Foreign banking inflows, financial sector development and economic growth in ECOWAS and SADC

Thesis Presented for the Degree of

Doctor of Philosophy

in the

School of Economics

University of Cape Town

By

Sulemana Mahawiya

Supervisor: Professor Haim Abraham

August, 2015

Abstract

The focus of this study is two-fold. First, it examines the relationship between financial development and growth. Second, it investigates the role of foreign banks, inflation and openness in the state of financial development. The above are discussed in relation to a comparative study of regional economic blocs of Economic Community of West African States (ECOWAS) and Southern African Development Community (SADC) in three essays for the period 1980-2011. The dissertation comprises four essays as stated below. Existing studies on financial system development usually rely on single measure of financial development which is inadequate in capturing the financial system properly and leads to mixed results. This research addresses this critical issue by constructing a composite measure of the variable.

The first essay provides a comparative analysis on the impact of financial development on growth and development between the two regions. In addition, it investigates the influence of financial development through political development on growth. The motivation stems not only from inadequate studies on regional economic blocs, but, importantly, the methods applied in previous panel studies ignored issues of heterogeneity. To address this, the study employs a combination of methodologies, Pooled Mean Group, Mean Group and Dynamic Fixed Effect approaches. These approaches also capture both the short run and long run dynamics. The results indicate that financial development induces economic growth in both regions with the impact in SADC more than that of ECOWAS. Also, more political development robustly supports more financial sector to impact on growth positively in ECOWAS, but not in SADC. Finally, the speed of adjustment suggests that deviations from the long run equilibrium path following a shock are corrected at about 13% per year in ECOWAS and 15% in SADC

The second essay, which is another comparative study, addresses the question of why some countries having underdeveloped financial systems after it has been established that the sector is vital for growth. SSA has one of the least developed financial system, and, since the first essay documented that indeed the sector is crucial to growth, the main aim of this essay is to investigate whether inflation and openness to trade and financial system (that is, Rajan and Zingales Hypothesis) matter for financial development. Importantly, the effects of the growing communication infrastructure on financial development is also captured, which is a novelty. Four approaches were used: Least square dummy variable, Feasible GLS, Panel corrected standard errors and Seemingly unrelated regression. The main findings provide evidence that

in both regions inflation robustly reverses financial development with the effect in ECOWAS much more. Overall, the results seem to indicate that the cost of inflation to the financial system is genuine and not explained by a sort of omitted variable bias. Access to communication indicated a strong positive effect on financial development in both regions, with the impact in SADC more. Finally, the study indicates that even though more simultaneous opening of the financial sector and trade lead to more financial development in SADC, trade openness alone still enhances development in the sector. However, more financial openness alone is detrimental to financial development in the region. Hence, this seems to provide partial support for the hypothesis in SADC. The hypothesis, however, is rejected in ECOWAS.

The third essay examines the asymmetric effects of inflation on financial development. It is motivated by existing theories which posit that the detrimental effects of inflation on the financial development is only observed beyond certain threshold level. The study is the first of its kind to be conducted on SSA, especially on regional economic blocs. Using a novel Panel smooth transition regression that endogenously determines this threshold value, a comparative study is conducted between the two regions. The results suggest evidence of the existence of a robust single threshold of 17.9% inflation for ECOWAS and 14.5% for SADC. The result indicates that inflation above these thresholds presents significant detrimental effects for financial development in both regions.

The last essay focuses on financial sector stability via banking sector stability. It is motivated by the evidence that the financial system of the two regions are bank based which is also over 50% foreign bank dominated. Specifically, the essay investigates the effects of foreign banking inflows on banking crisis (financial instability) of both regions for the period 1995-2009. This objective is informed by the widely held conventional wisdom that foreign banks lack long term commitment to the domestic financial system and will leave at the first sign of trouble. This can stir instability in the sector. The study employs two econometric approaches, namely, the multivariate logit and the two-step system generalised method of moment using bank crisis measure constructed by Laeven and Valencia (2012) and bank z-score (Bankscope). The main results of the methods indicate evidence that the presence of foreign banks in the domestic banking sector reduces the probability of bank crisis. Generally, the results reveal that the benefits from the foreign banks in the financial system are unaffected by any sort of omitted variable bias.

This study has significant implication for policy formulation since it is the first study on comparative analysis between two regional economic groups in SSA. The study argues that more efforts should be committed in improving the financial system and governance. Improvement in the legal system can enhance financial development and this should be coupled with good macroeconomic policies. The study recommends that price stability policies with inflation targeting framework that falls below the estimated threshold, should be the primary objective in monetary policy. Furthermore, more investment into telecommunication industry is necessary for FSD and should be given attention. In terms of foreign banking inflows, the study advocates for a cautious approach towards attracting more foreign banks as well as more opening of the financial sector.

Acknowledgements

This thesis has received a lot of contributions from many distinguished people associated with my studies at the University of Cape Town. First and foremost, the thesis owes its timely completion to my supervisor, Professor Haim Abraham, whose excellent guidance, constructive comments and steadfast commitment was felt throughout the process.

I greatly appreciate the feedback I received from various individuals at the following conferences: the African Economic Research Consortium (AERC) conferences in Arusha (Tanzania) and Accra (Ghana); the International Association of Applied Econometrics (IAAE) conference at Queen Mary University of London, UK; and, the Finance and Economic Conference of Economic Research Southern Africa (ERSA) at the South Africa Reserve Bank, South Africa.

I thank Professor Ron P. Smith from the Department of Economics Mathematics and Statistics, Birkbeck College, for his valuable feedback on Chapter 3 of the thesis. Also, thanks to Professor Hashem Pesaran from the University of Cambridge, for his thoughtful comments when the chapter was presented at the conference of IAAE in June, 2014. Finally, thanks to the organisers of the IAAE conference for the sponsorship to attend the presentation.

I also wish to express gratitude, appreciation and acknowledgement for the financial support from Carnegie Incorporation and AERC, without which this study would not have been possible. I am indebted to Carnegie for funding my entire studies, and to the AERC for the award of Thesis and research grant. Any errors remain entirely mine. The acknowledged persons bear no responsibility for the views contained herein.

Lastly but not the least, I also wish to express my acknowledgement and gratitude to my lecturers and colleagues at the School of Economics, University of Cape Town, for the support they offered me throughout the course of my study. I thank my family, in particular my sisters, Maidere, Bintu and Asmawu and my nephew, Awal, for their support throughout my studies.

Dedication

To my late father, Alhaj Mohammed Sulemana and my loving mother, Mohammed Safura.

List of Acronyms and Abbreviations

AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed Lag Model
BRVM	Bourse Regionale Des Valeurs Mobilieres
CEMAC	Economic and Monetary Community of Central Africa
CEN-SAD	Community of Sahel-Saharan States
CMA	Common Monetary Area
DFE	Dynamic Fixed Effects Model
DMBA	Domestic Money Bank Assets to the sum of Domestic Money Bank Assets and Central Bank Assets
EAC	East African Community
ECCAS	Economic Community of Central African States
ECM	Error Correction Model
ECOWAS	Economic Community of West African States
ERP	Economic Recovery Program
FE	Fixed effects Model
FGLS	Feasible Generalised Least Squares Model
FISCU	Finance and Investment Sector Coordinating Unit
GMM	Generalised Method of Moments
IGAD	Intergovernmental Authority on Development
IMF	International Monetary Fund
MENA	Middle East and North African
MG	Mean Group Model
OECD	Organisation for Economic Co-operation and Development
PCSE	Panel Corrected Standard Errors Model
PMG	Pooled Mean Group Model
RE	Random Effects Model
SACU	Southern African Customs Union
SADC	Southern African Development Community
SAP	Structural Adjustment Program
SBC	Schwarz Bayesian Criterion
SURE	Seemingly Unrelated Regression Model
VECM	Vector Error Correction Model
WAEMU	West African Economic and Monetary Union

Contents

Abstract ..... **i**

Acknowledgements ..... **iv**

Dedication ..... **v**

List of Acronyms and Abbreviations ..... **vi**

Table of Contents ..... **vii**

1 Introduction **1**

1.1 Background and Motivation of the Study 1

1.1.1 Justification of the study 7

1.1.2 Objectives of the research 8

1.1.3 Published work 9

1.1.4 Organisation of the thesis 10

2 Background of financial sector development and economic performance of SSA, ECOWAS and SADC **11**

2.1 Introduction 11

2.2 Overview of economic performance of SSA 11

2.3 Overview of the state of the financial system of SSA and other regions 14

2.3.1 Foreign Banking in SSA 17

2.4 SADC 19

2.4.1 Economic Performance of SADC 19

2.4.2 Inflation in SADC 21

2.4.3 Overview of the financial system of SADC 22

2.4.4 Stock market development in SADC 25

2.5 ECOWAS 26

2.5.1 Economic Performance of ECOWAS 27

2.5.2 Inflation in ECOWAS 28

2.5.3 Overview of the financial sector 29

2.5.4 Stock market development in ECOWAS 311
2.5.5 Other areas of the financial system 34
2.6 Governance and democratic development in ECOWAS and SADC 34

3 Financial sector development, political institutions and economic growth: A comparative study of ECOWAS and SADC 37

3.1 Introduction 37
3.2 Literature Review 40
3.3 Method and Model specification 47
3.3.1 Panel unit root test 54
3.3.2 Measures of financial development 55
3.3.3 Data 56
3.3.4 Descriptive Statistics 57
3.4 Empirical Results and Analysis 57
3.4.1 Results of growth and composite measure of financial development 60
3.4.2 Results of growth and the ratio of domestic money bank assets to the sum of domestic money bank asset and Central Bank assets 67
3.4.3 Results of growth and the domestic bank credit to the private sector 68
3.4.4 Results of growth and liquid liabilities as a percentage of GDP 70
3.5 Robustness and Sensitivity analysis 72
3.6. Summary and Conclusion 73

4 Financial sector development, inflation and openness: A comparative panel study of ECOWAS and SADC 76

4.1 Introduction 76
4.2 Literature Review 79
4.2.1 Finance-Inflation theory: 79
4.2.2 Rajan and Zingales Interest Group Argument of financial development 80
4.3 Method and Model specification 82
4.3.1 The Fixed Effect estimator 85
4.3.2 Feasible Generalised Least Squares 86
4.3.3 Seemingly Unrelated regression technique 86
4.3.4 Data description 87

4.4 Empirical analysis 87

4.4.1 Diagnostic tests 87

4.4.2 Estimated results of composite measure of financial development as a dependent variable 89

4.4.3 Estimated results of Liquid liabilities (M3/GDP) as a dependent variable 93

4.4.4 Estimated results of ratio of domestic money bank assets to the sum of domestic money bank assets and Central Bank assets as a dependent variable 95

4.4.5 Estimated results of bank private credits (percentage of GDP) as a dependent variable 96

4.4.6 Estimated results using SURE for composite measure of financial development as a dependent variable 98

4.5 Summary and Conclusion 100

5 Financial sector development and threshold effect of inflation in ECOWAS and SADC: A Panel smooth transition regression approach 102

5.1 Introduction 102

5.2 Literature Review 105

5.3 Method and Model specification 108

5.3.1 Data 112

5.3.2 Descriptive statistics 113

5.4 Analysis of Results 115

5.5 Robustness and Sensitivity analysis 122

5.6 Summary and Conclusion 122

6 Financial sector development, banking stability and foreign banking inflows in ECOWAS and SADC: A panel approach 125

6.1 Introduction 125

6.1.1 A brief account of banking crises in Africa 128

6.2 Literature Review 131

6.2.1 Diamond and Dybvig model of bank runs /Panic model 131

6.2.2 Banking Crises and Foreign banks 132

6.2.3 Business cycle models 133

6.3. Method and Model specification 137

6.3.1 The Multivariate Logit Method 140

6.3.2 The System GMM 142
6.3.3 Data 145
6.4. Analysis of results 146
6.4.1 Analysis of the results of Bank crisis obtained from Multivariate logit model 146
6.4.2 Analysis of the results of Bank *z*-score obtained from two-step system GMM 152
6.5 Robustness and sensitivity analysis 155
6.6 Summary and conclusion 156
7 Conclusion and Policy Implications 157
7.1 Summary 157
7.2 Policy Implications of the findings 160
7.3 Suggestions for future research 162
References 1644
APPENDICE 1822
APPENDIX A 1822
Appendix for chapter 2 1822
APPENDIX B 1844
Appendix for chapter 3 1844
APPENDIX C 19090
Appendix for chapter 4 1900
APPENDIX D 1988
Appendix for chapter 5 1988
APPENDIX E 2033
Appendix for chapter 6 2033

List of Tables

2.2.1 Recent growth (%) of SSA and other regions....12
2.3.1 Some selected financial development measures of SSA and other regions....16
2.4.1 Average annual GDP growth rates (%) and real per capita income for the period 1990 to 2010 for SADC....21
2.4.2 Showing inflation in SADC for the period of 1990-2011....22
2.4.3 Financial sector development of member states of SADC....24
2.5.1 Average annual GDP growth rates (%) and real per capita income for the period 1980 to 2010 for ECOWAS....28
2.5.2 Showing inflation in ECOWAS for the period of 1990-2011....29
2.5.3 Financial sector development of member states of ECOWAS....31
2.5.4 Stock market development in SADC and ECOWAS....33
2.6.1 Summary description of governance and democratic development in ECOWAS and SADC....36
3.2.1 Showing recent panel studies on SSA and regional groupings....45
3.3.1 Descriptive statistics of variables used....57
3.4.1 Panel unit root result for the two sub-regions....59
3.4.2 Results of long run PMG, MG and DFE with composite measure as financial development indicator....64
3.4.3 Results of long run PMG, MG and DFE with DMBA as a measure of financial development indicator....68
3.4.4 Results of long run PMG, MG and DFE with bank credit (%GDP) as a measure of financial development indicator....69
3.4.5 Results of long run PMG, MG and DFE with liquid liabilities (M3/GDP) as a measure of financial development indicator....71
3.4.6 Showing summary of the result....72
4.4.1 Diagnostic test....88
4.4.2 Results of composite financial findex....92
4.4.3 Results of Liquid liabilities as a percentage of GDP....93
4.4.4 Results of ratio of domestic money bank assets to the sum of domestic money bank assets and central bank assets....96
4.4.5 Results of Bank private credits as a percentage of GDP....98
5.3.1 Showing descriptive statistics....114

