 and 3.5 is that the results reported in Table 3.4 control for cross-sectional dependence while those in Table 3.5 do not.

Table 3. 4: FDI's impact on domestic investments using static common correlated effects

Explanatory variables	CCEMG 1	CCEMG0 2	CCEPMG 3	CCEPMG0 4
D.trade openness	-0.455 (0.70)	-1.423 (1.53)	0.146 (0.29)	0.098 (0.72)
D.FDI	-0.051 (0.11)	0.180 (0.26)	-1.364 (1.31)	-0.407 (0.34)

D.uncertainty	0.061 (0.05)	0.047 (0.07)	-0.024 (0.03)	0.034 (0.04)
D.official exchange rate	0.644 (0.64)	2.680 (2.73)	-0.108 (0.76)	-0.251 (0.96)
D.expected output	0.992 (1.47)	-0.486 (5.03)	3.114 (2.39)	0.267 (1.59)
D.inflation	-0.019 (0.02)	0.063 (0.06)	0.008 (0.01)	0.047 (0.06)
D.lending interest rate	-0.137* (0.08)	0.792 (0.70)	-0.217* (0.11)	0.041 (0.09)
D.infrastructure	0.081 (0.06)	- -	-0.623 (0.81)	-0.499 (0.57)
trade openness	0.878 (1.10)	1.690 (1.82)	-0.095 (0.09)	0.023 (0.23)
FDI	-0.719 (1.39)	-0.038 (0.07)	-0.666 (0.63)	1.844 (17.99)
Uncertainty	0.510* (0.31)	0.012 (0.03)	0.059 (0.05)	0.262 (2.53)
official exchange rate	5.525 (5.48)	0.014 (0.13)	-0.705 (0.65)	-1.074 (11.30)
expected output	0.037 (0.23)	0.132*** (0.03)	0.252*** (0.08)	0.248 (1.12)
Inflation	0.175 (0.34)	-0.016 (0.01)	0.027 (0.03)	-0.470 (4.55)
lending interest rate	-0.398 (0.80)	0.019 (0.03)	0.071 (0.07)	-0.063 (0.76)
infrastructure	1.093 (1.25)	- -	-0.002 (0.01)	-0.067 (0.61)
Observations	939	939	939	939
R-squared	0.74	0.89	0.43	0.70
Number of groups/countries	40	40	40	40
Residual stationarity	I(0)	I(0)	I(0)	I(0)
Residual CD test	-0.11	-1.17	-0.26	1.44
CD test p-value	0.9149	0.2435	0.719	0.1505

Notes: Residual non-stationarity: The order of integration of the residuals is determined by applying the Maddala and Wu (1999) panel unit root test (MW), the Pesaran (2007) CIPS test and the Pesaran (2003) CADF test. Null for MW, CIPS and CADF tests in series is I(1). Stata routines multipturt for MW and CIPS and pescadf for CADF tests are used. I(0) indicates that the residual series is stationary; I(1) implies non-stationary; an ambiguous result is denoted by I(1)/I(0). RMSE reports the root mean squared error. CD test: The Pesaran (2004) test is applied to test cross-sectional dependence. The null hypothesis of this test is that the residuals are cross-sectionally independent. Cross-sectional p-values are reported.

Table 3.5 presents the results the regression models of dynamic fixed effects (DFE), mean group (MG) and pooled mean group (PMG).

The error correction terms in all the three models are significant with the expected signs and within the range of values that the error term is supposed to assume. Error correction mechanisms (ECMs) are useful for estimating both short-term and long-term effects of a given time series on another time series. The idea of error-correction is related to how the last period's deviation from a long-run equilibrium, the error, affects its short-run dynamics. Hence, ECMs

directly estimate the speed at which a dependent variable returns to equilibrium after a change in other variables.

The DFE model shows that trade openness and the lending interest rate positively and significantly affect domestic investments while the official exchange rate negatively and significantly impacts it in the long-run at the 1 percent significance level.

In the short-run, trade openness has a positively significant effect on domestic investments at the 5 percent level of significance. On the other hand, FDI and the official exchange rate have a negatively significant impact on domestic investments at the 1 percent significance level. The remaining variables have a neutral impact on domestic investments. From the findings reported in Table 3.5, we can conclude that the static version of CCE estimators provides evidence that FDI's impact on domestic investments in the host countries is either negative or neutral.

The diagnostic test statistics for each of the models indicate that the residuals of the regression are stationary implying the existence of long-run cointegration.

Table 3. 5: FDI's impact on domestic investments using the dynamic common correlated effects estimator models (Dependent variable: domestic investments)

Explanatory variables	DFE 1	MG 2	PMG 3
Ec	-	-	-
trade openness	0.479*** (0.15)	-	-
FDI	-0.038 (0.03)	-0.119 (0.10)	0.002 (0.00)
official exchange rate	-0.082*** (0.02)	0.085 (0.12)	-0.007 (0.01)
Infrastructure	0.001 (0.00)	0.027 (0.02)	-
Inflation	-0.000 (0.00)	0.001 (0.01)	0.000 (0.00)
lending interest rate	0.012*** (0.00)	-5.036 (5.05)	-0.001 (0.00)
SR	-	-	-
Ec	-0.411*** (0.03)	-0.897*** (0.06)	-0.435*** (0.05)
D.trade openness	0.208** (0.09)	-	-
D.FDI	-0.037*** (0.01)	0.033 (0.05)	-0.073*** (0.02)
D.official exchange rate	0.158** (0.08)	0.173 (0.36)	0.447 (0.29)
D.infrastructure	0.001 (0.00)	-0.008 (0.02)	-

D.inflation	-0.000 (0.00)	0.001 (0.00)	-0.001 (0.00)
D.lending interest rate	-0.002 (0.00)	-0.053 (0.05)	-0.001 (0.01)
Constant	0.322 (0.26)	88.955 (87.05)	1.177*** (0.17)
Observations		989	989
Number of groups	40	40	40
Residual stationarity	I(0)	I(0)	I(0)

Notes: The prefix 'D' stands for differenced. Those variables are meant to capture short-run impacts on domestic investments. 'ec' stands for error correction while 'SR' is short-run.

Table 3.6 presents the regression results obtained using various forms of the system GMM model using different lags of the dependent and explanatory variables as instruments.

The lagged value of domestic investments positively and significantly affects the current value of domestic investments in six out of the seven models. In four of the models, the lagged value of domestic investments affects its current value at the 1 percent significance level while on two occasions, it positively and significantly affects domestic investments at the 5 percent and 10 percent significance levels. Trade openness also has a significantly positive effect on domestic investments at the 5 percent and 10 percent significance levels. Uncertainty too has a positive and significant effect on domestic investments at the 5 percent significance level which is counterintuitive.

Inflation and the lending interest rate have a negatively significant effect on domestic investments at the 10 percent level of significance while the lending interest rate has a statistically significant negative impact on domestic investments at the 5 percent and 10 percent significance levels.

The regression coefficients from the system GMM estimation method given in Table 3.6 indicate that six coefficients of the FDI variable are negative and only one is positive. Nevertheless, none of these coefficients are statistically significant.

All the models pass the diagnostic tests. Failure to reject the null hypothesis of 'no over-identification problem' leads us to conclude that the instruments as a group are exogenous. As far as the serial correlation test is concerned, our empirical findings lead us to reject the null of the absence of the first-order serial correlation, AR(1), and not to reject the null of the absence of the second-order serial correlation, AR(2), which is expected for consistency of the GMM estimators. The number of instruments is less than the number of cross-sectional units. These findings confirm that the instruments are valid and the models are correctly specified.

Table 3. 6: FDI's impact on domestic investments using system GMM

Explanatory variables	Model22 1	Model23 2	Model33 3	Model34 4	Model44 5	Model45 6	Model55 7
Domestic-investment-lag	0.851** (0.33)	0.881*** (0.29)	0.633 (0.49)	0.701*** (0.19)	0.532*** (0.12)	0.437*** (0.09)	0.648* (0.34)
trade openness	0.511** (0.22)	0.437 (0.40)	1.148 (0.90)	0.586* (0.33)	-0.037 (0.27)	0.435 (0.28)	0.499 (0.37)
FDI	-0.019 (0.02)	-0.017 (0.04)	-0.014 (0.02)	-0.005 (0.01)	0.019 (0.02)	-0.001 (0.01)	-0.020 (0.01)
Expected output	0.098 (0.36)	0.026 (0.28)	-0.177 (0.36)	-0.224 (0.33)	0.129 (0.29)	0.242 (0.26)	0.287** (0.12)
infrastructure	-0.002 (0.00)	-0.001 (0.00)	-0.001 (0.00)	0.001 (0.00)	-0.002 (0.00)	-0.003 (0.00)	-0.003** (0.00)
uncertainty	-0.000 (0.00)	0.000** (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
inflation	0.000 (0.00)	-0.000* (0.00)	0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
lending interest rate	-0.001 (0.00)	-0.002 (0.00)	-0.002 (0.01)	-0.005 (0.01)	-0.040** (0.02)	-0.021* (0.01)	-0.017* (0.01)
Official-exchange-rate	0.020 (0.02)	0.019 (0.02)	0.013 (0.03)	-0.014 (0.03)	-0.075* (0.04)	-0.001 (0.03)	0.009 (0.02)
constant	-3.875 (7.80)	-2.032 (5.27)	0.266 (8.72)	3.620 (8.15)	-0.351 (6.81)	-5.228 (5.95)	-7.140** (3.00)
Observations	1090	1090	1090	1090	1090	1090	1090
Number of instruments	16	22	16	22	16	22	16
Number of Countries	40	40	40	40	40	40	40
F-test (P-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hansen P-value	0.266	0.106	0.447	0.315	0.312	0.190	0.800
AR(1) P-value	0.018	0.020	0.073	0.010	0.002	0.006	0.030
AR(2) P-value	0.546	0.184	0.687	0.724	0.689	0.606	0.371

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The unobserved panel level effects are correlated with the lagged dependent variable in linear dynamic panel data models which makes the use of standard estimators inconsistent.

Though it is not ideal to use the standard static models for linear dynamic panel data models we apply them to see how they compare with the other models that take into account the dynamism of the system.

All the five models in Table 3.7 indicate that the lag of domestic investments is positively and significantly associated with the current value of the variables at the 1 percent significance level. FDI has a negatively significant effect on domestic investments in three of the five models at the 1 percent significance level and at 5 percent in one of the five models. In the only other remaining model, the sign is negative but it is statistically insignificant.

Uncertainty has coefficients with a negative sign in four of the five models, as expected *a priori*, but in the only other model, that is, the between effects (BE) model it has a positively significant effect at the 5 percent significance level which is highly unexpected. Infrastructure

and human capital also have statistically significant effects on domestic investments at the 10 percent level of significance.

Inflation has a statistically significant negative effect on domestic investments at the 1 percent significance level. All the other variables have a neutral effect on domestic investments.

Table 3. 7: FDI's impact on domestic investments using various types of static panel data models
(Dependent variable: domestic investments)

Explanatory variables	POLS 1	RE 2	FE 3	BE 4	PA 5
lag of domestic investments	0.690*** (0.06)	0.690*** (0.07)	0.359*** (0.11)	0.979*** (0.02)	0.518*** (0.09)
trade openness	0.052 (0.06)	0.052 (0.07)	0.447 (0.32)	-0.056 (0.04)	0.168 (0.14)
FDI	-0.012*** (0.00)	-0.012** (0.00)	-0.017*** (0.01)	-0.004 (0.00)	-0.015*** (0.01)
Uncertainty	-0.005 (0.01)	-0.005 (0.01)	-0.014 (0.01)	0.010** (0.00)	-0.011 (0.01)
official exchange rate	0.006 (0.01)	0.006 (0.01)	-0.128 (0.14)	0.001 (0.01)	0.005 (0.02)
Infrastructure	0.001* (0.00)	0.001 (0.00)	0.001 (0.00)	0.000 (0.00)	0.001* (0.00)
Inflation	0.001 (0.01)	0.001 (0.00)	0.006 (0.00)	-0.007** (0.00)	0.004 (0.01)
lending interest rate	0.001 (0.00)	0.001 (0.00)	0.006 (0.00)	-0.000 (0.00)	0.003 (0.00)
broad money	0.006 (0.03)	0.006 (0.03)	-0.071 (0.06)	0.012 (0.03)	-0.022 (0.04)
institutional quality index	0.007 (0.02)	0.007 (0.03)	0.108 (0.24)	-0.005 (0.01)	0.026 (0.05)
human capital	0.145* (0.08)	0.145* (0.08)	1.125 (0.96)	0.053 (0.04)	0.152 (0.14)
Constant	0.504** (0.25)	0.504 (0.32)	-0.252 (1.61)	0.266 (0.19)	0.469 (0.60)
Observations	589	589	589	589	589
F-statistic(p-value)	0.000	-	-	-	-
R-squared	0.503	-	-	-	-
Overall R-squared		0.503	0.191	0.485	-
Wald-chi-squared		324.01	22.65	310.96	339.89
Wald-chi-square test (p-value)		0.000	0.000	0.000	0.000

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3.6.3 Main Findings of the PVAR Model

This section discusses the relationship between FDI, DI, foreign aid and economic growth

using panel VAR models by focusing on impulse-response functions and forecast error variance decomposition.

A panel VAR analysis is based on choosing the optimal lag order in both panel VAR specifications and moment conditions. Andrews and Lu (2001) propose consistent moment and model selection criteria (MMSC) for GMM models based on the Hansen (1982) J statistic of over-identifying restrictions. Their proposed MMSC are analogous to various commonly used maximum likelihood-based model selection criteria, namely the Akaike information criteria (AIC), the Bayesian information criteria (BIC) and the Hannan-Quinn information criteria (HQIC) (Abrigo & Love, 2015).

pvarsoc which is a Stata routine, user-written add-on command, reports the overall coefficient of determination, Hansen's (1982) J statistic and the corresponding p-value and the moment model selection criteria (MMSC) developed by Andrews and Lu (2001): MMSC-Bayesian information criterion (MBIC), MMSC-Akaike information criterion (MAIC) and MMSC-Hannan and Quinn information criterion (MQIC) for a series of panel vector autoregressions of order 1. Like the maximum likelihood-based information criteria AIC, BIC and HQIC, the model that minimizes MAIC, MBIC or MQIC is the preferred model. Andrews and Lu's MMSC are based on Hansen's J statistic, which requires the number of moment conditions to be greater than the number of endogenous variables in the model. Of Andrews and Lu (2001), three model selection criteria, MBIC and MQIC indicate that first-order panel VAR is the preferred model because the values associated with these criteria are the smallest.

The panel vector autoregression model's estimates are seldom interpreted per se. Practically, researchers are often interested in identifying the impact of exogenous changes in each endogenous variable on other variables in the panel VAR system. However, before estimating impulse-response functions (IRF) and forecast-error variance decompositions (FEVD), it is necessary to check the stability condition of the estimated panel VAR. The post-estimation command pvarstable checks the stability condition of panel VAR estimates by calculating the modules of each eigenvalue of the estimated model. A VAR model is stable if all moduli of the companion matrix are strictly less than one (Hamilton, 1994; Lutkepohl, 2005). Stability implies that the panel VAR is invertible and has an infinite-order vector moving average representation, which allows for a meaningful interpretation of the estimated impulse-response functions and forecast-error variance decompositions. The test shows that all the eigenvalues lie inside the unit circle and the panel VAR satisfies the stability condition.

An interpretation of the results of the orthogonalized impulse-response functions is amenable to the particular ordering of the shocks. In our study, it is difficult to conceive a specific ordering of the shocks. However, based on economic intuition, the foreign aid shocks are ordered first which are followed by FDI shocks, investment shocks and growth shocks. The results are tested with different ordering for the robustness check and the results are similar.

Most of the panel VAR Granger causality test results show that causality runs one-way, that is, it is unidirectional. For example, it is found that domestic investments Granger cause foreign aid but foreign aid does not Granger cause domestic investments. Similarly, FDI does not Granger cause foreign aid whereas foreign aid does Granger cause FDI. Domestic investments do not Granger cause FDI but FDI Granger causes domestic investments.

The two exceptions regarding the Granger causality test's results are related as follows: Per capita GDP's growth rate does not Granger cause foreign aid and foreign aid also does not Granger cause the growth rate of per capita GDP. Contrarily, the per capita GDP's growth rate Granger causes FDI and FDI in turn Granger causes the growth rate of per capita GDP.

From the orthogonalized IRF presented in Figure 3A.1 in the Appendix we can see that an increase in an orthogonalized shock to foreign aid causes a short series of increases in the foreign aid variable itself that diminish in magnitude over time (see the bottom right of the fourth column). On the other hand, an increase in the orthogonalized shock to FDI causes a continuous increase in foreign aid over time. Increases in orthogonalized shocks to the growth rate of per capita GDP and domestic investments have similar impacts on foreign aid.

The third column shows FDI's response to unexpected orthogonalized shocks in the other variables of the model. A shock or an innovation to FDI produces a positive effect on the actual inflow of foreign direct investments in SSA. A shock to FDI has an expansionary effect on the actual FDI inflows in the short, medium and long runs. An orthogonalized shock to domestic investments has an initial positive effect but the effect turns negative starting from the seventh period whereas an unanticipated change in the orthogonalized shock to foreign aid causes FDI to shrink in all periods in the lead up to the tenth period. An unanticipated change in real per capita income is shown to have an initial expansionary effect on the actual inflows of foreign direct investments in SSA although the positive effect eventually vanishes around the tenth period.

An unexpected shock to the growth rate of per capita GDP causes domestic investments to expand but the expansion almost vanishes around the ninth period. The positive effect of the

shock of foreign aid on domestic investments substantially drops from the sixth period onwards. On the other hand, the effect of current shocks in FDI has an initial negative impact on domestic investments which then turns to positive values that decline as time passes. Shocks to domestic investments have a positive persistent impact on future domestic investments.

A shock to foreign aid has a negative impact on the growth rate of per capita GDP that persists into the future. Whereas, the impact of a shock to FDI on the growth rate of per capita GDP is positive and persists into the future. The current shock to the growth rate of per capita GDP has a persistently positive impact on the future growth rate of per capita GDP. A shock to the current value of domestic investments has a positive impact on the current and future value of the growth rate of per capita GDP.

Impulse responses give us information about the effect of changes in one variable on another variable but they do not show us how important shocks to one variable are in explaining fluctuations in other variables. To assess the importance of changes in one variable for explaining changes in other variables, we resort to a variance decomposition.

Based on the forecast error variance decomposition estimates presented in Table 3A.5 in the Appendix, we see that as much as 87.01 percent of the variations in foreign aid are explained by themselves. On the other hand, domestic investments explain 12 percent of the variations in foreign aid whereas FDI and per capita GDP explain only 0.84 and 0.12 percent of the variations in foreign aid respectively.

When it comes to FDI, around 73.98 percent of its variations are explained by shocks to itself. Some 20.92 percent of the variations in FDI are explained by changes in foreign aid while domestic investments and the growth rate of per capita GDP contribute only 2.54 percent each to variations in FDI. Regarding domestic investments, the lion's share of the variability is attributed to unexpected changes to itself. Specifically, about 92.46 percent of the variations in domestic investments are accounted for by the unanticipated shocks to itself. Of the remaining 7.54 percent variations in domestic investments, 5.43 percent go to FDI whereas foreign aid and the growth rate of per capita GDP account for 1.1 and 0.99 percent respectively.

Finally, nearly 63 percent (62.65 to be exact) of the variations in the growth of per capita GDP are explained by sudden shocks that occur to itself which is followed by FDI that explains 26.88 percent of the variations in per capita GDP's growth rate. Domestic investments account for 6.89 percent of the variations and foreign aid's share is a mere 3.56 percent in explaining the variability in the growth rate of per capita GDP.

3.7 Conclusion and Policy Implications

3.7.1 Conclusion

This chapter investigated various dimensions of the relationship between FDI, domestic investments, foreign aid and economic growth in SSA. It focused on analyzing whether FDI crowds-out or crowds-in domestic investments in SSA. Besides, it also studied the impact of foreign aid on economic growth along with domestic investments and FDI by the using panel vector autoregressive (panel VAR) models to mitigate the limitations of traditional panel data estimators. It constructed models of FDI, domestic investments, foreign aid and economic growth and estimated these as a system with multi-ways causal relationships using a PVAR model. It also used the panel VAR impulse-response function (IRF) and the forecast-error variance decomposition (FEVD) for interpreting the results.

FDI is presumed to influence economic growth by promoting domestic investments and exports and developing human capital, infrastructure and institutions. Of all these channels, domestic investment is probably the most important through which the host country's economic growth is influenced by FDI. This happens to be the case because FDI influences employment and income more directly through this mechanism than through other channels. This is the main reason why the impact of FDI on domestic investments is addressed as a separate chapter in this thesis.

Using the flexible accelerator model of investments and the dynamic common correlated effects estimators and other types of dynamic and static estimation methods, the study found that FDI crowds-out domestic investments in SSA countries. Specifically, on the basis of Chudik and Pesaran (2015) dynamic common correlated effects estimator, the study found that a 1 percent increase in FDI inflows resulted in a reduction in domestic investments by 0.037 to 0.126 percent which is significant at the 1 percent significance level.

The results of the impulse-response function and forecast error variance decomposition seem to corroborate these findings but they are not as clear-cut.

The finding that FDI crowds-out domestic investments should not be misconstrued to mean that FDI is not important. The argument here is confined to mean that profitable investment opportunities are limited to foreign investors only. MNCs have greater advantages over local investors in that they have better access to investment finance, technology, global markets and management skills.

3.7.2 Policy Implications

To mitigate the adverse effects associated with FDI's crowding-out domestic investments, it is essential for policymakers to come up with the right policies that suit their economic realities and investment climates in the host countries. One possible avenue to do this is sifting and screening FDI projects to make sure that they do not displace domestic investments made by domestic firms. Instead, the authorities should opt for MNCs that promote linkages with local producers. These linkages could take several forms. They can be related to technology transfers, supplying contracts, training workers and skill upgrading through apprenticeship and on-the-job training.

The preferential treatment afforded to foreign firms is another area that needs to be looked at and revised. Believing that FDI positively affects domestic investments and economic growth, many SSA countries have made fiscal reforms to attract FDI such as tax holidays, low corporate tax rates and abolishing import duties on intermediate inputs. Here, it might be reasonable to argue that now is the time to abandon this type of discriminatory treatment that favors foreign firms to the detriment of domestic firms. Ideally, domestic investors should enjoy the same privileges and incentives as their foreign counterparts, yet incentives are necessary for competing with alternative destinations of capital and for attracting foreign investments.

Appendix 3

Table 3A. 1: Correlation Matrix

Dominv	Dominv 1	Openness	FDI	uncertainty	OER	infrastructure	Inflation	Intrate	BM	IQI
openness	0.441	1								
FDI	-0.0074	0.552	1							
uncertainty	-0.0462	-0.0382	-0.0198	1						
OER	-0.0126	-0.104	-0.00096	-0.0410	1					
infrastructure	0.0528	0.203	0.117	-0.0461	0.0179	1				
inflation	-0.0350	-0.0161	-0.0139	0.738	-0.034	-0.0396	1			
Interest rate	-0.105	0.0530	0.0332	0.163	-0.010	-0.158	0.194	1		
BM	0.0109	-0.0048	0.0049	-0.0039	-0.027	-0.010	-0.0027	0.0621	1	
IQI	0.205	-0.031	-0.069	-0.058	-0.090	0.106	-0.0372	0.0556	-0.057	1

Note: Dominv is domestic investments, OER is the official exchange rate, intrate denotes the lending interest rate, BM is broad money and IQI is the institutional quality index.

Table 3A. 2: Lag length selection order criteria of the PVAR model

```
. pvarsoc FAID FDIG lndominv GDPPCannualg,maxlag(3) pvaropts(instl(1/4))
Running panel VAR lag order selection on estimation sample
...
```

Selection order criteria

Sample: 1990 - 2013

No. of obs = 932

No. of panels = 39

Ave. no. of T = 23.897

lag	CD	J	J pvalue	MBIC	MAIC	MQIC
1	.94261	56.60566	.1846308	-271.5863	-39.39434	-127.9445
2	.946902	17.80037	.9798402	-200.9943	-46.19963	-105.2331
3	.8368746	10.47698	.8405614	-98.92034	-21.52302	-51.03974

Table 3A. 3: PVAR Granger Causality test

```
. pvargranger
```

```
panel VAR-Granger causality Wald test
```

```
Ho: Excluded variable does not Granger-cause Equation variable
```

```
Ha: Excluded variable Granger-causes Equation variable
```

Equation \ Excluded	chi2	df	Prob > chi2
FAID			
FDIG	1.339	1	0.247
lndominv	8.913	1	0.003
GDPPCannualg	0.025	1	0.875
ALL	11.242	3	0.010
FDIG			
FAID	11.466	1	0.001
lndominv	2.170	1	0.141
GDPPCannualg	26.652	1	0.000
ALL	58.323	3	0.000
lndominv			
FAID	2.652	1	0.103
FDIG	7.311	1	0.007
GDPPCannualg	2.178	1	0.140
ALL	9.344	3	0.025
GDPPCannualg			
FAID	0.498	1	0.480
FDIG	39.847	1	0.000
lndominv	2.416	1	0.120
ALL	40.864	3	0.000