5.3.2 Panel unit root result for the two sub-regions 115
5.4.1 Test of linearity against non-linearity for ECOWAS and SADC 115
5.4.2 Testing the number of regimes: Tests of no remaining non-linearity 116
5.4.3 PSTR Result of finance-inflation rate 119
6.4.1 Descriptive statistics 146
6.4.2 Results of Marginal effects of multivariate logit 149
6.4.3 Results of two-step system GMM for bank z-score 153
A.0.1 Regional comparison of foreign banking inflows into the banking system 1822
B.0.1 Showing description of data and source 1844
B.0.2 Showing countries used in sample of both regions 1855
B.0.3 Long run estimates without South Africa 185
B. 0.4 Short run pooled mean group for ECOWAS individual countries 186
B.0.5 Short run pooled mean group for SADC individual countries 187
B.0.6 Robustness test using different governance indicator (political right). 1899
C.0.1 Showing variables used in the study with description and sources 1900
C.0.2 Results of SADC 1911
C.0.3 Results of ECOWAS 1922
C.0.4 LSDV results without Zimbabwe and DRC 1933
C.0.5 SURE estimates of SADC (composite measure of financial development) 1944
C.0.6 SURE estimates of ECOWAS (composite measure of financial development) 1955
C.0.7 Correlation matrix of residuals of SADC 1966
C.0.8 Correlation matrix of residuals of ECOWAS 1977
D.0.1 Showing description of data and source 198
D.0.2 Test of linearity against non-linearity 199
D.0.3 Testing the number of regimes: Tests of no remaining non-Linearity 200
D.0.4 PSTR results with DRC, Ghana and Zimbabwe 200
D.0.5 Test of linearity against non-linearity-savings 200
D.0.6 Testing the number of regimes: Tests of no remaining non-linearity 2011
D.0.7 Sensitivity analysis of PSTR results without DRC Ghana and Zimbabwe 2011
E.0.1 Variables, sources and description 2033
E.0.2 Showing banking crises for the period 1980-2011 in SSA 204
E.0.3 Showing results of multivariate logit model of bank crisis 2055
E.0.4 Results of Marginal effects of multivariate probit 2066

List of Figures

Figure 2.1: Comparison of real GDP per capita between SSA and other regions 13
Figure 2.2: Development in financial institution and markets.....15
Figure 2.3: Regional comparison of foreign bank ownership among total banks 18
Figure 2.4: Stock market developments in SADC.....26
Figure 2.5: Stock market developments in ECOWAS.....32
Figure 5.1: Estimated transition function of ECOWAS and SADC.....120
Figure 6.1: Percentage of foreign banks ownership among total banks 126
Figure A.1: Inflation in SADC.....183
Figure A.2: Inflation in ECOWAS 1833
Figure B.1: Real GDP and Life expectancy.....188
Figure D.1: Transition function of the two regions 202

Chapter 1

Introduction

1.1 Background and Motivation of the Study

The relationship between financial sector development (FSD) and economic growth and development has drawn the interest of many academics around the world. Numerous studies have been done on this important topic following the seminal study of King and Levine (1993), which rekindled a lot of interest in this area. This relationship between FSD and economic growth was observed over a century ago by Bagehot (1873) who argued that the financial system played a crucial role in igniting industrialisation in England. This was done by facilitating and propelling the mobilisation of capital in the industrialisation process. About eight decades ago, Schumpeter (1939) also observed and emphasised the importance of the banking system in economic growth. According to Schumpeter (1939), banks can actively spur innovation and future growth by identifying and channelling funds to productive investments[1].

Based on the above, several models have been proposed to demonstrate how FSD promotes economic growth. For instance, Pagano (1993) and Murinde (1996) developed a theoretical framework which show the positive effects that the financial sector has on economic growth, and Levine (1997) established the theoretical channel of this link. According to Levine (1997), the five key functions of the financial system that lead to growth are (i) Producing information on investment and allocating capital (ii) Monitoring and exerting corporate governance (iii) Facilitating trading and management of risk (iv) Mobilising and pooling of risk, and (v) Easing exchange of goods and services. Therefore a well-functioning financial system is able to execute these functions adequately and this will indeed, enable it to induce growth positively. Also, some hypotheses have been established to show how financial sector promotes growth

[1] Other early writers include Hicks (1969) and relatively recent contributions of McKinnon (1973) and Shaw 1973).

which is described as Supply-leading hypothesis and growth inducing financial development, also known as the Demand-following hypothesis.

Why is the financial sector deemed relevant to economic growth? According to Mishkin (2006),

> "…the financial system is like the brain of the economy: it is a coordinating mechanism that allocates capital to building factories, houses and roads. If capital goes to the wrong uses or does not flow at all, the economy will operate inefficiently and economic growth will be very low." (p. 8)

Following the above developments on the issue of FSD and growth and as part of the wider debate on the link between financial development and economic growth, large volumes of empirical studies have tried to address the potential link between these measures, for example, Allen and Ndikumana (2000), King and Levine (2004), Ghirmay (2004), Deidda and Fattouh (2008), Esso (2010), Bangake and Eggoh (2011), and Oluwatosin and Festus (2012) and Menyah et al. (2014) among others. While the theory presents a strong case for a positive effect of financial development on economic growth, empirical work shows inconclusive evidence. There has been considerable number of empirical studies that lend support to the financial sector inducing economic growth positively (King & Levine, 1996; Rousseau & Wachtel, 2000; Levine et al., 2000; Beck et al., 2000; Beck & Levine, 2004; Apergis et al., 2007; Kar et al., 2011). However, other empirical evidence does not reveal causality running from finance to growth, but from growth to finance (Jung, 1986; Demirgüc-Kunt & Levine, 1999; Zang, 2007). In addition, while other studies provide bidirectional relationship between finance and growth (Demetriades & Hussein, 1996; Greenwood & Smith, 1997; Luintel & Khan 1999; Shan et al., 2001; Al-Yousif, 2002: Bangake & Jude, 2011), some argue no relationship between the two measures (Lucas, 1988; Shan & Morris; 2002; Andrés et al., 2004) which supports China as a counter-example to the findings of the finance-growth literature. The Chinese economy has a malfunctioning financial sector, but is one of the fastest growing economy in the world. This presents enigma and could be a motivation for further investigation.

In light of the above startling different views and ambiguity, there is no definite consensus on this issue. This convincingly indicates that the debate is far from over. Accordingly, Levine (1997), Levine and Zervos (1998) and Beck (2002) observed that the issue of the role of a financial system in inducing growth is an area that has received a lot of attention in economic literature in the past and renewed interest in recent years, due to availability of economic data,

advancement in econometric techniques and statistical software[2]. Part of this study constitutes a portion of this renewed interest in finance-growth literature. This gives motivation for this thesis.

Furthermore, despite the numerous studies on this issue, studies that focus on Sub-Saharan Africa (SSA) have been relatively sparse compared with other regions. More importantly, available studies that are dedicated to regional economic groupings failed to conduct comparative studies of these regional groupings. This is especially ignored in SSA. This has implication for regional economic integration that is at the center stage for policy deliberations in SSA. Although evidence on SSA is still limited, existing studies on the region generally indicate that financial development has positive effects on growth (see Odedokun, 1996; Allen & Ndikumana, 2000)

To our knowledge, empirical studies are silent concerning the studies in the context of comparing regional economic blocs. Consequently, among its aims, this thesis aims to fill this gap by considering a comparative analysis on the impact of financial development on economic growth and development between the Economic Community of West Africa States (ECOWAS) and the Southern Africa Development Community (SADC). Supporting this idea, Ghirmay (2004) suggests that it is important to conduct comparative study regarding finance-growth nexus between countries at different levels of development in order to reach a more conclusive causal relationship.

Furthermore, over the years, SSA have made tremendous improvement in governance and its institutions resulting to political stability across the region. Institutional experts such as Acemoglu et al (2005) argue that institutions are important in the process of economic growth and development. Therefore based on this development in governance system of the region, the question to ask is, does this development complement the financial system of the two regions to induce economic growth? Therefore, in addition to investigating the role of financial development in the growth process, this study seeks to examine the influence of financial development through institutional development on economic growth. The motivation emanates from not only because of the lack of such studies in SSA, but also due to the fact that

[2] King and Levine (2004), King and Levine (1993), De Gregorio and Guidotti (1995), Arestis et al.(2001) are among others.

such studies may reveal differences from those that exist for developed economies, due to their level of economic advancement.

Additionally, and more importantly, despite the lack of comparative studies, previous studies have provided useful insights into the effects of financial development on growth. However, some important methodological issues are observed in these studies. These include (i) the use of a single measure of financial development which does not capture the functional definition or different aspects of the financial system adequately, and (ii) heterogeneity effects among countries are usually ignored. These methodological flaws can bias the results and lead to inefficient estimates. This thesis is motivated by these observations. It estimates a composite measure of financial development using three indicators: Liquid liabilities as percentage of gross domestic product (GDP), ratio of domestic money bank asset to the sum of central bank assets and domestic money bank assets, and bank private credit as percentage of GDP. The study uses this composite measure in the first three chapters.

It is worth noting that the financial sector, which is an important component of the economy or 'the brain of the economy' as Mishkin (2006) describes it, is relatively underdeveloped in many regions, especially in developing regions. The financial system of SSA is relatively the least developed compare to other developing regions (this is discussed in details in chapter 2)[3]. Considering the theoretical positive effects that the sector has on economic growth[4], the question is, what is responsible for this underdeveloped state of the financial sector after years of financial sector reforms in SSA? Even though some studies have tried to address this issue, as in Boyd et al. (2001), Aziakpono (2004), Detragiache et al. (2006), Baltagi, et.al (2009), Law and Habibullah (2009) and Kablan (2010), these studies come with some challenges. Not only is the important issue of comparative studies between regional economic blocs ignored, but most of the studies involve a mixture of developed and developing economies which seem worrying since differences exist between these economies. Some of these studies include Boyd et al. (2001), Detragiache et al. (2006) and Kablan (2010).

In addition, not only do these studies used a single measure of FSD, but the methods used in these studies usually do not investigate in details what happens at each specific country level. Therefore, motivated by these challenges, this thesis employs a number of panel methodologies

[3] Except South Africa
[4] Supported by many empirical studies such as King and Levine (1993), Agbetsiafa (2004) and King and Levine (2004)

that address these issues by investigating the critical questions concerning the underdeveloped state of the financial sector of the two regional blocs: ECOWAS and SADC. Theories such as the one developed by Huybens and Smith (1999) argues that inflation presents a detrimental effect on FSD while Rajan and Zingales (2003) hypothesis advocates that simultaneous opening of both trade and the financial sector is necessary for the development of the financial sector. SSA over the last three decades experienced phenomenal increases in inflation. Countries such as Angola, Democratic Republic of Congo (DR), Ghana, Guinea Bissau, Zambia and Zimbabwe are among the worst affected. Also, since the adoption of the Structural Adjustment Program (SAP) by the region, many countries have continuously open up trade and the financial sectors in attempt to develop the financial system with little or no success. Therefore, specifically, the study focuses on the effects of inflation and openness on the FSD. More so, the influence of access to communication infrastructure on FSD is also investigated. This is a novelty to previous studies.

Similarly, existing theories suggest that inflation has an asymmetric effects on FSD as in Azariadis and Smith (1996) and Choi et al. (1996). These models argue that the negative effects of inflation on financial development is only observed beyond certain level of inflationary rate. Hence, it is crucial to understand the dynamic relationship between these policy variables and FSD. This will help shape well-designed policy frameworks that will facilitate the process of financial development. Thus, the crucial question is, at what level of inflation will its detrimental effects on the financial sector be observed in these two blocs? Therefore, this thesis investigates this asymmetric effect of inflation on FSD using a novel panel technique developed by González et al. (2005). This is also examined in the context of comparing the same regional economic groupings. This is the first study that attempts to provide a comprehensive investigation on such threshold effects of inflation on financial sector development in SSA, in particular of regional groupings.

A comparative study is important and necessary for the following reasons.

i. Regional blocs are increasingly an important and dominant feature today. More so, they are considered as pillars of Africa Economic Community (AEC). For this reason, a comparative study is justified since it can reveal the peculiarities in each bloc and the desired policy framework for financial development, economic growth and integration process.

ii. Comparative study is not only capable of exposing the level and the extent to which FSD and other controlling factors impact on growth and why, if there are any differences between the two regions, but it can also reveal the reasons for the state of the financial systems of the two regions. Knowledge of this can provides guideline for policy formulation and recommendation.

iii. Finally, it is particularly insightful to separate and compare regional groups in SSA, since member states in each bloc pursue almost the same policy objectives in their attempt to achieve similar goals that will lead to meeting the convergence criteria[5] set by the bloc. Moreover, there is significant income differences between the two regions in favour of SADC. This makes comparative studies more informative.

The choice of ECOWAS and SADC is dictated by the following: (i) the blocs seem to be one of the oldest regional blocs in SSA, (ii) they represent about two thirds of SSA, and (iii) consistent data exist for most of the countries. The study included twelve countries in each regional bloc, as shown in Table B.0.2.

Also, despite the undeveloped state of the financial system of SSA, there is a rapid growing banking industry, which generally accounts about 90% of the total financial sector assets. The banking sector plays an important role in the process of financial system development and economic growth. As a result, policymakers are formulating the relevant polices required to attract more investments into this area. The results of these policies are increased inflows of foreign banks into the region. However, many studies such as McKinnon (1993), Gros and Steinherr (1995), Bonn et al.(1998), Murinde and Mullinneux (1999) argue that banking market liberalisation often leads to banking crisis in the early stages of transition to market economy. These crises often give incentives for foreign banks to exploit their ownership advantages as local banks become illiquid and less trustworthy. This leads to a significant reduction in the value of these domestic banks and creates an opportunity for takeover at low price by mostly foreign banks (Murinde & Mullinneux, 1999). The result is increased presence of foreign banks in the domestic banking sector in 1980s.

The increasing presence of foreign banks in the domestic financial system is generating a great deal of debate, especially, in the least developed world of SSA. This is because the banking

[5] Some of these goals include achieving a low inflation rate as well stable exchange rate and stable economic growth rate.

sector dominates the financial sector and the stability of which is a major concern. Foreign banks are believed to lack commitment to the domestic banking system and will leave if there are any negative shocks. Foreign banks in this study refer to any bank in the host country whose ownership by foreigners is above 50%. This could come from SSA or outside SSA. According to Kirkpatrick et al. (2008), foreign banks presence have increased from less than 10% to more than 50%, and is estimated at 100% in Gambia, Botswana, Lesotho and Swaziland. Thus, since the financial system of the regions is bank based with over 50% foreign bank dominating, this could be a curse or blessing to the banking system. For this reason, this thesis specifically investigates the effects of foreign banking inflows on banking crisis (financial instability) of both regions for the periods 1995 and 2009. This study is motivated by the non-existence of studies on this issue in SSA. The study therefore provides recent evidence on foreign banking inflows, FSD and economic growth. In doing so, it makes an important contribution to existing finance literature.

1.1.1 Justification of the study

SSA is one of the least developed regions in the world. According to the World Bank (2009), the continent accounts for 28% of the world's poverty and only 1% of global GDP, 2% of global trade and 3% of foreign direct investment (Allen et al., 2011). However, recent development indicates that the region is making progress in economic development. SSA is a resource rich region. The economies are diverse with wide variety of natural resources. Thus, given this background, it makes SSA one of the unique regions suitable for empirical investigation.

Several macroeconomic policy measures as well as relentless efforts are being made to raise growth and reduce poverty, and establish SSA as a major player in the world economy. To work towards this direction, SSA countries adopted market economy and democratic governance. These are seen as important steps towards economic growth and development. Also, it is argued and commended that the formation of regional blocs will result in pulling resources together that will lead to economic growth and the development in the financial system, eventually leading to reduction in poverty. Working towards this, SSA countries have formed regional economic blocs in an attempt to benefit from its fruits. Therefore, the question is, what has been the experience?

This thesis focuses on SSA (particularly on regional economic groupings), whose economic growth and financial sector have increasingly become a concern in policy formulation and

implementation. In line with their development policies, the majority of countries opened up the financial sector in the region during the 1980s in response to the economic reforms of Economic Recovery Program (ERP) as well as Structural Adjustment Program (SAP). It is, therefore, important to empirically investigate the role of the financial system development on economic growth, as well as what forces are responsible for the low level of development of the financial sector after over 30 years of economic and financial sector reforms. It is evident that there is still a huge financial sector development gap in SSA after years of liberalisation.

Empirical evidence in this area (e.g. Boyd et al., 2001; Aziakpono, 2004; Detragiache, et al., 2006; Kablan, 2010) is typically based on a broad cross section of countries. However, comparatively, little work has been done in terms of SSA. This study contributes to the current literature in filling this gap by providing recent evidence.

This thesis, therefore, provides the first attempt to explore the empirical link between foreign banking inflows, financial sector development and economic growth by comparing two regionals groups of ECOWAS and SADC. As such, results from this study has implication for policy direction and hence could guide policy makers to understand the dynamics of financial development in SSA.

1.1.2 Objectives of the research

This study has four key objectives shaped around the empirical chapters of this thesis. The first objective is to investigate the relationship between FSD, political institutions and economic growth. This is done in the context of regional comparison of ECOWAS and SADC. To achieve this, the study constructs a composite measure of financial index and applies three estimators, Pooled Mean Group, Mean Group and Dynamic fixed effects approaches to determine the impact of financial development on economic growth, as well as the impact of financial development conditional on political variable. The study examines if new evidence can be drawn especially with the comparison. We follow the works of Demirgüç-Kunt and Levine (1996) and Allen and Ndikumana (2000) to construct the composite index of the financial development measure.

The second objective is to investigate the reasons for the underdeveloped state of the financial system, since it is deemed crucial to economic growth. In particular, the study investigates the effects of inflation and both openness to trade and the financial system on financial development. In addition, the impact of access to communication infrastructure on the

development of the financial sector is also investigated. This is examined in the context of comparing ECOWAS and SADC. Even though the composite measure of FSD is used, the individual measures are also used in order to determine specific policies suitable for financial development

The third objective of this thesis is to investigate if there are threshold effects of inflation on FSD. This is done using the novel technique of Panel Smooth Transition regression technique developed by González et.al. (2005). The technique provides a test that checks if a nonlinear relationship exist between inflation and financial development in both regions. This investigation is motivated by the existing theories that suggest that the negative effects of inflation on FSD are only realized beyond certain threshold level. This objective also considers a comparative study between ECOWAS and SADC.

Finally, the fourth objective of this thesis is to examine the financial sector stability through the stability in banking sector. In particular, it investigates the effects of foreign banking inflows on banking crises of the two regions using a cross country analysis. This is the first of its kind to be studied in SSA.

1.1.3 Published work

Some of the original work presented in the thesis have been presented in conferences and published. These include chapters 4 and 5:

1. Mahawiya, S .2014, ″Financial sector development, political institutions and economic growth: A comparative study of ECOWAS and SADC. Presented on the 27th of June, 2014, at the *International Association of Applied Econometrics (IAAE), Queen Marry University of London, UK.*

2. Mahawiya, S. 2015, ″Financial sector development, inflation and openness: A comparative panel study of ECOWAS and SADC*″ ERSA Working Paper Series (Number 528)*

3. Mahawiya, S. 2015, ″Financial sector development and threshold effect of inflation in ECOWAS and SADC: A Panel smooth transition regression approach*″ ERSA Working Paper Series (539)*

1.1.4 Organisation of the thesis

This thesis is organised into seven chapters. Chapter one provides the introduction of the thesis which includes the background, motivation and objectives of the thesis.

Chapter two describes and discusses economic and financial sector performance of SSA as well as foreign banking inflows. A comparison is made with other developing regions. This chapter also includes detailed discussions of the macroeconomic and financial sector performance of ECOWAS and SADC. It ends with a brief discussion of governance and political dispensation in the region.

The first essay is presented in chapter 3. It investigates the financial sector development, political institutions and economic growth of ECOWAS and SADC through a comparative study. This is done using a number of econometric techniques which includes Pooled Mean Group, Mean Group and Dynamic fixed effects estimators. The chapter answers the two questions: Does financial development propel growth in the two regions? If so, how different are the impacts? Is there a complementarity effects between financial development and governance on economic growth and development?

Chapter 4 investigates the role of inflation and openness in determining the state of the financial sector of ECOWAS and SADC. In particular, the chapter examines the role of increases in inflation and more openness in trade and the financial sector on the financial system. The influence of development in communication infrastructure is also measured. This is achieved using a number of panel approaches.

Chapter 5 explores the threshold effects of inflation on financial development. This chapter also considers a comparative study between ECOWAS and SADC using the Panel Smooth Transition regression technique developed by González et.al. (2005). This technique provides a test which supports a nonlinear relationship between inflation and financial development in both regions.

In Chapter 6, the thesis examines the effects of foreign banking inflows on financial sector stability through the banking system using member states of ECOWAS and SADC. This is done using two econometric approaches of Multivariate logit and System GMM.

Chapter 7 concludes by making a summary of the empirical findings and suggests policy recommendations based on these findings.

Chapter 2

Background of financial sector development and economic performance of SSA, ECOWAS and SADC

2.1 Introduction

This chapter presents an overview of the economic and financial sector performance as well as foreign banking inflows into SSA over the last few decades in two parts. In particular, the first part makes comparison with other developing economies of South East Asia and Pacific, as well as Latin America and the Caribbean.

The second part discusses some of these issues in details in relation to ECOWAS and SADC. It compares the macroeconomic performance of the two regions as well as the developments in the financial sectors. Accordingly, the chapter makes available information on the financial system development of the two regions for the subsequent chapters to be analyzed.

2.2 Overview of economic performance of SSA

Africa is one of the least developed continents in the world, even though the 21st century is described as witnessing progress and recovery in economic performance in the region. In terms of SSA, recent growth rates from 2005 to 2014 indicate that the region has registered a phenomenal increase. This resulted in the region outperforming the rest of the world as demonstrated in Table 2.2.1. Even though growth slowed down in 2009, which may be blamed on the effects of the 2008/9 global financial crisis, it picked up in 2010. The region registered a positive growth rate of 2% in 2009 whereas the rest of the other regions grew under 1% with Organisation for Economic Co-operation and Development (OECD) and Latin America and the Caribbean registering negative growth rates. The region recorded her highest growth rate in 2007 at almost 7% which was the highest among other regions. Table 2.2.1 also indicates that OECD performed the least during this period.

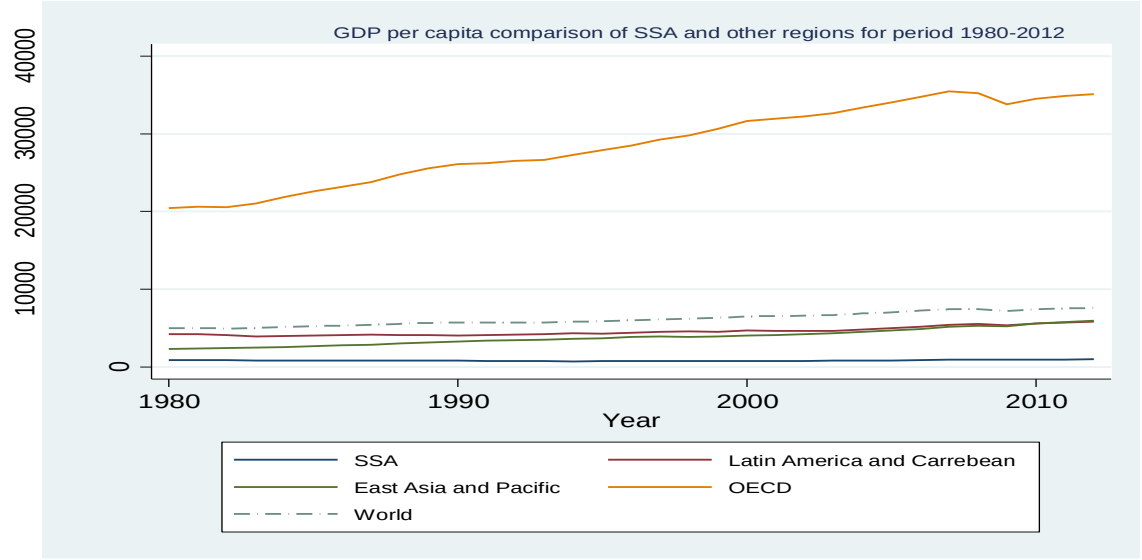
Table 2.2.1: Recent growth (%) of SSA and other regions

Year	East Asia & Pacific	Latin America & Caribbean	SSA	OECD	World
2005	4.5	4.4	5.7	2.6	3.6
2006	5.2	5.4	6.5	3.0	4.1
2007	6.2	5.3	6.9	2.6	3.9
2008	3.0	3.5	5.0	0.2	1.5
2009	0.5	-1.6	2.0	-3.6	-2.1
2010	7.0	5.7	5.2	2.9	4.1
2011	4.0	4.6	4.2	1.7	2.8
2012	4.3	3.0	4.0	1.2	2.2
2013	4.2	2.7	4.5	1.4	2.4
2014	3.6	1.3	4.2	1.7	2.5

Source: World Development Indicators, 2014

However, using per capita income at constant 2005 US dollars for the period 1980–2011, the economic performance indicates that the region is not only the least among other developing regions, but also falls far below the world trends as demonstrated by Figure 2.1. Indeed, the Figure shows that whereas Latin America and the Caribbean, as well as East Asia and the Pacific are increasing gradually and converging towards the world, SSA seems to show no signs of notable improvement. The Figure reveals that in the 1980s, the real per capita income of Latin America and the Caribbean was about 2000US$ higher than that of East Asia and the Pacific. This difference, however, was eliminated by 2009. For this same period, SSA in 1980 had around 900US$ and by 2010 it increased negligibly to about 1000US$. This poses a huge challenge for the region since it leaves it with perverse poverty which is exacerbated by civil wars and political unrest in some areas such as Somalia, Central Africa, Mali and Republic of Congo.

Figure 2.1: Comparison of real GDP per capita between SSA and other regions



Source: Own construct with data from World Development Indicators, 2012

As a result, relentless efforts are being made in the region by governments, policy makers as well as the international community to raise growth, reduce poverty, and to integrate into the world economy. Hence, among other things to induce economic growth and development, African states have formed multiple regional groupings, and within each bloc may be another subgroup. Apart from ECOWAS and SADC, we have East African Community (EAC), Community of Sahel-Saharan States (CEN-SAD), Economic Community of Central African States (ECCAS) and Intergovernmental Authority on Development (IGAD). The subgroups include Common Monetary Area (CMA), Economic and Monetary Community of Central Africa (CEMAC) and Southern Africa Custom Union (SACU).

These blocs aimed at pulling resources together for the advancement of the continent. Even though their formation may result in loss of economic sovereignty[6], it has among its benefits the ability to stimulate developments in the financial sector which is link to economic growth. This is because the formation of these regional groups will lead to the free flow of capital among member states. What is the experience in these regional groupings? The studies conducted so far have revealed mixed results. For instance, the study of Atindehou et al. (2005) on ECOWAS suggested a weak causal link. Other studies include Aziakpono (2004) on SACU, Allen and Ndikumana (2000) on SADC, and Tachiwou (2009) on West African Monetary Union. These studies argued that financial development is important to growth. However, a

[6] This is evidenced by the recent experience of Greece and Ireland in European Monetary Union

comparative study between these regional blocs, which is crucial, seems to be ignored. The next section gives a summary description and comparison of the state of the SSA's financial system with other regions.

2.3 Overview of the state of the financial system of SSA and other regions

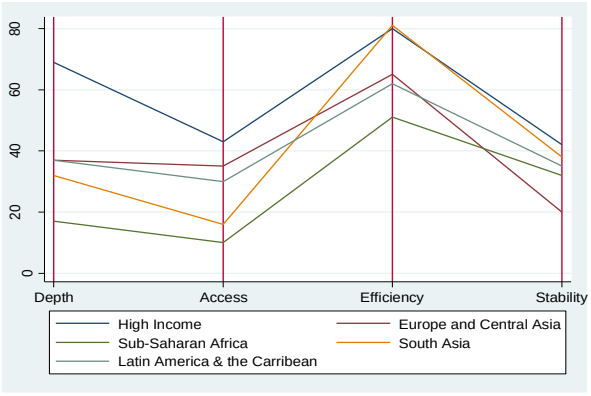
The financial system of SSA is relatively underdeveloped even though the formation of regional blocs leads to the free flow of goods and services, capital and investment which are expected to cause financial markets integration and eventual expansion in the sector. To assess the state and the level of the financial system of the region in terms of financial depth, access, efficiency and stability, Figure 2.2 was constructed using data from Čihák et al. (2012) based on the Global Financial Development Database which presents the financial system of 205 countries. This data shows the mean value of these indicators for financial system development for the period 1960–2010. Figure 2.2a from the graph suggests that financial institutions (FIs) of the region are not only much less deep and less efficient, but also less accessible compared to other emerging regions of Latin America and the Caribbean, Europe and Central Asia and South Asia. Furthermore, overall comparison also reveals that the region is internationally least developed and only do better than Europe and Central Asia in terms of financial stability.

On financial markets development, SSA does better than South Asia and Europe with Central Asia in terms of depth, but worst in terms of access[7] (see Figure 2.2b).

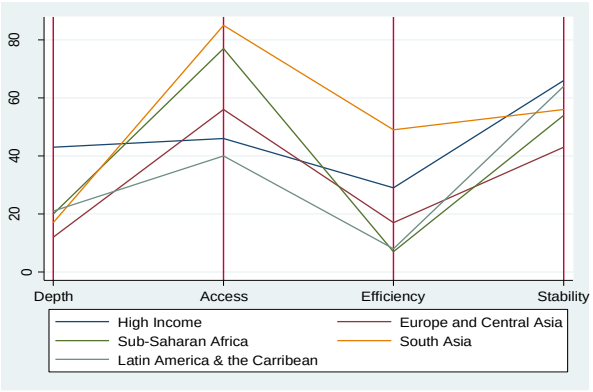
[7] Others such as Boyd et al. (2001) support this assertion.