Figure A3. 1: Panel VAR stability test

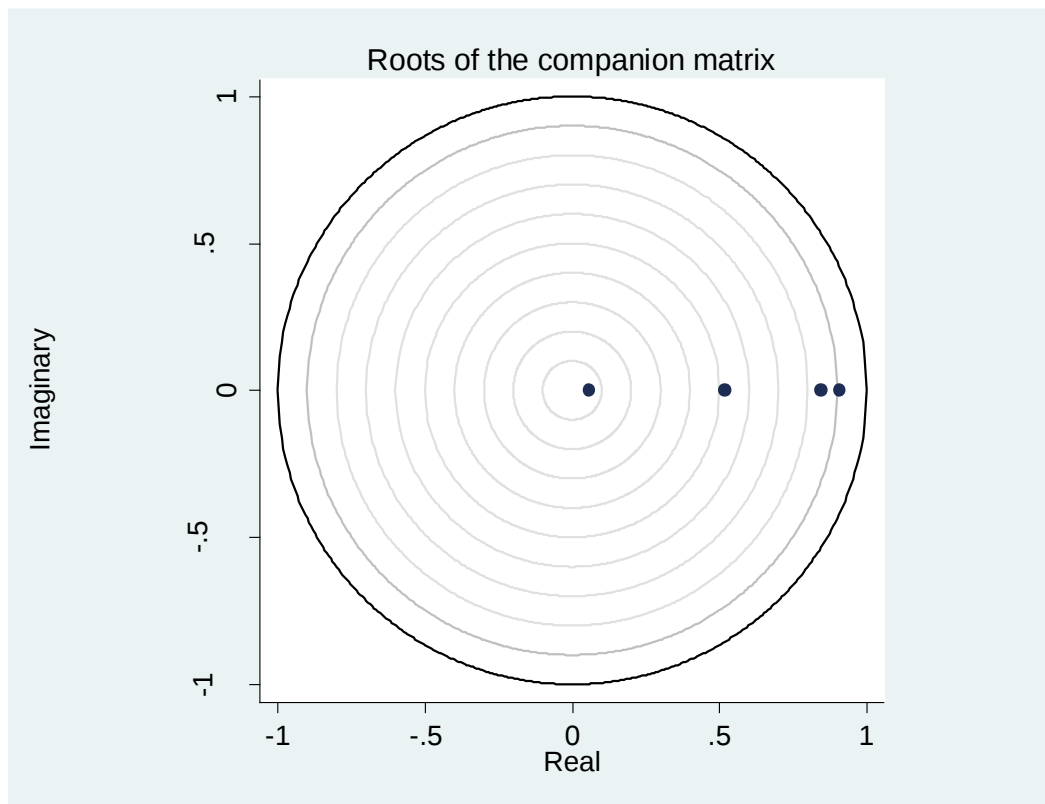


Figure A3. 2: Orthogonalized Impulse Response Functions

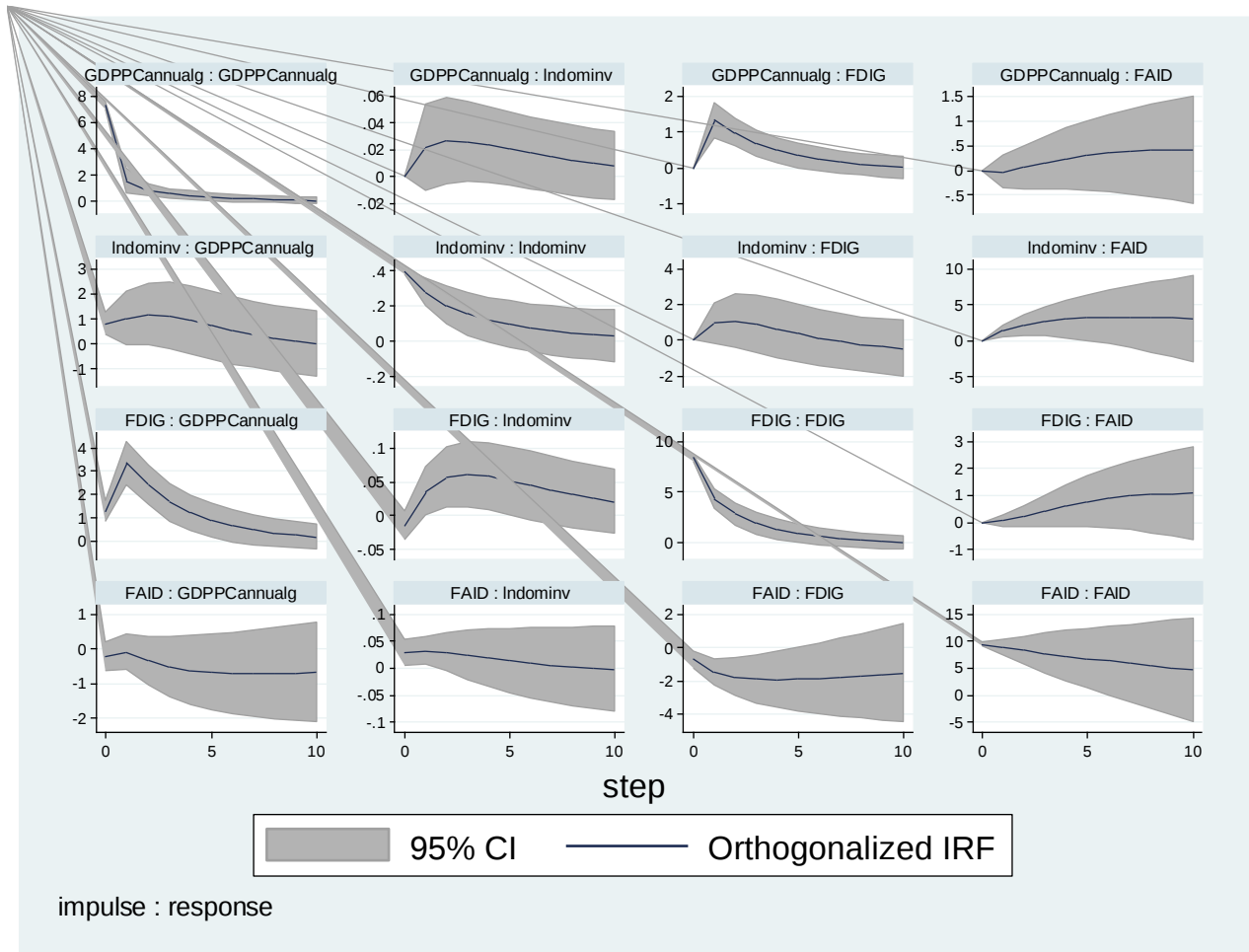


Figure A3. 3: Cumulative Orthogonalized Impulse Response Functions

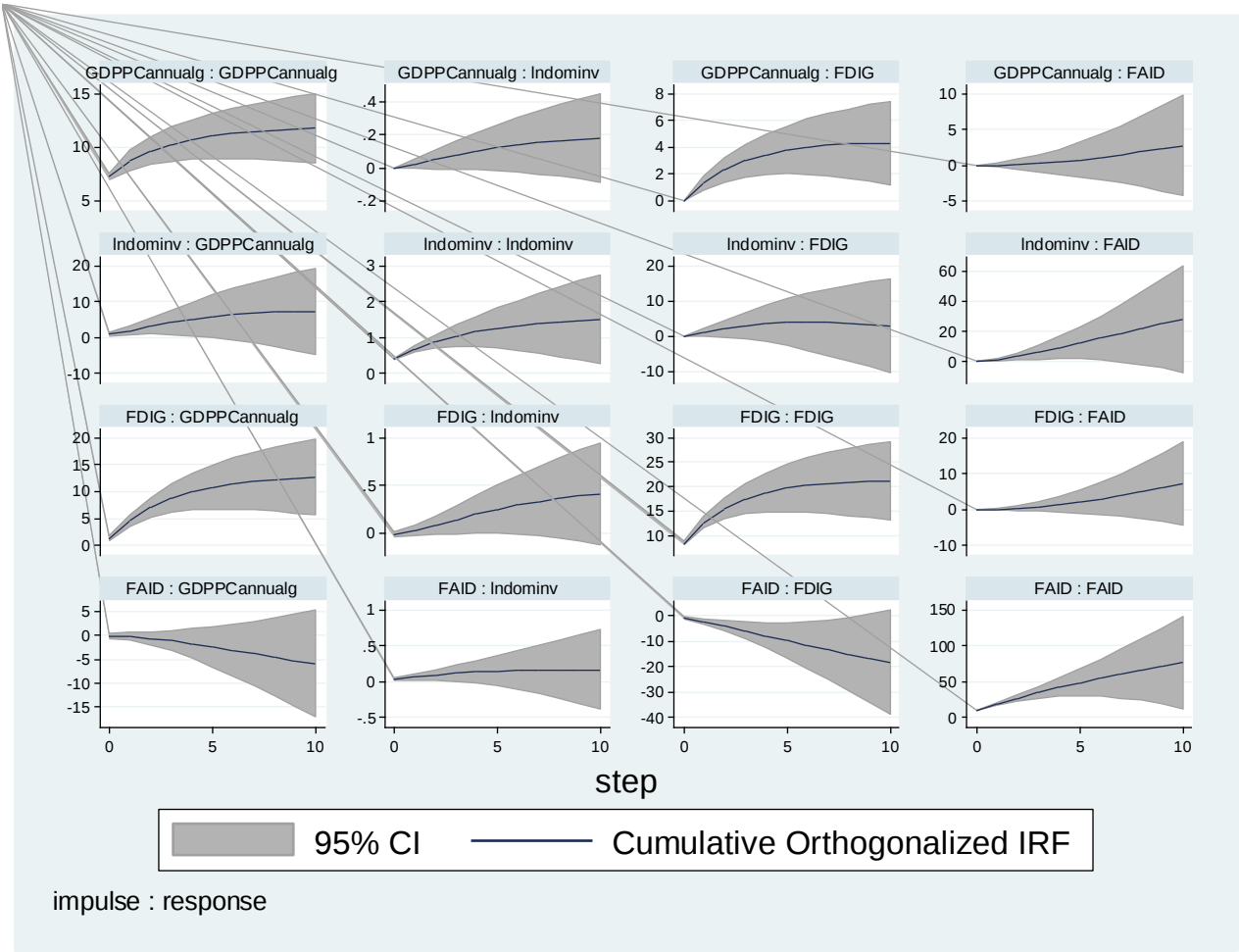


Table 3A. 4: PVAR forecast error-variance decomposition

```
. pvarfevd, mc(200) save("fevd12.dta")porder(FAID FDIG lndominv GDPPCannualg
> nnualg)
note: label truncated to 80 characters
```

Forecast-error variance decomposition

Response variable and Forecast horizon	Impulse variable			
	FAID	FDIG	lndominv	GDPPCannualg
FAID				
0	0	0	0	0
1	1	0	0	0
2	.9901111	.0000196	.0098658	3.54e-06
3	.9744363	.0002072	.0253386	.0000178
4	.9569435	.0007214	.0422458	.0000893
5	.9394758	.0015908	.0587123	.0002211
6	.9228956	.0027512	.0739533	.0003999
7	.9075907	.0041057	.0876949	.0006087
8	.893706	.0055605	.0999012	.0008322
9	.8812576	.0070392	.1106447	.0010585
10	.8701923	.0084857	.1200429	.0012791
FDIG				
0	0	0	0	0
1	.0075416	.9924583	0	0
2	.0293264	.942851	.0095345	.0182881
3	.054941	.9013994	.0187918	.0248678
4	.0818209	.86687	.0242547	.0270544
5	.108268	.8378426	.0263058	.0275836
6	.1331911	.8130192	.0263545	.0274352
7	.1559508	.7913756	.025666	.0270075
8	.1762385	.7722237	.0250583	.0264796
9	.1939828	.755141	.0249389	.0259373
10	.2092725	.7398725	.0254323	.0254226
lndominv				
0	0	0	0	0
1	.005396	.0012602	.9933438	0
2	.0078567	.0063472	.9837617	.0020343
3	.0096064	.0168508	.9693683	.0041744
4	.0106303	.027428	.9559881	.0059536
5	.0111242	.036126	.9454503	.0072994
6	.0112921	.0426645	.9377747	.0082687
7	.011288	.0473532	.9324113	.0089476
8	.0112126	.0506237	.9287489	.0094147
9	.0111256	.0528637	.9262785	.0097322
10	.011058	.0543768	.9246196	.0099457
GDPPCannualg				
0	0	0	0	0
1	.0008381	.0301265	.0116334	.957402
2	.000767	.1835656	.0240024	.791665
3	.0022234	.2381733	.0395187	.7200846
4	.0053545	.2586257	.0523092	.6837107
5	.0096682	.2667162	.060883	.6627327
6	.0146857	.2698072	.0658359	.6496712
7	.0200342	.2706831	.0682662	.6410165
8	.025438	.2705035	.06916	.6348986
9	.0306996	.2697991	.0692364	.6302649
10	.0356845	.2688377	.0689618	.6265161

FEVD standard errors and confidence intervals based
on 200 Monte Carlo simulations are saved in file
fevd12.dta

Chapter Four

Do Remittances Promote Economic Growth? Empirical Evidence from SSA

Yemane Michael

Department of Economics

College of Business and Economics

Addis Ababa University

E-mail: yemanewj@yahoo.com

[February 16, 2019](#)

Abstract

The debate on whether remittances promote economic growth is not yet settled. Hence, this study probes the impact of remittances on economic growth for 40 sub-Saharan Africa (SSA) countries for which data is available for the period 2001-15. The study uses the system GMM dynamic linear panel data model due to its superiority in addressing endogeneity, individual heterogeneity and other issues related to the estimation of a dynamic panel data model. Its findings show that remittances had an insignificant and negative contemporaneous impact on economic growth in the sampled SSA countries over the study period under most estimation techniques. The study concludes that a big chunk of the remittances that flow into SSA is directed towards economically unproductive uses. Moreover, the small size of the remittances that flow into SSA could also explain the negligible impact that they have on economic growth.

JEL Classification Codes: C23, C33, C51, F24, F43, O11

Keywords: Dynamic system GMM, remittances, economic growth, SSA.

4.1 Introduction

Remittances or money sent by migrants for family support back home are regarded as significant drivers of economic development in many low-income developing countries. Personal remittances are the sum total of personal transfers and compensation sent by employees. As a new item in the *Balance of Payments Manual* (6th edition) (BPM6) personal transfers represent a broader and wider definition of worker remittances.

Remittances have shown a remarkable increase in the past two decades. They represent a significant part of capital inflows into many low-income countries surpassing export revenues, foreign direct investments and foreign aid. Currently, remittances are the second highest source of foreign exchange both in absolute terms and as a percentage of GDP. For some countries, especially small island nations and labor-exporting countries, remittances represent more than 10 percent of the GDP. Remittances can affect economic growth through more than one channel. On the one hand, by lowering transaction costs, well-functioning financial markets can help direct remittances to projects that yield the highest returns and therefore boost economic growth and on the other hand, remittances can play a compensatory role for bad and malfunctioning financial systems, that is, by loosening credit constraints potential entrepreneurs can get an opportunity to use remittances whenever the financial system does not advance loans to help them start businesses on account of lack of collateral or due to unreasonably high lending rates (Paulson & Townsend, 2000).

Literature provides no conclusive answer to the question: Do remittances promote economic growth? It is known that remittances increase income levels of recipient households in the receiving countries and plausibly also contribute to poverty reduction (Gupta, Pattillo, & Wagh, 2007). However, it is far from guaranteed that remittances boost output and promote long-term economic growth because remittances can be spent on consumption and bring about moral hazards which are deleterious to economic growth (Chami et al., 2003). But it is also possible that they promote domestic investments and hence boost economic growth in countries characterized by market imperfections and liquidity constraints (Giuliano & Ruiz-Arranz, 2009). There is less controversy about the positive effects of remittances on the standard of living and welfare of the recipient households though when it comes to the macroeconomic impacts of remittances the situation is ambiguous. Their impact depends on whether remittances fund investments or consumption expenditure, the activities they stimulate, that is, work or leisure and whether they end up appreciating the real exchange rate or not. Due to

these reasons, empirical findings on the nexus between remittances and economic growth are mixed (Catrinescu, Leon-Ledesma, Piracha, & Quillin, 2009; Chami et al., 2003; Mundaca, 2009). The question as to whether remittances contribute positively to economic growth has been around for more than two decades now.

Despite the fact that remittances serve as a big source of foreign exchange, the relationship between remittances and economic growth has been overlooked in literature and it has not got the close attention that it deserves, especially in SSA countries. Rapoport and Docquier (2005) state that the lack of comprehensive cross-country data has been one constraint in analyzing the impact of remittances on economic growth in the receiving countries.

To the best of our knowledge, there are limited studies that have investigated the macroeconomic impact of remittances, especially on investments. Mention may be made of Giuliano and Ruiz-Arranz (2009) who studied the impact of remittances on investments at the macro-level based on a sample of 73 developing countries. The other study that is noteworthy is Bjuggren, Dzansi, and Shukur (2010) study on the relationship between investments and remittances in 79 developing countries using dynamic panel data models for the period 1995-2005.

This chapter focuses on the effects of remittances on economic growth in a panel of 40 sub-Saharan African (SSA) countries over the period 2001-15. It especially emphasizes the role of financial development and institutional quality in enhancing or retarding remittances' impact on economic growth. Its aim is investigating the role of financial development and institutional quality in serving as catalysts for enhancing remittances' impact on economic growth and domestic investments. Hence, the study probes how local financial development and institutional quality influence a country's capacity to take advantage of inflows of remittances. The study uses the system GMM method of estimation to achieve its objective. The principal contribution of this paper is that it studies the role of financial development and institutional quality in economic growth and domestic investments.

4.2 Motivation for the Study

The macroeconomic impact of remittances in SSA has received very little attention in literature partly because of the relatively small share of remittances that the region receives. Most of the studies done on SSA have fundamentally been case studies at the microeconomic level in

specific countries or are in the form of reports. Hence, this study fills this research gap. Its objective is probing macroeconomic consequences of remittances in SSA by focusing on economic growth and domestic investments. It also studies the impact that financial development and institutional quality have in enhancing the role of remittances in economic growth and domestic investments. Hence, this paper also probes the impact of remittance incomes on economic growth in SSA.

There is dearth of empirical research on the macroeconomic impacts of remittances in SSA. Most of the existing cross-country studies focus on low-income countries in general and they incorporate a dummy variable to capture the specificities of SSA countries. Though using a broad sample has a virtue in that it increases the degrees of freedom, it may also introduce undesirable heterogeneity if there are large variations in the factors that explain remittances in different country groups.

This study analyzes the macroeconomic impact of remittances in SSA with special emphasis on economic growth and domestic investments. The study solely focuses on SSA so as to do a richer and deeper analysis of remittances which would not be possible in a study that has a global scope.

The research questions that this study addresses are:

What are the macroeconomic effects of remittances?

How does financial development influence the growth and investment effects of remittances?

How does institutional quality influence the growth and investment effects of remittances?

Are remittances important for productive investments?

This study analyzes the importance of remittances in promoting macroeconomic economic growth with special emphasis on the link between remittances and the financial sector as well as institutional quality.

4.3 Literature Review

4.3.1 Motives for Remitting

The World Bank (2016a) *Migration and Remittances Fact-book* (2016) estimates that more than 250 million people or 3.4 percent of the world's population lives outside their countries of birth. The volume of South–South migration which stands at 38 percent of the total migrants

is larger than South–North migration. The United States is the top-migrant destination country followed by Saudi Arabia, Germany and the Russian Federation. The largest migration corridor in the world is the Mexico-United States one followed by Russia-Ukraine and Bangladesh-India. As a share of the population, the number of workers is the highest in the smaller nations of Qatar (91 percent), the United Arab Emirates (88 percent) and Kuwait (72 percent).

However, remittance flows to developing countries registered a decline for two successive years for the first time in recent history. Remittances dwindled by an estimated 2.4 percent, to \$429 billion, in 2016, after a decline of 1 percent in 2015. The largest remittance-receiving country worldwide, India, led the slump with a fall of 8.9 percent in remittance inflows. The remittance inflows into South Asia and Central Asia were further affected by cyclical factors such as low oil prices and weak economic growth in the Gulf Cooperation Council (GCC) countries and the Russian Federation. Remittance flows to North Africa and SSA were affected by weak economic growth in Europe. This decline in remittances' inflows is further exacerbated when expressed in US dollars because of the weakening of the Euro and the British Pound and the Ruble against the US dollar. Since 2013, remittance flows to Europe and the Central Asian region have registered a significant decline of 30 percent for the third consecutive year. The only region that has registered an increase in remittance flows is Latin America and the Caribbean (6.9 percent), which is supported by strengthening employment levels in the United States (World Bank, 2017).

Compared to the 0.8 percent decline in 2015, remittance flows to the SSA region are projected to decline by 0.5 percent in 2016. Angola, Nigeria and Sudan, among many other countries, have imposed exchange controls due to weak earnings from commodity exports and other balance of payments difficulties. Nigeria, which accounts for two-third of the region's remittance inflows, is projected to register a decline of 2.2 percent in 2016 after registering a 1.8 percent decline in 2015. Flows through official channels were dampened because of a significant parallel market exchange rate premium which in September 2016 stood at around 450 Nairas/US dollar compared to the official rate of around 320 Nairas/US dollar. Flows to the region were also impacted by a disruption in the services of several money-transfer operators due to de-risking behavior by international correspondent banks.

A great deal of the empirical literature contends that remittances are more stable than the other components of the balance of payments such as exports, FDI and ODA (see Chami et al., 2008; Gupta, Pattillo, & Wagh, 2009; Neagu & Schiff, 2009). The debate whether remittance inflows are countercyclical or procyclical is still going on with no end in sight. From a macroeconomic

perspective, the issue of the cyclicality of remittances has two main implications. First, based on theory, remittances' cyclicality serves as a good indicator of the motive behind the remittances. If a country receives more remittances during an economic slump, macroeconomic shocks and other disasters, their inflows are believed to be driven by altruistic motives. Whereas, the inflow of remittances that is procyclical is supposed to be driven by self-interest or investment motives. Second, from a practical aspect, the nature of the cyclicality of remittances gives a clue to policymakers as to what kind of role remittances play in attenuating the adverse effects of a shock when the inflow of remittances is countercyclical. In contrast, procyclical remittances could aggravate the effects of a shock on domestic business cycles and hence could endanger macroeconomic stability.

International labor migration and remittance flows that accompany them have become pivotal drivers of international development (UNDP, 2009). A World Bank (2015) brief report indicates that the number of international migrants reached 247 million in 2013 which is approximately 3 percent of the world's population and this is expected to exceed 250 million in 2015 and 258 million in 2017. Remittances to developing countries are estimated to increase to \$440 billion during 2014-15 up from the \$414 billion they were in 2013 and this figure for 2013 is 6.3 percent more than that of 2012. The estimated \$440 billion remittances exceed the official development assistance (ODA) and FDI received by developing countries excluding China (World Bank, 2015). Of late, there has been a shift in global migration and remittance patterns with 'South-South' migration surpassing 'South-North' migration. More than 50 percent of the emigrants from developing countries move to other developing countries mainly within the same region (UN, 2013).

The remittances received by developing countries have more than doubled in the last decade. However, their increase in Africa in general and in SSA in particular has been marginal. For example, of the \$9 billion official migrant remittances to Africa in 1990, SSA received only \$1.86 billion and out of the \$14 billion in 2003, SSA received \$5.96 billion. Official migrant remittances' flows to SSA reached \$10 billion in 2005 and shot up to \$21.6 billion in 2008 before slightly dropping to \$20.7 billion in 2009 in the aftermath of the global financial crisis which resulted in economic recession in the industrialized world.

SSA lags behind other regions in the developing world in terms of remittances' flows. To put it in perspective, in 2009 SSA in its entirety as a sub-region received substantially less remittances (\$20.74 billion) than any of the world's top three migrant remittance recipient countries -- India (\$49.26 billion), China (\$47.55 billion) and Mexico (\$22.16 billion).

Despite the fact that remittances to SSA are far less than those to other major regions both in per capita and in absolute terms the differences are much less exaggerated when viewed relative to the GDP of the recipient countries. Though the differences become less pronounced even relative to GDP the volume of remittances to SSA is generally lower than that to other developing countries. When analyzed relative to their GDP, we find a number of SSA countries among the largest recipients of remittances. For some of them, remittances serve as a significant source of foreign exchange.

The World Bank (2006) acknowledges that the remittances received by developing countries are exceedingly less than the actual amount received. The amount of remittances that is unrecorded and that goes through unofficial channels is estimated to be 50 percent higher than the officially reported level. Freund and Spatafora (2005) claim that SSA receives the highest informal remittances which is in the region of 45-65 percent of the official amount as opposed to 5-20 percent in the case of Latin America. Remittance inflows into SSA and other developing countries through informal channels is not without risks as it can have serious repercussions for peace and stability. Some of the other risks associated with it are money laundering, sponsoring of anti-government and anti-peace elements to advance one's self-interests, financing of terrorist activities, the creation and expansion of informal financial markets which include the underground foreign exchange markets, de facto dollarization and arbitrary growth in money supply in remittance receiving countries. At the end of the day, the unbridled flow of remittances through informal channels could undermine the economic and political stability of the remittance receiving countries and threaten the peace and security of the world order.

Understanding the motives for remitting money are important for identifying its flows and growth effects. The most recurrent motives in literature are:

- i) 'Insurance' motives: remittances are regarded as a potential source of income to cushion households against external adverse shocks. In this case, remittances serve as a risk spreading strategy. Garip (2006) argues that migration is viewed as a strategy by which a household tries to minimize income risks or they serve as an individual's strategy for maximizing incomes. Migrants are expected to remit more if the argument of minimizing income risks holds. Whereas if the income-maximization strategy of an individual turns out to be true, migrants will remit less. The argument that remittances can be motivated by altruism or family arrangements is related to the insurance motive. This means, if one or more family members are located elsewhere, the welfare of the entire family would be less affected by local economic fluctuations in a given country.

If an adverse shock hits family members in one country, family members in another country can help them overcome this hardship.

- ii) ‘Altruism’ motives: assume that migrants remit because of emotional attachment to their relatives in their home countries. This motive presumes that migrants send money to their relatives and friends in their country of origin because they value their relatives’ utility in the home country (Lucas & Stark, 1985; Rapoport & Docquier, 2005).
- iii) ‘Self-interest’ motives: the main factor that drives remitters to send money is for investment or entrepreneurial purposes (Agunias, 2006). Besides, under the self-interest motive, migrants remit money to invest or inherit assets back home and also to pave the way for their return with dignity and their reputation intact. The investment-motive, the inheritance-motive, maintaining links and intentions to return motive can be considered as components of the self-interest motive.
- iv) ‘Tempered altruistic’ motives: also called enlightened self-interest motives view remittances as part of intertemporal and mutually beneficial covert contractual arrangements between a migrant and his/her family in the home country. The contractual arrangements could take the form of co-insurance, loan repayments or exchange of services. To put it differently, this is a contractual arrangement and bargaining power within a family or household. For example, a migrant worker abroad recompenses the debts that the family accumulated to pay for the migration or effects payments on the basis of an agreement entered into with the family before departing.

In reality, remittances combine elements of altruism, repayment of loans, insurance, inheritance and exchange for a range of services. This complex mix of motives is best described using fuzzy and bleak concepts such as ‘impure altruism’ (Andreoni, 1989) or ‘enlightened selfishness’ (Lucas & Stark, 1985).

4.3.2 The Impact of Remittances at the Micro-Level

A great deal of empirical evidence suggests that remittance receiving households, in general, have higher levels of consumption spending and lower incidence of extreme poverty than their counterparts who do not receive remittances. According to Ratha (2013) because remittances increase households’ incomes in the developing world they could play a pivotal role as a ‘powerful anti-poverty force’. Stratan, Chistruga, Clipa, Fala, and Septelici (2013) found that

remittances contributed to reducing the severity of poverty in Moldova as migrants' relatives received remittances. Adams and Cuechuecha (2010a) claim that remittances have the greatest impact on reducing the extent (magnitude) and depth (severity) of poverty rather than on reducing its scale. On the other hand, Adams and Page (2005) undertook an empirical investigation based on a sample of 71 developing countries and found a relationship between remittances and poverty reduction. They assert that a 10 percent increase in international remittances from each remitter will result in a decrease of 3.5 percent in the share of people living in poverty.

Empirical research's findings also show that remittances as 'social insurance' form a part of a risk-spreading strategy in countries affected by economic and political turmoil. A typical example here is Egypt during the Arab Spring. At a time when FDI and ODA were pulling out, remittance inflows to the country increased between 2009 and 2011.

Pessimists and skeptics about remittances, however, argue that remittances tend to imprint a culture of dependency within the developing world by undermining recipients' enthusiasm to work hard because they receive remittances at certain known intervals.

Remittances might make a significant contribution to income stability and improving welfare in developing countries (Lubambu, 2014). However, this is not tantamount to saying that they contribute to poverty alleviation because it is not the poorest who migrate the most on account of the costs and risks associated with migration. Most benefits of remittances are selective and tend not to flow to the poorest members of communities and the poorest countries because migration is a selective process (Schiff, 1994). Often migration and remittances are selective and expensive in that they are not accessible to all the needy populations. Not all the poor and vulnerable households have the initial capital required to migrate. In fact, the exorbitant costs and risks associated with migration are insurmountable hurdles for the poorest people (Stark, Taylor, & Yitzhaki, 1988; World Bank, 2011).

Under these circumstances, migration is deemed to worsen income inequalities (Adams, 2011), not only between international and internal migrants, but also between migrants and non-migrants. Empirical evidence shows that the economic behavior of remittance recipient households very often results in a price hike of goods and services in local markets which has the potential of affecting the entire community, in particular the non-recipient households. For example, in Cape Verde an increase in remittance recipients' consumption led to an increase in local prices. Moreover, migration and remittances could deepen inequalities within home

countries and between the peripheral and central regions (Lipton, 1980; Mishra, 2007; Papademetriou, 1985). The bottom line here is that remittances do not necessarily imply financial benefits for all the poorest, marginalized and underprivileged people.

However, some studies also indicate that the consumptive expenses of recipient households within the home countries could positively affect the labor market and incomes of non-recipient households via a multiplier effect (Adelman et al., 1988; Durand et al., 1996; Taylor & Fletcher, 1996). These scholars argue that migration and remittances do not lead to an increase in inequalities between the core and peripheral areas because non-migrants can also benefit indirectly from the investment and retail activities of the recipients such as building houses and other development enterprises.

4.3.3 The Macroeconomic Consequences of Remittance Inflows

Investigations and analyses of the role of remittances at the macro-level have mainly focused on poverty, investments, growth, financial development, consumption, competitiveness and macroeconomic stability (Adams & Page, 2005; Amuedo-Dorantes & Pozo, 2004; Barajas et al., 2009; Bugamelli & Paternò, 2011; Catrinescu et al., 2009; Chami, Hakura, & Montiel, 2009; Chami et al., 2003; Giuliano & Ruiz-Arranz, 2009; Woodruff & Zenteno, 2007). However, there is substantial research at the micro level on issues pertaining to the impact of remittances on household poverty and welfare, education, health, income inequalities and labor supply (Adams, 2011; Adams & Cuechuecha, 2010a; Cox-Edwards & Rodríguez-Oreggia, 2009; Ebeke, 2011; Funkhouser, 2006; Hassan, 2011; Ratha, 2013).

As far as the macroeconomic consequences of remittance inflows to developing countries is concerned, there are two main contending views put forward by remittance optimists and remittance skeptics (pessimists).

Those who have a favorable view of remittances (optimists) argue that they contribute positively to the development of recipient countries by overcoming households' financial constraints (Aggarwal, Demirgüç-Kunt, & Pería, 2011; Gupta et al., 2009) by protecting them against natural disasters (David, 2010; Mohapatra, Joseph, & Ratha, 2009; Yang, 2008) and by minimizing the vulnerability of recipient countries to macroeconomic volatility (Bugamelli & Paternò, 2011; Chami et al., 2009; Craigwell, Jackman, & Moore, 2010; IMF, 2005). Remittances are also credited with improving the sovereign rating (Avendano, Gaillard, & Nieto-Parra, 2011). They can also help reduce the possibility of current account reversals

(Bugamelli & Paternò, 2009) which contribute to reinvigorating the credibility of the recipient countries in the eyes of international investors. In other words, in addition to serving as a source of foreign currency, remittances can also improve a country's creditworthiness for external borrowing thereby expanding access to capital and lowering borrowing costs (World Bank, 2006). Moreover, remittances can alter the fiscal adjustment required to attain sustainable debt. There is anecdotal and empirical evidence which indicates that remittances reduce inter-household income inequalities (Chauvet, Gubert, & Mesple-Somps, 2009; Koechlin & Leon, 2007) and foster economic growth in financially less developed countries (Giuliano & Ruiz-Arranz, 2009).

A few empirical studies suggest that remittances have the potential to positively affect a country's economic growth (Solimano, 2003; World Bank, 2006). Aggarwal et al. (2011) and Giuliano and Ruiz-Arranz (2009) found that remittances had a significant positive impact on both bank deposits and bank credit to the private sector. They argue that remittances serve as substitutes for other financial markets that are either missing or imperfect in developing countries such as credit and insurance. Remittances may also have the potential of reducing the size of a recession and boosting the local economy in certain countries by stimulating consumption and investments.

The pessimists opine that remittances have a detrimental effect on the macro-economy in that the remittances increase the level of the real exchange rate which leads to the deterioration of the external competitiveness of the country that receives them (Acosta, Baerg, & Mandelman, 2009; Acosta, Lartey, & Mandelman, 2009; Amuedo-Dorantes & Pozo, 2004; Barajas et al., 2009). Additionally, remittances could aggravate the domestic business cycle by increasing the co-movement between labor supply and output (Chami et al., 2008). There is still another downside associated with remittances which has to do with the moral hazard problem on the part of the receiving households. It is possible that households which receive remittances could reduce their supply of labor hours and increase leisure time which could plausibly have a negative effect on economic growth.

4.3.4 Remittances, Financial Development and Economic Growth

Financial development in the recipient country is one of the catalysts that makes remittances effective for growth. Rapoport and Docquier (2005) and Giuliano and Ruiz-Arranz (2009) argue that access to credit is one major constraint in entrepreneurial activities in developing

countries. Further, remittances can boost financial development in recipient countries which, in turn, plays a pivotal role in mitigating poverty, reducing income inequalities and promoting economic growth (Aggarwal et al., 2011; Beck, Demirgüç-Kunt, & Levine, 2007; Gupta et al., 2009). Empirical findings of the relationship between remittances and financial development are mixed. Some research findings claim that there is a complementarity between remittances and financial development while others contend that remittances and financial development are substitutes for each other. Remittances not only remove liquidity constraints but they also finance projects by talented but financially handicapped entrepreneurs if properly managed.

Giuliano and Ruiz-Arranz (2009) analyzed dynamic panel data for 73 developing countries for the period 1975-2002 and provided evidence of substitutability between remittances and financial development in fostering economic growth. Their findings show that remittance inflows are positively related to economic growth only in financially under-developed countries. The intuitive interpretation given for their results is that remittances compensate for inefficient and missing credit markets which enable recipients to hoard financial resources for self-financing human and physical capital investments. In contrast, when credit markets work properly and more efficiently, access to credit is no longer an issue and remittances are channeled for subsidizing recipient households' consumption and thus kill the incentive for working. This is another line of argument that substantiates the validity of the substitutability between remittances and financial development. In short, this argument is: in well-developed economies, credit constraints do not exist and remittances received from relatives abroad need not necessarily be used in a productive way. However, in countries whose financial sectors are poor, remittances serve as crucial sources of financing growth-enhancing activities.