Figure 2.2: Development in financial institution and markets

a. Development in the financial institutions



b. Development in financial Markets



Source: Own construction using information from Cihak et al. (2012). The figures show mean value of the indicators for the period 1960-2010. To show comparison between the proxy variables, the indicators are Winsorized truncating the top 5% and bottom 5% of the distribution by Čihák et al. (2012).

Considering other selected measures of financial development, Table 2.3.1 indicates that not only is average private credit as a percentage of total economic activities of SSA greater than that of Latin America and Caribbean, but also its average bank credit as a percentage of GDP for the period 1990–2012 is greater than that of the region. In addition, the Table indicates that these two measures of financial development of East Asia and Pacific is about three times that of SSA. Furthermore, in terms of monetisation of the economy as indicated by M2/GDP, SSA is the least developed. It also shows a high interest rate spread among the three developing regions. This implies that the region's financial sector is relatively less competitive.

Table 2.3.1: Some selected financial development measures of SSA and other regions

Region	Average credit to private sector (% of GDP)-1990-2012	Average credit by the banking sector as % of GDP-1990-2012	M2 /GDP-1990-2012	Interest rate Spread (2000-2012)
SSA	56.07	72.03	39.79	10.83
Latin America and Caribbean	34.39	55.63	40.05	7.57
East Asia and Pacific	153.69	210.59	168.54	5.01

Source: Own construct with data from World Development Indicators 2012.

These stylised facts collaborate the assertion by Allen et al. (2011) who estimated that liquid liabilities averaged about 30% of GDP for SSA in 2007 compared with that of East Asia, Latin America, South Asia and the Middle East and North Africa which exceeds 50%. Private credit provision reveals 16.6% of GDP, whereas it is 32.5% to 43.9% to GDP for the other developing economies. In addition, according to earlier classification of FSD by Gelbard and Leite (1999) on 38 SSA countries, only five countries had relatively developed financial system. These countries include South Africa, Kenya, Ghana, Zambia and Mauritius.

In the mid-1980s, many countries in SSA initiated financial sector reforms as part of SAP in response to economic deterioration that led to bank failures in many parts of the region. One of the main objectives of the financial reforms was to remove obstacles that were believed to interfere with the financial system developments in the region. The argument was that, the removal of these obstacles could induce financial deepening and ensure financial stability. This led most SSA governments to shift from state control to more market led systems as a means of promoting a stable economic environment. This was particularly relevant to the financial sector where it was hoped that this shift would stimulate domestic resources mobilisation and increase the capacity of the banking system to support private sector participation in economic development. Hence, a number of measures were taken which includes interest rates liberalisation and the removal of credit controls. Therefore, the underdeveloped state of the region's financial system raises a lot of concerns about what is being implemented to achieve

progress in in the sector. Even though the financial sector of the region performs relatively poor compared to other regions, there have been some recent improvements, which according to Allen et al. (2011) is explained by the economic and financial reforms that SSA countries have implemented in the recent past. These reforms also led to the attraction of foreign banks into the region. This is discussed further in the next section. Chapter 4 and 5 of the thesis give an empirical investigation of this in detail.

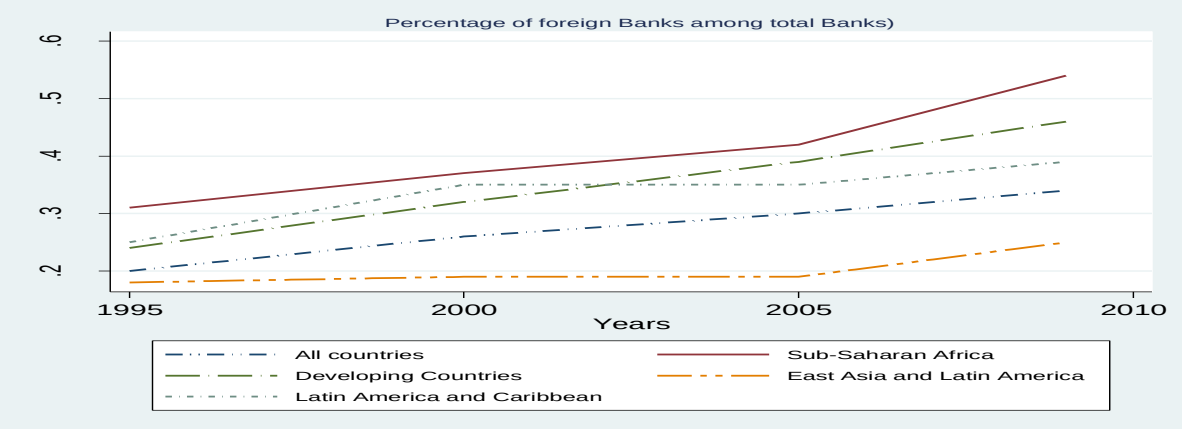
2.3.1 Foreign Banking in SSA

Despite the evidence that the financial system of SSA is considered underdeveloped, the reforms led to opening up of the banking system to foreign banks entry. This resulted in the recent past two decades witnessing an unprecedented level of increase presence of these banks into the financial system in many countries of the region. This has spurred concerns of major players in the industry such as the World Bank. According to Van Horen and Claessens (2012), not only has cross-border bank flows increased dramatically, but also many banks from both advanced and developing countries have moved abroad and established branches. The majority of these banks come from industrialised countries and recent development show evidence of foreign banks from developing economies expanding across borders into other developing countries (Van Horen, 2007). According to Van Horen (2007), these inflows of foreign banks seem to be influenced by economic integration, common language and proximity. Also importantly, banks from developing countries are more likely to invest in small developing countries, with weak institutions, where high-income country banks are unenthusiastic to go. The World Bank (2006) considers global economic trends, such as increases in trade and foreign direct investment (FDI), as some of the important answers to these unprecedented increases in FDI in the banking sector of the financial system of the region. Other important reasons are: to follow international client to take advantage of bank-client relationships (Petersen & Rajan, 1994), increase profitability (Focarelli & Pozzolo, 2000), and, to diversify risk (Van Horen, 2007).

According to Van Horen and Claessens (2012), in terms of loans, deposits and profits and current market shares, foreign banks amount to an average of 20% in OECD countries and almost 50% in emerging markets and developing countries. In terms of SSA, using data from

Van Horen and Claessens (2012)[8], Figure 2.3 was constructed which demonstrates inflows of foreign banks in terms of different regions.

Figure 2.3: Regional comparison of foreign bank ownership among total banks



Author's own construct with data from Claessens and Horen (2012)

The data includes 5377 banks in 137 countries for the period 1995–2009. The figure seems to provide evidence that SSA is the preferred destination of foreign banks. It indicates that, the region received the highest percentage of foreign bank inflows for the period, reaching about 54% in 2009. However, the rest of the regions fall below 50% with East Asia and Latin America the least.

In addition, the total share of foreign banks present in SSA in terms of the number present in developing countries are 54%, 50% 46.1% and 47% for the period 1995, 2000, 2005 and 2009, respectively, as indicated in Table A.0.1 in the Appendix A. Even though the numbers suggest a decline, foreign banks' presence in the region reveals increasing trends of 31%, 37%, 42% and 54% for the same period as shown in the Table. The Table also suggests that between 1995 and 2009, foreign banks almost doubled from 94 banks to 181, indicating an increase of about 93%. In most cases, intraregional foreign banking inflows are relatively a noteworthy proportion, giving support to recent literature that emphases the role of distance in both foreign investment and financial investment. The literature argues that regional investment could be more attractive than global[9]. Nigerian and South African banks created pan-African networks. However, this expansion is recent and happened in the mid-2000s (International Monetary Fund-IMF, 2015). Moreover, the expansion of these banks echoes the increases in economic

[8] The authors compiled number of banks both domestic and foreign in terms of regions and income level.
[9] Van Horen and Claessens (2012) gave evidence that supports this argument.

integration within Africa more generally, and is contributing to improved competition, financial inclusion, and rise to greater economies of scale (IMF, 2015). In addition, these banks have been filling the recent gap left by European banks and are becoming the lead arrangers of syndicated loans (IMF, 2014).

The discussion thus suggests how important these banks are in the domestic banking industry of SSA and thus the overall financial sector development of the region. However, some concerns have been raised about this situation. According to Frankel (1999), since the 1990s, international private capital inflows have increased tremendously, prompting an increasing financial sector vulnerability and the transmission to financial crisis. Therefore, cautious policy approach is required to contain their activities. The next section considers these issues in terms of ECOWAS and SADC.

2.4 SADC

SADC was formed in April 1980. It is a fifteen-member regional integrated trade group which includes, Angola, Botswana, Lesotho, Madagascar, Malawi, Mozambique, Mauritius, Namibia, the Democratic Republic of Congo (DRC), Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. The main objectives among other things are to achieve sustainable development and economic growth, alleviate poverty and enhance quality of life of the people. The Community is not only endowed with huge minerals deposits, precious and base metals, but also has fertile land that produces wide range of agriculture products. According to Cling (1998), the region does not only roughly account for half of the GDP of SSA, but also has four out of the five richest economies in SSA. South Africa is the most industrialised economy in the region.

2.4.1 Economic Performance of SADC

Economic performance among SADC members shows wide disparities. Table 2.4.1 reveals that even though the average annual GDP growth rate of SADC is 3.58% for the period 1990 –2010, which is slightly above the SSA growth rate of 3.42 %, DRC, Madagascar, South Africa, Zambia and Zimbabwe performed poorly below this SSA growth rate. The Table indicates that DRC and Zimbabwe have registered negative growth rates of 0.57% and 0.91% respectively. Internal conflict in DRC could be responsible for this, whereas that of Zimbabwe may be blamed on inappropriate macroeconomic policies. However, Mozambique experienced

the highest average growth rate of 6.41%, followed by war-torn Angola with 6.01% which is caused by petroleum and diamond exports.

In terms of average per capita income for the period, SADC (2289.8 US$) is almost three times the average per capita income of SSA (819.8US$) with Seychelles (10721.1 US$) out performing all member states. However, eight countries that include Madagascar, DRC, Lesotho, Malawi, Mozambique, Tanzania, Zambia and Zimbabwe performed poorly below the SSA level, with DRC the lowest (160.9US$). Thus economic performance of the region presents wide disparities among the member states.

Considering recent annual GDP growth rate and per capita income for 2012, again SADC performs well above SSA with per capita income over three times that of SSA. Both DRC and Zimbabwe recorded huge improvement in their annual growth rates (7.15% and 5.02% respectively) but still performed poorly in terms of per capita income. Also, there is noticeable improvement in the per capita income of thirteen countries over the average per capita income of 1990–2010. The discussion thus far shows that the region has the best and the worst economies in SSA. This corroborates Allen and Ndikumana's (2000)[10] assertion that the region includes both the poorest and the richest African nations with regional and national income disparities representing the best and the worst. However, this economic performance was characterised by high inflation in the 1990s. This is discussed in the following section.

[10] For more discussion on the economic performance of SADC see (Allen & Ndikumana, 2000)

Table 2.4.1: Average annual GDP growth rates (%) and real per capita income for the period 1990 to 2010 for SADC.

Country/Region	Average annual GDP rate % (1990-2010)	Average Per capita GDP (2005 US $)(1990-2010)	Annual GDP rate % (2012)	Per capita RGDP (2005 US $)-2012
Angola	6.01	1572.2	6.83	2685.83
Botswana	5.18	4608.3	6.10	6934.86
DRC	-0.57	160.9	7.15	164.51
Lesotho	4.04	656.3	3.96	928.54
Madagascar	2.32	283.3	3.10	273.44
Malawi	4.20	214.1	1.89	258.96
Mauritius	4.86	4458.1	3.17	6711.16
Mozambique	6.41	257.3	7.40	417.45
Namibia	4.31	3226.9	4.98	4328.07
Seychelles	3.68	10721.1	2.90	14301.52
South Africa	2.55	4946.4	2.55	6003.46
Swaziland	3.50	2213.4	-1.50	2341.38
Tanzania	5.11	334.0	6.86	483.48
Zambia	3.02	622.3	7.32	798.26
Zimbabwe	-0.91	577.4	5.02	428.54
SADC	3.58	2289.8	4.51	3137.30
SSA	3.42	819.8	4.23	992.84

Source: Own construct with data from World Development Indicators 2012.

2.4.2 Inflation in SADC

In terms of inflation, Table 2.4.2 indicates that inflation was high in the 1990s, as shown by the five-year average inflation in the Table. Countries such as Angola, DRC, Zambia and Zimbabwe experienced three and four digits inflation which extended to 2000–2004. DRC recorded the highest inflation of 6425% in the 1990s, followed by Zimbabwe with 2567% in 2011. It is clear from the Table that, in general, inflation reduced after the 1990s in many countries resulting in the region's average becoming relatively low without Angola, DRC, Zambia and Zimbabwe. However, in general, it seems the region is experiencing convergence in inflation, as shown by Figure A.1 in Appendix A. The Figure suggests a downwards trend of inflation in all member states which seems to converge. This trend could be suggestive of member state trying to meet the region's inflation convergence criteria which is 3% by 2018[11].

[11] SADC. (2011). Retrieved from SADC Website: www.sadc.int.

If this low inflationary trend continues, the region stands to improve the financial sector since low inflation is theoretically unlikely to be detrimental to financial development.

Table 2.4.2: Showing inflation in SADC for the period of 1990 –2011

	Year					
Country	1990-1994	1995-1999	2000-2004	2005-2009	2010	2011
Angola	677.7	1478.3	145.6	14.9	14.5	13.5
Botswana	12.8	8.7	7.9	9.6	6.9	8.5
DRC	6425.0	309.4	184.4	16.9	16.7	16.6
Lesotho	13.6	8.6	8.4	7.1	3.6	5.0
Madagascar	16.8	17.9	9.5	11.6	9.2	9.5
Malawi	21.1	40.9	17.6	10.9	7.4	7.6
Mauritius	8.6	6.6	4.9	7.0	2.9	6.5
Mozambique	46.2	22.9	12.9	8.4	12.7	10.4
South Africa	12.4	7.3	5.5	6.8	4.3	5.3
Swaziland	11.1	8.0	8.2	7.7	4.5	6.1
Seychelles	2.4	1.6	3.9	14.9	-2.4	2.6
Tanzania	26.7	16.4	4.6	7.3	10.5	10.6
Namibia	-	-	-	6.6	4.5	5.0
Zambia	121.7	30.7	21.8	12.8	8.5	6.4
Zimbabwe	26.5	30.6	197.3	1196.8	2031.0	2567.0
SADC (Excludes HIC)	18.0	15.4	8.3	10.2	7.4	8.1

Source: Own construct with data from World Bank *African Development Indicators*, 2012
HIC=High inflation countries.