The substitutability found by Giuliano and Ruiz-Arranz (2009) between remittances and financial development was further bolstered by Ramirez (2013) and on a larger set of countries by Barajas et al. (2009) who mainly focused on Latin American and Caribbean countries. However, evidence of the opposite relationship between remittances and financial development is also found in studies that principally focus on African countries (see Nyamongo, Misati, Kipyegon, & Ndirangu, 2012; Zouheir & Sghaier, 2014). The two variables seem to complement each other in this part of the world. Continuing financial deepening is strengthening the positive effects of remittances on growth rather than dampening it. The possibility of depositing remittances in banks brings a larger share of the population in contact with the financial sector widening the availability of credit and savings products (Aggarwal et al., 2011; IMF, 2005).

Bettin and Zazzaro (2012) contend that the negative sign of the interaction term between remittances and financial development need not necessarily indicate that the two are substitutes. They can be considered as alternative sources of financing productive investments for economic growth. Following Rioja and Valev (2004) and Barajas et al. (2009) Bettin and Zazzaro (2012) explain that the coefficient may capture a non-linear effect of the size of the financial sector on output growth. This alternative interpretation rests on the idea of the marginal effect of financial development rather than that of migrants' transfers. In this case, the negative sign of the interaction term's coefficient can mean that growing remittances increase bank deposits and available credit but loans are not necessarily given in an efficient way. Therefore, this remittance-driven increase in the financial sector's size does not contribute to economic growth (Sobiech, 2015).

4.3.5 Remittances, Institutions and Economic Growth

Banerjee and Lyer (2005) and Dollar and Kraay (2003) emphasize that trade openness, human capital formation and other macroeconomic policies become ineffective in a weak institutional environment. Like FDI and other foreign capital inflows, institutional quality also plays a key role in attracting and fostering the growth impact of remittances. Catrinescu et al. (2009) argue that good institutions serve as incentives in reducing uncertainty thus promoting efficiency which, in turn, contributes to better economic performance. They estimated dynamic panel data models including remittances, different measures of institutional quality and interaction terms of remittances and institutional quality. They found that good quality institutions enhanced the impact of remittances on economic growth. However, their findings also indicate that the direct effects of remittances are not robust and are significantly positive only occasionally.

Catrinescu et al. (2009) contribute to empirical literature by incorporating institutions which they saw as an important omitted variable in a dynamic panel data framework that accounted for endogeneity. There is ample empirical evidence that attests the existence of a strong relationship between institutions and economic growth (see for example, Acemoglu & Robinson, 2006; Lartey & Mengova, 2015; Rodrik, Subramanian, & Trebbi, 2004). The core question is whether institutions promote economic growth by making remittances more effective. Ratha (2003) explains that better institutions could help turn remittances into higher rates of investment and/or make investments more efficient. Specifically, he substantiates his argument by asserting that remittance receipts during 1996-2000 averaged 0.5 percent of GDP

in countries with a higher-than-median level of corruption compared to 1.9 percent in countries with a lower-than-median level of corruption which gives a clue that corruption has an association with or an impact on the level of income generated through remittances. Holzmann and Munz (2004) point out that institutions may affect the extent of migration which in turn will affect remittances.

Rodrik (2004a) stipulates that it is a generally accepted maxim that institutional quality plays an irreplaceable role in ushering sustained prosperity across countries. He says that wealthier and more affluent nations attract investors because of the presence of effective, well-functioning and reliable property rights and the rule of law. Moreover, there exist sound monetary and fiscal policies that are grounded in solid macroeconomic institutions. On the contrary, these institutions either do not exist in poor countries and if they exist, they do not function well and efficiently.

4.4 Methodology

We used a panel system GMM regression model popularized by Arellano and Bover (1995) to address issues related to endogeneity. Empirically and theoretically, it is possible for the magnitude of remittances and the efficiency of financial markets to increase with higher growth rates. This makes the use of OLS inappropriate as it could lead to an over-statement of the effect of both the variables and their interactions with growth (Giuliano & Ruiz-Arranz, 2009). Using instruments for financial development may be one option for overcoming the problem of endogeneity. Variables not subject to reverse causality such as origins of a country's legal system and creditor rights (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997) have been commonly used. However, the drawback with these variables is that they are time-invariant and as a result their adoption for a panel framework becomes subtle.

Despite its shortcomings, we estimate the impact of remittances on economic growth by pooled OLS. The interaction between remittances and financial development, institutional quality or other variables that represent financial development is not included in our first regression for the sake of comparison. We begin by estimating the equation:

$$(4.1) \quad GDPPC_{it} = \beta_0 + \beta_1 GDPPC_{it-1} + \beta_2 rem_{it} + \beta_3 X_{it} + u_t + \eta_i + \varepsilon_{it}$$

where $GDPPC_{it}$ denotes the (logarithm of) initial level of GDP per capita, rem_{it} is remittances as a percentage of GDP and X_{it} is the matrix of control variables. Some of the control variables include government consumption expenditure (government size), trade openness, inflation, population growth, average years of education, loans, credit and broad money (M2). u_t is a time specific effect, η_i is an unobserved country-specific fixed effect and ε_{it} is the error term. Our main interest here is testing whether the marginal impact of remittances on growth, β_2 , is statistically significant.

We use Equation (4.1) as a benchmark model in which we do not include any variables of financial development and institutional quality. The model simply examines the impact of remittances and other control variables on economic growth barring financial development and institutional quality.

Equation (4.1) can alternatively be rewritten with the growth rate as a dependent variable as:

$$(4.2) \quad Growth_{it} = GDPPC_{it} - GDPPC_{it-1} = \beta_0 + (\beta_1 - 1)GDPPC_{it-1} + \beta_2 rem_{it} + \beta_3 X_{it} + u_t + \eta_i + \varepsilon_{it}$$

where $\beta_1 - 1$ captures the convergence rate.

Nowadays, remittances have become a significant source of external finance. Remittance flows and their effect on economic growth can be influenced by the quality of institutions especially when remittance inflows are driven by a self-interest and portfolio choice motive, a situation where migrants try to take advantage of investment opportunities to allocate their savings optimally between their host country and country of origin. Thus, the presence of high quality institutions that attract foreign investments could attract remittances towards investment opportunities in the recipient country.

Equation (4.3) captures the impact of remittances on economic growth via financial development. This equation is a slight generalized variant of Equation (4.1) in which we introduce an interaction term between remittances and the indicator of financial development ($rem*FD$):

$$(4.3) \quad Growth_{it} = \beta_0 + \beta_1 Growth_{it-1} + \beta_2 rem_{it} + \beta_3 FD_{it} + \beta_4 (rem_{it} * FD_{it}) + \beta_5 X_{it} + u_t + \eta_i + \varepsilon_{it}$$

where FD_{it} is financial development of country i at time t .

If $\beta_2 > 0$ and $\beta_4 < 0$, it signals that remittances promote growth only in the recipient countries whose financial systems are under-developed and functioning poorly. This means that a negative coefficient of the interaction term between remittances and financial development provides evidence of substitutability between the two.

If, on the other hand, $\beta_2 < 0$ and $\beta_4 > 0$, or when both of them are positive and jointly significant, this signals that a better functioning financial system will enable remittances to promote growth which supports the complementarity view between remittances and financial development.

We used the Arellano and Bover (1995) and Blundell and Bond (1998a) system GMM method to exploit the time series dimension of the data and individual country specific effects to correct any endogeneity bias in the explanatory variables. Blundell and Bond (1998a) show that the first differenced GMM procedure could cause large finite-sample biases when it is used for estimating autoregressive models for fairly persistent series for short panels. In addition, they show that these biases can be mitigated by including additional moment conditions. This is done by using lagged first differences as instruments for equations in levels in addition to the lagged levels as instruments for equations in first differences (Arellano & Bover, 1995; Wooldridge, 2003). We assume that this system GMM approach is superior to the first difference GMM procedure because the time period is fairly short. The GMM estimator assumes that the error terms are not serially correlated. Besides, it also assumes that the explanatory variables are weakly exogenous which means that they are not correlated with future realizations of the error terms.

The other variable of interest here is investigating whether the institutional quality of the remittance recipient country affects the effect of remittances on economic growth. To this end, we formulate the equation:

$$(4.4) \quad Growth_{it} = \beta_0 + \beta_1 Growth_{it-1} + \beta_2 rem_{it} + \beta_3 IQI_{it} + \beta_4 (rem_{it} * IQI_{it}) + \beta_5 X_{it} + u_t + \eta_i + \varepsilon_{it}$$

where IQI_{it} stands for the institutional quality index of country i at time t .

There are four possible scenarios regarding the two main coefficients of interest here, β_2 and β_4 .

- If $\beta_2 > 0$ and $\beta_4 > 0$, remittances have a positive impact on economic growth, and the level of the institutional quality index favorably affects that positive impact.

- If $\beta_2 > 0$ and $\beta_4 < 0$, remittances have a positive impact on economic growth, and the level of the institutional quality index adversely affects that positive impact (for example, political risks could lessen this positive effect).
- If $\beta_2 < 0$ and $\beta_4 > 0$, remittances have a negative impact on economic growth, and the level of the institutional quality index attenuates the negative effect of remittances on economic growth.
- If $\beta_2 < 0$ and $\beta_4 < 0$, remittances have a negative impact on economic growth, and the level of the institutional quality index worsens the negative effect of remittances on economic growth.

The panel nature of the data helps us differentiate the regressors to control for unobserved effects in applying GMM estimators. Taking into consideration the time-specific effects, we obtain:

$$(4.5) \quad GDPPC_{it} - GDPPC_{it-1} = \beta_1(GDPPC_{it-1} - GDPPC_{it-2}) + \beta(X_{it} - X_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1})$$

where X_{it} , as explained earlier, is a set of explanatory variables also including remittances, the institutional quality index, financial development and the interaction terms. To estimate Equation (4.5), we need to use an instrumental variable to take care of the endogeneity of the columns of X as well as the correlation between the new error term and the lagged difference of the dependent variable. Finding strictly exogenous instruments is a difficult exercise but it is possible to construct internal predetermined instruments using lagged values of the right-hand side variables under certain restrictive assumptions. The second- and higher-order lags of the columns of X could be employed as instruments in the estimation of Equation (4.5) if we adopt a relatively tenuous and innocuous assumption that $E[\varepsilon_{it} | X_{is}] = 0$ for all $t > s$ but not the other way round. This condition possibly holds if ε_{it} is serially uncorrelated in which case the second- and higher-order lags of the endogenous variables become valid instruments.

With the use of the internal instruments discussed earlier, a difference-GMM estimator can be constructed though this estimator has some serious drawbacks. First, differencing the equation leads to a loss of valuable information as it removes the long-run cross-country information present in the levels of the variables. Second, the lagged levels of the endogenous variables will be poor instruments if the columns of X display persistence and their values are close to 1. However, by using further assumptions about the moment conditions we can construct an

alternative system GMM estimator that addresses these problems. The system GMM estimator uses suitably lagged differences of the dependent and independent variables as instruments. Even once-lagged differences of the regressors can become valid instruments if ε_{it} is serially uncorrelated. Thus, we can construct a system GMM estimator by combining the level and first-difference specifications of the regressors.

For these reasons the system GMM estimator outperforms the difference GMM estimator (see Arellano & Bover, 1995; Blundell & Bond, 1998a). The lagged levels of the explanatory variables are used as instruments for the regression in differences and the lagged differences of the explanatory variables are used as instruments for the regression in levels. These are considered appropriate instruments under the assumption that there is no correlation between the differences in the explanatory variables and the country specific effect, although there might be a correlation between the levels of the explanatory variables and country specific effects.

The consistency of the difference and system GMM estimators depends on the validity of the moment conditions, which can be tested using two specification tests. The first test is the Arellano-Bond test for autocorrelation, testing for no second-order serial correlation in the disturbances. The second test, the Hansen (1982) J test of over-identifying restrictions is done to ensure the validity of the instruments. The joint null hypothesis of the Hansen test supposes that the instruments are exogenous, that is, uncorrelated with the idiosyncratic error term. Moreover, it assumes that the excluded instruments are correctly excluded from the estimated equation. The Hansen test is used in place of the Sargan (1958) test for over-identifying restrictions because of its consistency in the presence of autocorrelation and heteroscedasticity (Roodman, 2009a).

The relationship between remittances and domestic investments is another issue that this study discusses. We investigate the role that financial development and institutional quality play in promoting domestic investments. The dataset consists of 15 annual observations for each of the 43 SSA countries included in the study based on data availability.

As a starting point, we begin with the static model and then proceed to the dynamic model's specification:

$$(4.6) \quad inv_{it} = \beta_0 + \beta_1 rem_{it} + \beta_2 IQI_{it} + \beta_3 FD_{it} + \beta_4 (rem_{it} * IQI_{it}) + \beta_5 (rem_{it} * FD_{it}) + \beta_6 X_{it} + \varepsilon_{it} \quad \text{where}$$

inv_{it} stands for domestic investments in country i at time t , and all the other variables are as explained earlier.

Using Equation (4.6) we will be able to test whether the marginal impact of remittances²² on domestic investments is significantly different from zero. Moreover, we test what sort of relationship exists between financial development and remittances and between the institutional quality index and remittances, that is, we are interested in knowing whether the relationship is one of complementarity or substitutability.

If we find a positive and significant coefficient of the interaction term between financial development and remittances, β_5 in this case, this will imply that remittances serve as a complement to financial development. In other words, when the sign of the coefficient of the interaction term is positive and statistically significant, financial development is deemed to complement remittance inflows in boosting domestic investments. However, if the sign of the coefficient is negative and statistically significant, it means that remittances are a substitute for financial development. This means, remittances serve as sources of credit for undertaking investment ventures in financially under-developed and constrained economies. The interaction term between remittances and the institutional quality index can be interpreted analogously. For example, a statistically significant positive coefficient of the interaction term between remittances and the institutional quality index, β_4 , would imply that remittances are more effective in promoting domestic investments in environments where sound institutional set ups exist. In that case, higher institutional quality is deemed to be complementary to remittance inflows for boosting remittance-based domestic investments.

We begin by estimating the parameters of Equation (4.6) using pooled OLS. However, we should ensure that the assumptions underlying ε_{it} are reasonably realistic before we take the OLS estimates too seriously. For instance, Equation (4.6) assumes that the error terms are independent across countries. But, ε_{it} can be disentangled into u_i , a country specific effect like geography and the state of technological development and others and v_{it} (the classical

²² $\frac{\partial inv_{it}}{\partial rem_{it}} = \beta_1 + \beta_4 \overline{IQI} + \beta_5 \overline{FD}$.

standard error with the usual assumptions). Next, we obtain the parameters of Equation (4.6) using the random-effects (RE) estimator assuming that the country specific effects are uncorrelated with the regressors in Equation (4.6). However, we should not take for granted the assumption that the covariates are uncorrelated with u_i . Therefore, we should run the fixed-effects (FE) estimator which accommodates this kind of correlation. Finally, we do the restricted F-statistics, Breusch and Pagan (1980) LM and the Hausman (1978) specification tests to differentiate between these three (pooled OLS, FE and RE) estimators.

The OLS, FE and RE estimators have some glaring limitations in that they fail to address issues related to autocorrelation and endogeneity problems. This weakness cannot be overlooked as an empirical research underscores that investment outlays are autocorrelated. It takes time for innovations in current investment outlays to decay; they only decay with lags whose explanations are related to the idea of the business cycle's effects. Most empirical studies attempt to overcome the problem of autocorrelation by averaging observations over 3-year, 4-year, 5-year periods or more. However, the drawback of this approach is that it leads to excessive loss of information in addition to the fact that the choice of the number of years over which data are averaged is arbitrary. For instance, if we average the data over a 5-year interval, it is tantamount to saying that waves of contractions and expansions in economic activities occur at regular interval of 5 years.

$$(4.7) \quad inv_{it} = \beta_0 + \sum_{s=1}^p \gamma_s inv_{it-s} + \beta_1 rem_{it} + \beta_2 IQI_{it} + \beta_3 FD_{it} + \beta_4 rem_{it} * IQI_{it} + \beta_5 rem_{it} * FD_{it} + \beta_6 X_{it} + \varepsilon_{it}$$

where the error term $\varepsilon_{it} = u_i + \delta_t + v_{it}$ and its components $\delta_t \sim IID(0, \sigma_\delta^2)$, $u_i \sim IID(0, \sigma_u^2)$, and $v_{it} \sim IID(0, \sigma_v^2)$, are independent of each other and among themselves. The vector X_{it} which denotes the control variables includes human capital, ODA, FDI, government expenditure, inflation and lending interest rate.

Once we include the lagged dependent variable on the right-hand side along with the list of the regressors, the static panel data models' estimation techniques such as the pooled OLS, FE and RE become irrelevant because they are biased. This bias does not necessarily vanish with an increase in the sample size. This occurs because the country specific effects, u_i , are correlated with inv_{it} and its lagged realizations even when there is no serial correlation of the random error term v_{it} . There is a strong possibility that inv_{it} and δ_t will be correlated. The recent global

crisis is a good example of this possibility. At first glance, we could be tempted to persuade ourselves that the FE estimator will help us get rid of this problem. However, given the fact that we have a fairly large number of countries and a relatively short time period in our sample, the FE estimator becomes biased and potentially inconsistent (Nickell, 1981).

In dynamic panel data models such as the one given in Equation (4.7) we should be wary of reverse causality. Our main interest is examining whether remittance inflows result in increased domestic investments.²³ However, it is theoretically possible that increasing domestic investments in the country of origin could inspire migrants to increase remittances for financing domestic investment opportunities that are availed in their countries of origin. Similarly, financial sector development could emerge as a result of higher demand from the business sector. For example, private credit may increase in response to demand for such credit. This means that the financial sector's development is not only a demand side phenomenon but a supply side one as well. In many developed and developing countries different interest groups and lobbyists pressurize the government in power to adopt and ratify improved policies in general and better institutions in particular. Thus, the bottom line is we cannot claim strict exogeneity even for institutional quality. The prevalence of these complications takes us away from static panel data estimators to the realm of dynamic panel data estimators, of which the system GMM is one.

4.5 Data Sources

To study the relationship between remittances, financial development and growth we used a dataset of 40 SSA countries for the period 2001-15. All the data was retrieved from the World Bank's, World Development Indicators (World Bank, 2016b).

Per capita GDP's annual percentage growth rate based on a constant local currency: FDI consists of the net inflows of foreign investment funds from foreign investors. For it to be counted as FDI, the acquisition should have at least 10 percent of the voting stock. It is calculated as a percentage of GDP. Domestic investments are found by subtracting FDI from gross fixed capital formation. This is calculated as a percentage of GDP. Openness is the sum of exports and imports as a percentage of GDP. Government expenditure as a percentage of

²³ inv_{it} in Equation (4.7) is meant to address domestic investments.

GDP includes the purchase of goods and services. Compensation of employees and expenditure on national defense and security are also included but military expenditure that is a part of government capital formation is not. Broad money includes money and quasi money. It is the sum of currency outside banks and demand deposits excluding those held by the central government. Inflation is a measure of the consumer price index and is the annual percentage price change of acquiring a representative basket of goods and services. Remittances consist of personal transfers and employee compensation. Net ODA comprises concessional loans and grants by official sectors with the aim of promoting economic development and welfare. It also includes loans with a grant element of at least 25 percent. It is calculated as a percentage of GNI. Annual population growth rate for year t is the exponential rate of growth of the mid-year population from year $t-1$ to t , expressed as a percentage. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. human capital is proxied using average years of schooling. Finally, the institutional quality index is developed by calculating the average of the World Bank's six worldwide governance indicators (WGI, 2016 database) -- control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law and voice and accountability.²⁴

4.6 A Discussion of the Results

Table 4.1 presents the summary statistics of the data used in the study. Skewness is the measure of the extent and direction of the asymmetry. A normal distribution is symmetric and has a skewness value of 0. When a distribution is skewed to the left, it is said to have a negative skewness implying that the mean is less than the median, at least in a unimodal distribution. In our case, the growth rate of per capita GDP, its lagged value, domestic investments and population growth rate are negatively skewed whereas all the other remaining variables are positively skewed.

Another summary of the descriptive statistics is given in Table 4A.1 in the Appendix. This table shows the correlation matrix among the variables used in the study. The correlation matrix shows that the growth rate of per capita GDP (GDPPCg) is positively and significantly

²⁴ The data for most of the variables along with their definitions is retrieved from the WDI (2016) database. Some of the definitions are taken from WDI (2016) verbatim, word for word.

correlated with domestic investments (inv), the population growth rate (popgr) and the institutional quality index (IQI) while it is negatively and significantly correlated with inflation rate. Moreover, the growth rate of per capita GDP is positively but insignificantly correlated with broad money, a proxy for financial development and openness to trade. Further, it is negatively but insignificantly correlated with FDI, ODA, remittances and human capital. Significant correlations also exist among the other explanatory variables. Domestic investments are positively and significantly correlated with government expenditure (govexp), human capital (HC) and the institutional quality index (IQI). But they are negatively and significantly correlated with FDI, ODA, remittances and inflation.

Table 4. 1: Summary Statistics

Variables	N	Sum	mean	sd	Kurtosis	skewness
per capita GDP growth	600.00	1,228.54	2.05	4.80	20.21	-1.14
per capita GDP growth lagged	560.00	1,243.87	2.04	4.84	19.04	-0.82
Domestic investments	600.00	9,687.63	16.15	9.97	17.62	-2.15
Broad money	600.00	54,349.90	90.58	1,042.88	298.02	17.23
Government expenditure	600.00	8,471.26	14.12	5.18	16.72	1.78
Inflation	600.00	56,126.84	93.54	1,408.52	297.13	17.20
Official Development Assistance	600.00	6,415.49	10.69	13.37	63.92	6.22
Remittances	600.00	1,943.11	3.24	4.84	8.85	2.28
Population growth rate	600.00	1,540.44	2.57	0.76	4.11	-0.78
Openness	600.00	44,030.50	73.38	36.18	13.96	2.41
FDI	597.00	2,903.43	4.86	8.27	39.41	4.94
Institutional quality index	600.00	17,794.29	29.66	18.22	2.93	0.74
Human capital	600.00	1,023.21	1.71	0.42	2.52	0.64

The estimation results of the static models are presented in Table 4.2. Static panel data models were estimated for the study period to provide additional empirical evidence on the nexus between remittances and economic growth in SSA. We also estimated the pooled OLS, robust static panel data fixed (within) effects (FE) and random GLS effects (RE) models. It should be noted that static panel data modeling is not the most appropriate approach for the issues at hand in terms of efficiency and reliability as well as consistency of the estimators. There is no guarantee that the estimates from the static panel data models will conform with those obtained from the system GMM estimates. When the results from the two different approaches fail to match and corroborate each other, one should resort to the robust two-step system GMM results and take them as more reliable estimates.

The results of all the three models indicate that the coefficient of broad money, which is used as one of the indicators of financial development in this study, is negative and significant at

various levels of significance. This finding is in line with Demetriades and Law (2004) and Shan (2005) while it is contrary to Levine et al. (2000), Christopoulos and Tsionas (2004), and Shahbaz and Islam (2011). This negative relationship can possibly be attributed to the inherent limitation associated with the measurement of broad money. The measurement problem of financial development is highly pronounced in the developing part of the world due to excessive dominance of the currency in circulation (M1) over quasi-money which ends up measuring the degree of monetization rather than financial development.

Our findings show that the impact of remittances on economic growth is negative and statistically significant only under the fixed-effects estimation. The sign of the result is robust across different specifications and suggests that the adverse effects of remittances on growth surpass their positive effects in SSA countries. The inflow of remittances could mitigate macroeconomic volatilities like consumption and alleviate financial and liquidity constraints thereby boosting investments on the positive side. However, these merits seem to have been outstripped by the combined negative effects of remittances on real exchange rate appreciation, brain drain of a skilled, educated and productive labor force and the adverse incentives for labor force participation which clearly outweigh the positive contributions. This is valid at the aggregate national level which can differ from the household level.

Singh, Haacker, Lee, and Goff (2010) found a significant negative impact of remittances on economic growth in SSA. Using a dynamic stochastic general equilibrium model with endogenous labor supply, Chami et al. (2008) showed that a high remittances-to-GDP ratio could actually aggravate output instability on account of the negative impact of these flows on the labor supply of remittance-receiving households. Using a cross-country approach, Chami et al. (2009) showed that the stabilizing effect of remittances on output diminished when the remittances-to-GDP ratio exceeded 2 percent. Abdi, Dagher, Chami, and Montiel (2008) claim that a high remittances-to-GDP ratio potentially leads to corruption. Among many others, Amuedo-Dorantes and Pozo (2004), Bourdet and Falck (2006) and Lartey and Mengova (2015) indicate that higher levels of remittances lead the exchange rate to appreciate. Chami et al. (2003) studied 113 countries and found a negative link between remittances and economic growth as did Rajan and Subramanian (2005). Moreover, IMF (2005) conducted a study on 101 countries and failed to find a statistical relationship between remittances and economic growth.

Concerning other key determinants of growth, our empirical findings suggest that the government expenditure to GDP ratio retards economic growth in SSA rather than propelling

it forward. This result might appear counterintuitive at first glance. However, it can be justified on the grounds that most of the SSA countries are import-dependent which implies that the governments of these countries might have spent a chunk of their expenditure on imported consumer goods rather than on locally-produced ones. Moreover, the prevalence of graft and corruption and other inefficiencies may have contributed to the adverse impact of government expenditure on economic growth.

Based on microeconomic theoretical justifications there is consensus about the pivotal role that human capital can play in economic growth (see Barro, 1991, 1996; Mankiw, Romer, & Weil, 1992). However, this is in stark contrast to the reality that one sees in macroeconomic empirical findings which are inconclusive. This could be because a number of factors are at play in influencing the role that human capital plays in economic growth. The availability of institutions, good governance, on-the-job training and apprenticeship, ease of access to jobs and social infrastructure among many others play an essential role in determining the quality of human capital and its eventual impact on long-run growth. In addition, educational quality, retention of an educated and skilled labor force in the domestic economy along with work ethics within the formal sector have a direct bearing on the productivity of labor, thereby affecting the contribution of human capital to economic growth.

Benhabib and Spiegel (2002), Caselli and Coleman (2002), Coviello and Islam (2006); Islam (1995) have documented a weakly positive, neutral or negative impact of human capital on economic growth at the macro-level. Bils and Klenow (2000), Bond, Hoeffler, and Temple (2001b), Easterly and Levine (2001a), Kumar and Woo (2010) and Prichett (2001) argue that the impact of human capital on economic growth is non-positive. On the other hand, Fedderke (2002) found that the quality of human capital had a positive role in total factor productivity but not the quantity of human capital accumulation. Temple (1999a) and Krueger and Lindahl (2001) assert that educational stock positively affects economic growth only when the initial educational stock is relatively low.

This seemingly counterintuitive result of the impact of human capital, which is measured in terms of educational attainments, on economic growth could be attributed to the presence of a lag. In other words, this means that human capital as proxied by educational attainments or the average number of years spent in school does not have a contemporaneous effect. Further, as Fuente and Domenech (2006) argue, the proxies of human capital like educational stock are subject to measurement errors.

The empirical findings of our paper support Rajan and Subramanian (2005) criticism that there is very little evidence that decades of official development assistance has contributed in a meaningful way to growth in developing countries.

Table 4. 2: The relationship between per capita GDP and remittances using static panel data models

	POLS	FE	RE
Explanatory variables	1	2	3
broad money	-0.006*** (0.00)	-0.007* (0.00)	-0.007** (0.00)
domestic investments	0.089*** (0.03)	0.083** (0.03)	0.082*** (0.03)
broad money*remittances	0.008*** (0.00)	0.010* (0.00)	0.010** (0.00)
population growth	0.978** (0.44)	1.663** (0.65)	1.312** (0.51)
foreign direct investments	0.002 (0.07)	-0.015 (0.04)	-0.013 (0.05)
official development assistance	-0.014 (0.02)	-0.032 (0.02)	-0.024 (0.02)
Remittances	-0.143 (0.10)	0.009 (0.28)	-0.105 (0.13)
Openness	0.021** (0.01)	0.052*** (0.01)	0.032*** (0.01)
government expenditure	-0.080* (0.04)	-0.097 (0.07)	-0.081 (0.06)
human capital	-1.211** (0.50)	-5.725* (2.86)	-1.829** (0.80)
Inflation	-0.000** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)
institutional quality index	0.053*** (0.02)	0.142** (0.05)	0.074*** (0.03)
remittances*institutional quality index	-0.009*** (0.00)	-0.007 (0.01)	-0.010 (0.01)
Constant	-1.060 (1.83)	-0.237 (5.27)	-2.180 (2.22)
<i>Number of observations</i>	597	597	597
<i>F-test (p-value)</i>	0.000	0.000	0.000
<i>R²</i>	0.129	0.134	0.146

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

From Table 4.3 we can see that the coefficient of the lagged value of the growth of per capita GDP is positive and significant meaning that the past value of the growth of per capita GDP propels its current growth.

Domestic investments positively and significantly affect economic growth; this can be seen in the three static panel data models in Table 4.3. However, when it comes to the linear dynamic

panel data model estimated using the system GMM, the sign of the coefficient of domestic investments is positive but statistically insignificant.

FDI has a negative impact on economic growth in the FDI receiving economies. On average, the net FDI inflows to SSA countries have not been effective in contributing to economic growth over the past decade and a half most likely due to the weak absorptive capacity of the host countries. Besides, it might also be the case that most foreign firms are participating in the retail markets in a number of SSA countries in lieu of investments in productive sectors that add value to the economy.

Trade openness positively and significantly affects economic growth. This implies that economic openness has a positive influence on growth in SSA. This finding substantiates Frankel and Romer (1999), Harrison (1996), Sachs and Warner (1995) findings that openness to international trade and foreign capital promote economic growth. Based on our findings, after controlling the effect of the other variables, one can say that a one-unit increase in the openness to GDP ratio results in an increase in per capita GDP growth by around 0.03 units in the period under consideration.

Inflation which could represent lack of price stability or a wider economic stability affects growth negatively. Macroeconomic uncertainty and investment risks are usually proxied by inflation. A spike in the general price level can discourage private investments through its adverse effect on the inflow of remittances whose motive is investment purposes (that is, non-altruistic remittances). Long-term investments can be suppressed by excessive variability of inflation because this might be construed as a signal of a malfunctioning government which has the potential of eroding investment and capital gains (Romer, 2012). Besides, Temple (1999b) argues that high inflation goes hand-in-hand with exchange rate volatility, political instability and other malaises in an economy which could potentially inhibit growth.

Institutions' impact on growth is positive meaning countries with better institutional set ups register faster economic growth.

Table 4. 3: Estimation results of per capita GDP growth rate and remittances using various econometric techniques (Dependent variable: per capita GDP growth rate)

Explanatory variables	POLS 1	FE 2	RE 3	sysGMM 4
lag of per capita GDP growth	0.239*** (0.06)	0.073 (0.06)	0.239*** (0.06)	0.196** (0.08)
domestic investments	0.076** (0.03)	0.101*** (0.03)	0.076*** (0.03)	0.074 (0.05)

population growth	0.722 (0.44)	2.238*** (0.69)	0.722* (0.42)	0.686 (0.45)
foreign direct investments	-0.031 (0.07)	-0.015 (0.04)	-0.031 (0.04)	-0.097* (0.06)
official development assistance	0.001 (0.02)	-0.017 (0.02)	0.001 (0.02)	0.023 (0.02)
Remittances	-0.036 (0.03)	0.303 (0.13)	-0.036 (0.06)	-0.078 (0.06)
Openness	0.021** (0.01)	0.053*** (0.01)	0.021** (0.01)	0.033*** (0.01)
government expenditure	-0.054 (0.04)	-0.102 (0.08)	-0.054 (0.04)	-0.022 (0.06)
human capital	-0.220 (0.45)	-6.656** (2.79)	-0.220 (0.58)	-0.405 (0.69)
Inflation	-0.000** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.001*** (0.00)
institutional quality index	0.017 (0.01)	0.095* (0.05)	0.017 (0.02)	0.012 (0.02)
Constant	-2.118 (1.98)	-0.030 (5.16)	-2.118 (1.97)	-2.420 (2.27)
<i>Number of observations</i>	557	557	557	516
<i>F-test (p-value)</i>	0.000	0.000	0.000	
<i>R²</i>	0.162	0.159	0.191	
<i>Number of groups</i>				40
<i>Number of instruments</i>				34
<i>AR(1), p-value</i>				0.004
<i>AR(2), p-value</i>				0.623

Notes: POLS is pooled OLS, sysGMM is system GMM. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

From the FE and RE estimations we observe that population growth has a positive and significant effect on economic growth while it is still positive but insignificant under the pooled OLS and system GMM estimation techniques. Mankiw et al. (1992) opine that population growth has a deleterious impact on economic growth as the available capital is thinly spread over the working age population. Temple (1999b) emphasizes the Malthusian hypothesis that population growth is economically harmful but also suggests that population growth can spur economic growth by boosting demand. Endogenous growth theorists also maintain that the more the people, the more likely it is that new ideas will be generated which will enhance productivity and encourage innovations. Hence, the final impact of population growth is ambiguous and it depends on which effect eventually dominates.

As stated earlier, remittances had an insignificant and negative contemporaneous impact on economic growth in the sampled SSA countries over the study period under most estimation techniques except a few where it had a positive but insignificant impact on economic growth. This study shows that a big part of the remittances that flow into SSA countries is directed

towards economically unproductive uses. Moreover, the fact that the proportion of remittances that flow into SSA is low can also explain the negligible impact of remittances on economic growth.

Our study found that ODA did not have an effect on domestic investments. Given this finding, a question arises as to where does the aid go? We should be cautious that aid not having a positive effect on domestic investments is not tantamount to saying that aid is ineffective. Aid could finance legitimate consumption expenditure, social services such as education and health and capacity building and other merit goods which may not necessarily reflect investment uses. Under such circumstances, aid will have a positive indirect effect on economic development through education and health. Hence, our findings should not be taken as the ineffectiveness of foreign aid in SSA countries.

From Table 4.4 we can see that remittances have a statistically significant negative impact on domestic investments. This finding contradicts Giuliano and Ruiz-Arranz (2009) and Mundaca (2009) findings of a positive impact of remittances on domestic investments.

FDI's estimated coefficients in most of the regression models provide unassailable support for the argument that FDI crowds-out domestic investments. This finding is robust across a number of specifications and is statistically significant.

The coefficient corresponding to the lending interest rate carries the anticipated negative sign though it is statistically insignificant under most of the estimation techniques. However, it has a statistically significant negative effect under the fixed-effects method at the 1 percent significance level.

The fact that the coefficient of remittances is negative and statistically significant under some of the models estimated in this paper supports remittance pessimists' view that remittances could have a harmful effect in net terms on a nation's economic growth. This happens because remittances have the potential to fuel inflation, detrimentally affect the tradable sector through domestic currency appreciation and reduce incentives to work because the receiving households tend to opt for leisure over work. Domestic investments are one of the channels through which the negative impact of remittances on economic growth is reflected.

Table 4. 4: The determinants of domestic investments

	Pooled OLS	Fixed effect	Random effect	Model33	Model34
Explanatory variables	1	2	3	4	5
lag of domestic investments	0.549*** (0.09)	0.242*** (0.08)	0.549*** (0.17)	0.532*** (0.21)	0.529** (0.23)
Remittances	-0.436** (0.19)	0.727** (0.32)	-0.436*** (0.15)	-1.281 (0.81)	-1.451* (0.78)
institutional quality index	0.045** (0.02)	0.170** (0.07)	0.045 (0.04)	0.062 (0.12)	0.078 (0.12)
broad money	-0.005* (0.00)	0.004 (0.00)	-0.005* (0.00)	-0.021 (0.02)	-0.025 (0.02)
remittances*institutional quality index	0.006 (0.00)	-0.019*** (0.01)	0.006 (0.01)	-0.002 (0.02)	-0.006 (0.03)
broad money*remittances	0.007* (0.00)	-0.005 (0.01)	0.007* (0.00)	0.028 (0.02)	0.034 (0.03)
human capital	-0.691 (0.76)	9.743** (3.67)	-0.691 (1.43)	-2.102 (2.80)	-2.821 (3.33)
official development assistance	-0.044 (0.03)	-0.144*** (0.02)	-0.044 (0.04)	- -	- -
foreign direct investments	-0.513*** (0.13)	-0.645*** (0.14)	-0.513*** (0.19)	-0.909*** (0.22)	-0.899*** (0.21)
government expenditure	0.114* (0.05)	0.120* (0.07)	0.114 (0.10)	-0.101 (0.40)	-0.156 (0.37)
Inflation	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	-0.001 (0.00)	-0.001 (0.00)
lending interest value	-0.005 (0.00)	-0.012*** (0.00)	-0.005 (0.00)	-0.005 (0.02)	-0.004 (0.02)
Openness	0.038** (0.02)	0.119*** (0.02)	0.038* (0.02)	0.114* (0.06)	0.115** (0.06)
Constant	6.205*** (1.45)	-15.173*** (4.41)	6.205** (3.01)	7.753 (7.92)	9.556 (6.56)
<i>Number of observations</i>	543	543	543	543	543
<i>F-test (p-value)</i>	0.000	0.000	0.000		
<i>R²</i>	0.231	0.174	0.183		
<i>Number of groups</i>				40	40
<i>Number of instruments</i>				23	33
<i>AR(1), p-value</i>				0.003	0.006
<i>AR(2), p-value</i>				0.453	0.853

Notes: Model33 indicates that the estimated model uses the second lag of the endogenous variables as instruments while Model34 implies that the estimated model applies the third and fourth lags of the endogenous variables as instruments. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.6. 1. Robustness Checks and Diagnostic Tests

Tables 4.5 and 4.6 present the coefficients of the models used for robustness checks with data from the same source with the addition of new variables and varying lag lengths of the endogenous variables.

The estimation results in Table 4.5 show that remittances do not make a significant positive contribution to economic growth. In some of the instances when remittances have a significant impact on economic growth, it is generally negative. Most of the coefficients are very small in magnitude and lack significance particularly when the lag lengths of the conditioning variables change. The choice of the conditioning variables and the estimation methods strongly affect the coefficients and their significance. Hence, our study gives no robust empirical evidence that remittances contribute positively to economic growth.

The coefficient estimates for FDI, domestic investments and the institutional quality index are positive but statistically insignificant while those for government expenditure are negative and insignificant under all the three model specifications.

The findings of our study do not fully substantiate, and only suggest, the widely held view that remittances deter growth in low-income developing countries like SSA countries which are characterized by high marginal propensity to consume because of the statistical insignificance of the coefficients though they are negative. Nonetheless, Barajas et al. (2009), Chami et al. (2003), Jongwanich (2007) and Karagöz (2009) decisively concluded that remittances inhibited economic growth in developing countries. Unlike previous studies such as those by Barajas et al. (2009) and Karagöz (2009) which analyzed the impact of remittances on the logarithm of (level of) real per capita GDP, this study probes the impact of remittances on the growth rate of real per capita GDP.

Our study finds that remittances have a negative impact on economic growth. Moreover, the positive and significant coefficient of the interaction term between remittances and financial development as proxied by broad money signifies that the adverse marginal impact of remittances on economic growth decreases with the level of financial development. To put it differently, the contribution of remittances to growth is likely to be higher in countries with well-developed financial systems. Remittances complement financial systems to boost growth. By doing so they channel resources towards productive investment ventures. Remittances offer a requisite response to the exigencies of credit and insurance in tandem with other financial

institutions. In the process, they also act as *de facto* complements to financial services in promoting growth.

The negative coefficient of remittances and the other positive and significant coefficient of the interaction term between remittances and the institutional quality index suggest that the adverse impact of remittances on economic growth declines as the level of institutional quality index increases probably because recipients become more skillful and savvy in their use of remittances when there are strong institutions.

The two-step system GMM estimation technique satisfies all the post-estimation diagnostic tests. The Arellano and Bond (1991) test for second-order serial correlation fails to reject the null of no autocorrelation. Moreover, the Hansen (1982) test for over-identification does not reject the null hypothesis that the over-identification restrictions are valid which is a desirable thing.

Table 4. 5: The impact of remittances on per capita GDP growth using the system GMM formulation

Explanatory variables	Model22 1	Model23 2	Model33 3
lag of GDP per capita growth	0.198** (0.10)	0.214*** (0.07)	0.205*** (0.07)
foreign direct investments	0.007 (0.14)	0.112 (0.15)	0.119 (0.17)
domestic investments	0.262 (0.16)	0.121 (0.14)	0.288 (0.22)
Inflation	-0.001*** (0.00)	-0.001* (0.00)	-0.001 (0.00)
broad money	0.016* (0.01)	-0.010 (0.01)	-0.027* (0.01)
Remittances	0.649 (0.51)	-0.484 (0.82)	-0.204 (0.57)
official development assistance	0.191** (0.08)	0.057 (0.08)	-0.015 (0.07)
institutional quality index	0.017 (0.16)	0.255 (0.22)	0.048 (0.11)
government expenditure	-0.160 (0.23)	-0.192 (0.25)	-0.331 (0.28)
human capital	1.146 (4.95)	-1.583 (3.40)	-5.012 (7.35)
broad money*remittances	-0.021* (0.01)	0.013 (0.01)	0.035*** (0.01)
remittances*institutional quality index	0.013 (0.02)	-0.005 (0.03)	0.070*** (0.02)
Constant	-6.447	-2.283	12.471

	(7.52)	(8.73)	(13.60)
<i>Number of observations</i>	557	557	557
<i>Number of groups</i>	40	40	40
<i>Number of instruments</i>	23	33	23
<i>AR(1), p-value</i>	0.005	0.004	0.003
<i>AR(2), p-value</i>	0.502	0.607	0.453

Notes: Model22 indicates that the estimated model uses the second lag of the endogenous variables as instruments while Model23 implies that the estimated model applies the second and third lags of the endogenous variables as instruments. Model33 can be interpreted analogously.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

As can be seen from Table 4.6, the estimated coefficient of the remittances variable is negative in five of the seven specifications and positive in two. However, none of these coefficients are statistically significant; this result is the same as the baseline regression presented in Tables 4.2-4.4. These coefficients corroborate our earlier finding that remittances do not have any statistically significant impact on economic growth. Thus, the negative sign of the coefficient of remittances looks to be robust to various specifications and selections of different lags of the explanatory variables.

In addition to broad money, we also used credit and loans as financial development indicators. The positive but insignificant coefficient of credit is consistent with economic theory and most other empirical findings. Moreover, the coefficient of loans bears the *a priori* expected positive sign but it is statistically insignificant.

In all the specifications that we apply, the Hansen test and the second-order autocorrelation tests verify that we cannot reject the validity of the moment conditions that we assumed for the estimation models.

The models in Table 4.6 differ in the combination of the variables that they use in representing financial development. For instance, Model 1 does not use any variable that reflects financial development whereas Model 2 uses broad money as a proxy for financial development. Model 3 uses domestic credit to the private sector as a percentage of GDP while Model 4 uses claims on the private sector (annual growth of loans as a percentage of broad money) to proxy for financial development. Model 5 uses all the three financial development indicators as well as the interaction between broad money and remittances. On the other hand, Model 6 uses broad money, credit, loans and the interaction between institutional quality and remittances as

indicators of financial development in the model. Finally, Model 7 encompasses all the proxies of financial development applied in Models 2-6 as proxies for financial development.

The role of human capital in output and economic growth is not without controversy. Islam (1995) found the impact of human capital on output to be insignificant. But he opines that human capital should affect growth through its effect on TFP. Benhabib and Spiegel (1994) incorporated human capital into their output-growth estimation and found that the impact of human capital on output-growth was either insignificant or negative. They concluded that human capital did not affect growth directly but rather indirectly through its effect on TFP. Contrary to this finding, Miller and Upadhyay (2000) argue that there is no direct significantly positive effect of human capital on the TFP stock. However, it positively and significantly affected income growth at the 10 percent significance level. Notwithstanding all these empirical findings, Ang (2009) stresses that the composition of educational attainment is important for human capital to have either a positive or a negative impact on economic growth and TFP. He argues that in high- and middle-income countries, the presence of a larger stock of human capital with tertiary education boosts TFP because people are more likely to engage in innovations. However, in low-income countries the role of human capital is likely to be minimal in enhancing output and TFP growth as the people are mainly preoccupied with imitating the technologies of the more affluent and advanced countries.

Table 4. 6: Estimation results of per capita GDP growth using various forms of the linear dynamic panel data

Explanatory variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model6	Model 7
lag of per capita GDP growth	0.196** (0.08)	0.196** (0.08)	0.176** (0.08)	0.195** (0.08)	0.191** (0.08)	0.197** (0.08)	0.190** (0.08)
domestic investments	0.074 (0.05)	0.074 (0.05)	0.074 (0.05)	0.079* (0.04)	0.054 (0.05)	0.087* (0.05)	0.066 (0.05)
population growth	0.684 (0.45)	0.680 (0.45)	0.511 (0.49)	0.545 (0.41)	0.621 (0.49)	0.467 (0.46)	0.682 (0.50)
foreign direct investments	-0.097* (0.06)	-0.097* (0.06)	-0.096 (0.06)	-0.091 (0.06)	-0.107* (0.07)	-0.086 (0.06)	-0.098 (0.07)
official development assistance	0.024 (0.02)	0.024 (0.02)	0.022 (0.02)	0.025 (0.02)	0.020 (0.02)	0.026 (0.02)	0.017 (0.02)
Remittances	0.076 (0.06)	-0.078 (0.06)	0.077 (0.06)	-0.069 (0.06)	-0.349 (0.15)	-0.029 (0.17)	-0.339 (0.14)
Openness	0.033*** (0.01)	0.033*** (0.01)	0.035*** (0.01)	0.031*** (0.01)	0.031*** (0.01)	0.031*** (0.01)	0.033*** (0.01)
government expenditure	-0.023 (0.06)	-0.023 (0.06)	-0.016 (0.06)	-0.011 (0.05)	-0.015 (0.05)	-0.013 (0.06)	-0.035 (0.06)
human capital	-0.404 (0.69)	-0.406 (0.69)	-0.397 (0.71)	-0.239 (0.69)	-0.354 (0.68)	-0.346 (0.65)	-1.250* (0.69)
Inflation	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.000*** (0.00)
institutional quality index	0.012 (0.02)	0.012 (0.02)	0.021 (0.02)	0.005 (0.02)	0.010 (0.02)	0.010 (0.02)	0.047** (0.02)
broad money		-0.000**			-0.005**	-0.000***	-0.011***

		(0.00)			(0.00)	(0.00)	(0.00)
Credit		0.021			-0.008	-0.005	-0.011
		(0.02)			(0.02)	(0.02)	(0.02)
Loan			0.048		0.049	0.047	0.049*
			(0.03)		(0.03)	(0.03)	(0.03)
broad money*remittances					0.007*		0.014***
					(0.00)		(0.00)
remittances*institutional quality index						-0.001	0.012***
						(0.01)	(0.00)
Constant	-2.412	-2.397	-2.011	-2.758	-1.916	-2.570	-1.235
	(2.27)	(2.27)	(2.26)	(2.20)	(2.15)	(2.13)	(2.13)
<i>N</i>	516	516	516	516	516	516	516
<i>Number of groups</i>	40	40	40	40	40	40	40
<i>Number of instruments</i>	36	36	36	36	36	39	40
<i>AR(1), p-value</i>	0.007	0.004	0.009	0.006	0.006	0.005	0.003
<i>AR(2), p-value</i>	0.748	0.843	0.398	0.728	0.312	0.356	0.472

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.7 Conclusion and Policy Implications

4.7.1 Conclusion

Our findings suggest that decades of remittance transfers have contributed little to growth in remittance-receiving SSA countries. Once remittances were properly measured and other relevant factors were accounted for in the model specifications, we failed to find a robust and significant positive effect of remittances on economic growth. Though statistically insignificant, the relationship between remittances and economic growth was negative under most scenarios.

Remittances had an insignificant and negative contemporaneous impact on economic growth in the sampled SSA countries over the study period 2001-15 under most estimation techniques except for a few cases where it had a positive but insignificant impact on economic growth. Our study concludes that a big chunk of the remittances that flow into SSA is directed towards economically unproductive uses though more empirical investigation is needed to back this claim. Moreover, the fact that the proportion of remittances that flow into SSA is low could be another reason for the negligible impact that they have on economic growth.

Our findings do not fully substantiate the widely held view that remittances deter growth in low-income developing countries like SSA countries which are characterized by high marginal propensity to consume. This happens to be the case due to the statistical insignificance of the coefficients though they are negative. Nonetheless, Barajas et al. (2009), Chami et al. (2003), Jongwanich (2007) and Karagöz (2009) conclude that remittances inhibit economic growth in developing countries. Unlike previous studies such as those by Barajas et al. (2009) and Karagöz (2009) which analyzed the impact of remittances on the logarithm of real per capita

GDP, our study probed the impact of remittances on the growth rate of real per capita GDP in SSA countries.

The effects of most of the control variables on economic growth are in line with standard growth regression results. However, there are some whose effects are inconsistent with popular *a priori* economic theory. For example, there is enough theoretical and empirical evidence about the positive role of financial deepening in economic growth. Contrary to this conventional thinking, our study finds that financial deepening, as proxied by broad money, retards growth rather than serving as a catalyst. However, the two other proxies for financial development (credit and loans) have the expected positive signs but their impact on economic growth is statistically insignificant.

In general, our findings give insights on both channels of financial development and institutional quality through which remittances may affect economic growth positively.

4.7.2 Policy Implications

Our findings suggest that economic and financial policies which pave the way for a business-friendly investment environment to flourish are crucial for remittances to have a positive impact on longer-term development. Further, the provision of quality public services in the form of education and healthcare as well as reliable security and a healthy financial sector are catalysts in enabling remittances to have a positive role in growth.

Our findings corroborate the widely held view in development literature that most of the remittances are spent on consumption, housing and land and are not utilized as productive investments which would contribute to long-term economic growth. Hence, more should be done to exhort remittance recipients to harness their money into productive ventures.

Governments and development practitioners in SSA should educate remittance recipients to nurture and bolster their culture of saving. Besides, policymakers and other relevant government bodies should advise remittance recipient households to desist from viewing remittances as substitutes for labor income. Further, well-functioning and strong institutions should be built that will enable the region to unlock and tap into the enormous potential that remittances have for boosting growth.

Appendix 4

Table 4A. 1: Correlation Matrix

	GDPPCg	BM	inv	popgr	FDI	ODA	rem	openness	inflation	govexp
GDPPCg	1									
BM	0.002	1								
inv	0.207***	0.010	1							
popgr	0.099**	-0.012	-0.037	1						
FDI	-0.046	0.004	-0.546***	0.099**	1					
ODA	-0.016	0.026	-0.328***	0.294***	0.348***	1				
rem	-0.064	-0.027	-0.192***	0.002	0.207***	0.201***	1			
openness	0.060	-0.009	0.171***	-0.175***	0.419***	0.324***	0.152***	1		
inflation	-0.174***	-0.002	-0.082**	-0.096**	-0.026	0.007	-0.042	0.037	1	
govexp	0.022	-0.048	0.147***	-0.052	0.039	0.026	-0.001	0.139***	-0.130***	1
HC	-0.003	0.062	0.188***	-0.496***	-0.008	-0.240***	-0.030	0.257***	0.087**	0.102**
IQI	0.112***	0.014	0.366***	-0.364***	-0.039	-0.128***	-0.024	0.094**	-0.081**	0.303***

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

Note: GDPPCg is the growth rate of per capita GDP, BM is broad money, Inv is domestic investments, Popgr is the population growth rate, rem is remittances, govexp is government expenditure, HC is human capital and IQI is the institutional quality index.

Chapter Five

The Impact of External Debt on Economic Growth: Empirical Evidence from SSA

Yemane Michael

Department of Economics

College of Business and Economics

Addis Ababa University

E-mail: yemanewj@yahoo.com

[February 16, 2019](#)

Abstract

This study empirically investigates the relationship between external debt and economic growth in SSA. The debate about the threshold effects in the debt-growth nexus has re-emerged and become heated following Reinhart and Rogoff (2010a) and (Reinhart, Reinhart, & Rogoff, 2012) recent work. Hence, this study analyzes the debt-growth nexus within a standard neo-classical growth model for aggregate economy data. The data used is from 1986 to 2015. The empirical findings obtained using the system GMM method show that there is no evidence to support the existence of the highly popular hypothesis of an Inverted-U shaped relationship between external debt and economic growth. If the Inverted-U relationship were to hold, the sign of the coefficient of external debt should be positive whereas that of external debt squared should be negative which is not the case here. Our results show that the coefficient of the square of external debt is positive and significant which contravenes the hypothesis and suggests that our empirical findings do not back the Inverted-U shaped or concave type non-linear quadratic relationship between external debt and economic growth. This finding corroborates Presbitero (2006); Schclarek (2004); and Warner (1992) empirical studies.

JEL Classification Codes: C33, C51, C52, E22, E23, E62, F43, H63

Keywords: External public debt, economic growth, impacts, SSA.

5.1 Introduction

Public debt is defined as the amount of money that a country owes to lenders other than itself. The lending entities can include individuals, businesses and even other governments. The term ‘public debt’ is often used interchangeably with the terms sovereign debt, national debt and government debt.

Public debt very often refers to national debt, but some countries also include the debt owed by states as well as by provinces and municipalities. Therefore, one needs to be cautious when comparing public debt in different countries to make sure that the definition is the same. Notwithstanding what it is called, public debt is the accumulation of annual budget deficits. It is a result of years of a government spending surpassing the revenue that it generates via taxes, fines and other mechanisms. In short, public debt is classified as the sum of external and domestic debt.

External (public) debt refers to a portion of a country’s debt that is borrowed from foreign lenders including commercial banks, governments and international financial institutions. These loans, and the accrued interest, must very often be paid in the currency in which the loan was taken.

There is a wealth of empirical literature on the non-linear effects of public debt on economic growth in various regions. A large number of these studies are cross-country studies which mainly focus on advanced countries (see Geiger, 1990; Panizza & Presbitero, 2013; Reinhart & Rogoff, 2010a; Schclarek, 2004; Serrão, 2016). However, there are very few such studies on SSA. Most of the studies undertaken in recent years provide a superficial glimpse of SSA and some of them even neglect it totally.

This study empirically explores the relationship between external public debt and economic growth in SSA. It specifically examines the turning point or the threshold value of public debt below (above) which it has a positive (negative) effect on economic development. It does this by studying the long-run impact of external public debts on economic growth and investigates whether the debt-growth relation varies with the level of indebtedness in SSA using panel data for 1986-2015.

5.2 Motivation for the Study

Achieving economic growth and development has been on the agenda of policymakers and governments in developing countries. To attain these goals, resources have been mobilized

from a variety of sources including tax collections, money printing or seigniorage and borrowing from domestic and foreign sources.

External (public) debt²⁵ is regarded as one essential way of financing budget deficits by both developed and developing countries. The debt crisis which can be traced back to the 1970s and 1980s recently reared its head again particularly after the 2008 financial crisis. Hence, in recent times, soaring debt burdens have become a concern for governments not only in the developing countries but also in developed countries.

Many studies investigate the effects of debt on economic growth only to reach conflicting conclusions. The main point of contention is the level of debt considered as ‘optimal’ marking the line where the amount of debt starts posing a risk to the economy.

Quite a large number of studies assess the nexus between external debt and economic growth in both single-country and cross-country cases. But most of this empirical literature by prominent economists focuses on the cross-country case making use of panel data for advanced and emerging market economies.

Hence, this study is motivated to fill this gap because of the dearth of empirical literature on the topic in SSA. Some recent studies deal with the impact of debt on economic growth without addressing the threshold effects and the potential non-linearities that could exist between the two. Further, literature’s main emphasis is on the relationship between external debt and economic growth mainly in emerging market economies while neglecting SSA.

Though theoretical literature on external debt and economic growth is well established, the empirical evidence is mixed and there is no agreement on external debt’s real effect on economic performance. Thus, this study focuses on the economic repercussions of external debt in SSA with the goal of re-examining the channels through which external debt affects economic growth and domestic investments.

In recent times, research has started focusing on estimating the impact of public debt on economic growth particularly after the 2008 financial crisis. There is also an emerging line of research which emphasizes the non-linearities in the debt’s impact on economic growth (see Clements, Bhattacharya, & Nguyen, 2003; Karagol, 2002; Patillo et al., 2002; 2004; Schclarek,

²⁵ External debt and external public debt are used interchangeably.

2004). Moreover, there are diverging results in literature on the debt threshold behavior. All these issues motivated this chapter.

5.3 Research Questions

This study answers the following questions related to the external debt-economic growth nexus:

- What are the channels through which external debt affects economic growth?
- How does the government react to the accumulation of debt?
- What is the threshold value of external public debt which results in a sign change in the debt-growth nexus?

5.4 Objectives of the Study

The main objective of this study is answering these questions by investigating the effect of external public debt on economic growth in SSA. To attain this core objective, it addresses the following specific objectives:

- Probing the external debt-economic growth nexus in SSA
- Analyzing the impact of external debt on domestic investments
- Finding the threshold value of external debt above (below) which it has a negative (positive) effect on economic growth

5.5 Literature Review

Public debt becomes unsustainable when the debt burden starts mounting as the growth in debt surpasses revenue growth and debt servicing starts exceeding the recommended threshold levels. Certain aspects are of great importance in avoiding this situation. First, fiscal consolidation and a policy mix that support growth are required for successful debt reduction. Second, fiscal consolidation that is aimed at reforming structural limitations is preferred over myopic measures. Third, it is well recognized that debt reduction is bound to be time consuming.

An interesting issue related to public debt is associated with the idea of the ‘rational Ponzi game’ which is a situation where all principal repayments and interest are forever ‘rolled over’, that is, financed by issuing new debt. The predictions in theoretical economics literature about the impact of public debt and deficit spending on the economy are ambiguous and acrimonious.

A country’s public debt is considered sustainable when its government’s budget constraints can be met without disrupting and compromising its monetary and fiscal policies. In other words, a debt is sustainable when the present value of future revenue flows minus debtor expenses can pay for all that has been contractually agreed upon so far.

Internationally different indicators and thresholds have been used for assessing the debt sustainability of low income countries at different times. Prior to the introduction of the Highly Indebted Poor Countries (HIPC) initiative in 1996, debt sustainability was usually assessed using the ratios of debt stock to gross national product (GNP) and/or exports and debt service to exports. Determining debt and fiscal sustainability is not easy as there are no internationally agreed on benchmarks and criteria for classifying countries under different levels of indebtedness. Notwithstanding this, the World Bank regularly publishes the ranges that it uses for classifying countries as severely or moderately indebted on the basis of 3-year average ratios of the present value (PV) of debt to GNP or PV of debt to exports of goods and all services.²⁶

With the introduction of the HIPC Initiative in 1996 and its enhancement in 1999 the key indicators used for evaluating a country’s debt sustainability are: the present value of debt to domestic budget revenue, the present value of debt to exports and debt service to exports ratio. However, in recent times, the Bretton Woods Institutions (BWI) have re-examined how to gauge and evaluate long-term debt sustainability and the indicators and thresholds to be used for low income countries which go far beyond the HIPC Initiative. For this they have formulated the new long-term debt sustainability framework (DSF).

Capital accumulation plays a pivotal role in economic growth. Developing countries which strive for a higher economic growth trajectory find it very difficult to achieve this due to their high fiscal imbalances. This inhibits them from generating investment opportunities that will help them prosper. To overcome this hurdle, they rely on foreign borrowings or external debt.

²⁶ Severely indebted countries were defined as those with $PV/GNP > 80\%$ or $PV/exports > 220\%$. Moderately indebted countries had $48\% < PV/GNP < 80\%$ or $132\% < PV/exports < 220\%$.

With the passage of time, there emerges the accumulation of external debt stock. External debt by itself may not be an economic problem and hence might not necessarily retard economic growth. It is a country's failure to meet its external debt obligations that poses a serious risk to economic prosperity and very often leads to a debt overhang. Krugman (1988) describes the term 'debt overhang' as a situation in which a country's expected repayment ability for external debt falls below the contractual value of the debt. Clements et al. (2003) came up with a theoretical model of the non-linear impact of foreign borrowings on domestic investments, a relationship which can be extended to economic growth. They argue that up to a certain threshold, foreign debt accumulation can enhance investments, but beyond such a threshold point debt overhang starts adding negative pressure on investors' willingness to provide more capital.