2.4.3 Overview of the financial system of SADC

The overall financial sector performance using credit to the private sector as percentage of GDP, as well as credit by the banking sector as percentage of GDP, for the period 1990 –2012 revealed that the average credit of SADC for that period does not only fall below SSA standards, but also other developing economies, such as Latin America and the Caribbean as well as East Asia and the Pacific (see Table 2.4.3). However, the data reveals that private sector as percentage of GDP is 125.28 whiles banking sector as percentage of GDP is 154.07 for South Africa suggesting that it is more than twice the SSA average. This is followed by Mauritius whose financial sector activities on the average make up more than half of the economic activities in the country. Also, even though private credit is about 22% of economic activities in Seychelles, credit by banks is over 80% of GDP

The trend is not very different considering financial sector depth with M2 as percent of GDP[12]. However, the rest of the region performs below 50%. Hence, if Schumpeter is right, then there should be measures to improve the financial sector of these economies. Exclusion of South Africa from the estimates revealed a noticeable drop of SADC financial sector performance from 27.04% to 20.04% for credit to private sector, and from 35.50% to 27.03% of banking sector credit for the period. We can conclude with caution that South Africa exerts some influence on the financial sector performance in the region.

To measure the importance of the banking sector, the ratio of deposit money bank asset to deposit money bank asset plus central bank asset shows that, apart from DRC and Zambia, the rest of the countries are above 60%. This suggests diminishing influence of central banks in the financial system and increasing influence of commercial banks. This is a good sign since banks are not only able to efficiently mobilise savings and channel to more promising areas, but they also have the capacity to monitor how these resources are used. This process could generate economic growth. For SADC, on average it is about 75%. This signifies the importance of commercial banking in the region. And since the underlying intuition about the banking institutions is that they have the ability to provide the five main financial functions as outlined by Levine (1997), efficient organisation could lead to more resources being channeled to the productive sectors of the region.

[12] This variable is used instead of M3 for the analysis in this chapter because there is consistent data for all member states. However, M3 is the preferred proxy for the estimation.

Table 2.4.3: Financial sector development of member states of SADC

Country/Region	Average credit to private sector (% of GDP)-1990-2012	Average credit by the banking sector as % of GDP-1990-2012	Average bank assets to bank assets and central bank assets (%) 1990-2011	M2 % GDP-1990-2012	Interest rate Spread (2000-2012)
Angola	9.08	10.74	67.23	24.93	32.85
Botswana	16.29	31.03	99.20**	33.91	6.52
DRC	2.66	7.40	44.06	12.69	34.70*
Lesotho	15.56	-1.43	81.11	36.33	9.01
Madagascar	11.30	16.33	65.12	21.75	23.22
Malawi	10.19	20.15	62.53	20.38	21.62
Mauritius	62.51	81.76	97.48	85.66	7.72
Mozambique	15.41	11.30	86.96	29.29	8.43
Namibia	43.84	46.28	95.95	42.45	5.47
Seychelles	22.14	82.50	77.96	73.88	7.16
South Africa	125.28	154.07	97.43	63.03	4.15
Swaziland	18.05	13.40	97.97	23.54	6.57
Tanzania	10.18	17.90	72.30	24.56	9.75
Zambia	9.16	42.71	37.69	20.18	15.28
Zimbabwe	34.21	60.37	67.51	47.63	197.04
SADC	27.06	35.50	76.48	37.35	25.96
SADC(Excl SA)	20.04	27.03	75.17	35.51	13.75
SSA	56.07	72.03	-	39.79	10.83
Latin America and Caribbean	34.39	55.63	-	40.05	7.57
East Asia and Pacific	153.69	210.59	-	168.54	5.01

Source: Own construct with data from World Development Indicators 2012. This source and financial measures are used in this analysis for this chapter since data on these measures are available at source. Ratio of Bank assets to bank assets plus central bank asset is obtained from Global development Financial Data Base *only have data for last 5 years, **only have data for the last 11 years.

Also, Table 2.4.3 indicates that interest rate spread, which measures the degree of cost of intermediation in a competitive financial system, is relatively high in the region. This indicator can also be used to gauge not only the development of the banking sector and the measure of the level of efficiency in the sector, but also measures the overall financial sector. It is evident that the majority of the countries are below SSA level of 10.83%, which exceeds that of developing economies of Latin America and the Caribbean as well as East Asia and the Pacific for the period 2012. This indicator shows that the financial sector of South Africa has greater competition in the region. Theoretically, interest rate spread should fall as financial sector develops. Thus, the low interest rate of the developed financial sector of South Africa comes as no surprise. With the majority of member states revealing relative competitive environment

in the financial system, a model relating FSD to growth and development will be informative to policy direction. However, the interest rate spread of Zimbabwe is 197.04%. It reflects the impact of the recent inflation trends in the country. Overlooking Zimbabwe reduces SADC interest rate spread from 25.96% to 13.75%. Other member states with higher interest rate spread include Angola, DRC, Madagascar and Malawi which may be blamed on high bank concentration. Bank concentration for the three largest banks in Angola, DRC, Madagascar and Malawi are 72%, 58%, 89% and 88% respectively

2.4.4 Stock market development in SADC

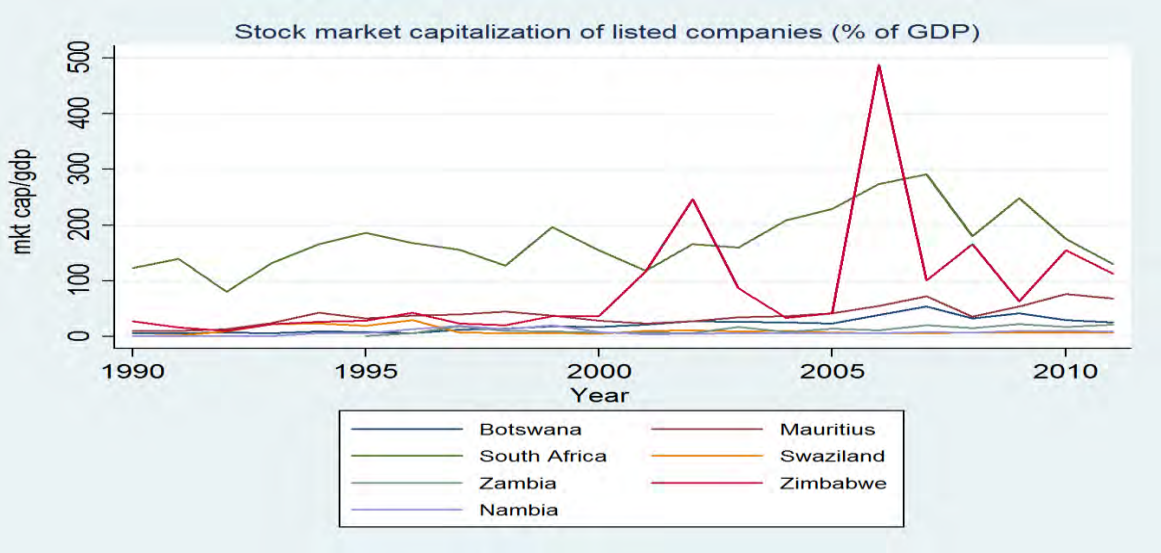
In terms of stock market development, SSA has relatively little to discuss. This component of the financial structure is largely under developed, leaving the region a basically bank-based financial system. Nevertheless, some positive developments are observed. SADC has relatively the most developed stock markets. There are about seven stock exchanges in the region, with South Africa having a highly developed and sophisticated market, ranking 17th in the world in terms of market capitalisation (SADC- Finance and Investment Sector Coordinating Unit, FISCU, 1998). From Table 2.5.4, it is clear that average stock market capitalisation of listed companies as a percentage of GDP indicates that it is almost 173% of economic activity in South Africa, with total average market capitalization of 362.096 billion US$ for the period 1990 –2011.

Removal of South Africa leaves average stock market performance of SSA to drop conspicuously from 107.3% to 24.7%. This reveals the stock market power of South Africa in SSA. Namibia performs the least with almost 8% of GDP and average total market capitalisation for the period to be 473.15 million US$. The rest of the economies, apart from Zimbabwe and Mauritius (39.9%), on average perform poorly during the period indicating stock market capitalization of less than 40% of GDP.

Figure 2.4 shows the performance of the stocks markets over the entire period of 1990 –2012 in the sub-region. It is evident that South Africa performs well reaching all time highest performance ever in 2007 of about 300% of GDP. This was followed by a sharp decline in 2008 to about 170%. The decline was largely the result of the recent financial crisis of 2008. Zimbabwe reached all-time high of almost 500% of economic activity in stock market capitalisation in 2006, but experienced a sharp drop to about 100% in 2007 and the lowest ever recorded in 2009 to about 62%. This reveals the negative impact of the financial crisis as well

as hyper inflationary effects. However, there is recovery since 2010. Dismal records were observed in Zambia, Swaziland and Namibia. Mauritius and Botswana, even though look promising, remained below 80% of GDP, with the former performing better.

Figure 2.4: Stock market developments in SADC



Source: Own construct with data from GFDD, 2012.

2.5 ECOWAS

In contrast to SADC, ECOWAS was established on 28th May 1975 in Nigeria with 16 countries which include: Benin, Burkina Faso, Cape Verde, Cote d' Ivoire, Ghana, Gambia, Guinea (Conakry), Guinea Bissau, Liberia, Mali, Mauritania, Nigeria, Niger, Senegal, Sierra Leone and Togo. However, Mauritania has opted out. The objective is to promote economic integration in all spheres of economic activity, such as industry, telecommunications, commerce, monetary and financial development, energy, agriculture, natural resources, social and cultural matters, etc. The bloc does not only aim at pooling resources of member countries to raise living standards and reduce poverty, but it also aims at improving and maintaining economic stability, as well as promote relations among member states.

Like SADC, the region has huge and diverse natural mineral resources which include gold, diamond, iron ore, bauxite and uranium. There is also a huge potential for crude oil as evidenced by the recent discovery of vast deposits in Ghana. Agricultural products include timber, cocoa, coffee, rubber, and so on. Therefore if properly harnessed, they can cause a dent on poverty in the region.

2.5.1 Economic Performance of ECOWAS

In terms of economic performance as shown in Table 2.5.1, average annual economic growth rate from 1990 to 2010 is marginally above the SSA growth rate, but average per capita income for the same period is lower than that of SSA. This is mainly as a result of poor economic performances by Nigeria and Cote d' Ivoire whose combined GDP is over 50% of the region (see Table 2.5.1). Fueled by political instability, Cote d' Ivoire registered mostly negative growth rates. However, Nigeria did not register negative growth rates, but experienced low performance[13]. Seven member states have their growth rates above the ECOWAS rate. These includes Benin, Burkina Faso, Cape Verde, Ghana, Liberia, Mali and Nigeria.

It is clear that Cape Verde had the highest average growth rate of 6.17% over the period as well as the highest per capita income of 1730 US$ at 2005 prices, followed by Burkina Faso with growth rate of 5.37% but with real per capita income far below both ECOWAS and SSA level. Apart from Cape Verde, Cote d' Ivoire, Nigeria and Senegal whose average real per capita incomes are above the ECOWAS level, that of the rest of the member states are not only below the ECOWAS level, but are also very low and fairly uniform with war devastated Liberia the least (151.22US$). One of the reasons assigned to this poor performance is primarily because of a sharp decline in the terms of trade (-3.3% in 1999) [14] and political uncertainties in several countries, notably Cote d' Ivoire. In addition, droughts, inappropriate economic policies, and other internal and external constraints, have rendered many member countries to endured harsh economic conditions leading to poor economic performance.

Nevertheless, recent estimates of 2012 (column 4) revealed a remarkably improvement in annual GDP growth in the region. They show the average annual GDP of 3.80% rising to 6.5%, with war-devastated but diamond-supported Sierra Leone registering a double digit growth rate of 15.22%. It was the highest in the bloc. On average, twelve member states experienced improvement in economic growth in 2012 over the 1990 –2010 rates, with Cote d' Ivoire growing at the rate of 9.50% with the return of political stability, and war-worn Liberia growing at the rate 10.82%. There is also evidence from the Table that reveal that the per capita income of twelve countries have improved in 2012 with Cape Verde maintaining the lead. With the region vastly politically stable, the prospects for good economic performance is clear.

[13] See data from WDI, IMF World Bank 2012
[14] (www.worldbank.org).

Table 2.5.1: Average annual GDP growth rates (%) and real per capita income for the period 1980 to 2010 for ECOWAS

Country/Region	Average annual GDP % (1990-2010)	Average Per capita GDP (2005 US $)-1990-2010	Annual GDP rate % (2012)	Per capita GDP (2005 US $)-2012
Benin	4.45	506.80	5.40	567.91
Burkina Faso	5.37	351.99	10.03	494.99
Cape Verde	6.17	1730.10	4.29	2986.67
Cote d' Ivoire	1.59	990.54	9.50	957.88
Gambia	3.60	429.09	6.01	444.23
Ghana	4.99	461.90	7.91	724.35
Guinea	3.32	289.18	3.94	308.20
Guinea Bissau	2.02	456.53	-1.50	423.38
Liberia	5.89	151.22	10.82	277.94
Mali	4.72	398.33	-1.19	476.44
Niger	2.24	267.23	11.20	246.23
Nigeria	4.79	739.47	6.55	1052.34
Senegal	3.39	710.85	3.69	799.39
Sierra Leone	2.26	313.09	15.22	435.41
Togo	2.25	393.40	5.62	412.79
ECOWAS	3.80	545.98	6.50	707.21
SSA	3.42	819.84	4.23	992.84

Source: Own estimation with data from World Development Indicators 2012. This source and financial measures are used in this analysis for this chapter since data on these measures are available at source.

2.5.2 Inflation in ECOWAS

Unlike SADC, only few countries experienced high and double-digits inflation in ECOWAS in the 1990s, as demonstrated by Table 2.5.2. These countries include Ghana, Nigeria and Guinea Bissau. These double-digits inflation extend to 2010 and 2011 in Ghana and Nigeria respectively. Available data on Guinea also suggests such double-digits from 2005–2011. This may suggests that in these countries, monetary policy was out of control. The data also reveals that countries that belong to the West African Economic and Monetary Union (WAEMU) have relatively low inflation rate during this period. WAEMU includes Benin, Burkina Faso, Cote d' Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo

The union has a strong periodic reviews of member countries' macroeconomic policies and performance based on the convergence conditions. This may suggest the reason for such a relatively low inflation rate among member states. Like SADC, the average ECOWAS inflation

seems fairly low and appears trending downward. This indicates that member states are moving towards inflation convergence as shown by Figure A.2 in Appendix A.

Table 2.5.2: Showing inflation in ECOWAS for the period of 1990-2011

	Year					
Country	1990-1994	1995-1999	2000-2004	2005-2009	2010	2011
Benin	9.6	5.9	2.6	4.1	2.1	2.1
Burkina Faso	5.1	4.0	1.7	4.4	-0.8	2.8
Cape Verde	6.5	6.3	0.4	3.6	2.1	4.5
Cote d' Ivoire	6.7	5.3	2.9	3.1	1.7	4.9
Gambia	7.7	3.2	9.0	4.3	5.0	4.8
Ghana	23.0	32.2	22.4	14.5	10.7	8.7
Mali	3.8	4.5	1.0	4.2	1.1	2.9
Niger	4.4	4.2	1.6	4.0	0.8	2.9
Nigeria	35.8	25.4	13.5	10.9	13.7	10.8
Senegal	6.0	2.9	1.3	2.9	1.3	3.4
Togo	8.2	6.1	1.7	4.4	1.8	3.6
Guinea Bissau	44.7	30.2	2.5	3.7	2.5	5.0
Guinea	-	-	-	22.4	15.5	21.4
Liberia	-	-	-	10.9	7.3	8.5
Sierra Leone	-	-	-	-	16.6	16.2
ECOWAS Average	13.5	10.8	5.1	6.9	5.4	6.8

Source: Own construct with data from World Bank African Development Indicators, 2012

2.5.3 Overview of the financial sector

Unlike SADC, ECOWAS has dual financial systems comprising a formal financial system and an informal financial sector. The former comprises the Central Bank, the banking sector and non-banking financial institutions. The informal financial system, which is widespread in the region, involves mainly unrecorded small mobile and micro financial systems that move from door to door of their clients who are mainly unattractive to the formal financial system. They are named differently in different countries such as "susu" in Ghana, "esusu" in Nigeria and "so" in Benin[15]. They are not only engaged in mobilizing small savings of small businesses, and small farmers dotted across the region but also engage in giving loans which are easily accessible and the mainly life line of many small businesses. Individual honesty as well as trust of the society for the individual usually becomes collateral. Loans are usually in small amounts and for a short period. The informal financial system plays a crucial role in the economies of ECOWAS. Hence, as Atindéhou et al. (2005) point out, converting it into formal financial institutions is a concern for ECOWAS. With the support of international organisation, several

[15] For further discussion, see Atindéhou et al.(2005)

formal microfinancial structures have been created, including Cre´dit Rural in Guinea, Cre´dit mutuel and Banques villageoises Nganda in Senegal, and Caisses villageoises du pays Doyon in Mali.

In terms of formal system, ECOWAS's financial system is dominated by banks. From Table 2.5.3, it is evidenced that average private sector credit as a percentage of GDP (15%) is extremely low compared to that of SSA (56 %). However, the average private sector credit as a percentage of GDP of Cape Verde, Cote d' Ivoire, Mali, Nigeria, Senegal and Togo are above ECOWAS average, with Cape Verde performing better in the region. Guinea performs poorly during this period with 7.16 % economic activities as a credit to the private sector. In terms of credit by the banking sector, as a percent of GDP, the estimates show that the average financial sector activity is less than half of economic activity of the bloc (32.92% of GDP). This is far below the SSA level of 72.03%. However, it is over 64% of GDP for Cape Verde and 180% in Liberia. Again, in terms of this measure, the rest of the member states have very low and relatively uniform distribution as demonstrated by Table 2.5.3.

However, ratio of domestic banking assets to the sum of domestic banking assets and central bank assets reveal an average of 61.35% for the region. This indicates the increasing importance of the banking sector with Ghana, Guinea, Guinea Bissau, Liberia and Sierra Leone registering figures below 50%.

Table 2.5.3: Financial sector development of member states of ECOWAS

Country/Region	Average credit to private sector (% of GDP)-1990-2012	Average credit by the banking sector as a % of GDP-1990-2012	Average bank assets to bank assets and central bank assets (%) 1990-2011	M2 % GDP-1990-2012	Interest rate Spread (2000-2012)
Benin	14.54	11.79	84.03	28.88	
Burkina Faso	13.63	12.59	79.81	22.47	9.28
Cape Verde	38.73	64.27	69.52	14.55	7.58
Cote d' Ivoire	19.15	26.58	79.37	27.56	5.93
Gambia	9.41	16.20	79.68	27.86	14.01
Ghana	10.32	26.12	48.06	35.78	3.36
Guinea	7.16	15.30	30.02	16.40	13.18
Guinea Bissau	7.66	12.48	45.50	27.42	
Liberia	10.03	180.61	11.52	13.27	12.26
Mali	16.11	14.28	79.45	25.70	
Niger	8.25	10.79	62.17	14.94	
Nigeria	20.84	21.99	63.80	23.66	7.49
Senegal	21.49	25.36	76.56	28.59	
Sierra Leone	3.85	31.93	33.46	15.20	12.83
Togo	20.09	23.45	77.28	31.93	
ECOWAS	14.75	32.92	61.35	23.62	
SSA	56.07	72.03	-	39.79	10.83
Latin America and Caribbean	34.39	55.63	-	40.05	7.57
East Asia and Pacific	153.69	210.59	-	168.54	5.01

Source: Author's computations with data from World Development Indicators, 2013 and Global Financial Development Database, 2012.

The average depth of financial system is dissatisfactorily 23.62% with all member states also revealing less than 40% of economic activities. Ghana is the only country performing relatively better. Interest rate spread shows some relative efficiency in the region, with Ghana showing more competition in the bloc. This could be explained by the liberalisation of the banking sector which resulted in inflows of foreign banks. However, Gambia has the highest interest rate spread of 14.01%. This may have been caused by bank concentration which increased to 100% in 2011. This is the opposite in Ghana. Ghana's bank concentration fell from 100% in the 1990s to about 42% in 2011 as demonstrated by the data from Global Financial Data Base 2012.

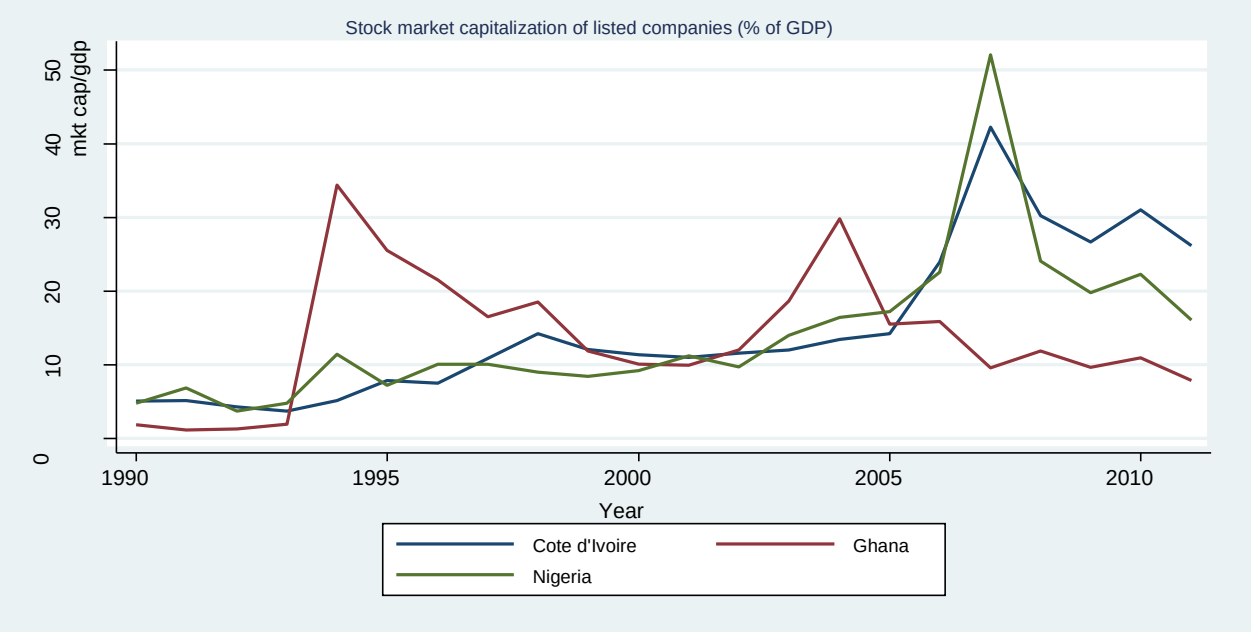
2.5.4 Stock market development in ECOWAS

The sub-region has only three active stock markets namely: the Ghana Stock Exchange, Nigeria Stock Exchange and the Bourse Regionale des Valeurs Mobilieres (Abidjan), which is stock

exchange for WAEMU member states. From Table 2.5.4, the average stock market capitalisation of listed companies as a percentage of GDP for the period 1990–2011 was 15.72 for Bourse Regionale des Valeurs Mobilieres (BRVM) (Abidjan). It was the highest in the bloc, followed by Nigeria Stock Exchange (14.5%), and Ghana Stock Exchange (13.3%). Clearly, stock market activities of the region are disproportionately very low in terms of total economic activity in each country. They remain thin and illiquid compared to markets in both developed countries as well as other developing countries.

Nevertheless, from Figure 2.5, it is evidenced that there is improvement from 1990 to 2011 as these markets started from less than 10% and followed steady growth path reaching around 14% for Cote d' Ivoire, 15% for Ghana, and 17% for Nigeria in 2005. After which, Cote d' Ivoire and Nigeria experienced a sharped increased in performance with all-time high of 42% and 52% respectively in 2007. There was, however, a sharp decline of the 2007 performance in 2008 (30% for Cote d' Ivoire and 24% for Nigeria). It further worsened in 2009. This indicates the debilitating effects of the financial turmoil of the period. Even though the three markets suffered reduction in their performance, the Figure reveals that Nigeria was heaviest hit.

Figure 2.5: Stock market developments in ECOWAS



Source: Own construct with data from GFDD, 2013

In terms of total stock market capitalisation, Nigeria registered the highest average of 18.7307 billion current US$ during this period, Cote d' Ivoire, 2.8468 billion current US dollars, and Ghana 1.6481 billion current US$ (See Table 2.5.4).

Table 2.5.4: Stock market development in SADC and ECOWAS

Country/Region	Market capitalization of listed companies (% of GDP):1990-2011	Market capitalization of listed companies (current US$ millions)	Stocks traded, total value (current US$ millions):1990-2012	Stocks traded, total value (% of GDP):1990-2012
		ECOWAS		
Cote d' Ivoire	15.72	2846.9	66.1	0.36
Ghana	13.25	1648.3	49.7	0.44
Nigeria	14.467	18730.7	2816.2	1.72
		SADC		
Botswana	21.29	2003.5	65.0	0.81
Mauritius	39.90	2686.1	156.9	2.27
Namibia	7.71	4731.5	15.9	0.32
South Africa	172.46	362,096	150,930	61.22
Swaziland	9.924	184.9	-	-
Zambia	12.47	1241.4	44.4	0.43
Zimbabwe	87.33	5906.3	658.7	9.52
SSA	107.31	-	-	-
SSA	24.66	-	-	-

Source: Author's computations with data from GFDD, 2013

From the discussion, it is clear that both average and recent GDP rates for ECOWAS exceed that of SADC. However, both average and recent per capita income of SADC far exceeds the former, with recent estimates showing SADC is about four and halve times ECOWAS, but with wide income disparities, whereas incomes are fairly uniform in ECOWAS. In terms of financial sector development, the banking sector has the largest share in terms of total financial sector assets in a majority of countries in the two regions. Furthermore, even though the two blocs are relatively underdeveloped, SADC seems to perform better than ECOWAS. Hence, a comparative study focus on investigating the reason for the state of the financial system, as well as relating financial development and other growth influencing control variables to economic growth, is not only justified but informative, and has implication for policy directions.

2.5.5 Other areas of the financial system

Other aspects of the financial structure such as the bond markets, the insurance markets as well as the mortgage markets, which are all very important components of the financial system are relatively immature. However, it seems to be picking up in some few countries in the two regions. Countries in SADC include Mauritius, Seychelles and South Africa, with South Africa having the most developed. In ECOWAS, this seems to be growing in Nigeria and Ghana.

2.6 Governance and democratic development in ECOWAS and SADC

Democracy is seen as a set of representative institutions that strive to uphold liberal values. It is increasingly perceived that democracy offers a solution to major social and economic difficulties. It guarantees political freedoms and multi-party elections which enables voters to hold governments more accountable, not only in terms of delivering public services, but also in assuring the security of property rights and economic freedom (Limongi & Przeworski, 1997; Besley & Prat, 2006). The accountability of public officials, transparency in both government spending and policy-making, provision of property rights, as well as economic freedom lead to economic growth. Hence, democracy allocates resources more efficiently than autocratic regimes. Therefore, transition from more autocratic and dictatorial rule to more democratic administration will induce economic growth

Democratic theorists such as Campbell et al. (1960), Fenno (1978) and Fiorina (1981) contend that elections under democracy make available to the citizens an opportunity to influence the way governments behave. Through voting, a population can either threaten to remove a representative or can reward her with a renewed reputation for competency and an additional term in office. Hence, in theory, a more democratic system is more likely to produce policy outcomes that coincide with citizens' preferences than a less democratic system resulting in economic growth.

Despite this, Gwartney et al.(1996) argues that a country may be liberal in a political sense and highly democratic with major civil liberties being protected and still adopt policies that conflict with economic freedom which may reverse economic growth. Therefore, democratic governance is a necessary condition for economic growth, but not a sufficient condition, unless it is supported by good macroeconomic policies.

On the other hand, even though autocratic and demagogic regimes are mostly characterised and blamed with expropriations, bureaucracy, corruption and nepotism, which increase the cost of doing business and eventually lead to the reversal of economic growth, the study argues that this is not always the case. Evidence from the development-dictators of Singapore, Korea and Thailand indicates that even though a country may be under autocratic administration, some remarkable economic growth can still be recorded. Some, such as the World Bank, argue that some element of autocracy is needed to induce economic growth.

Governance and democratic dispensation in SSA have undergone series of metamorphosis. From authoritarian rule in the 1960s, to democratic governance in the 1990s. Like any region in SSA, SADC and ECOWAS have made tremendous strides towards multiparty democratic governance from authoritarian regimes. These regions were characterised with military interventions resulting in dictatorial regimes. This is especially the case with ECOWAS. Civil wars in Liberia and Sierra Leone in ECOWAS resulted in destruction and political instability, causing unstable macroeconomic environment which led to economic hardship in the economies. Other areas were marked by series of coups d'états leading to dictatorship regimes. Countries such as Ghana, Nigeria, Burkina Faso, Niger, Gambia, and so on suffered in 1960s to the late 1980s. Unlike the development-dictators of South East Asia, these military regimes plugged their economies into total anarchy with some of the economies like Ghana recording negative growth rates.

In SADC, notably countries that were plugged into authoritarian rule include Zaire (DRC) and Angola. These countries were engaged in long civil war which resulted in destruction and underdevelopment. Currently, the focus is on Zimbabwe, even though the administration is under democracy.

To examine the level of governance, political rights, civil liberties and Freedom Status, we constructed Table 2.6.1 using information from Polity IV and Freedom House. The system of governance is measured by polity2 from Polity IV. This index measures the degree of democracy and autocracy by assigning a positive number to the former and a negative for the latter. The values are from -10 to 10 indicating extreme autocracy and extreme democracy. The rest of the indices are obtained from Freedom House, which indicates 1 for total political right, civil liberty and total freedom; 7 demonstrates absence of these rights and freedom.