Further, Greene and Villanueva (1991), Serven and Solimano (1993), Elbadawi, Ndulu, and Ndung'u (1997), Deshpande (1997) and Chowdhury (2001) find evidence in support of the debt overhang hypothesis. Fosu (1999) empirically investigated the relationship between external debt and economic growth in 35 SSA countries and argues that there is empirical support for the debt overhang hypothesis. In contrast, Hansen (2001) using a sample of 54 developing countries, of which 14 are HIPC countries did not find a statistically significant result in support of the negative effect of external debt on growth. Similarly, Savvides (1992) found that the ratio of debt to gross domestic product (GDP) did not have a statistically significant effect on growth. After reviewing a number of studies on the debt overhang hypothesis, Dijkstra and Hermes (2001) concluded that empirical evidence was inconclusive. On top of this, only a few studies gave a threshold value of the debt-to-GDP ratio which kick-starts the debt overhang effect.

Developing economies have limited sources for generating revenues. Failure to channel external funds for boosting productivity and creating employment opportunities in developing countries could eventually result in lower tax revenues and higher debt servicing, leading to higher deficits. Inability to service debt on time as per the agreements reached with the creditors makes it harder for developing countries to get additional debt at concessional rates. Besides, stringent conditionalities could be attached to their future loan agreements, if ever granted. This could increase the sovereign risk which may reduce FDI inflows to the country. This, in turn, increases the country's reliance on domestic resources which disrupts the balance between fiscal and monetary policies and results in crowding-out, further dragging down economic growth. Shabbir (2013) found a long-run inverse relationship between external debt indicators

and economic growth. Moreover, he observed that fixed capital formation helped an economy to grow while external debt servicing significantly diminished fixed capital formation.

According to the neo-classical view, government expenditure that is financed through tax collections will affect the economy differently if the expenditure is financed by issuance of government bonds. This school of thought opines that budget deficits will increase consumption by shifting taxes to future generations. It further argues that savings will have to decrease due to an increase in consumption if the economy is at its full employment level. Hence, interest rates need to increase to return the capital market to equilibrium. Therefore, this view propounds that deficit finance crowds-out capital accumulation thus inhibiting and retarding economic growth. The bottom line is that the neo-classical view believes that debt financing will increase consumption and so have an adverse effect on the economy.

On the contrary, the Keynesian view posits that provided there is under-employment and unemployment of resources, deficit financing has expansionary effects. Treating deficit spending as an increase in disposable incomes, individuals will raise consumption, which in turn will increase aggregate demand throughout the economy. The Keynesians argue that a current tax cut will increase the aggregate demand by a significant amount due to the assumption of myopic individuals who possess a high marginal propensity to consume. As a result, national income will spike and bring about the typical Keynesian multiplier effects. Therefore, national income increases with deficit finance because of which capital accumulation will not be adversely affected. Instead, deficit finance, if implemented at the right time, will have a positive multiplier impact on the economy.

The third strand of literature known as the Ricardian Equivalence Theorem (RET) justifies the impact of deficit spending on economic growth from a different perspective. According to the Ricardian view the way a government finances its budget does not affect the economy. The Ricardian equivalence proposition says that under a set of bold assumptions such as infinite time horizons, a perfectly operating capital market, rational and farsighted individuals, certainty about future incomes and non-distortionary or lump-sum taxation, government financing of expenditure either by debt or taxation has an equivalent effect on the economy, that is, debt and tax financing methods yield equivalent outcomes. The equivalence proposition was named in memory of David Ricardo who was the first in stating that, ‘In point of economy, there is no real difference in either the modes...taxation versus issuance of public debt.’ Robert Barro in his seminal paper ‘Are Government Bonds Net Wealth?’(1974) talked of this proposition in the context of modern economic theory. In the framework that Barro developed,

intergenerational transfers act as an operative chain that converts finite horizons into infinite ones. Private consumption is not affected by an increase in taxes used for retiring government debt. Individuals anticipate an increase in future taxation and hence leave operative bequests or wealth to their children for them to be able to redeem a future increase in taxes. If individuals can freely borrow or lend at an interest rate, they will be indifferent to a one-dollar tax increase used for retiring a one-dollar debt instrument paying the interest rate. Hence, tax and debt-financing will have an equivalent effect on the economy and the consumption decision will remain unchanged. This is the famous Ricardian Equivalence Theorem (Adji, 2007).

Reinhart and Rogoff (2010a) point out the existence of strong negative effects of high public debt on economic growth. On the basis of simple descriptive statistics, they forcefully demonstrate that economic growth slowed down considerably if the public debt-to-GDP ratio exceeded 90 percent. Patillo et al. (2002) empirically support the claim that the impact of debt on growth is non-linear meaning that at low levels debt has positive effects on growth; but above a particular turning point and threshold, additional debt starts having a detrimental impact on growth.

One of the key assumptions implied in most empirical studies which deal with the impact of public debt on economic growth is that lower economic growth is spurred by high debt stocks. They contend that an increase in budget spending leads to a crowding-out effect and even to a debt overhang. However, in theory there could be bidirectional causality. For example, during recessions, debt increases due to automatic stabilizers. On the other hand, a countercyclical fiscal policy decreases taxes and increases spending to boost GDP growth. Moreover, debt is usually measured as a debt to GDP ratio, in which case when GDP falls, there is a mechanical increase in the debt ratio. There is also another possibility that both debt and growth can be impacted by a third factor. For instance, wars or economic crises both shrink GDP growth and increase debt. This is an important endogeneity issue which is a typical case of feedback effect. Some literature tries to mitigate the feedback effect by incorporating the initial value level of the economic growth rate or public debt. Besides, Reinhart et al. (2012) argue that when the relationship is non-linear, causality runs from large public debt to a slowing down of economic growth.

Krugman (1988) and Checherita and Rother (2010) propound that an external debt overhang affects economic growth through private investments, as both domestic and foreign investors are prevented from supplying further capital. According to these writers, the channels through which government debt is found to have an impact on the economic growth rate are private

savings, public investments, total factor productivity (TFP) and sovereign long-term nominal and real interest rates.

There is widespread consensus among economic theorists that ‘reasonable’ levels of borrowing by a developing country can enhance its economic growth, both through productivity growth and capital accumulation. Developing countries in the early stages of their development are manifest by a shortage of capital stock. This implies that developing countries are likely to have investment opportunities with rates of return higher than in developed countries. Given this scenario, if developing countries use borrowed funds for productive investments and do not suffer from any macroeconomic malaise, policies that distort economic incentives or sizable adverse shocks then their growth should improve and allow for sensible, prudent and well-timed debt repayments.

Reinhart and Rogoff (2010a) found that the annual average growth rate of countries with public debt/GDP ratio that exceeded 90 percent was 2 percentage points lower than the average growth rate of countries with that ratio falling below 30 percent (1.7 percent and 3.7 percent per year respectively). The other interesting finding of their study is that the growth rate was not sensitive to public debt at intermediate levels of the debt/GDP ratio. They compared countries with a debt/GDP ratio between 30 and 60 percent with those whose ratio ranged between 60 and 90 percent and found the difference in the annual average growth rate to be only 0.4 percent higher, that is, 3 and 3.4 percent respectively. Based on this finding, they arrived at the conclusion that the relationship between public debt and economic growth was non-linear and opined that there was a threshold level of the debt/GDP ratio above which the effect on growth was significantly stronger. They further indicated that the threshold level is 90 percent for advanced countries (Tourinho & Sangoi, 2015).

External debt is a crucial source of finance which is principally used for augmenting domestic sources of funds to advance a country’s development projects and other needs. Countries usually resort to external debt when they are unable to fully mobilize resources from domestic sources of revenue generation like savings, taxes and domestic borrowings to cover government expenditure. If the external debt is not appropriately utilized in income generating and productive activities, a debtor nation’s ability to repay the loan could be significantly compromised. It is believed that excessive debt accumulation and debt servicing are impediments to sustainable growth and poverty reduction (Berensmann, 2004; Maghyereh & Hashemite, 2003; Siddique, 2015).

Other things being equal, the government's interest bill and budget deficit could increase due to higher debt servicing which implies that interest rates could be hiked leading to the crowding-out of the credit available for private investments dampening economic growth. Moreover, higher debt service payments could have deleterious effects on the composition of public spending by reducing the amount of resources that are meant for infrastructure development and human capital formation with negative impacts on growth. Some non-governmental organizations (NGOs) hold the view that high external debt is one of the barriers in meeting basic human needs in developing countries.

Ajayi (1991) contends that there is a direct impact of the macroeconomic implications of debt management systems on the borrowing countries. For example, if appropriate fiscal policies are not pursued to dampen the effect of foreign resource inflows on the value of the home currency, large scale external borrowings can lead to the Dutch-Disease. Due to large inflows of foreign currency as a result of external debt, appreciation of the local currency could take place which, in turn, will result in a loss of competitiveness for the export sector of the country. This is detrimental to economic growth. Besides, there is a possibility that external borrowings lead to the under-employment of the financial sector's potential. When the government chooses to borrow from outside sources instead of from domestic sources, domestic financial intermediaries are denied money creation to some extent. In the meantime, the associated benefits that could have contributed to growth are taken away from the domestic financial intermediaries. Abbas (2007) concludes that there exists a negative relationship between external debt and economic growth. Moreover, he finds that when the domestic debt as a percentage of GDP surpasses 35 percent, it retards economic growth. However, Blavy (2006) claims that this threshold level of domestic debt is 21 percent of GDP.

There is a counter-argument to this which says that internal financing entails problems of its own. For instance, when the central bank finances government expenditure by printing more money, it leads to inflationary pressures and could ultimately lead to financial repression. In addition, reliance on commercial banks for financing domestic deficit potentially brings other distortions in the economy. Beugrand, Loko, and Mlachila (2002) argue that domestic debt is more expensive as compared to external debt. Besides, on account of the high yields on domestic public debt, banks become complacent about costs and consequently fail to exert more effort to mobilize deposits that help finance private sector projects. When analyzed from a risk-weighted perspective, government borrowings are more lucrative for banks. As a result, domestic debt can crowd-out private investments (Hauner, 2006).

Contrary to the findings of (Patillo et al., 2002, 2004) that at low levels external debt affects economic growth positively while at high levels the relationship becomes negative. Schclarek (2004) examined a panel dataset comprising 59 developing and 24 industrialized countries and concluded that for developing countries, the relationship between external debt and economic growth was always negative and statistically significant. He argues that there is no evidence to support a positive relationship between external debt and economic growth even at low debt levels and asserts that the relationship between the two is negative at all levels. Cunningham (1993), Deshpande (1997) and Ezeabasili, Isu, and Mojekwu (2011) reached similar conclusions that there exists a negative relationship between external debt and economic growth. Moreover, Sawada (1994), Iyoha (1999a), and Kutivadze (2011) claim that this negative relationship emanates from the fact that increased external debt leads to a reduction in investments.

A number of empirical investigations have been undertaken on external debt and economic growth. Some of the studies found a negative impact of external debt on economic growth (proxied by GDP growth) while others failed to find any significant relationship between economic growth and external debt. On the other hand, most of the empirical findings on the impact of external debt on GDP per capita growth are mixed and inconclusive.

5.6 Methodology

Theories of public finance espouse that there is a non-linear relationship between external public debt and economic growth.²⁷ There is also ample empirical literature that shows that the relationship between external public debt and economic growth is not linear. For example, Checherita and Rother (2010), Kumar and Woo (2010) and Shabbir (2013) captured the non-

²⁷ The non-linear relationship between debt and sources of growth is estimated using the spline function:

$$y_{it} = \alpha_{it} + \beta X_{it} + \gamma D_{it} + \chi (D_{it} - D^*) Z + \varepsilon_{it}$$

where y_{it} is the logarithmic difference in GDP, physical/human capital per capita or TFP and X_{it} are control variables (including lagged per capita GDP). D^* represents the debt threshold and Z is a dummy variable equal to 1 if debt is above threshold D^* (and 0 otherwise). This specification allows the impact of debt on the dependent variable to have a structural break, in the sense that the impact is different in areas below and above the threshold if χ is significantly different from zero (Patillo et al., 2004).

linearity by developing a quadratic functional form to see the impact of external debt on economic growth.

However, the difficulty with this approach is that it requires knowledge of the shape of the non-linearity prior to estimation. A threshold model can be used as an alternative approach for testing for any non-linearity. The threshold approach allows the data to determine whether non-linearity exists and for estimating the size of any difference in effect.

5.6.1 Constructing a Model of the Growth Equation

The theoretical underpinning of this model is the augmented Solow model and the endogenous growth model which incorporate the impact of public debt on economic growth. We extend the models further to include human capital as an additional input in the production function following Romer (1986b) and debt burden based on Cunningham (1993). The Solow growth model shows that economic growth is explained by capital accumulation, expansion of labor and technological progress.

We augment a generalized theoretical economic growth model with an external debt variable to account for the impact of the level of external debt-to-GDP ratio on the real growth rate of per capita GDP. We are mainly interested in the existence of a non-linear effect of external debt on GDP growth based on the spirit of Checherita and Rother (2010) and Jernej, Aleksander, and Miroslav (2014) model. Hence we use a quadratic equation in the external debt-to-GDP ratio. Kumar and Woo (2010) and (Patillo et al., 2002, 2004) argue that the estimation process encounters problems of heterogeneity and endogeneity which eventually yield inconsistent and biased estimates when the pooled OLS and other types of static panel data models are applied. This happens because the regression model involving pooled OLS does not take care of unobserved country-specific effects that vary across countries. Hence, the result could be affected by an omitted variable bias (Patillo et al., 2002, 2004). The heterogeneity problem can be mitigated by using the fixed-effects (FE) estimator that enables us to control for all time-invariant country-specific factors, both observable and unobservable. The problem of heterogeneity can be corrected by introducing a lagged explanatory variable of the initial level of per capita GDP in a dynamic panel data model specification. This, however, brings an added complication as the presence of a fixed-effects panel estimation leads to a correlation between the lagged endogenous variable and the residuals which negatively biases the result of the coefficient of the lagged initial level of per capita GDP (Patillo et al., 2004).

We used two different models to empirically assess the impact of external debt on GDP growth. We then identified the external debt turning point where the negative effect of external debt on economic growth prevails. We started with the non-dynamic baseline FE panel regression specification to control heterogeneity as:

$$(5.1) \quad g_{it} = \alpha_i + \beta(GDPPC)_{it} + \gamma_1 exdebt_{it} + \gamma_2 exdebtsq_{it} + \delta X_{it} + \eta_i + \varepsilon_{it}$$

We then used the instrumental variable (IV) dynamic panel regression specification to control for endogeneity of per capita GDP as:

$$(5.2) \quad g_{it} = \alpha_i + \beta(GDPPC)_{it-1} + \gamma_1 exdebt_{it} + \gamma_2 exdebtsq_{it} + \delta X_{it} + \varepsilon_{it}$$

where g_{it} and $exdebt_{it}$ are the annual changes in per capita GDP and initial external debt as a share of GDP respectively while i and t are country and time respectively. The model is augmented with quadratic equation in external debt ($exdebtsq_{it}$) because we assume a non-linear relationship between external debt and GDP growth. On the basis of this non-linear relationship from theory and some empirical findings (concave form or the Inverted-U shaped hypothesis), the coefficient of the external debt variable is expected to be positive while that of the external debt squared is expected to be negative. The implication of this argument is that external debt is supposed to have a positive impact on growth at lower levels whereas it is presumed to have a detrimental impact at higher levels. Further, X_{it} comprises a vector of other control variables that determine economic growth such as financial development (proxied by M_2), domestic investments, population growth rate, government consumption expenditure as a percentage of GDP, inflation and trade openness, FDI, remittances and ODA. The model in Equation (5.1) also includes country-fixed effects η_i to control the heterogeneity and unobserved country-specific effects and the random error term ε_{it} .

The least squares dummy variable (LSDV) estimator which takes into account individual country-specific effects is used in the baseline analysis of Equation (5.2). The dynamic structure of the growth model and the endogeneity of the variables included in the regression make the LSDV estimator flawed. However, the LSDV estimator is used by a lot of studies at least as a benchmark (see Clements et al., 2003; Patillo et al., 2004).

The OLS estimator is upward biased and inconsistent when the model is dynamic because in this particular case the lagged level of per capita GDP is correlated with the error term. This

problem cannot be solved even by a within transformation. The model in Equation (5.2) can be transformed from the LSDV estimator by subtracting the time series mean values of the variables for each country and then estimating the new model by applying the OLS estimator on the transformed data.

$$(5.3) \quad g_{it} - \bar{g}_i = \alpha_i + \beta(\overline{GDPPC_{it-1}} - \overline{GDPPC_{i-1}}) + \gamma_1(\overline{exdebt_{it}} - \overline{exdebt_{i-1}}) + \gamma_2(\overline{exdebt_{it}} - \overline{exdebt_{i-1}}) + \delta(X_{it} - \bar{X}_i) + (\varepsilon_{it} - \bar{\varepsilon}_i)$$

The method given in Equation (5.3) has one important merit in that it helps us get rid of the country-specific effects η_i which are time-invariant. However, the coefficients are still biased as Nickell (1981) has shown that for a finite T, the within group estimator is biased and inconsistent as the first regressor which is lagged GDP in this case is correlated with the new transformed error term (Baltagi, 2005).

To overcome this problem, Anderson and Hsiao (1981) proposed the use of the first difference transformation of the model and adopting the past level of income in period t-2 for the first difference of dy_{it-1} . This instrumental variable technique results in consistent but not necessarily efficient estimates since it does not use the whole available moment conditions (Baltagi, 2005). Hence, we can estimate the growth equation by using Arellano and Bond (1991) difference GMM estimator and Blundell and Bond (1998a) system GMM estimator.

The Arellano and Bond difference GMM estimator as given in Equation (5.3) wipes out the time-invariant effects. It is an extension of the Anderson and Hsiao model incorporating the past values lagged for more than two periods as valid instruments. As the Arellano and Bond estimator uses all the feasible lagged values of the predetermined control variables and debt as valid instruments, it yields asymptotically more efficient and consistent estimates than the Anderson Hsiao Instrumental Variable (IV) estimators.

Blundell and Bond (1998a) show that the difference GMM estimator has poor finite sample properties when the β coefficient is close to one which makes the dependent variable follow a path close to a random walk. Under such circumstances the estimates of the coefficients of the difference GMM estimator are downward biased especially when T is small. This occurs due to a weak instrument problem because the lagged level of income is weakly correlated with the first difference. The log of GDP in period t-3, t-4 and so on is a weak instrument for dy_{it-1} . The pitfall of such a model gets aggravated for autoregressive models like the growth equation

in this case, scenarios when the per capita income is observed in 3, 4 or 5 year averages and T is very small (not more than 10 periods) (Bond, Hoeffler, & Temple, 2001a).

To address the limitations inherent in the difference GMM estimator, Blundell and Bond (1998a) proposed the system GMM estimator which is derived from an estimation of a combination of two simultaneous equations where one is in levels which uses the lagged first differences as instruments and the other is in first differences and uses the lagged levels as its instruments. The system GMM estimator performs better than the difference GMM estimator when the series are persistent and there is a dramatic reduction in the finite sample bias due to the use of additional moment conditions. Results of the Monte Carlo simulation attest that the first difference GMM estimator is characterized by a significant bias and low precision when the coefficients of the series are close to unity, that is, persistent whereas the system GMM estimator improves the precision of the estimates and alleviates the finite sample bias (Presbitero, 2006).

Bond, Hoeffler, and Temple (2001c) argue that the pooled OLS and LSDV estimators should be regarded as the upper and lower bounds of the system GMM. This happens because of the individual specific effects that bias the pooled OLS estimates upwards and the Nickel (1981) downwards bias of the fixed-effects that drag down the estimates. Hence, a consistent system GMM estimate should lie between the pooled OLS and LSDV estimates. This conclusion is supported by the empirical findings of Hoeffler (2002) using the augmented Solow model.

Though the main estimation methodology that we use is system GMM, we also consider a variety of other estimation methodologies such as the pooled OLS, the between effects (BE) estimator, the fixed-effects (FE) estimator, static panel regression and the dynamic common correlated effects estimator of Chudik and Pesaran (2015). There is a trade-off between the choice of each of these estimators. This means that estimators that may seem attractive for addressing a specific econometric problem could lead to a different type of bias. For example, if there is a simultaneous coexistence of omitted variables' bias with measurement errors that are likely in cross-country data, dealing with the first problem may exacerbate the second (Kumar & Woo, 2010).

5.6.2 Investment Equation

Keeping in mind the importance of investments, a number of authors have suggested that the relationship between investments and external debt be analyzed as one possible channel

through which economic growth is affected. Hence, we estimate the following reduced form estimable equation of domestic investments:

$$(5.4) \quad inv_{it} = \alpha + \beta exdebt_{it} + \delta X_{it} + \eta_i + \varepsilon_{it}$$

where inv_{it} are investments of country i at t time and X_{it} is a vector of control or conditioning variables, $exdebt_{it}$ is the external debt indicator and ε_{it} is the classical error term. The vector of control variables includes the growth rate of per capita GDP, the lagged value of domestic investments to GDP ratio, openness, government consumption expenditure, broad money, FDI, remittances, population growth rate and the lending interest rate.

5.7 Data Sources

The data for this study was obtained from the World Bank's World Development Indicators (2016b), International Monetary Fund's International Financial Statistics and the World Economic Outlook (2016) databases. Data on FDI comes from the United Nations Conference on Trade and Development (UNCTAD, 2016) database. Sub-Saharan Africa comprises 48 countries. However, due to data unavailability for some important variables for some countries, annual data for 43 SSA countries is used in this research.²⁸ Moreover, the study covers a time period of 30 years (1986-2015). The point here is that for lack of complete data for some of the variables for all the required time periods in executing the dynamic panel system GMM approach based regressions, some of the countries could not make it to the detailed econometric analyses of the external debt-growth nexus; they were subsequently excluded. However, the remaining sample is large and representative enough to lead to stable parameter estimates.

²⁸ The 43 SSA countries included in the study are Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Brazzaville), Congo (Democratic Republic), Côte d'Ivoire, Equatorial Guinea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia and Zimbabwe

5. 8. A Discussion of the Main Findings

Table 5.1 presents summary statistics of the data used in the empirical investigation. The table presents the mean, standard deviation, skewness and kurtosis for each variable. The mean value of per capita GDP growth is a mere 1.12 percent with a standard deviation of 6.47 while the mean growth of GDP is 3.8 percent with a standard deviation of 6.92. All the other variables can be interpreted analogously. With skewness values either more or less than zero, the variables do not seem to be normally distributed. Except domestic investments and population growth rate, all the variables are positively skewed. Moreover, with positive kurtosis values, the variables exhibit relatively highly peaked distributions.

One of the striking features of the summary statistics is the mean value of inflation (92.95 percent). This result is highly influenced by the hyperinflations experienced in the Democratic Republic of Congo around the 1980s and 1990s and in Zimbabwe by the turn of the century. Zimbabwe's Central Statistics Office claimed that the last official month-to-month inflation recorded was 231 million percent for July 2008 while estimates from other sources are much higher. For example, the IMF estimated that the annual inflation rate was 489 billion percent for September 2008. On the other hand, Hanke and Kwok (2009) assert that mid-November 2008 was the peak month of hyperinflation with the inflation rate estimated at 79.6 billion percent per month which prompted the country to abandon its currency.

The correlation matrix in Table 5A.1 in the Appendix shows that the GDP growth rate, domestic investments, the population growth rate, FDI and openness had a positive and significant correlation with the per capita GDP growth rate while inflation had a negatively significant correlation with the same variable. ODA, external debt and the lending interest rate had a negative but insignificant correlation with the per capita GDP growth rate whereas broad money, remittances and credit had a positive but insignificant correlation with the per capita GDP growth rate. Most of the correlations are possible and confirm the *a priori* expected signs. Besides, the correlation coefficients yield moderate estimates effectively ruling out the possibility of multicollinearity.

Table 5. 1: Summary Statistics

Variables	N	sum	mean	sd	kurtosis	skewness
per capita GDP growth	1,200	1,348	1.12	6.47	45.34	0.95
Domestic investments	1,200	19,269	16.06	9.19	13.48	-1.16
GDP growth rate	1,195	4,54	3.80	6.92	53.80	1.31
Broad money	1,200	68,278	56.90	738.0	597.8	24.42
FDI	1,200	3,954	3.29	8.15	50.95	3.85
Government expenditure	1,200	17,536	14.61	6.11	11.55	1.91
Inflation	1,200	111,537	92.95	1,23	374.5	19.10
Lending interest rate	1,170	30,171	25.79	56.02	79.10	8.38
ODA	1,200	14,671	12.23	12.94	39.42	4.32
Remittances	1,200	3,227	2.69	4.314	10.47	2.57
Population growth rate	1,200	3,144	2.62	1.043	16.05	-1.37
Openness	1,200	81,551	67.96	33.75	11.43	2.02
External debt	1,200	109,160	90.97	111.0	45.45	5.36
External debt squared	1,200	2.470e+07	20,58	99,05	186.8	12.34
Loan	1,200	17,603	14.67	53.09	111.0	9.59
Credit	1200	18,416	15.35	14.62	11.82	2.65

After a brief explanation of the descriptive statistics, the rest of this section presents the empirical evidence of an analysis of the external debt-growth nexus. We used the system GMM method to study the impact of external debt on economic growth in the selected SSA countries for which data is available. To examine the existence of the Laffer-Curve (inverted U-shaped) relationship between external debt and economic growth, we estimated a quadratic form of the growth model. To provide robust evidence about the link between external debt and economic growth, this paper also estimates the economic growth and domestic investment models using a number of methods.

Table 5.2 presents the results of the growth and external debt model for the overall sample of 43 SSA countries included in the study for the period 1986-2015 using a number of static panel data estimation methods such as the pooled OLS, random-effects and fixed-effects methods.

The results of all the three static panel data models are presented in Table 5.2. The diagnostic tests reveal that the random-effects model is preferable over the pooled OLS. Further, the Hausman test attests that the fixed-effects model is more suitable and appropriate than the random-effects model for the data at hand.

The results of the FE model show that the coefficient of external debt had a negative sign but it was statistically insignificant. The results of pooled OLS and the RE models show that external debt had a statistically significant negative impact on the growth rate of per capita GDP (at 10 percent and 1 percent significance levels respectively). However, as stated earlier,

the main model of interest among the three static panel models is the FE model and we should not emphasize on interpreting the outcomes obtained using the other two methods.

Domestic investments, broad money and FDI are the other control variables which had a positive and significant effect on the GDP per capita growth rate at the 1 percent significance level, while GDP and openness had a statistically significant positive effect at the 5 percent significance level.

Government (consumption) expenditure had a statistically significant negative effect on the per capita GDP growth rate at the 1 percent significance level. Economic theory gives some reasons for this negative effect. First, there is a strong possibility of government expenditure crowding-out private spending. Second, the level of government spending could stifle free operations of the private sector through different ways like excessive regulations and other prohibitions that retard economic growth and efficiency. Our result is in line with those of Barro (1991) Barro and Sala-i-Martin (1995) and Grier and Tullock (1989) who found that government (consumption) expenditure had a negative effect on economic growth. Inflation also had a statistically significant negative effect on the growth prospects of per capita GDP (at the 1 percent level of significance).

Population growth rate and remittances had a positive but insignificant impact while ODA and external debt squared had negative but insignificant effects on the growth rate of per capita GDP.

Table 5. 2: The impact of external debt on the per capita GDP growth rate using various forms of static panel data

Explanatory variables	Pooled OLS 1	Random Effects 2	Fixed Effects 3
GDP	0.000*** (0.00)	0.000** (0.00)	0.000** (0.00)
domestic investments	0.139*** (0.04)	0.137*** (0.04)	0.119*** (0.03)
broad money	0.000** (0.00)	0.000*** (0.00)	0.000*** (0.00)
population growth	1.221** (0.50)	1.373 (1.01)	1.744 (1.16)
foreign direct investments	0.087 (0.10)	0.086*** (0.01)	0.088*** (0.02)
official development assistance	0.012 (0.03)	0.005 (0.02)	-0.013 (0.01)
Remittances	0.061	0.071	0.087

	(0.05)	(0.05)	(0.07)
Openness	0.017	0.018*	0.019**
	(0.01)	(0.01)	(0.01)
government expenditure	-0.086**	-0.103***	-0.174***
	(0.04)	(0.02)	(0.04)
Inflation	-0.000***	-0.000***	-0.000***
	(0.00)	(0.00)	(0.00)
external debt	-0.016*	-0.015***	-0.010
	(0.01)	(0.01)	(0.01)
external debt squared	0.000	0.000***	0.000
	(0.00)	(0.00)	(0.00)
Constant	-3.788*	-3.987	-4.066
	(2.08)	(3.67)	(3.90)
<i>Number of observations</i>	1197	1197	1197
<i>F-test (p-value)</i>	0.000	0.000	0.000
<i>R²</i>	0.119	0.127	0.140

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The results in Table 5.3 obtained using the system GMM show that there is no evidence to support the existence of the highly popular hypothesis of an Inverted-U shaped relationship between external debt and economic growth. If the Inverted-U shaped relationship were to hold, the sign of the coefficient of external debt should be positive whereas that of external debt squared should be negative which is not the case here. Our results show that the coefficient of the square of external debt is positive and significant which contravenes the hypothesis and suggests that there is no empirical finding to back the Inverted-U shaped or concave type non-linear quadratic relationship between external debt and economic growth. This finding corroborates Presbitero (2006); Schclarek (2004); and Warner (1992) empirical work.

Lack of evidence to support the Debt-Laffer curve could potentially be explained by the composition of the sample countries included in the study which are mostly poor and highly indebted. Due to their indebtedness, they are more likely to be located on the wrong side of the Debt-Laffer curve where external debt deters economic growth. The effect of external debt is positive on the left-side of the curve and that is more likely to be occupied by advanced and low indebted countries. On this side of the curve, increased debt leads to higher growth. Patillo et al. (2002) found that for an external debt to export ratio of approximately 160 percent and below, external debt promoted growth. However, the ratio of external debt to exports in the sample of SSA countries included in our study is staggeringly high and is more than double the figure indicated by their study. Besides, Patillo et al. (2002) also found that the marginal effect of external debt became negative when the debt ratio was close to 60 or 80 but in our sample

the external debt to export ratio is in excess of 90 which implies that the countries fall on the negatively-sloped side of the Inverted-U shaped curve. As Cochrane (2011) argues, the negative impact of external debt on economic growth could also occur due to the fact that higher external debt leads to uncertainty or expectations of a financial repression in the future. However, some authors also claim that the negative relationship between external debt and economic growth is through a decline in investments (see Iyoha, 1999b; Kutivadze, 2011; Sawada, 1994). Lin and Sosin (2001) found that debt had a negative and significant relationship with economic growth in African countries.