From Table 2.6.1, it is clear that on average, SADC is more democratic than ECOWAS, as indicated by their mean estimates. In terms of political right and civil liberties, on average, the former is slightly in favour of SADC, with the latter in favour of ECOWAS. The variation in political rights is higher in ECOWAS than in SADC; civil liberty is the same in both regions.

Finally, overall freedom, which is the average of political right and civil liberty, indicates that on average it is the same in both regions. This summary statistics is not surprising since these two regions have almost similar transition process to democracy, and were both characterised in the 1980s with authoritarian regimes.

Table 2.6.1: Summary description of governance and democratic development in ECOWAS and SADC

	ECOWAS					SADC				
Variable	Obs	Mean	std.Dev	Min	Max	Obs	Mean	std.Dev	Min	Max
Polity2	384	-0.15	6.02	-9	10	384	0.74	7.03	-10	10
Political right	384	4.42	1.9	1	7	416	4.3	1.7	1	7
Civil liberties	384	4.2	1.4	1	7	416	4.3	1.4	2	7
Freedom status	384	4.3	1.6	1	7	416	4.3	1.51	1.5	7

Source: Own construction with polity 2 data from Polity IV and political right, civil rights and freedom status from Freedom House.

Although it is widely accepted that the two regions have undergone democratic transition away from authoritarian rule of the past and made commendable progress, evidently as shown in Table 2.6.1, these regions still face a plethora of democratic deficits that need serious attention. Therefore if democratic consolidation is to occur and persist, then efforts should be geared towards minimising the wide gap between the minimum and maximum values of the indices. By theory, removal of this governance, political right and civil liberty deficit should induce economic growth.

Chapter 3

Financial sector development, political institutions and economic growth: A comparative study of ECOWAS and SADC

3.1 Introduction

The issue of the link between financial development and economic growth has been a fascinating and controversial one. This issue generated a great deal of interest among academics and policy makers alike. Ever since the observation was made that the development of the financial sector provides remedy for economic growth, a lot of countries, including those in SSA, took measures not only to open up the financial system for capital inflows, but also to put policy measures in place to develop the sector. Available evidence from the structure of the economies of developed countries, such as the United States of America, Britain, France, Germany, indicates that the most advanced economies also have an advanced and sophisticated financial systems. On the contrary, most economies of underdeveloped countries are characterised by less developed and inefficient financial systems. This observation provides support for the idea that the financial system is crucial in the growth process. According to Levine (1997), the development of the financial markets and institutions is a critical and inextricable part of the growth process. Following McKinnon's (1973) and Shaw's (1973) contributions and generally, the advent of endogenous growth models, the relationship between financial development and economic growth over the last thirty years, has raised fresh research interest. This chapter is part of these fresh and renewed interest in finance-growth literature.

There have been a lot of empirical studies on this important issue. While the results of some studies reveal that financial development causes economic growth (e.g. King & Levine, 1993; Wang, 1999; Beck, 2002; Levine et al., 2000; Ang 2008; Kar et al., 2011), others argue that economic growth causes financial development (e.g. Goldsmith, 1969). Despite a great deal of efforts devoted in empirical studies aiming at finding an accurate, precise and definite conclusion on this issue, researchers have not agreed on such a definite conclusion. Studies thus have mixed results. This mixed empirical evidence makes it difficult, if not impossible, to draw a firm decision on the relationship between the two measures.

A key reason for such mixed evidence is the use of different measures of financial development as well as the application of an inappropriate econometric techniques. Accordingly, Adu et al. (2013), who estimated the long run growth effects of financial development in Ghana, argue that the growth effect of financial development is sensitive to the choice of proxy. The study concluded that whether financial development is good or bad for growth depends on the indicator used as a proxy for financial development. This argument was earlier posited in Odhiambo (2007) who looked at the case of Kenya, South Africa and Tanzania. Consequently, as one of the contributions of this chapter, a composite financial development index is constructed using three indicators of financial development to measure broadly financial development. These measures include: bank private credit to GDP, liquid liabilities (M3 to GDP), and bank assets to the sum of bank assets and central bank assets.

Even though several empirical studies have been done in this area, most of the research are related to developed economies (see Neusser & Kugler, 1998; Rousseau, 1998; Arestis et al., 2001; Rousseau & Sylla, 2005; Shan, 2005; Van Nieuwerburgh, 2006; Diekmann & Westermann, 2010). Relatively few studies have been done on developing economies and far less on SSA. Other studies are a mixture of developed and developing countries (see King & Levine, 1993; Rajan & Zingales 1996; Beck et al., 2000; Levine et al., 2000; Calderón & Liu, 2003; Apergis et al., 2007; Bangake & Eggoh, 2011)

The studies on SSA are either on a single country analysis (e.g Akinboadi,1998; Ghali, 1999; Odhiambo, 2004; Akinboade & Makina, 2006; Abu-Bader & Abu-Qarn 2008; Odhiambo, 2011) or a cross-country analysis (e.g. Odhiambo, 2007) or analysis of a single economic bloc (e.g. Allen & Nidkumana, 2000; Agbetsiafa, 2004; Aziakpono, 2004). Thus a comparative study of regional groupings, especially in SSA, has been ignored.

In addition, like any developing region, SSA over the last 20 years, has experienced a wave democratization. This results in stability in most parts of the region. According to Besley and Prat (2006), democratic development leads to assuring the security of property rights and economic freedoms. It is argued that financial development induces economic growth under better institutional arrangement and environment. La Porta et al. (1997) also argue on the importance of legal system. According to these authors, the legal system play a crucial role in determining the financial system and growth relationship and that secure property right, contract rights are key for banks and institutions to operate efficiently. This influences growth positively. However, this is ignored in many studies especially those on SSA. This study

captures this effect in the form of interactive term between financial development and governance system since the region has experienced improvement in governance. Therefore, the main objectives of this chapter are twofold: (i) to provide comprehensive analysis on the impact of financial development on economic growth and, (ii) to determine the complementarity effect between financial development and political institutions on economic growth. This is done in the context of regional comparison of ECOWAS and SADC in SSA for the period 1980–2011.

Another important contribution of this study is the application of an appropriate econometric technique in examining the relationship between the measure of financial development and economic growth in the two regions. Even though the sample of countries in both regions may be homogenous in terms of income levels and standard of living, heterogeneity may occur in terms of geography, history, cultural background, and so on. Previous studies use traditional OLS, cross-sectional and panel approaches, without taking into account of the existence of heterogeneity among countries in their sample. This may lead to less efficient results. In this study we apply the novel technique of Pooled Mean Group (PMG) estimator developed by Pesaran et.al (1999), which is not only able to address this problem, but it can also estimate the long run relationship between the variables following a shock. This empirical strategy leads to more efficient results. Whiles there have been increasing empirical studies on finance-growth relationship, there are limited number of empirical studies that have attempted to apply the PMG estimator. In cases where there are, the studies are mostly outside SSA. The estimator allows the short-run dynamics to vary across countries, but constrains the long-run slope coefficients to be the same across countries. Furthermore, Mean Group (MG) as well as Dynamic fixed estimators (DFE) are also used to facilitate comparison of the results.

Unlike the PMG, the MG estimator assumes that both the short-run and long run coefficients are heterogeneous across panels. Hence, each panel is estimated separately and the resulting coefficients are averaged across panels. In contrast, DFE estimator assumes that all the coefficients of the short run and long run are same.

The results from this chapter seem to support financial development inducing growth in both sub-regions, with the impact on SADC greater than that on ECOWAS. This outcome seems to indicate that ECOWAS is not benefiting much from the relatively underdeveloped financial system, thus efforts should be directed at improving it. Interestingly, the influence of financial development through institutions reveals a positive relationship with growth for ECOWAS but

not in SADC. This seems to suggest that the current political system of SADC has limited support for financial system development to exert significant positive effects on growth. However, the error correction term reveals 13% for ECOWAS and 15% for SADC.

The rest of the chapter is organised as follows. Section 3.2 discusses the literature review and section 3.3 describes the model and econometric technique. Section 3.4 describes the data used. Section 3.5 presents discussion of results whiles the section 3.6 concludes.

3.2 Literature Review

The theoretical link between financial development and growth is simply expressed by a linear (AK) endogenous growth model developed by Pagano (1993). The model shows that higher financial development might drive a higher economic growth[16]. Consider a simple endogenous model of production function where output *Y* produce at time *t* is a function of a single factor capital K_t given as:

$$Y_t = f(AK_t) \tag{3.1}$$

Where A is marginal productivity of capital or a variable indicating the economy's general efficiency in using the capital stock K

For simplicity, the model assumes that population is stationary and that the economy produces single good that may be consumed or invested. If the single good is invested, it depreciates at the rate of σ per period. Thus gross investment will be given as;

$$I_t = K_{t+1} - (1 - \sigma)K_t \tag{3.2}$$

For a closed economy, capital market equilibrium requires saving, S_t to equals investment, I_t. Assuming the proportion of saving, (1-φ), is lost through financial intermediation, then we have;

$$\varphi S_t = I_t \tag{3.3}$$

From 3.1, the growth rate is obtained at time t+1 as

[16] The contribution of the financial sector to economic growth received considerable attention with the advent of endogenous growth theory. Greenwood and Smith (1997) as well as Bencivenga et.al (1995) and Murinde (1996) also comprehensively account for the role of the finance in their models.

$$g_{t+1} = (Y_{t+1}/Y_t - 1) = (K_{t+1}/K_t - 1) \quad (3.4)$$

Therefore using equation 3.2 and dropping the time element, the steady-state growth rate, Y (g) will be obtained by:

$$g_t = A\frac{I_t}{Y_t} - \sigma = A\varphi S_t - \sigma \quad (3.5)$$

That is, from equation 3.5, the growth rate, g at time t is a product of marginal productivity of capital A, savings rate S and proportion of savings invested φ minus depreciation σ. Hence, both saving and productivity of capital affect long-term economic growth positively. Therefore, higher level of FSD will cause higher growth if: (i) it causes higher S (ii) it raises A (iii) reduces the proportion of saving wasted by inefficient intermediation (1-φ).

The new growth theory argues that financial markets and institutions appear endogenously in response to market failures and thereby contribute to long run growth. Financial markets and institutions mitigate the effects of transaction and information costs of the market, which leads to channelling resources to more promising areas that will spur economic growth. Levine (1997, 2005) argues that the financial system causes economic growth through five basic functions of the financial system which includes: mobilising savings, facilitating risk amelioration, acquisition of information on investment and allocating resources, monitoring managers and exerting corporate control and, lastly, facilitating exchange of goods and services.

However, there is disagreement about the direction of causality. Some argue that causality is from finance to growth which is described as Supply-leading hypothesis. Early proponent of the hypothesis was Schumpeter (1939). That is, the development of the financial sector leads to growth. McKinnon (1973), King and Levine (1993), and Levine et.al (2000) among others support this argument. Others such as Patrick (1966)[17] and Goldsmith (1969) argue that causation run from growth to finance which is described as Demand-following hypothesis. Under this argument, an expanding economy triggers demand for financial services which will induce growth in the financial sector. Unlike the above, some causation is bi-directional. That is, FSD causes growth and growth causes FSD.

[17] Patrick (1966) earlier categorised the relationship in terms of the two main hypotheses.

In addition, some researchers argue that there is negative causal link where finance could have detrimental effect on economic growth. Roubini and Sala-i-Martin (1995) reveal that financial repression does not only reduce output of capital, but also lowers savings which impedes economic growth and development. According to McKinnon (1973), Shaw (1973), and King and Levine (1993), various constraints exerted by governments on the banking system may slow FSD, and thus, economic growth. Lucas (1988) disagrees with the existence of a finance-growth relationship and argues that there is an over emphasis on the role of FSD in the process of economic growth. Lucas proposes that financial development may well turn out to be an impediment to economic growth when it induces volatility and discourage risk adverse investors from investing[18].

There is an extensive amount of empirical literature that have been conducted outside Africa. Wang (1999), using seemingly unrelated regression (SURE) model in Taiwan, shows that supply-leading is highly related to financial variables, whereas demand-following is related to real variables that affect industrial production. And in the same direction, Beck et al. (2000) show a significant link between financial development on both real per capita GDP growth and total factor productivity of 63 countries using cross-country regression.

Xu (2000), using 41 countries and multivariate VAR, rejects the argument that finance follows economic growth, and that domestic investment is the main channel through which finance affects economic growth. Conversely, Shan et al. (2001), using 9 OECD countries including China, posit a reverse causality, that is, a bidirectional causality in others and no evidence of causality from financial development to economic growth. However, Deidda and Fattouh (2008), using 119 countries, find no significant relationship between financial depth and economic growth in low income group in their sample, although the opposite holds for high income group. Ang (2008) estimated six equations on Malaysia. His study supports finance-led growth through the promotion of both private saving and private investment. The studies of Ang and McKibbin (2007) and Mirdala (2011) support positive relationship.

With the studies on Africa, Odhiambo (2007) show that causality between FSD and economic growth is sensitive to the measure of proxy for financial development using South Africa, Tanzania and Kenya. But using information of Egypt, Abu-Bader and Abu-Qarn (2008) apply Granger causality test, cointegration and VEC modeling; the study reveals a strong support for

[18] Further discussion on theoretical approaches is prudently done by Murinde (2012).

the view that FSD and economic growth are mutually causal. In a recent study on Tanzania, Odhiambo (2011) used ARDL- bound testing procedure; the study reveals a distinct unidirectional causal flow from economic growth to financial depth in Tanzania for both short and long run. However, there was bi-directional causality from foreign capital flows to economic growth. The study therefore concludes that financial development in Tanzania follows growth.

In terms of cross-country studies in SSA, Spears (1992), Levine (1998) and Levine et al. (2000), show that finance causes economic growth. Trabelsi (2002), looking at 69 developing countries using cross-sectional and pooled–cross sectional time series, argues that FSD seems to affect growth only with cross-sectional estimates. However, Ghirmay (2004) contends that there is a mixed result in finance-growth nexus using 13 SSA and VAR model: 11 countries show finance and growth are cointegrated; VECM suggests evidence of FSD causing economic growth in 8 countries; economic growth causing finance in 9 countries.

Considering studies on regional groupings of Africa, the study of Allen and Ndikumana (2000) on SADC supports a positive relationship between finance and growth. The result was more evident in regression that used five year average of the data. This suggests that the relationship between finance and growth is a long run phenomenon. Collaborating the results of Allen and Ndikumana (2000), Aziakpono (2004) on SACU using SURE technique confirms finance-led growth. This is also the case with Abu-Bader and Abu-Qarn's (2008) study on six Middle East and North African (MENA) countries. However, in more recent study, Kar et al. (2011) employ different proxies for FSD on MENA countries. Using SURE and Granger causality, they find no clear consensus on the direction of causality between finance and economic growth for all proxies of FSD. Also, the study of Atindéhou et al. (2005) on ECOWAS reveals that the results of a few countries indicate a weak causal relationship between finance and economic growth on one side, and economic growth and finance on the other side. The study thus suggests that ECOWAS members should focus their policies on the development of the financial sector which will lead to growth.