Table 5. 3: An Empirical Test of the Debt-Laffer Curve (Dependent variable: per capita GDP growth rate)

Explanatory variables	Pooled OLS 1	Fixed effects 2	System GMM 3
Lag of per capita GDP growth	0.201*** (0.07)	0.128* (0.06)	0.161 (0.17)
domestic investments	0.111*** (0.04)	0.114*** (0.03)	0.120 (0.10)
broad money	0.000** (0.00)	0.000*** (0.00)	-0.000** (0.00)
population growth	1.025** (0.49)	1.595 (1.00)	1.302 (0.89)
foreign direct investments	0.052 (0.11)	0.065*** (0.02)	-0.356** (0.14)
official development assistance	0.007 (0.03)	-0.009 (0.01)	-0.158 (0.11)
Remittances	0.042 (0.05)	0.074 (0.06)	0.206 (0.37)
Openness	0.015 (0.01)	0.017** (0.01)	0.038 (0.04)
government expenditure	-0.069* (0.04)	-0.153*** (0.03)	-0.159 (0.23)
Inflation	-0.000** (0.00)	-0.000*** (0.00)	-0.001** (0.00)
external debt	-0.013 (0.01)	-0.010 (0.01)	-0.005 (0.01)
external debt squared	0.000 (0.00)	0.000 (0.00)	0.000** (0.00)
Constant	-2.943 (2.05)	-3.506 (3.68)	-2.650 (3.52)
<i>Number of observations</i>	1160	1160	1160
<i>F-test (p-value)</i>	0.000	0.000	0.000
<i>R²</i>	0.156	0.151	
<i>Number of groups</i>			40

<i>Number of instruments</i>	25
<i>AR(1), p-value</i>	0.022
<i>AR(2), p-value</i>	0.404
<i>Hansen's J-test, p-value</i>	0.332

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

In addition to probing the nexus between external debt and economic growth, we also investigated the direct link between external debt and domestic investments. The results are given in Table 5.4. The positive but statistically insignificant coefficient obtained from the regression of the dynamic panel data model using the system GMM suggests that external debt did not boost domestic investments. Dollar and Easterly (1999) argue that investments do not have a tight and strong link with growth in the short-run and not even much of a link in the long-run. The point here is that even if external debt were to significantly affect domestic investments, this does not mean that it will necessarily affect economic growth.

The finding that shows the lack of a significant impact of remittances on domestic investments reinforces and is consistent with the fact that a large share of the remittances primarily target household consumption expenditure and other services such as education and health. However, if an environment conducive to investments is created and the exorbitant transfer fees and transaction costs are reduced, remittances could play a pivotal role by serving as a source of investment capital particularly for small and medium-sized enterprises. Thus, they should be included in the policies that potentially help increase domestic investments.

Concerning other key conditional variables, if a substantial portion of foreign aid is apportioned to financing consumption, its effect on domestic investments may be limited. Griffin (1970) also argues that foreign aid could reduce domestic savings and increase consumption which will eventually result in aid inflows having little or no impact on domestic investments as is the case here.

The econometric estimation technique takes into consideration heterogeneity across countries and potential biases due to omitted country-specific factors by using a fixed-effects model. We used a dynamic panel data (DPD) estimation method to incorporate the dynamic nature of investments (by including their own lagged value) and to account for the endogeneity of the regressors, especially growth. Our empirical findings reveal that domestic investments in SSA countries are driven by their own lagged value, trade openness and the growth rate of per capita GDP. The results show that the other variables included in the model are statistically insignificant (see Table 5.4).

Table 5. 4: External debt's impact on domestic investments

Explanatory variables	Pooled OLS 1	Fixed effect 2	System GMM 3
Lag of domestic investments	0.680*** (0.06)	0.509*** (0.09)	0.561*** (0.13)
Remittances	0.055 (0.05)	0.067 (0.08)	-0.010 (0.26)
foreign direct investments	-0.310*** (0.10)	-0.323*** (0.04)	0.253 (0.16)
Openness	0.029** (0.01)	0.051** (0.02)	0.058** (0.04)
external debt	-0.005 (0.01)	-0.001 (0.00)	0.021 (0.02)
population growth	0.178 (0.20)	0.061 (0.23)	-1.037 (0.81)
broad money	0.000** (0.00)	-0.000* (0.00)	-0.000 (0.00)
growth rate of GDP per capita	0.134*** (0.05)	0.121*** (0.04)	0.362* (0.21)
lending interest rate	-0.007** (0.00)	-0.006** (0.00)	-0.006 (0.01)
government expenditure	0.051 (0.04)	0.099* (0.05)	0.121 (0.22)
Constant	3.298*** (0.99)	3.810 (2.59)	12.882*** (3.73)
<i>Number of observations</i>	1131	1131	1131
<i>F-test (p-value)</i>	0.000	0.000	0.000
<i>R²</i>	0.647	0.623	
<i>Number of groups</i>			39
<i>Number of instruments</i>			21
<i>AR(1), p-value</i>			0.039
<i>AR(2), p-value</i>			0.692
<i>Hansen's J-test, p-value</i>			0.470

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The dynamic investment model fails to confirm the negative relationship between external indebtedness and domestic investments suggesting that large debt stocks do not impinge on the nominal level of domestic investments.

The consistency of the GMM estimator depends on two specification tests, the Hansen J test of over-identifying restrictions and a serial correlation test in the disturbances. The Hansen J test has a null hypothesis of 'the instruments as a group are exogenous'. In other words, this means that there is no correlation between the instruments and the residuals. Failure to reject

the null of the Hansen J test implies that the instruments as a group are valid and the model is correctly specified. Therefore, the higher the p-value of the Hansen J test statistic the better it is. With respect to the serial correlation test, one should reject the null of the absence of the first-order serial correlation (AR1) and should not reject the absence of the second-order serial correlation (AR2).

5.9 Conclusion and Policy Implications

5.9.1. Conclusion

The empirical findings of the system GMM method show that there is no evidence to support the existence of the highly popular hypothesis of an Inverted-U shaped relationship between external debt and economic growth. If the Inverted-U relationship were to hold, the sign of the coefficient of external debt should be positive whereas that of external debt squared should be negative which is not the case in our study. Our results show that the coefficient of the square of external debt is positive and significant which contravenes this hypothesis and suggests that there is no empirical finding to back the Inverted-U shaped or concave type non-linear quadratic relationship between external debt and economic growth. This finding corroborates Presbitero (2006); Schlarek (2004); and Warner (1992) empirical work.

Lack of evidence in support of the Debt-Laffer curve can be explained by the composition of the sample countries included in the study which are mostly poor and highly indebted. Due to their indebtedness, they are more likely to be located on the wrong side of the Debt-Laffer curve where external debt deters economic growth. The effect of external debt is positive on the left-side of the curve and that is more likely to be occupied by advanced and low indebted countries. On this side of the curve, increased debt leads to higher growth. Patillo et al. (2002) found that for the external debt to export ratio of approximately 160 percent and below, external debt promotes growth. However, the ratio of external debt to exports in the sample of SSA countries included in this study is staggeringly high and is well above double the figure indicated by their study. Besides, Patillo et al. (2002) found that the marginal effect of external debt becomes negative when the debt ratio is close to 60 or 80 but in our sample the external debt to export ratio is in excess of 90 which implies that the countries fall on the negatively-sloped side of the Inverted-U shaped curve. As Cochrane (2011) argues the negative impact of external debt on economic growth could also possibly occur due to the fact that higher external debt stocks lead to uncertainty or expectations of a financial repression in the future. However,

some other authors claim that the negative relationship between external debt and economic growth is through decline in investments (see Iyoha, 1999b; Kutivadze, 2011; Sawada, 1994). Lin and Sosin (2001) have found that debt has a negative and significant relationship with economic growth for African countries.

5.9.3 Policy Implications

Given the empirical results of the existence of a negative relationship between external debt and economic growth, policymakers should be cautious in their approach to debt and its utilization. It should be kept in mind that debt can promote economic growth, particularly when it is used for financing public investment expenditures. However, when the debt is exorbitantly high, it could affect economic growth negatively.

This general policy framework should guide external borrowing decisions in a way that guarantees the profitability of invested funds and the generation of adequate foreign exchange earnings to enable external debt servicing. As external debt is a binding constraint, it cannot be ignored. SSA countries should introduce effective debt management mechanisms to garner and reap the benefits of external finance without posing difficulties of macroeconomic and balance of payment stability. A prudent macroeconomic policy is crucial because it impacts the value and servicing of external debt as well as credit ratings.

External debt should be consistent and in line with a credible policy framework in the areas of exchange rate policy, interest rate policy, pricing policy and other related aspects. The credibility of policies and policymakers plays a paramount role in spurring confidence in both local and foreign investors.

Appendix 5

Table 5A. 1: Correlation Matrix

	GDPPCg	GDPg	inv	M2	PG	FDI	ODA	rem	OP	GX	inf
GDPPC growth	1										
GDP growth	0.98*	1									
Dom. Investments	0.16*	0.14*	1								
Broad money	0.01	0.01	0.01	1							
Population growth	0.18*	0.32*	-0.01	-0.01	1						
FDI	0.08*	0.09*	-0.37*	0.01	0.03	1					
ODA	-0.01	0.00	-0.11*	0.01	0.08*	0.15*	1				
Remittances	0.06	0.05	-0.09*	-0.01	-0.05	0.22*	0.15*	1			
Openness	0.08*	0.05	-0.00	0.00	-0.14*	0.33*	0.12*	0.21*	1		
Gov. Expenditure	-0.03	-0.03	0.09*	-0.03	-0.03	0.06	-0.01	0.04	0.26*	1	
Inflation	-0.10*	-0.11*	-0.06	-0.00	-0.01	-0.01	-0.01	-0.04	0.02	-0.06	1

Note: GDPPCg is the growth rate of per capita GDP, GDPg is the growth rate of GDP, M2 is broad money, Inv is domestic investments, PG is the population growth rate, rem is remittances, OP is openness, GX is government expenditure and inf is the inflation rate.

Table 5A. 2: Description of Variables and Data Sources

variable	Description
per capita GDP growth rate	Annual percentage growth rate of per capita GDP based on the constant local currency. Aggregates are based on constant 2010 US dollars. Per capita GDP is gross domestic product divided by the mid-year population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (source: WDI, 2016).
GDP growth rate	Annual percentage growth rate of GDP at market prices based on the constant local currency. Aggregates are based on constant 2010 US rates.
Domestic investments	The difference between gross fixed capital formation and FDI.
Broad money	Broad money is the sum of currency outside banks; demand deposits other than those of the central government; the time, savings and foreign currency deposits of resident sectors other than the central government; bank and travelers' checks; and other securities such as certificates of deposit and commercial papers.
Population growth rate	Annual population growth rate for year t is the exponential rate of growth of the mid-year population from year t-1 to t, expressed as a percentage. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.
FDI	Foreign direct investments are the net inflows of investments for acquiring a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP.
ODA	Net official development assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of the principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list

of ODA recipients. It includes loans with a grant element of at least 25 percent (calculated at a rate of discount of 10 percent).

Remittances	Personal remittances comprise personal transfers and employee compensations. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from non-resident households. Personal transfers include all current transfers between resident and non-resident individuals. Compensation of employees refers to the income of border, seasonal and other short-term workers who are employed in an economy where they are not residents and of residents employed by non-resident entities. Data is the sum of two items defined in the sixth edition of the IMF's Balance of Payments Manual: personal transfers and compensation of employees.
openness	The sum of exports and imports of goods and services measured as a share of gross domestic product.
inflation	Inflation as measured by the consumer price index reflects the annual percentage change in the cost of acquiring a basket of goods and services for a consumer that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.
Government expenditure	General government final consumption expenditure (formerly general government consumption) includes all government current expenditure for purchases of goods and services (including employee compensations). It also includes most expenditure on national defense and security, but excludes government military expenditure that is part of government capital formation.
External debt	Total external debt stocks to gross national income. Total external debt is debt owed to non-residents repayable in currency, goods or services. Total external debt is the sum of public, publicly guaranteed and private non-guaranteed long-term debt, use of IMF credit and short-term debt. Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. GNI (formerly GNP) is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad.

Lending-interest rate	Lending rate is the bank rate that usually meets the short- and medium-term financing needs of the private sector. This rate is normally differentiated according to the creditworthiness of borrowers and the objectives of financing. However, the terms and conditions attached to these rates differ by country limiting their comparability.
credit	Domestic credit to the private sector by banks refers to financial resources provided to the private sector by other depository corporations.
loan	Claims on central government include loans to central government institutions net of deposits.

Source: All data retrieved from the WDI (2016) database. The description of the variables is verbatim, almost word-for-word from the same source.

Chapter Six

General Conclusion and Suggested Areas for Further Research

6.1 General Conclusion

The five empirical chapters in this dissertation analyzed the macroeconomic consequences of FCIs such as FDI, remittances and external debt on economic growth in SSA for the period largely spanning 2001-15. The thesis explored the impact of the different forms of FCIs on economic growth, TFP and domestic investments in SSA countries. It also investigated the effects of each type of foreign capital influx on these variables.

The first chapter investigated FDI's impact on economic growth in 43 SSA countries for which data is available. Theoretically, there is widespread consensus about FDI's positive contribution to economic growth. However, empirical findings on this issue are inconclusive and controversial. Some empirical studies show that FDI is crucial for economic growth. Others argue that FDI's effect depends on the degree of complementarity and substitutability between FDI and domestic investments, macroeconomic stability, the institutional and legal framework, knowledge and human capital, trade openness and other socioeconomic and demographic characteristics (Abadi, 2011; Agrawal, 2011, 2015; Alege & Ogundipe, 2013; Beugelsdijk & Zwinkels, 2008; Lamine, 2010; Sala & Trivin, 2014; Zekarias, 2016). Generally, these empirical results contradict each other.

A debate on whether FDI promotes or retards economic growth is still raging and there are no clear answers in sight. FDI's role in economic growth is contentious and controversial when viewed from both theoretical and empirical literature. Chapter 1 took these contending views into account and empirically investigated FDI's impact on economic growth in selected SSA countries for which data is available.

The main finding of this chapter obtained using the system GMM is that FDI had a negative and statistically significant impact on the growth of per capita GDP (income) for the 43 SSA counties included in the study in 2001-15. The other variables with a positive and significant contribution to the growth of per capita GDP included the lagged value of the growth rate per capita GDP itself, gross capital formation which is used as a proxy for domestic investments and exports.

The second chapter studied FDI's impact on the level and growth of TFP in SSA for the period 2001-15. It also considered the role of other macroeconomic control variables such as capital accumulation, human capital, institutions and governance to see how they interacted with FDI in influencing TFP's level and growth rate. It parametrically estimated TFP based on a production function and used a principal component analysis (PCA) method to describe the main variables that affect TFP growth. It estimated the main model using a system GMM linear dynamic panel model. Moreover, it also did a thorough survey of growth literature to come up with the factors that explain sub-Saharan Africa's growth sluggishness, especially in per capita income terms, for more than three decades starting from the 1960s till the second half of the 1990s. The recent upsurge in economic growth in SSA is another area of investigation that warrants a closer scrutiny. Hence, the chapter discussed some of the factors that contributed to growth in SSA in recent times.

It should be noted that theoretical literature claims that FDI is an important factor for technology transfers and improving TFP. Despite the presence of a range of persuasive theoretical arguments, the question as to whether FDI promotes productivity growth is eventually an empirical one.

The extensions of the new growth theory formulate a framework by which FDI leads to a permanent increase in the host country's growth via diffusion, technology transfers and other spillover effects. Extant empirical studies predominantly assess spillover effects by estimating FDI's effect on GDP and come up with mixed findings. FDI is supposed to result in technological changes in the recipient countries. Hence, Chapter 2 also analyzed FDI's impact on the level and growth of TFP in SSA countries.

Chapter 2's results show FDI's negative but insignificant effect on the level and growth of TFP in SSA. These findings are in line with those of Aitken and Harrison (1999) and Carkovic and Levine (2002) who also questioned this widely held view about FDI.

The third chapter focused on the nexus between FDI and domestic investments. It addressed two related questions. First, does FDI crowd-out or crowd-in domestic investments? Second, what is the role of institutions, openness, human capital, financial development and infrastructure in the crowding-out and/or crowding-in of FDI on economic growth? The chapter applied static and dynamic panel data econometric techniques to study the relationship.

FDI is presumed to influence economic growth by promoting domestic investments and exports and developing human capital, infrastructure, institutions and so on. Of all these channels,

domestic investments are probably the most important one through which economic growth in the host country is influenced by FDI because FDI influences employment and income more directly through this mechanism than through other channels. This is the main reason why this thesis studied the impact of FDI on domestic investments as a separate chapter.

Chapter 3 systematically addressed the role played by internal factors in host countries such as institutional quality, openness to trade and financial development in domestic investments. Besides, it also assessed the impact that other external capital inflows like foreign aid have on domestic investments using a system GMM model to account for endogeneity. It also used the FE and RE estimators as well as other forms of static and dynamic common correlated effects estimators to test the robustness of the findings obtained by applying the system GMM.

The overall finding of this chapter indicates that there was a negative relationship between FDI and domestic investments in SSA during 1986-2015. This negative relationship between the two implies that FDI crowded-out domestic investments. However, it could also be construed as the presence of ample and untapped investment opportunities which call for foreign investments. This might be the case due to an abundance of resources that necessitate foreign know-how and expertise. The negative association between FDI and domestic investments should not be taken as a justification for nullifying the efforts made for attracting FDI. Even though this chapter's empirical findings do not support the argument, FDI may enhance TFP and hence boost growth. Besides, it could have long-term growth effects.

The fourth chapter dealt with the impact of remittances on economic growth and domestic investments in SSA for the period 2001-15. There is a heated and unsettled debate going on about the importance and role of remittances in economic growth. Thus, this chapter investigated the impact of remittances on economic growth for 40 SSA countries for which data is available for the period 2001-15.

Remittances can affect economic growth through more than one channel. While lowering transaction costs can help well-functioning financial markets get direct remittances for projects that yield the highest returns boosting economic growth rates, remittances can also play a compensatory role for bad and malfunctioning financial systems, that is, by loosening credit constraints, potential entrepreneurs can get an opportunity to use remittances whenever the financial system does not advance loans to help them start businesses on account of lack of collateral or due to unreasonably high lending costs (Paulson & Townsend, 2000).

The chapter used the system GMM dynamic linear panel data model due to its superiority in addressing endogeneity, individual heterogeneity and other issues related to the estimation of dynamic panel data models. Its findings show that remittances had an insignificant and negative contemporaneous impact on economic growth in the sampled SSA countries over the study period under most estimation techniques. The study implies that a big share of the remittances that came into SSA were directed for economically unproductive uses. The fact that the proportion of remittances that came to SSA was low can also explain the negligible impact that they had on economic growth.

The fifth chapter focused on the effects of external debt on economic growth and domestic investments in 40 SSA countries for which data is available. The chapter focused on the economic consequences of high external debt for economic growth in SSA countries. It also studied the channels through which external debt affected domestic investments and economic growth thus improving the dependability and reliability of its policy recommendations.

There is no consensus on whether external debt promotes or inhibits economic growth and the empirical findings are mixed at best. Some studies claim that external debt has a positive impact on economic growth while others argue that its impact on economic growth is negative. Some studies also contend that there is no relationship between the two.

A debt crisis is partly to blame for the disappointing economic growth in low-income countries. A big proportion of the money that low-income countries borrowed to combat poverty was borrowed funds rather than grants. Hence, it can be argued that this dragged the efforts that these countries made for achieving economic growth and poverty reduction. However, Arslanalp and Henry (2004) argue that debt overhang was not the reason for the dismal economic performance of low-income countries. Instead, they opine that low-income countries did not convert their net external financing to activities that could bring about economic growth and poverty reduction. This happened because of lack of requisite infrastructure that is the foundation of any profitable economic activity and includes clearly defined property rights, access to roads, schools, hospitals and clean potable water.

The main purpose of Chapter 5 was empirically testing for the existence or non-existence of the Inverted-U shaped relationship between external debt and economic growth. Its empirical findings obtained using the system GMM showed that there was no evidence to support the existence of the highly popular hypothesis of an Inverted-U shaped relationship between external debt and economic growth. If the Inverted-U relationship were to hold, the sign of the

coefficient of external debt should be positive whereas that of external debt squared should be negative which was not the case here. The results show that the coefficient of the square of external debt was positive and significant which contravenes the Inverted-U shaped hypothesis and suggests that there is no empirical finding to back the Inverted-U shaped or concave type non-linear quadratic relationship between external debt and economic growth. This finding corroborates Presbitero (2006); Schclarek (2004); and Warner (1992) empirical studies.

6.2 Suggested Areas for Further Research

Future research needs to be undertaken on the impact of other forms of FCIs like foreign portfolio investments (FPI) on economic growth. Moreover, additional research is required on the impact of various types of FDI such as green-field FDI and mergers and acquisitions (M&As) on economic growth, TFP and domestic investments.

The effect of all forms of FCIs on the real exchange rate and hence the Dutch-Disease also needs to be investigated. Another area that requires further scrutiny is TFP. It is important to approach TFP using a stochastic frontier analysis and other forms of non-parametric modeling techniques. This will help split TFP into its component parts of technical efficiency and technological progress. It is also important to probe the nexus between external debt and TFP.

References

- Abadi, B. M. (2011). The Impact of Foreign Direct Investment on Economic Growth in Jordan. *IJRRAS*, 8(2).
- Abbas, S. M. (2007). *Public Domestic Debt and Economic Growth in Lower Income Countries*. (Ph.D Thesis), Department of Economics, University of Oxford, United Kingdom.
- Abdih, Y., Dagher, J., Chami, R., & Montiel, P. (2008). *Remittances and institutions: Are remittances a curse?* IMF Working Papers 08/29. International Monetary Fund.
- Abdullah, M. (2017). *Three Essays on the Macroeconomic Impact of Foreign Direct Investment In Low and Middle Income Countries*. (Ph.D Thesis), University of Manitoba, Manitoba, Canada.
- Abramovitz, M. (1956). Resource and Output Trends in the United States since 1870. *American Economic Review*, 46, 5-23.
- Abramovitz, M. (1986). Catching Up, Forging Ahead, and Falling Behind". *Journal of Economic History*, 46, 385-406.
- Abrigo, M. R. M., & Love, I. (2015). Estimation of Panel Vector Autoregression in Stata: a Package of Programs.
- Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review*, 91, 1369-1401.
- Acemoglu, D., & Robinson, J. A. (2006). *Economic Origins of Dictatorship and Democracy*. New York, U.S.A.: cambridge university press.
- Acosta, P. A., Baerg, N. R., & Mandelman, F. S. (2009). Financial development, remittances, and real exchange rate appreciation. *Economic Review*, 14(2), 1-12.
- Acosta, P. A., Lartey, E. K., & Mandelman, F. S. (2009). Remittances and the Dutch disease. *Journal of International Economics*, 79(1), 102-116.
- Adams, R. (2011). Evaluating the economic impact of international remittances on developing countries using household surveys: A literature review. *Journal of Development Studies*, 47(6), 809-828.
- Adams, R., & Page, J. (2005). The impact of international migration and remittances on poverty. In: *Remittances: Development Impact and Future Prospects* (S.M. Maimbo and D. Ratha, eds.). The World Bank Group, Washington D.C., pp. 277–306.

- Adams , R. H., & Cuechuecha, A. (2010a). *The economic impact of international remittances on poverty and household consumption and investment in Indonesia*. Policy Research Working Paper Series 5433. World Bank. Washington, D.C.
- Addison, T., & Heshmati, A. (2004). *The New Global Determinants of FDI Flows to Developing Countries: The Importance of Ict and Democratization*. Monetary Integration, Markets and Regulation: Research in Banking and Finance, Volume 4, 151–186.
- Adelman, I., Taylor, J. E., & Vogel, S. (1988). Life in a Mexican village: A Sam perspective. *Journal of Development Studies*, 25(1), 5-24.
- Adj, A. (2007). *Essays on Ricardian Equivalence*. (Ph.D Dissertation), Georgia State University. Retrieved from http://scholarworks.gsu.edu/econ_diss/19
- Aggarwal, R., Demirgüç-Kunt, A., & Pería, M. S. M. (2011). Do remittances promote financial development? *Journal of Development Economics*, 96 (2), 255-264.
- Aghion, P., Akcigit, U., & Howitt, a. P. (2008). What Do We Learn From Schumpeterian Growth Theory? *Harvard University Press*.
- Agosin, M. R., & Mayer, R. (2000). *Foreign investment in developing countries: Does it crowd in domestic investment?* UNCTAD Discussion Paper 146. Geneva.
- Agrawal, G. (2011). Impact of FDI on GDP Growth: A Panel Data Study. *European Journal of Scientific Research*, 57(2), 257-264.
- Agrawal, G. (2015). Foreign Direct Investment and Economic Growth in BRICS Economies: A Panel Data Analysis. *Journal of Economics, Business and Management*, 3(4). doi:10.7763/JOEBM.2015.V3.221
- Agunias, D. R. (2006). *Remittances and Development: Trends, Impacts, and Policy Options*. Migration Policy Institute, Washington, D.C.
- Ahiakpor, J. C. W. (1986a). The Profits of Foreign Firms in a Less Developed Country: Ghana. *Journal of Development Economics*, 20, 321-335.
- Aitken, B. J., & Harrison, A. E. (1999). Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela. *The American Economic Review* 89, 605-618.
- Ajayi, S. I. (1991). *Macroeconomic approach to external debt: The case of Nigeria*. AERC Research Paper, 8. African Economic Research Consortium. Nairobi, Kenya.
- Ajayi, S. I. (2006). *FDI and Economic Development in Africa*. Paper presented at the ADB/AERC International Conference on Accelerating Africa's Development Tunisia, November 22-24, 2006.

- Alege, P., & Ogundipe, A. (2013). Sustaining Economic Development of West African Countries: A System GMM Panel Approach. *Munich Personal RePEc Archive*. <http://mpira.ub.uni-muenchen.de/51702/>
- Alemayehu, G. (2006). *Openness, Inequality and Poverty in Africa*. DESA Working Paper No. 25. Department of Economic and Social Affairs, UN.
- Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2006). *How Does Foreign Direct Investment Promote Economic Growth? Exploring the Effects of Financial Markets on Linkages*. Working Paper. Harvard Business School.
- Alfaro, L., Chanda, A., S., K.-O., & Sayek, S. (2004). FDI and Economic Growth: The Role of Local Financial Markets,. *Journal of International Economics*, 64(1), 89-112.
- Altenburg, T. (2000). *Linkages and Spillovers between Transnational Corporations and Small and Medium-Sized Enterprises in Developing Countries – Opportunities and Policies, MNC-SME Linkages for Development. Issues – experiences – best practices*
- Paper presented at the Special Round on MNCs, SMEs and Development, UNCTAD X,, Bangkok, United Nations, Geneva.
- Amin, S. (1990). *Maldevelopment*. New York: Zed Books.
- Amuedo-Dorantes, C., & Pozo, S. (2004). Workers' remittances and the real exchange rate: a paradox of gifts. *World Development*, 32(8), 1407-1417.
- Amusa, K., Monkam, N., & Vieg, N. (2016). *Foreign aid and Foreign direct investment in Sub-Saharan Africa: A panel data analysis*. ERSa working paper 612.
- Anderson, J. (2006). "What Happened to the MNCs?". *UBS Investment Research: Asia Focus*.
- Anderson, T. W., & Hsiao, C. (1981). Estimation of dynamic models with error components. *Journal of the American Statistical Association*, 76(1), 598-606.
- Andreoni, J. (1989). Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence. *The Journal of Political Economy*, 97(6), 1447-1458.
- Andrews, D. W. K., & Lu, B. (2001). Consistent model and moment selection procedures for GMM estimation with application to dynamic panel data models. *Journal of Econometrics*, 101(1), 123-164.
- Ang, J. B. (2009). Financial development and the FDI-growth nexus: The Malaysian experience. . *Applied Economics*, 41(13), 1595-1601.
- Apergis, N., Katrakilidis, C. P., & Tabakis, N. M. (20006). Dynamic linkages between FDI inflows and domestic investment: a panel cointegration approach. *Atlantic Economic Journal*, 34(386-394).

- Arellano, C., Bulir, A., Lane, T., & Lipschitz, L. (2009). The dynamic implications of foreign aid and its variability. *Journal of Development Economics*, 88, 87-102.
- Arellano, M., & Bond, S. (1991). Some Test of Specification for Panel Data: Monte Carlo Evidence and An Application to Employment Equations. *Review of Economic Studies*, 58(2), 277-297.
- Arellano, M., & Bover, O. (1995). Another Look at the Instrumental Variable Estimation of Error-components Models. *Journal of Econometrics*, 68(1), 29-51.
- Arslanalp, S., & Henry, P. (2004). *Helping the Poor to Help Themselves: Debt Relief or Aid*. NBER Working Paper Series No. 10230, National Bureau of Economic Research.
- Artelaris, P., Arvanitidis, P., & Petrakos, G. (2006). *Theoretical and methodological study on dynamic growth regions and factors explaining their growth performance*. Dynamic Regions in a Knowledge-Driven Global Economy, Lessons and Policy Implications for the EU. Working Paper.
- Asiedu, E. (2002). On the determinants of foreign direct investment to developing countries: is Africa different? *World Development*, 30(1), 107-119.
- Asiedu, E. (2006). Foreign Direct Investment in Africa: The Role of Natural Resources, Market Size, Government Policy, Institutions and Political Instability. *World Economy* 29(1), 63-77.
- Asiedu, E. (2013). *Foreign direct investment, natural resources and institutions*. Working Paper series. International Growth Centre
- Asiedu, E., & Lien, D. (2011). Democracy, foreign direct investment and natural resources. *Journal of international Economics*, 84(1), 99-111.
- Avendano, R., Gaillard, N., & Nieto-Parra, S. (2011). Are workers' remittances relevant for credit rating agencies? *Review of Development Finance*, 1(1), 57-78.
- Azizov, A. (2007). *Determinants of FDI in CIS countries with Transition Economy*. (M.Sc. Thesis), Aarhus School of Business, Aarhus, Denmark.
- Bailliu, J. N. (2000). *Private capital flows, financial development, and economic growth in developing countries*. Bank of Canada Working Paper 2000-15. Bank of Canada.
- Balasubramanyam, V., Salisu, M., & Sapsford, D. (1996). FDI and Growth in EP and IS Countries. *The Economic Journal*, 107(445), 1770-1786.
- Balioune-Lutz, M. N. (2004). Does FDI contribute to economic growth? Knowledge about the effects of FDI improves negotiating positions and reduces risk for firms investing in developing countries. *Business Economics* 39(2), 49-63.

- Baltagi, B. H. (2005). *Econometric Analysis of Panel Data* (3rd ed.): John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England.
- Banerjee, A., & Lyer, L. (2005). History, institutions and economic performance: The legacy of colonial land. *The American Economic Review*, 95(4), 1190-1213.
- Barajas, A., Chami, R., Fullenkamp, C., Montiel, P., & Gapen, M. T. (2009). Do workers' remittances promote economic growth?, IMF Working Papers 09/153, International Monetary Fund.
- Barro, R., & Lee, J.-W. (1993). International comparisons of educational attainment. *Journal of Monetary Economics*, 32, 361-394.
- Barro, R., & Lee, J.-W. (1994). *Sources of economic growth*. Paper presented at the Carnegie Rochester Conference Series on Public Policy.
- Barro, R., & Sala-i-Martin, X. (1995). *Economic Growth*. Cambridge, MA: McGraw-Hill.
- Barro, R. J. (1991). Economic Growth in a Cross Section of Countries. *The Quarterly Journal of Economics*, 106(2), 407-443.
- Barro, R. J. (1996). *Determinants of Economic Growth: A Cross-Country Empirical Study*. NBER Working Paper 5698. National Bureau of Economic Research.
- Barro, R. J. (1998). *Human Capital and Growth in Cross-Country Regressions*. Harvard University.
- Barro, R. J. (2001). Human Capital and Growth. *Human Capital: Growth, History, and Policy*, 9(2).
- Barro, R. J. (2003). Determinants of Economic Growth in a Panel of Countries. *Annals of Economics and Finance* 4(231-274).
- Barro, R. J., & Lee, J.-W. (2011). A New Data Set of Educational Attainment in the World, 1950–2010.
- Basu, P., Chakraborty, C., & Reagle, D. (2003). Liberalization, FDI, and Growth in Developing Countries: A Panel Cointegration Approach. *Economic Inquiry*, 41(3), 510-516.
- Baum, C. F., Schaffer, M. E., & Stillman, S. (2003). Instrumental variables and GMM: Estimation and testing. *The Stata Journal*, 3(1), 1-31.
- Bazzi, S., & Clemens, M. (2009). *Blunt instruments: on establishing the causes of economic growth*. Working Paper. Centre for Global Development. Washington, D.C.
- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. *Journal of Economic Growth*, 12(1), 27-49.

- Bencivenga, V. R., & Smith, B. D. (1993). Some Consequences of Credit Rationing in an Endogenous Growth Model. *Journal of Economic Dynamics and Control*, 17(1), 97-122.
- Bende-Nabende, A., & Slater, J. (2003). Private capital formation: Short- and long-run crowding-in (out) effects in ASEAN, 1971-99. *Economics Bulletin* 3(27), 1-16.
- Benhabib, J., & Spiegel, M. (1994). The role of human capital in economic development: Evidence from aggregate cross-country data. *Journal of Monetary Economics*, 34, 143-173.
- Benhabib, J., & Spiegel, M. M. (2002). *Human Capital and Technology Diffusion*. FRBSF Working Paper #2003-02. New York University and Federal Reserve Bank of San Francisco.
- Berensmann, K. (2004). New Ways of Achieving Debt Sustainability beyond the Enhanced HIPC Initiative. *Intereconomics* 39(6), 321-330.
- Bettin, G., & Zazzaro, A. (2012). Remittances and financial development: Substitutes or complements in economic growth? . *Bulletin of Economic Research*, 64(4), 509-536.
- Beugelsdijk, R. S., & Zwinkels, R. (2008). The Impact of Horizontal and Vertical FDI on Host Country Economic Growth. *International Business Review*, 17, 452-472.
- Beugrand, P., Loko, B., & Mlachila, M. (2002). *The choice between external and domestic debt in financing budget deficits: the case of central and west African countries*. Working Paper, No. 02/79. Washington, D.C.: International Monetary Fund.
- Beveren, I. V. (2012). Total Factor Productivity Estimation: A Practical Review. *Journal of Economic Surveys*, 26(1), 98-128.
- Bhavan, T., Xu., C., & Zhong, C. (2011). Nexus between FDI and Foreign aid: the case of five South Asian Economies. *International Journal of Economics and Finance*, 3(2), 143-149.
- Bils, M., & Klenow, P. J. (2000). Does schooling cause growth? *American Economic Review*, 90(5), 1160-1183.
- Bitros, G. C., & Panas, E. E. (2001). Is there an inflation-productivity trade-off? Some evidence from the manufacturing sector in Greece. *Applied Economics*, 33(15), 19-61.
- Bjuggren, P.-O., Dzansi, J., & Shukur, G. (2010). *Remittances and Investment*. Jonkoping International Business School. Jonkoping University. Sweden.
- Blackburne, E. F., & Frank, M. W. (2007). Estimation of Nonstationary Heterogeneous Panels. *The Stata Journal*, 7(2), 197-208.

- Blavy, R. (2006). *Public debt and productivity: the difficult quest for growth in Jamaica*. Working Paper, No. 06/235. International Monetary Fund. Washington, D.C.
- Blejer, M., & Khan, M. S. (1984). Private investment in developing countries. *Finance and Development*, 21(2), 26.
- Blomström, M., Globerman, S., & Kokko, A. (1999). *The Determinants of Host Country Spillovers from Foreign Direct Investment: Review and Synthesis of the Literature*. Working Paper No. 76.
- Blomstrom, M., Lipsey, R., & Zejan, M. (1994). What explains growth in developing countries? *What Lies Behind Convergence*.
- Blundell, R., & Bond, S. (1998a). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics Review*, 87(1), 115-143.
- Blundell, R., & Bond, S. (1998b). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics*, 87, 115-143.
- Bond, S., Hoeffler, A., & Temple, J. (2001a). *Gmm Estimation of Empirical Growth Models*. Discussion Paper Series. Centre for Economic Policy Research.
- Bond, S. R., Hoeffler, A., & Temple, J. (2001b). *GMM Estimation of Empirical Growth Models*. CEPR Discussion Paper Series No. 3048. Centre for Economic Policy Research (CEPR), London.
- Bond, S. R., Hoeffler, A., & Temple, J. (2001c). *GMM Estimation Of Empirical Growth Models: International Macroeconomics*. Discussion Paper Series, No. 3048. Centre for Economic Policy Research.
- Borensztein, E., de Gregorio, J., & Lee, J.-W. (1998). How does foreign direct investment affect economic growth? *Journal of international Economics*, 45, 115-135.
- Bornschier, V., & Chase-Dunn, C. (1985). *Transnational corporations and under-development*. New York: Praeger Publishers.
- Bosworth, B. P., & Collins, S. M. (2003). *The Empirics of Growth: An Update*. mimeo, Washington, DC: Brookings Institution.
- Bourdet, Y., & Falck, H. (2006). Emigrants' Remittances and Dutch disease in Cape Verde. *International Economic Journal*, 20(3), 267-284.
- Boyd, J. H., & Smith, B. D. (1992). Intermediation and the Equilibrium Allocation of Investment Capital: Implications for Economic Development. . *Journal of Monetary Economics*, 30, 409-432.

- Breusch, T. S., & Pagan, A. R. (1980). The Lagrange Multiplier Test and Its Applications to Model Specification in Econometrics. *Review of Economic Studies*, 47(1), 239-253.
- Bruno, M. (1984). Raw materials, Profits, and the Productivity Slowdown. *Quarterly Journal of Economics*, 99(1), 1-30.
- Buckley, P. J. (2003). *FDI and Growth for Developing Countries: MNEs and the Challenges of the "New" Economy*. Paper presented at the The Role of Industrial Development in the Achievement of the Millennium Development Goal. Proceedings of the Industrial Development Forum and Associated Round Tables, United Nations Industrial Development Organization, Vienna
- Bugamelli, M., & Paternò, F. (2009). Do workers' remittances reduce the probability of current account reversals? *World Development*, 37, 1821-1838.
- Bugamelli, M., & Paternò, F. (2011). Output growth volatility and remittances. *Economica*, 78 (311), 480-500.
- Burnside, C., & Dollar, D. (2000). Aid, Policies, and Growth. *American Economic Association*, 90(4), 847-868.
- Burnside, C., & Dollar, D. (2004). *Aid, Policies, and Growth: Revisiting the Evidence*. World Bank Policy Research Paper.
- Busse, M., & Hefeker, C. (2007). Political risk, institutions and foreign direct investment. *European journal of political economy*, 23(2), 397-415.
- Canova, F., & Ciccarelli, M. (2013). *Panel Vector Autoregressive Models: A Survey*. Working Paper SerieS. European Central Bank (ECB).
- Cardoso, E. A., & Dornbusch, R. B. (1989). Foreign Private Capital Flows. In H. B. Chenery & T. N. Srinivasan (Eds.), *Handbook of Development Economics*, Vol. 2, . Amsterdam: Elsevier.
- Carkovic, M., & Levine, R. (2002). *Does Foreign Direct Investment Accelerate Economic Growth?* University of Minnesota.
- Caselli, F., & Coleman, W. J. (2002). *"The World Technology Frontier"*. Working Paper.
- Cass, D. (1965). Optimum Growth in an Aggregative Model of Capital Accumulation. *The Review of Economic Studies*, 32(3), 233-240.
- Castellano, A. (2015). Brighter Africa: The growth potential of the sub-Saharan electricity sector.
- Catrinescu, N., Leon-Ledesma, M., Piracha, M., & Quillin, B. (2009). Remittances, Institutions, and Economic Growth. *World Development*, 37(1), 81-92.

- Caves, E. R. (1974). Multinational Firms, Competition, and Productivity in Host-Country Markets. *Economica* 41(1-2), 176-193.
- Caves, R. (1996). *Multinational firms and economic analysis* Cambridge: Cambridge University Press.
- Caves, R. E. (1971). International Corporations: The Industrial Economics of Foreign Investment. *Economica* 38, 1-27.
- Chami, R., Gapen, M., Barajas, A., Montiel, P., Cosimano, T., & Fullenkamp, C. (2008). Macroeconomic Consequences of Remittances, IMF Occasional Paper 259.
- Chami, R., Hakura, D., & Montiel, P. (2009). Remittances: An automatic output stabilizer?, IMF Working Paper No. 09/91.
- Chami, R., Jahjah, S., & Fullenkamp, C. (2003). Are immigrant remittance flows a source of capital for development, IMF Working Papers 03/189, International Monetary Fund.
- Chauvet, L., Gubert, F., & Mesple-Somps, S. (2009). *Are Remittances More Effective than Aid to Reduce Mortality? An Empirical Assessment using Inter and Intra-Country Data*. IRD, DIAL and Paris School of Economics.
- Checherita, C., & Rother, P. (2010). *The impact of high and growing government debt on economic growth. An empirical investigation for the euro area*. ECB Working Paper Series no. 1327.
- Chen, T. J., Chen, H., & Ku, Y. H. (2004). Foreign direct investment and local linkages. *Journal of International Business Studies*, 35(4), 320-333. doi: <http://dx.doi.org/10.1057/palgrave.jibs.8400085>
- Chenery, H. B., & Strout, A. M. (1966). Foreign Assistance and Economic Development',. *American Economic Review*, 56, 679-733.
- Chika, O. G. (2014). *Determinants of Foreign Direct Investment into Sub-Saharan Africa and its Impact on Economic Growth*. (Ph.D Thesis), Bournemouth University, UK.
- Choe, J. I. (2003). Do Foreign Direct Investment and Gross Domestic Investment Promote Economic Growth? . *Review of Development Economics*, 7(1), 44-57.
- Chowdhury, A. R. (2001). *Foreign Debt and Growth in Developing Countries*. Paper presented at the Conference on Debt Relief, WIDER Helsinki: United Nations University.
- Christopoulos, D., & Tsionas, E. (2004). Financial development and economic growth: Evidence from panel unit root and co-integration tests. *Journal of Development Economics*, 73(2), 55-74.

- Chudik, A., & Pesaran, M. H. (2015). Common correlated effects estimation of heterogeneous dynamic panel data models with weakly exogenous regressors. *Journal of Econometrics*, 188(2), 393-420.
- Chudnovsky, D., & López, A. (2008). *Foreign Investment and Sustainable Development in Argentina*. Discussion Paper Number 12. Working Group on Development and Environment in the Americas.
- Clements, B., Bhattacharya, R., & Nguyen, T. Q. (2003). *External Debt, Public Investment, and Growth in Low-Income Countries*. IMF Working Paper. International Monetary Fund.
- Cochrane, J. H. (2011). Understanding policy in the great recession: Some unpleasant fiscal arithmetic. *European Economic Review*, 55(1), 2-30.
- Colen, L., Maertens, M., & Swinnen, J. (2008). *Foreign Direct Investment as an Engine for Economic Growth and Human Development: A Review of the Arguments and Empirical Evidence*. IAP P6/06. Working Paper No.16.
- Collier, P. (2000). *Economic Causes of Civil Conflict and Their Implications For Policy*. Development Research Group, World Bank.
- Collier, P., & Gunning, J. W. (1999). Why Has Africa Grown Slowly. *Journal of Economic Perspectives*, 13(3), 3-22.
- Coviello, D., & Islam, R. (2006). *Does Aid Help Improve Economic Institutions?* World Bank Policy Research Working Paper, No. 3990.
- Cox-Edwards, A., & Rodríguez-Oreggia, E. (2009). Remittances and labor force participation in Mexico: An analysis using propensity score matching. *World Development*, 37(5), 1004-1014.
- Craigwell, R., Jackman, M., & Moore, W. (2010). Economic volatility and remittances. *International Journal of Development Issues*, 9(1), 25-42.
- Crespo, N., Proença, I., & Fontoura, M. P. (2008). *FDI Spillovers at Regional Level: Evidence from Portugal*. Working Paper - 05/08. Economics Research Center, Lisbon University Institute.
- Cunningham, R. (1993). The Effects of Debt Burden on Economic Growth in Heavily Indebted Nations *Journal of Economic Development*, 18(1), 115-126.
- Daniele, V., & Marani, U. (2011). Organized crime, the quality of local institutions and FDI in Italy: A panel data analysis. *European Journal of Political Economy*, 27(1), 132-142.

- Daude, C., & Stein, E. (2007). The quality of institutions and foreign direct investment. *Economics & Politics*, 19(3), 317-344.
- David, A. (2010). How do international financial flows to developing countries respond to natural disasters?, IMF Working Papers 10/166, International Monetary Fund.
- De Gregorio, J., & Lee, J. W. (2003). *Growth and Adjustment in East Asia and Latin America*. Working Papers, Central Bank of Chile
- de la Fuente Angel, & Doménech, R. (2006). *Human capital in growth regressions: how much difference does data quality make? An update and further results*. Instituto de Análisis Económico (CSIC).
- De Mello, L. R. (1997). Foreign direct investment in developing countries and growth: A selective survey. *Journal of Development Studies*, 34(1), 1-34.
- De Mello, L. R. (1999). Foreign direct investment-led growth: Evidence from time series and panel data. *Oxford Economic Papers*, 5(1), 133-151.
- DeLong, J. B., & Summers, L. H. (1991). Equipment Investment and Economic Growth. *The Quarterly Journal of Economics*, 106(2), 445-502.
- Demetriades, P., & Law, S. H. (2004). *Finance, Institutions and Economic Growth*. Working Paper. Department of Economics, University of Leicester, UK.
- Deshpande, A. (1997). The Debt Overhang and the Disincentive to Invest. *Journal of Development Economics*, 52(1), 169-187.
- Devarajan, S., Easterly, W., & Pack, H. (2003). Low Investment is Not the Constraint on African Development. *Economic Development and Cultural Change*, 51(3), 547-571.
- Dijkstra, G., & Hermes, N. (2001). *The Uncertainty of Debt Service Payments and Economic Growth of Highly Indebted Poor Countries: Is There a Case for Debt Relief?* unpublished manuscript (Helsinki: United Nations University).
- Dixon, W. J., & Boswell, T. (1996). Dependency, disarticulation, and denominator effects: Another look at foreign capital penetration. *American Journal of Sociology* 102, 543-562.
- Djankov, S., & Hoekman, B. (2000). Foreign Investment and Productivity Growth in Czech Enterprises. *The World Bank Economic Review* 14(1), 49-64.
- Dollar, D., & Easterly, W. (1999). The search for the key: aid, investment and policies in Africa. *Journal of African Economies*, 8(4), 546-577.
- Dollar, D., & Kraay, A. (2003). Institutions, trade, and growth. *Journal of Monetary Economics*, 50(1), 133-162.

- Dollar, D., & Kraay, A. (2004). Trade, Growth, and Poverty. *Economic Journal* 114(493), 22-49.
- Domar, E. D. (1946). Capital Expansion, Rate of Growth, and Employment. *Econometrica*, 14(2), 137-147.
- Driffield, N., & Jones, C. (2013). Impact of FDI, ODA and Migrant Remittances on Economic Growth in Developing Countries: A Systems Approach. *The European Journal of Development Research*, 25(2), 173-196.
- Drukker, D. M. (2010). *An introduction to GMM estimation using Stata*. German Stata Users' Group. Berlin, Germany.
- Du, J., Lu, Y., & Tao, Z. (2008). Economic institutions and FDI location choice: Evidence from US multinationals in China. *Journal of comparative Economics*, 36(3), 412-429.
- Dunning, J. H. (1977). *Trade, Location of Economic Activity and the MNE: A Search for an Eclectic Approach*. London: Macmillan.
- Dunning, J. H. (2000). The Eclectic Paradigm as an Envelope for Economic and Business. Theories of MNE Activity. *International Business Review*, 9, 163-190.
- Durand, J., Kandel, W., Parrado, E. A., & Massey., D. S. (1996). International migration and development in Mexican communities. *Demography*, 33(2), 249-264.
- Durlauf, S., Johnson, P., & Temple, J. (2005). Growth econometrics. In P. Aghion (Ed.), *Handbook of Economic Growth*, : Elsevier, North Holland.
- Easterly, W. (2001). *The elusive quest for growth: economists' adventures and misadventures in the topics*: Cambridge MA: MIT Press.
- Easterly, W., & Levine, R. (1997). Africa's Growth Tragedy: Policies and Ethnic Divisions. *The Quarterly Journal of Economics*, 112(4), 1203-1250.
- Easterly, W., & Levine, R. (1998). Troubles with the Neighbors: Africa's Problem, Africa's Opportunity. *Journal of African Economies*, 7(1), 120-142.
- Easterly, W., & Levine, R. (2001a). It's Not Factor Accumulation: Stylized Facts and Growth Models. *World Bank Economic Review*, 15(2), 177-219.
- Easterly, W., & Levine, R. (2001b). What have we learned from a decade of empirical research on growth? It's Not Factor Accumulation: Stylized Facts and Growth Models. *The World Bank Economic Review*, 15(2), 177-219.
- Ebeke, C. H. (2011). *Essays on the macroeconomic consequences of remittances in developing countries*. (Ph.D Thesis), Universit e d'Auvergne - Clermont-Ferrand I.,

- Eberhardt, M., & Helmers, C. (2010). *Untested Assumptions and Data Slicing: A Critical Review of Firm-Level Production Function Estimators*. Working Papers Series 513. Department of Economics, University of Oxford, UK.
- Eberhardt, M., Helmers, C., & Strauss, H. (2011). Do Spillovers Matter When Estimating Private Returns to R&D? : European Investment Bank.
- Edwards, S. (1992). Trade Orientation, Distortions and Growth in Developing Countries. *Journal of Development Economics*, 39, 31-57.
- Elbadawi, I. A., Ndulu, B. J., & Ndung'u, N. (1997). *Debt Overhang and Economic Growth in Sub-Saharan Africa*. External Finance for Low-Income Countries. Washington: International Monetary Fund.
- Elfakhani, S. M., & Matar, L. M. (2007). Foreign direct investment in the Middle East and North Africa region. *Journal for Global Business Advancement*, 1(1), 49-70.
- Enderwick, P. (2005). Attracting desirable FDI: Theory and evidence. *Transnational Corporations*, 14(2), 93-120.
- Erden, L., & Holcombe, R. G. (2006). The Linkage between Public and Private Investment: A Co-Integration Analysis of a Panel of Developing Countries. *Eastern Economic Journal*, 32(3).
- Everaert, G., & De Groote, T. (2016). Common correlated effects estimation of dynamic panels with cross-sectional dependence. *Econometric Reviews*, 35(3), 428-463.
- Ezeabasili, V. N., Isu, H. O., & Mojekwu, J. N. (2011). Nigeria's External Debt and Economic Growth: An Error correction Approach. *International Journal of Business and Management*, 6(5), 1833-1849.
- Fambon, S. (2013). *Foreign capital inflow and economic growth in Cameroon*. United Nations University-WIDER, Working Paper No. 2013/124.
- Fedderke, J. (2002). The structure of growth in the South African economy: Factor accumulation and total factor productivity growth 1970-97. *South African Journal of Economics*, 70(4), 282-299.
- Fedderke, J. W., & Romm, A. T. (2006). Growth Impact and Determinants of Foreign Direct Investment into South Africa (1953-2003). *Economic Modelling*, 23, 738-760.
- Fosu, A. K. (1999). The External Debt Burden and Economic Growth in the 1980s: Evidence from Sub-Saharan Africa. *Canadian Journal of Development Studies*, XX(2), 307-318.
- Fosu, A. K. (2009). *Charting the Future of Africa: Avoiding Policy Syndromes and Improving Governance*. Paper presented at the UNU/UNESCO International Conference on

- ‘Africa and Globalization: Learning from the Past, Enabling a Better Future Tokyo, Japan, 28-29 September 2009.
- Fosu, A. K. (2012). *Growth of African Economies: Productivity, Policy Syndromes and the Importance of Institutions*
University of Oxford, UK.
- Fosu, A. K., & O’Connell, S. A. (2005). *Explaining African Economic Growth: The Role of Anti-Growth Syndromes*. Paper presented at the Annual Bank Conference on Development Economics (ABCDE), Dakar, Senegal.
- Frank, G. A. (1969). Capitalism and Underdevelopment in Latin America. *Monthly Review of Press: New York*.
- Frankel, J. A., & Romer, D. (1999). Does Trade Cause Growth? *American Economic Review*, 89(3), 379-399.
- Freund, C., & Spatafora, N. (2005). Remittances: costs, determinants, and informality. World Bank Policy Research Working Paper No.3704.
- Fry, M. (1992). *Foreign Direct Investment in a Macroeconomic Framework: Finance, Efficiency, Incentives, and Distortions*. Working Paper Series 1141. International Economics Department, The World Bank.
- Fuente, d. l., & Domenech, R. (2006). Human capital in growth regressions: How much difference does data quality make? *Journal of the European Economic Association*, 4(1), 1-36.
- Funkhouser, E. (2006). The Effect of Emigration on the Labor Market Outcomes of the Sender Household: A Longitudinal Approach using Data from Nicaragua. *Well Being and Social Policy*, 2, 5-27.
- Gao, T. (2005). Labor quality and the location of foreign direct investment: Evidence from China. *China Economic Review*, 16(3), 274-292.
- Garip, F. (2006). Social and economic determinants of migration and remittances: An analysis of 22 Thai villages; Princeton University, mimeo.
- Geiger, L. T. (1990). Debt and Economic Development in Latin America. *The Journal of Developing Areas*, 24(2), 181-194.
- Ghali, K. H. (1998). Government Size and Economic Growth: Evidence from a Multivariate Cointegration Analysis. *Applied Economics*, 31, 975.

- Gholami, R., Lee, S.-Y. T., & Heshmati, A. (2006). *The Causal Relationship Between Information and Communication Technology and Foreign Direct Investment*. United Nations University.
- Ghura, D., & Goodwin, B. (2000). Determinants of private investment: a cross-regional empirical investigation. *Applied Economics*, 32(14), 1819-1829.
- Gillman, M., Harris, M. N., & Mátyás, L. (2004). Inflation and growth: Explaining a negative effect. *Empirical Economics*, 29(1), 149-167.
- Giroud, A., & Scott-Kennel, J. (2006). *Foreign-Local Linkages in International Business :A Review and Extension of the Literature*. Paper presented at the Academy of International Business Conference, Beijing, 23-26 june.
- Giuliano, P., & Ruiz-Arranz, M. (2009). Remittances, financial development, and growth. *Journal of Development Economics*, 90 (1), 144-152.
- Globerman, S., & Shapiro, D. (2002). Global foreign direct investment flows: The role of governance infrastructure. *World development*, 30(11), 1899-1919.
- Glomm, G., & Ravikumar, B. (1992). *Public versus Private Investment in Human Capital: Endogenous Growth and Income Inequality*. University of Virginia.
- Gomanee, K., Girma, S., & Morrissey, O. (2002). *Aid, Investment and Growth in Sub-Saharan Africa*. School of Economics, University of Nottingham.
- Görg, H., & Greenaway, D. (2004). Much ado about nothing. Do domestic firms really benefit from foreign direct investment? . *World Bank Research Observer* 19, 171-197.
- Greene, J., & Villanueva, D. (1991). Private Investment in Developing Countries. *IMF Staff Papers*, 38(1), 33-58.
- Grier, K., & Tullock, G. (1989). An Empirical Analysis of Cross-National Economic Growth. *Journal of Monetary Economics*, 24(2), 259-276.
- Griffin, K. (1970). Foreign capital, domestic saving and economic development. *Oxford Bulletin of Economics and Statistics*, 32(2), 99-112.
- Gupta, S., Pattillo, C., & Wagh, S. (2007). *Impact of Remittances on Poverty and Financial Development in Sub-Saharan Africa*. Working Paper. IMF. Washington D.C.
- Gupta, S., Pattillo, C. A., & Wagh, S. (2009). Effect of remittances on poverty and financial development in Sub-Saharan Africa. *World Development*, 37, 104-115.
- Haddad, M., & Harrison, A. (1993). Are there positive spillovers from direct foreign investment? Evidence form panel data for Morocco. *Journal of Development Economics*, 42, 51-74.

- Hall, R. E., & Jones, C. I. (1999). Why Do Some Countries Produce So Much More Output Per Worker Than Others? *Quarterly Journal of Economics*, 114(1), 83-116.
- Hamilton, J. D. (1994). *Time Series Analysis*. Princeton , USA: Princeton University Press.
- Hanke, S., & Kwok, A. (2009). On the measurement of Zimbabwe's hyperinflation. *Cato Journal*, 29(2), 353–364.
- Hansen, H. (2001). *The Impact of Aid and External Debt on Growth and Investment: Insights from Cross-Country Regression Analysis*. Paper presented at the Conference on Debt Relief, WIDER, Helsinki: United Nations University.
- Hansen, H., & Rand, J. (2006). On the Causal Links between FDI and Growth in Developing Countries. *The World Economy*, 29(1), 21-41.
- Hansen, H., & Tarp, F. (2001). Aid and Growth Regressions. *Journal of Development Economics* 64(2), 547-570.
- Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica*, 50(4), 1029-1054.
- Harrison, A. (1996). Openness and Growth: A Timeseries, cross-country analysis for Developing Countries. *Journal of Development Economics*, 48(2), 419-447.
- Harrod, R. F. (1939). An Essay in Dynamic Theory. *The Economic Journal*, 49(193), 14-33.
- Hassan, G. M. (2011). *Growth Effects of Remittances: Cross-Country and Time Series Analysis*. (Ph.D Thesis), University of Western Sydney, Australia.
- Hauk, W., & Wacziarg, R. (2009). A Monte Carlo Study of Growth Regressions. *Journal of Economic Growth*, 14, 103-147. doi: 10.1007/s10887-009-9040-3
- Hauner, D. (2006). *Fiscal policy and financial development*. Working Paper, No. 06/26. International Monetary Fund. Washington, D.C.
- Hausman, J. A. (1978). Specification Tests in Econometrics. *Econometrica*, 46(6), 1251-1271.
- Helpman, E., & Krugman, P. R. (1985). Market structure and foreign trade: Increasing returns, imperfect competition, and the international economy. *MIT press*.
- Herzer, D., Klasen, S., & Nowak-Lehmann, D. F. (2008). In Search of FDI-led Growth in Developing Countries: The Way Forward. *Economic Modelling*, 25, 793-810.
- Heshmati, A., & Davis, R. (2007). *The Determinants of Foreign Direct Investment: Flows to the Federal Region of Kurdistan*. Discussion Paper No. 3218. Institute for the Study of Labor (IZA).
- Hoeffler, A. E. (2002). The augmented Solow model and the African growth debate. *Oxford Bulletin of Economics and Statistics*, 64(2), 135-158.

- Holtz-Eakin, D. (1994). Public Sector Capital and the Productivity Puzzle. *Review of Economics and Statistics*, 76(1), 12-21.
- Holtz-Eakin, D., Newey, N., & Rosen, H. S. (1988). "Estimating Vector Autoregressions with Panel Data". *Econometrica* 56(6), 1371-1395.
- Holzmann, R., & Munz, R. (2004). *Challenges and opportunities of international migration for the EU, its member states, neighboring countries, and regions*. A Policy Note," Social Protection Discussion Papers 30160, The World Bank.
- Hong, E., & Sun, L. (2011). Foreign Direct Investment and Total Factor Productivity in China: A Spatial Dynamic Panel Analysis. . *Oxford Bulletin of Economics and Statistics* 73(6), 771-791.
- Hymer, S. H. (1960). *The International Operations of National Firms: A Study of Direct Foreign Investment*. Cambridge, MA: MIT Press.
- IMF. (2005). World Economic Outlook: Globalization and External Imbalances, International Monetary Fund Chap. Two Current Issues Facing Developing Countries.
- IMF. (2009). World Economic Outlook 2009: Sustaining the Recovery. Washington: International Monetary Fund.
- IMF. (2013). Boom, bust, or prosperity? Managing Sub-Saharan Africa's natural resource wealth. Washington D.C.
- Isaksson, A. (2001). *The Importance of Human Capital for the Trade-Growth Link* UNIDO Working Paper No. 2, Vienna: UNIDO.
- Isaksson, A. (2007). *Determinants of Total Factor Productivity: A Literature Review*. Research and Statistics Branch, United Nations Industrial Development Organization (UNIDO).
- Islam, N. (1995). Growth Empirics: A Panel data Approach. *Quarterly Journal of Economics* 110(4), 1127-1170.
- Iyoha, M. A. (1999a). External Debt and Economic Growth in Sub-Saharan African Countries: An Econometric Study'. Paper presented at AERC workshop, Nairobi.
- Iyoha, M. A. (1999b). External Debt and Economic Growth in Sub-Saharan African Countries: An Econometric Study". Paper presented at AERC workshop, Nairobi.
- Jansen, W. J., & Stokman, A. C. J. (2004). *Foreign Direct Investment and International Business Cycle Co-movement* Working Paper Series No.401. European Central Bank,.
- Jernej, M., Aleksander, A., & Miroslav, V. (2014). The Impact of Growing Public Debt on Economic Growth in the European Union. *Amfiteatru Economic*, 16(35), 403-414.

- Jongwanich, J. (2007). *Workers' Remittances, Economic Growth and Poverty in Developing Asia and Pacific Countries*. Journal of Development Economics. UNESCAP Working Paper 07/01. United Nations Economic and Social Commission for Asia and the Pacific. Bangkok.
- Jugurnath, B., Chuckun, N., & Fauzel, S. (2016). Foreign Direct Investment & Economic Growth in Sub-Saharan Africa: An Empirical Study. *Theoretical Economics Letters*, 6, 798-807.
- Kamara, Y. U. (2013). *Foreign Direct Investment and Growth in Sub-Saharan Africa: What are the Channels?* University of Kansas.
- Karabarbounis, L., & Neiman, B. (2014). *Capital Depreciation and Labor Shares Around the World: Measurement and Implications*. University of Chicago and NBER.
- Karagol, E. (2002). The Causality Analysis of External Debt Service and GNP: The Case of Turkey. *Central Bank Review*, 2(1), 39-64.
- Karagöz, K. (2009). Workers' Remittances and Economic Growth: Evidence from Turkey. *Journal of Yasar University*, 4(13), 1891-1908.
- Kastrati, S. K. (2013). Impact of FDI on Economic Growth: An Overview of the Main Theories of FDI and Empirical Research. *European Scientific Journal* 9(7), 1857-1874.
- Khan, M., & Senhadji, A. (2000). *Financial Development and Economic Growth: An overview* IMF Working Paper Washington, DC.
- King, R., & Levine, R. (1993). Finance and Growth: Schumpeter Might Be Right *Quarterly Journal of Economics*, 108(3), 717-738.
- Klenow, P. J., & Rodríguez-Clare, A. (2005). *Externalities and Growth* Vol. 1A. P. Aghion & S. N. Durlauf (Eds.), *Handbook of Economic Growth* doi:10.1016/S1574-0684(05)01011-7
- Knack, S., & Keefer, P. (1995). Institutions and Economic Performance: Institutional Measures Cross-Country Tests using Alternative *Economics and Politics*, 7(3).
- Koechlin, V., & Leon, G. (2007). International Remittances and Income Inequality: An Empirical Investigation. *Journal of Economic Policy Reform*, 10, 123-141.
- Kojima, K., & Ozawa, T. (1975). International trade and foreign investment: Substitutes or complements. *Hitotsubashi Journal of Economics*, 16(1).
- Koopmans, T. C. (1965). *On the concept of optimal economic growth*. Cowls Foundation Discussion Paper No.163. Cowls Foundation for Research in Economics at Yale University

- Kose, M. A., Prasad, E., Rogoff, K., & Wei, S.-J. (2006). Financial globalization: a reappraisal. IMF Working Paper, 06/189.
- Krueger, A., & Lindahl, M. (2001). Education for growth: Why for whom? . *Journal of Economic Literature*, 39(4), 1101-1136.
- Krugman, P. (1988). Financing vs. Forgiving a Debt Overhang,. *Journal of Development Economics*, 29(3), 253-268.
- Krugman, P. (1994). The Myth of Asia's Miracle. *Foreign Affairs*, 73, 62-78.
- Krugman, P. (2000). *Fire-Sale FDI.* " In *Capital Flows and the Emerging Economies*. Chicago: The University of Chicago Press.
- Kumar, M., & Woo, J. (2010). *Public Debt and Growth*. IMF Working Paper. IMF, Washington, DC.
- Kutivadze, N. (2011). *Public debt and financial development*. University of Milano Working Paper No. 2011-13.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal Determinants of External Finance. *Journal of Finance*, 52(2), 1131-1150.
- Lamine, K. M. (2010). Foreign Direct Investment Effect on Economic Growth: Evidence from Republic of Guinea in West Africa. *International Journal of Financial Research*, 1(1).
- Lartey, E. K. K., & Mengova, E. (2015). *Does Institutional Quality in Developing Countries Affect Remittances?* California State University, Fullerton. U.S.A.
- Lee, M. I. H., Syed, M. M. H., & Xueyan, M. L. (2012). Is China Over-Investing and Does it Matter? (No. 12-277). International Monetary Fund.
- Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature*, 35(2), 688-726.
- Levine, R. (2005). Finance and Growth: Theory and Evidence. In P. Aghion & S. N. Durlauf (Eds.), *Handbook of Economic Growth* (pp. 865–934.). Amsterdam: Elsevier.
- Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: causality and causes. *Journal of Monetary Economics*, 46(1), 31-77.
- Levinsohn, J., & Petrin, A. (2003). Estimating production functions using inputs to control for unobservables. *Review of Economic Studies* 70, 317-341.
- Li, X., & Liu, X. (2005). Foreign Direct Investment and Economic Growth: An Increasingly Endogenous Relationship. *World Development*, 33(3), 393-407.

- Lin, S., & Sosin, K. (2001). Foreign debt and economic growth. *Economics of Transition*, 9(3), 635-655.
- Lipsey, R. E. (2002). *Home and Host Country Effects of FDI*. NBER Working Paper 9293.
- Lipsey, R. E. (2004). *Home- and Host-Country Effects of Foreign Direct Investment*.
- Lipton, M. (1980). Migration from rural areas of poor countries: The impact of rural productivity and income distribution. *World Development*, 8(1), 1-24.
- Loko, B., & Diouf, M. A. (2009). *Revisiting the Determinants of Productivity Growth: What's New?* IMF Working Paper.
- Love, I., & Zicchino, L. (2006). Financial development and dynamic investment behavior: Evidence from panel VAR. *The Quarterly Review of Economics and Finance*, 46(2), 190-210.
- Lubambu, K. M. K. (2014). *The Impacts of Remittances on Developing Countries*. The European Parliament: Directorate-General for External Policies of the Union. Switzerland.
- Lucas, R. (1993). On the determinants of direct foreign investment: Evidence from East and Southeast Asia. . 21, 391-406. doi:[http://dx.doi.org/10.1016/0305-750X\(93\)90152-Y](http://dx.doi.org/10.1016/0305-750X(93)90152-Y)
- Lucas, R., & Stark, O. (1985). Motivations to Remit: Evidence from Botswana. *Journal of Political Economy*, 93(5), 901-918.
- Lucas, R. E. (1998). On the Mechanics of Economic Development. *Journal of Monetary Economics*, 22, 3-42.
- Lutkepohl, H. (2005). *New Introduction to Multiple Time Series Analysis*. New York: Springer.
- Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and statistics*, 61(S1), 631-652.
- Maghyereh, A., & Hashemite, U. (2003). External Debt and Economic Growth in Jordan: The Threshold Effect. *Economia Internazionale/International Economics* 56(3), 337-355.
- Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics*, 58, 407-437.
- Mauro, P. (1995). Corruption and Growth. *The Quarterly Journal of Economics*, 110(3), 681-712.
- McKinnon, R. I. (1974). Money and Capital in Economic Development. *The American Political Science Review*, 68(4), 1822-1826.

- Mileva, E. (2007). *Using Arellano – Bond Dynamic Panel GMM Estimators in Stata: Tutorial with Examples using Stata 9.0 (xtabond and xtabond2)*. Economics Department, Fordham University
- Mileva, E. (2008). *The impact of capital flows on domestic investment in transition economies*. Working Paper Series. European Central Bank. Frankfurt, Germany.
- Miller, S. M., & Upadhyay, M. P. (2000). The Effects of Openness, Trade Orientation, and Human Capital on Total Factor Productivity. *Journal of Development Economics*, 63(399-423).
- Mishra, P. (2007). Emigration and wages in source countries: Evidence from Mexico. *Journal of Development Economics*, 82(1), 180-199.
- Mody, A., & Murshid, A. P. (2005). Growing up with capital flows *Journal of International Economics*, 65, 249-299.
- Mohapatra, S., Joseph, G., & Ratha, D. (2009). Remittances and natural disasters : ex-post response and contribution to ex-ante preparedness, Policy Research Working Paper Series 4972, The World Bank.
- Morrissey, O., & Udomkerdmongkol, M. (2012). Governance, private investment and foreign direct investment in developing countries. *World Development*, 40(3), 437-445.
- Moss, T., & Chiang, H. S. (2003). *The Other Costs of High Debt in Poor Countries: Growth, Policy Dynamics and Institutions*. Center for Global Development Washington, D.C.
- Mundaca, B. G. (2009). Remittances, financial market development, and economic growth: The case of Latin America and the Caribbean. *Review of Development Economics*, 13(2), 288-303.
- Mundell, R. A., 1968. (1968). *International Trade and Factor Mobility*”, *International Economics*. New York: Macmillan Press.
- Mutenyo, J. (2008). *Does Foreign Direct Investment Stimulate Economic Growth in Sub-Saharan Africa?* . Paper presented at the Paper Presented at the ESRC Development Economics Conference 17th – 18th September University of Sussex, London, UK.
- Mutenyo, J., Asmah, E., & Kalio, A. (2010). Does Foreign Direct Investment Crowd-Out Domestic Private Investment in Sub-Saharan Africa? *The African Finance Journal*, 12(1), 27-52.
- Nachega, J.-C., & Fontaine, T. (2006). *Economic Growth and Total Factor Productivity in Niger*. IMF Working Paper.

- Narula, R., & Lall, S. (2004). Foreign direct investment and its role in economic development: Do we need a new agenda? *The European Journal of Development Research* 16(3), 447-464.
- Nayak, D. a. R. N. C. (2014). *A selective review of foreign direct investment theories*. ARTNeT Working Paper Series No. 143. Bangkok, ESCAP. Retrieved from www.artnetontrade.org.
- Ndikumana, L., & Verick, S. (2008). The Linkages Between FDI and Domestic Investment: Unravelling the Developmental Impact of Foreign Investment in Sub-Saharan Africa *Development Policy Review* 26(6), 713-726.
- Ndulu, B. (2007). Challenges of African Growth: Opportunities, Constraints and Strategic Directions: The International Bank for Reconstruction and Development / The World Bank, Washington D.C.
- Neagu, I. C., & Schiff, M. (2009). Remittance stability, cyclicality and stabilizing impact in developing countries, Policy Research Working Paper Series 5077, The World Bank.
- Nelson, R. R., & Pack, H. (1999). The Asian Miracle and Modern Growth Theory. *The Economic Journal*, 109(457), 416-436.
- Nickell, S. (1981). Biases in Dynamic Models with Fixed Effects *Econometrica* 49(6), 1417-1426.
- Nonnenberg, M. B., & Cardoso de Mendonça, M. J. (2004). The Determinants of Foreign Investment in Developing Countries. <http://www.anpec.org.br/encontro2004/artigos/A04A061.pdf>
- North, D. C. (1990). *Institutions, Institutional Change, and Economic Performance*. . New York: Cambridge University Press.
- Nunnenkamp, P., & Spatz, J. (2003). *Foreign Direct Investment and Economic Growth in Developing Countries: How Relevant are Host – country and Industry characteristics?* Kiel working paper, No.1176
- Nunnenkamp, P., & Spatz, J. (2004). FDI and Economic Growth in Developing Economies: How Relevant are Host-Economy and Industry Characteristics? *Transactional Corporations*, 13(3), 53-83.
- Nyamongo, E. M., Misati, R. N., Kipyegon, L., & Ndirangu, L. (2012). Remittances, financial development and economic growth in africa. *Journal of Economics and Business* 64(3), 240-260.

- O'Rourke, K. H., & Williamson, J. G. (1999). *Globalization and History: The Evolution of a Nineteenth-Century Atlantic Economy*. Cambridge: MIT Press.
- OECD. (2008). *OECD Benchmark Definition of Foreign Direct Investment*
- Ogundipe, A. A., Ojeaga, P., & Ogundipe, O. M. (2014). Is Aid Really Dead? Evidence from Sub-Saharan Africa. *International Journal of Humanities and Social Science*, 4(10).
- Olley, S. G., & Pake, A. (1996). The Dynamics of Productivity in the Telecommunications Equipment Industry. *Econometrica*, 64(6), 1263-1297.
- Onyeiwu, S., & Shrestha, H. (2004). Determinants of foreign direct investment in Africa. *Journal of Developing Societies*, 20, 89-106.
- Orji, A., Uche, A. S., & Ilori, E. A. (2014). Foreign capital inflows and growth: An empirical analysis of WAMZ experience. *International Journal of Economics and Financial Issues*, 4(4), 971-983.
- Osvaldo, S. (1969). National Development Policy and External Dependence in Latin America. *Journal of Development Studies*, VI, 23-48.
- Pagano, M. (1993). Financial Markets and the Macroeconomy: Financial markets and growth, An overview. *European Economic Review* 37, 613-622.
- Panizza, U., & Presbitero, A. F. (2013). *Public Debt and Economic Growth in Advanced Economies: A Survey*. Working Paper No. 78. The Graduate Institute, Geneva.
- Papademetriou, D. G. (1985). Illusions and reality in international migration: Migration and development in post-World War II Greece. *International Migration*, 23(2), 211-223.
- Patillo, C., Poirson, H., & Ricci, L. (2002). *External Debt and Growth* IMF Working Paper no. 96, Washington, D.C.
- Patillo, C., Poirson, H., & Ricci, L. (2004). *What are the channels through which external debt affects growth?* IMF Working Paper no. 15, Washington, D.C.
- Paulson, A., & Townsend, R. (2000). *Entrepreneurship and Financial Constraints in Thailand*. Working Paper. Illinois: Northwestern University. Chicago.
- Pearce, R. (2006). Globalization and development:: an international business strategy approach *Transnational Corporations* (Vol. 15, pp. 39-70).
- Pesaran, H. (2003). *A Simple Panel Unit Root Test in the Presence of Cross Section Dependence*. Cambridge Working Papers in Economics 0346, Faculty of Economics (DAE), University of Cambridge.
- Pesaran, M. H. (2006). Estimation and inference in large heterogeneous panels with a multifactor error structure. *Econometrica*, 74(4), 967-1012.

- Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, 22(2), 265-312.
- Pesaran, M. H., Shin, Y., & Smith, R. P. (1997). *Estimating Long-run Relationships in Dynamic Heterogeneous Panels*. DAE Working Papers Amalgamated Series 9721.
- Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of American Statistical Association*, 94, 621-634.
- Pesaran, M. H., & Smith, R. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of econometrics*, 68(1), 79-113.
- Piketty, T. (2014). *Capital in the Twenty-First Century*. Harvard University Press.
- Piketty, T., & Zucman, G. (2014). Capital is Back: Wealth-Income Ratios in Rich Countries 1700-2010. *Quarterly Journal of Economics*, 129(3).
- Pistor, K., & Xu, C. (2002). *Law enforcement under incomplete law: Theory and evidence from financial market regulation*. London School of Economics Working Paper No. TE/02/442.
- Prasad, E., Rajan, R., & Subramanian, A. (2007). Foreign Capital and Economic Growth. *Brookings Papers on Economic Activity*, 38(1), 153-230.
- Presbitero, d. A. F. (2006). The Debt-Growth Nexus: a Dynamic Panel Data Estimation. *RIVISTA ITALIANA DEGLI ECONOMISTI*, 11(3), 415-459.
- Prescott, E. C. (1998). Needed: A Theory of Total Factor Productivity. *International Economic Review*, 39, 552-551.
- Prichett, L. (2001). Where has All the Education Gone? . *World Bank Economic Review*, 15(3), 367-391.
- Raguragavan, J. (2004). *Foreign Direct Investment and Its Impact on the New Zealand Economy: Cointegration and Error Correction Modelling Techniques*. (Ph.D Dissertation), Massey University.
- Rajan, R., & Subramanian, A. (2005). *What determines aid's impact on growth?* . IMF Working Paper 05/126 International Monetary Fund. Washington.
- Rajan, R. G., & Subramanian, A. (2007). Does Aid Affect Governance? . *American Economic Review*, 97(2), 322-327.
- Ramirez, M. (2013). Do financial and institutional variables enhance the impact of remittances on economic growth in latin america and the caribbean? a panel cointegration analysis. *International Advances in Economic Research* 19(3), 273-288.

- Ramirez, M. D. (1994). Public and private investment in Mexico, 1950-90: An empirical analysis. *Southern Economic Journal*, 1-17.
- Ramirez, M. D. (2000). 'Foreign Direct Investment in Mexico: A Cointegration Analysis'. *Journal of Development Studies*, 37, 138-162.
- Rapoport, H., & Docquier, F. (2005). *The Economics of Migrants' Remittances*. Discussion Paper No. 1531. Stanford University.
- Ratha, D. (2003). Workers' remittances: an important and stable source of external development finance. *Global Development Finance 2003 — Striving for Stability in Development Finance* Ch. 7. World Bank, Washington, DC, pp. 157–175.
- Ratha, D. (2013). *The Impact of Remittances on Economic Growth and Poverty Reduction*. Migration Policy Institute, Washington, D.C.
- Reinhart, C., Reinhart, V., & Rogoff, K. S. (2012). Public Debt Overhangs: Advanced-Economy Episodes Since 1800. *Journal of Economic Perspectives*, 26(3), 69-86.
- Reinhart, C., & Rogoff, K. S. (2010a). *Growth in a Time of Debt*. NBER Working Paper No.15639.
- Rioja, F., & Valev, N. (2004). Finance and the sources of growth at various stages of economic development. *Economic Inquiry* 42(1), 127-140.
- Rodrik, D. (2000). *Institutions For High-Quality Growth: What They Are And How To Acquire Them*. NBER Working Papers No. 7540.
- Rodrik, D. (2004a). Getting institutions right: Institutions and economic performance. *Journal for Institutional Comparisons*, 2(2), 10-15.
- Rodrik, D. (2004b). *Rethinking Growth Policies in the Developing World*. Harvard University. U.S.A.
- Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development. *Journal of Economic Growth*, 9, 131-165.
- Romer, D. (2012). *Advanced Macroeconomics* (Fourth ed.). New York: The McGraw-Hill Companies.
- Romer, P. (1986a). Increasing Returns and Long Run Growth. *Journal of Political Economy*, 94(5), 1002-1037.
- Romer, P. (1990). Endogenous technological change. *Journal of Political Economy*, 98, 71-102.

- Romer, P. M. (1986b). Increasing Returns and Long Run Growth *Journal of Political Economy*, 94(5), 1002-1037.
- Roodman, D. (2009a). How to do xtabond2: An Introduction to Difference and System GMM in Stata. *Stata Journal*, 9(1), 86-138.
- Roodman, D. (2009b). A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics* 71, 135-158.
- Sachs, J. D., & Warner, A. (1995). Economic Reform and the process of Global Integration. *Brooking Papers of Economic Activity*, 10(1), 1-95.
- Sachs, J. D., & Warner, A. M. (1997). Sources of Slow Growth in African Economies. *Journal of African Economies*, 6(3), 335-376.
- Sachs, J. D., & Warner, A. M. (1999). The big push, natural resource booms and growth. *Journal of Development Economics*, 59, 43-76.
- Sachs, J. D., & Warner, A. M. (2001). The curse of natural resources. *European Economic Review* 45, 827-838.
- Sal, A., & Dar, A. A. (2012). On Explaining Inter-Country Differences in Economic Growth Rates of OECD Countries for 1996-2008: Does Regulatory Quality Matter? *Applied Econometrics and International Development*, 12(2).
- Sala, H., & Trivin, P. (2014). Openness, Investment and Growth in Sub-Saharan Africa. . *Journal of African Economies* 1-33. [http://dx.doi.org/ 10.1093/jae/ejt027](http://dx.doi.org/10.1093/jae/ejt027).
- Saltz, I. (1992). "The Negative Correlation between Foreign Direct Investment and Economic Growth in the Third World: Theory and Evidence," *Rivista Internazionale di Scienze Economiche e Commerciali* 39(7), 617-633.
- Saqib, N., Masnoon, M., & Rafique, N. (2013). Impact of Foreign Direct Investment on Economic Growth of Pakistan. *Advances in Management & Applied Economics*, vol.3, no.1, 35-45.
- Sargan, J. D. (1958). The Estimation of Economic Relationships using Instrumental Variables. *Econometrica*, 26(3), 393-415.
- Savvides, A. (1992). Investment Slowdown in Developing Countries during the 1980s: Debt Overhang or Foreign Capital Inflows. *Kyklos*, 45(3), 363-378.
- Sawada, Y. (1994). Are the heavily indebted countries solvent?: Tests of intertemporal borrowing constraints. *Journal of Development Economics*, 45(2), 325-337.
- Schclarek, A. (2004). *Debt and Economic Growth in Developing and Industrial Countries*. Working Papers Series Number 34. Department of Economics, Lund University

- Schiff, M. (1994). How Trade, Aid, and Remittances Affect International Migration. World Bank, International Economics Department, Washington D.C.
- Selaya, P., & Sunesen, E. R. (2012). Does Foreign Aid Increase Foreign Direct Investment? *World Development* 40(11), 2155-2176.
- Serrão, A. (2016). Impact of Public Debt on Economic Growth in Advanced Economies. *International Journal of Managerial Studies and Research (IJMSR)*, 4(2). www.arcjournals.org
- Serven, L., & Solimano, A. (1993). Debt Crisis, Adjustment Policies, and Capital Formation in Developing Countries: Where Do We Stand? *World Development*, 21(1), 127-140.
- Shabbir, S. (2013). *Does External Debt Affect Economic Growth: Evidence from Developing Countries* SBP Working Paper Series.
- Shahbaz, M., & Islam, F. (2011). Financial development and income inequality in Pakistan: an application of ARDL approach. *Journal of Economic Development*, 36(1), 35-58.
- Shan, J. (2005). Does financial development 'lead' economic growth? A vector autoregression approach. *Applied Economics*, 37(1), 1353-1367.
- Shiu, A., & Heshmati, A. (2006). *Technical Change and Total Factor Productivity Growth for Chinese Provinces: A Panel Data Analysis*. Discussion Paper No. 2133. Institute for the Study of Labor (IZA). Bonn, Germany.
- Siddique, A. (2015). *The Impact of External Debt on Economic Growth: Empirical Evidence from Highly Indebted Poor Countries*. Griffith University. Business School, The University of Western Australia.
- Sims, C. A. (1980). Macroeconomics and Reality. *Econometrica*, 48(1), 1-48.
- Singh, R. J., Haacker, M., Lee, K.-w., & Goff, M. I. L. (2010). Determinants and Macroeconomic Impact of Remittances in Sub-Saharan Africa. *Journal of African Economies*, 20(2), 312-340.
- Sobiech, I. (2015). *Remittances, finance and growth: does financial development foster remittances and their impact on economic growth?* Department of Money and Macroeconomics. Goethe University Frankfurt. Germany.
- Solimano, A. (2003). Workers Remittances to the Andean Region: Mechanisms, Costs, and Development Impact. Multilateral Investment Fund-IDB Conference, Remittances and Development, Quito, Ecuador.
- Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, 70(1), 65-94.

- Soysa, I. d., & Oneal, J. R. (1999). Boon or Bane? Reassessing the Productivity of Foreign Direct Investment. *American Sociological Review*, 64(5), 766-782.
- Ssozi, J. (2015). *The Comparative Economics of Catch-Up in Output per worker, total factor productivity and technological gain in Sub-Saharan Africa*. African Governance and Development Institute (AGDI), WP/15/038.
- Stark, O., Taylor, J. E., & Yitzhaki, S. (1988). Migration, remittances and inequality: A sensitivity analysis using the extended Gini index. *Journal of Development Economics*, 28(3), 309-322.
- Stiglitz, J. E. (1989). Markets, Market Failures, and Development. *The American Economic Review*, 79(2), 197-2003.
- Stiglitz, J. E. (1994). The role of state in financial markets. Proceedings of the World Bank annual conference on development economics, Washington.
- Stiglitz, J. E. (1998). *The Role of the Financial System in Development*. Paper presented at the the Fourth Annual Bank Conference on Development in Latin America and the Caribbean (LAC ABCDE), El Salvador.
- Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *American Economic Review*, 71(3), 393-410.
- Stoneman, C. (1975). Foreign capital and economic growth. *World Development*, 3(1), 11-23.
- Stratan, A., Chistruga, M., Clipa, V., Fala, A., & Septelici, V. (2013). Development and side effects of remittances in the CIS countries: the case of Republic of Moldova. CARIM-East RR 2013/25, Robert Schuman Centre for Advanced Studies, European University Institute, San Domenico di Fiesole (FI).
- Suleiman, N. N., Kaliappan, S. R., & Ismail, N. W. (2013). Foreign Direct Investments (FDI) and Economic Growth: Empirical Evidence from Southern Africa Customs Union (SACU) Countries. *Int. Journal of Economics and Management* 7(1), 136-149.
- Sulimierska, M. (2014). *Total factor productivity estimation for Polish manufacturing industry- A comparison of alternative methods*. Working Paper Series, No. 67-2014. Department of Economics, University of Sussex, UK.
- Sun, H. (1998). Macroeconomic Impact of Direct Foreign Investment in China: 1979-96 *The World Economy*, 21(5), 675-694.
- Taylor, J. E., & Fletcher, P. L. (1996). International migration and economic development: A micro economy-wide analysis. In: *Development Strategy, Employment and Migration* (E.J. Taylor, ed.). OECD Development Centre, Paris.

- Temple, J. (1999a). The New Growth Evidence. *Journal of Economic Literature*, XXXVII 112-156.
- Temple, J. (1999b). A positive effect of human capital on growth. *Economics Letters*, 65(1), 131-134.
- Temple, J. (1999a). The new growth evidence. *Journal of Economic Literature*, 37(1), 112-156.
- Titarenko, D. (2006). The influence of foreign direct investment on domestic investment processes in Latvia. *Transport and Telecommunication*, 7(1), 76-83.
- Tourinho, O. A. F., & Sangoi, R. (2015). *Public Debt and Economic Growth: Tests of The Reinhart-Rogoff Hypothesis*. Universidade do Estado do Rio de Janeiro (UERJ), Brasil.
- UN. (2013). Maximizing the development impact of remittances. UNCTAD, New York and Geneva. Available from unctad.org/en/Docs/ditctncd2011d8_en.pdf. .
- UNCTAD. (1999). Foreign Direct Investment and the Challenge of Development. World Investment Report 1999. New York and Geneva: United Nations.
- UNCTAD. (2006). World Investment Report: FDI from Developing and Transition Economies: Implications for Development. New York—Geneva: United Nations.
- UNCTAD. (2014). World Development Report: Investing in SDGs, An Action Plan. New York and Geneva.
- UNCTAD. (2015). World Investment Report: Reforming International Investment Governance: United Nations, New York and Geneva.
- UNCTAD. (2016). *FDI Data*. United Nations Conference on Trade and Development. New York and Geneva.
- UNDP. (2009). Human Development Report 2009 – Overcoming Barriers: Human Mobility and Development. United Nations Development Program (UNDP), New York. Available from http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf.
- Wallerstein, I. (1974). The Rise and Demise of the World Capitalist System: Concepts for Comparative Analysis. *Comparative Studies in Society and History*, 16, 387-415.
- Wang, M. (2010). Foreign direct investment and domestic investment in the host country: evidence from panel study. *Applied Economics*, 42(29), 3711-3721.
- Warner, A. M. (1992). Did the Debt Crisis Cause the Investment Crisis. *Quarterly Journal of Economics*, 10(4), 1161-1186.
- Wei, S. J. (2000). How taxing is corruption on international investors?. *Review of economics and statistics*, 82(1), 1-11.

- Wermberly, & Bello. (1992). Law and Development in the Light of Dependency Theory. *Law and Society Review*, 14.
- Wheeler, D., & Mody, A. (1992). International Investment Location Decisions: The Case for U.S. Firms. *Journal of International Economics*, 33, 57-76.
- Woodruff, C., & Zenteno, R. (2001). *Remittances and Microenterprises in Mexico*. UCSD Working Paper.
- Woodruff, C., & Zenteno, R. (2007). Migration networks and microenterprises in Mexico. *Journal of Development Economics*, 82(2), 509-528.
- Wooldridge, J. M. (2003). *Econometric Analysis of Cross Section and Panel Data*: MIT Press.
- World Bank. (2006). The Development Impact of Workers' Remittances in Latin America. Vol. II: Detailed Findings. The World Bank Group, Washington, D.C.
- World Bank. (2011). Migration, Remittances, and Development in Africa. World Bank, Washington, D.C.
- World Bank. (2015). Migration and Development Brief. Migration and Remittances: Recent Developments and Outlook. Washington D.C.
- World Bank. (2016a). *Migration and Remittances Factbook 2016* (3rd ed.). Washington, DC.
- World Bank. (2016b). *World Development Indicators (WDI)*. World Bank. Washington D.C.
- World Bank. (2017). *Migration and Development Brief 27. Migration and Remittances: Recent Developments and Outlook*. World Bank. Washington D.C., U.S.A.
- World Bank Group. (2010). Investing Across Borders: Indicators of foreign direct investment regulation in 87 economies. Washington, D.C.
- World Bank Group. (2016). Global Economic Prospects: Divergences and Risks. Washington, DC: World Bank
- World Development Report. (2016). Mind, Society, and Behavior. Washington,DC: World Bank Group, .
- World Economic Forum. (2015). The African Competitiveness Report. Cologny/Geneva, Switzerland.
- World Economic Outlook. (2016). *World Economic Outlook (WEO) Database 2016*. IMF.
- Xinzhong, L. (2004). *Foreign Direct Investment Inflows in China: Determinants at Location*. Institute of Quantitative & Technical Economics, Chinese Academy of Social Sciences, Beijing, P. R. China.
- Yang, D. (2008). Coping with disaster: The impact of hurricanes on international financial flows, 1970-2002. *Advances in Economic Analysis & Policy*, 8(1), 1903-1913.

- Zekarias, S. M. (2016). The Impact of Foreign Direct Investment on Economic Growth in Eastern Africa: Evidence from Panel Data Analysis. *Redfame Publishing*, 3(1). <http://dx.doi.org/10.11114/aef.v3il.1317> doi:10.11114/aef.v3il.1317
- Zhang, K. H. (2005). *Foreign Direct Investment and Economic Growth in China*. Department of Economics, Illinois State University, USA.
- Zouheir, A., & Sghaier, I. M. (2014). Remittances, Financial Development and Economic Growth: The Case of North African Countries. *Romanian Economic Journal* 17(51), 137-170.