More on ECOWAS, Esso (2010) shows that there is a long-run relationship between financial development and economic growth in six countries: Burkina Faso, Cape Verde, Cote d'Ivoire, Ghana, Liberia and Sierra Leone. In addition, the study shows that finance induces growth and development in Ghana and Mali, while growth causes finance in Burkina Faso, Cote d'Ivoire and Sierra Leone, and a bidirectional causality in Cape Verde and Liberia. The study applied

Gregory and Hansen approach to cointegration with structural change and the procedure for non-causality test of Toda and Yamamoto, for the period 1960–2005 using ratio of credit to private sector to GDP.

In a more recent study, Fowowe (2011) shows bi-directional causality between financial development and economic growth in 17 countries of SSA using panel cointegration and causality test. The results show robustness with alternative measures for financial development. In the same year, Hassan et al. (2011), using Panel regression and variance decomposition, argues that a positive relationship exists between financial development and economic growth in developing countries. They also show that short run multivariate provides mixed results: one-way causality for poor region and two-way causality for domestic credit/GDP in most regions. Other recent work includes Bangake and Eggoh (2011). Their study uses panel unit root test, cointegration, dynamic OLS, causality test, VECM as well as the Engel and Granger approach. The results suggest strong support for bidirectional causality in low and middle income countries in the long run, but no short run effect for the 71 countries involving both developed and developing.

For a summary of cross-country and panel studies on regional groupings and SSA itself see Table 3.2.1. Table 3.2.1 provides results of relatively recent research. It indicates the name of author/s, year of publication, financial variable used, method and summary of findings. The table is by no means exhaustive. In general, the empirical results on the relationship between financial and economic growth are rather mixed. There is evidence of a long-run relationship between financial development and economic growth in SSA countries. However, the direction of causality is unclear. While some studies found evidence of bidirectional causality between finance and growth in Africa, there is no consensus on the direction of causality for all measurements as shown by Table 3.2.1. However, according to Murinde (2012), in general, the weight of the evidence is in favour of the argument that financial institutions and markets matter for growth, even when controlling for some key factors. For a more comprehensive and influential survey of literature on this issue, Murrnde (2012) has prudently compiled recent studies that seek to broaden the understanding on the relationship between finance and growth[19].

[19] See also Levine (2005) and Ang (2011)

Table 3.2.1: Showing recent panel studies on SSA and regional groupings

Author/s	Year	countries	Financial variables	method	findings
Spears	1992	5 countries of Africa	ratio of quasi-money to M_2, ratio of M_2 to GDP	Granger causality test.	financial development is measured by M_2 to GDP causes economic growth
Favarra	2003	85 countries mainly From Africa	Liquid liabilities, credit to the private sector	Pooled mean estimator, GMM, Instrumental Variable approach	Relationship is at best weak, non-linearity exist and therefore finance matters at intermediate level of FSD, for heterogeneous slope specification, no clear indication that finance spurs growth, in some specifications, it is worriedly negative
Allen and Ndikumana	2000	Southern Africa	credit by banks and credit to the private sector, M_3,	Pooled cross-sections. Fixed effects and random effect	less conclusive with credit by banks and credit to the private sector but positive between finance and growth of real per capita when M_3,
Al-Yousif	2002	30 developing-country study that includes 8 African countries	M1 and M3/GDP	Granger-causality test	finance and economic growth are mutual causal, supply-leading, demand-leading, and no relationship
Agbetsiafa	2003	8 emerging SSA countries	Money/GDP, Banking deposits liabilities/GDP, Private sector credit/GDP, Private sector credit/domestic credit, Domestic credit/GDP	Johansen-Julius approach, Granger causality test	unidirectional causation running from finance to growth in all countries
Ghirmay	2004	13 SSA countries	Level of credit to the private sector	VAR model	Existence of long run relationship between finance and economic growth in almost 12 out of the 13 countries in the sample
Atindéhou et al.	2005	ECOWAS states	Domestic private credit/GDP, liquid liabilities/GDP	Causality test	The result of few countries indicate a weak supply-leading on one side and demand-following on the other side
Aziakpono	2004	Southern Africa	Private credit by commercial banks to GDP, and liquid liabilities	SURE	Finance-led economic growth
Abu-Bader &Abu-Qarn,	2008	6 MENA countries	currency/GDP,M2/GDP, Bank credit/GDP Credit to non-financial private firms/total credit	Quadvariate VAR methodology of Toda-Yamamoto	strong support for finance -led growth in 5 out of the 6 countries
Gries *et al.*	2009	16 sub-Saharan African Countries	bank asset to bank asset plus central bank assets, M3 to GDP, private credit by deposit money bank to GDP	Hsiao-Granger method	limited support for the relationship between FSD and growth
Aboudou	2009	WAEMU	Real market capitalization, real value traded	Toda and Yamamoto approach	supply-leading hypothesis is supported
Thomas et.al	2009	16 SSA countries	bank asset to bank asset plus central bank assets, M3	Hsiao-Granger	Limited support for finance-led growth

			to GDP, private credit by deposit money bank to GDP		
Esso	2010	ECOWAS-Burkina Faso, Cape Verde, Cote d'Ivoire, Ghana, Liberia and Sierra Leone, Mali.	ratio of credit to private sector to gross domestic product	Gregory and Hansen approach to Cointegration	show that there is a long-run relationship between financial development and economic growth in six countries
Ahmed	2010	15 SSA	Private credit /GDP, Domestic credit to private sector/GDP	Panel unit root test, Pedroni cointegration test Granger causality test	Panel data supports a long-run bidirectional relationship between finance and growth. However, country-specific support mixed causality among the sample of countries.
Ahmed and Wahid	2010	15 SSA	Private credit /GDP, stock market capitalization/GDP, total value listed shares/GDP, stock market total traded, value of total domestic shares traded/GDP	Granger causality test and fully modified OLS	The study constructed market based financial measure and bank system development both of which indicates a positive effects on growth
Akinlo and Egbetunde	2010	10 SSA countries	M2/GDP	Error correction approach	Finance and economic growth are cointegrated
Hassan et al.	2011	16 SSA, 4 regional income groups of the world	Domestic credit by banks/GDP, M3/GDP, Domestic credit to the private sector/GDP, Gross domestic savings/GDP,	Panel regression and variance decomposition	Positive relationship between finance and growth in developing countries and short run multivariate provided mixed results: one-way causality for poor region and two-way causality for Domestic credit/GDP most regions.
Fowowe	2011	17 countries in SSA	Ratio of credit by banks to the private sector, ratio of bank deposit liabilities to GDP	Panel data cointegration and causality test	homogenous bi-directional causality between finance and growth
Kar et al	2011	15 MENA countries	Narrow money/GDP, Quasi money/GDP, M2/GDP Deposit money bank liabilities/GDP, Private sector credit/GDP, Domestic credit/GDP	SURE, Granger causality	No clear consensus on the direction of causality between financial development and economic growth for all measurements of financial development and it is also observed that the findings are country specific.
Demetriades and James	2011	18 SSA	bank deposits to GDP, liquid liabilities, private credit	continuously-updated and bias-corrected	Growth causes financial development but the reverse is absent
Oluwatosin and Festus	2012	Cote' d'Ivoire, Gambia, Ghana, Nigeria Sierra Leone	Liquid liabilities, banking sector credit and credit to the private sector.	Trivariate framework vector error correction	Support financial sophistication matters for the benefits of foreign direct investment to register on economic growth in Ghana, Gambia and Sierra Leone depending on the financial indicator used. Nigeria displays no evidence of any short- or long-run causal flow from FDI to growth.
Kagochi et al	2013	7 SSA	Liquid liabilities, private credit, bank assets/GDP, turnover ratio, stock/GDP, value traded	Panel Granger causality test	Causality from growth to bank based indicators and bi-directional from stock market indicators and growth

Menyah al	at	2014	21 SSA	M2/GDP, M3/GDP domestic provide banks/GDP, domestic private credit/GDP	Panel boostraped to Granger causality Test	There is evidence of limited support of finance led-growth

From the studies discussed above, some issues are highlighted. Firstly, there seems to be no consensus. Hence, one can conclude with caution that finance is significant in explaining growth. Secondly, it is evidenced that the effect results from the type of proxy used for FSD. For this reason, this study estimates a composite financial index that includes three variables. Thirdly, comparative studies of regional blocs and groupings, which are increasingly important and a dominant feature today, seem to be ignored in SSA. In addition, institutions that are expected to influence the impact of finance on growth also seem to be ignored in the studies of SSA. Therefore, the influences of institutions in the form of democratic development on financial development are captured in this study. More importantly, since there are heterogeneity among member countries in each region, a feature which was ignored in the previous studies, the novel feature of this chapter is the application of Pooled Mean Group estimation technique that addressed this issue. Even though Favarra (2003) used this approach, the study involves both developed and developing economies. More importantly, the study used single measure of financial development. The focus of this chapter is, thus, to investigate whether there is any effect of financial development on growth and development as well as its effects through the development in governance in the two regional groups of ECOWAS and SADC.

3.3 Method and Model specification

Following the literature discussed above and more specifically the work of Levine et al. (2000), we postulate a standard static panel growth model in a semi-log form by extending equation 3.5 to include other growth determining variables as:

$$lny_{t,i} = \alpha + \beta_i lnfindex_{i,t} + \gamma_i lnother_{i,t} + \varphi_i pol_{i,t} + \varepsilon_{i,t} \quad (3.6)$$

Where *i* is individual country at time *t* and i=*1 ...N; t=1... T.* $\varepsilon_{i,t}$ is the error term. As in many studies (e.g. Abu-Bader & Abu Qarn, 2008; Demetriade & James, 2011; Adu et al., 2013; Menyah et al., 2014) $y_{t,i}$ measures the level of growth and development. This is log of real GDP per capita, $findex_{it}$ is a composite measure of FSD computed using equation 3.7.

$$\frac{1}{n}\sum_{j=1}^{n}\left[100 * \left(\frac{F_{j,it}}{\bar{F}}\right)\right] \quad (3.7)$$

F_j and $\bar{F}$ are FSD indicators and sample mean of F_j respectively, n is the number of FSD indicators. Equation 3.7 is required because the measures of FSD face definitional problems. As one of the contribution of this study, this composite financial development index is constructed to measure broadly the financial system development. This is being informed by Levine's (1997) five key functional explanation of the financial market demonstrated earlier in Chapter 1. A good measure of FSD should reflect the different functions of the financial system. This is in line with the argument of Aziakpono (2004) who suggested that if the functional definition is accepted, then a single indicator cannot adequately measure FSD. Moreover, since financial development is a multi-dimensional concept, it is important to construct such an index.

Thus, equation 3.7 is estimated following Demirgüç-Kunt and Levine (1996) and Allen and Ndikumana (2000). We include three indicators commonly used in the literature: bank private credit to GDP, liquid liabilities (M3 to GDP), and domestic money bank assets to the sum of domestic money bank assets and central bank assets (See for example, Levine, 1997; Levine & Zervos, 1998; Levine et al. 2000; Aziakpono, 2004). These measures capture broadly the different aspects of financial development process rather than a single indicator of financial development. This is an advantage of the use of a composite measure of financial development over the single measure. Even though, Allen and Ndikumana (2000) applied constructed composite measure for the study on SADC, the data used was from 1970 to 1996. This study extends the construction from 1980 to 2011. Moreover, Allen and Ndikumana (2000) used different proxies for financial development without considering flow-stock problem in the data. In this study, the flow-stock problem is addressed.

The reasons for the selection of these variables are done in section 3.3.2. Even though we used the composite measure, the study also considered each individual indicator as a robustness check and also determined specific policy relevant to growth.

$lnother_{i,t}$ is log of control variables which includes policy variables of trade openness and government expenditure. The others are human capital, inflation and $pol_{i,t}$ which represents polity2 as an institutional variable that measures the governance system. It is not logged because the variable is either negative or positive and are relatively small values.

Trade openness is an important driver of growth (Hausmann et al., 2005). It measures international trade policy and is expected to have ambiguous effect on economic growth. Some recent studies support ambiguous or insignificant effect of openness on economic growth (Rodriguez & Rodrik, 2001). This is the ratio of the sum of exports and import to GDP. Exports could exert a positive impact on growth if it results in increases in foreign exchange reserves as well as exchange of ideas and specialisation. Imports will also do the same if it is mainly capital goods and importation of foreign technology, otherwise the effect could be negative. However, since this measure is a ratio of the sum of exports and import to GDP, the net effect could be observed through empirical analysis.

The expectation of inflation is negative. This is an indication of macroeconomic stability. Higher inflation may retard growth. However, recent studies suggest nonlinearity and thresholds in the inflation-growth relationship such as, Rousseau and Wachtel (2002) and Seleteng et al. (2012). These studies suggest that statistically significant effect is only observed after certain point where inflation is high.

Government expenditure as a share of GDP is also expected to have ambiguous effects on economic growth since it depends on the nature of spending. Barro and Sala-i-Martin (1995) contend that productive expenditure in the form of expenditure on education, infrastructure and other forms of productive capital promotes growth, whereas non-productive expenditure may impair growth. In addition, government expenditure may have crowding-out effect, which may reverse growth.

Growth theory suggests a positive relationship between growth and human capital (Garcia et al., 2012). This is mostly controlled by the level of schooling. Unfortunately, there is no consistent data for this variable for the two sub-regions, hence we used life expectancy following Barro and Sala-i-Martin (1995).

Finally, better institutional environment affect growth positively (Acemoglu et al., 2005). The study proxy this with measures of political environment $(pol_{i,t})$. The debate as to whether political democracy, political and civil liberties contribute to economic growth in developing countries continues to be evasive (Nelson & Singh, 1998).

Democracy is increasingly perceived to offer answers to major social and economic problems. With the provision of accountability, it is expected to impact on economic growth positively.

However, clientelism and identity politics may encourage voters to support a corrupt politician, especially if such politician is one of their own. This may interfere with the process of economic growth (Nelson & Singh, 1998). Furthermore, political freedom, civil liberties and democratic governments in developing countries are likely to lead to corruption and bribery among politicians, as well as promotion of rent seeking and bureaucracy, which will retard economic growth.

On the other hand, autocratic regimes may follow from revolutions or coups d'état. This is usually characterised by expropriation, bureaucracy, corruption and nepotism, which may increase the cost of doing business and, more so, create uncertainty about property rights. With this caveat, these processes impair economic growth. However, authoritarian regimes may provide high-quality governance which may provide incentives for economic growth, such as in the case with Singapore, Thailand and South Korea.

We expect an ambiguous impact of more open and democratic regimes on the process of economic growth. Existing evidence on the links between democracy and economic growth does not provide a clear cut support of the idea that more democracy causes more economic growth. Some early studies, such as those by Kormendi and Meguire (1985) and Scully (1988), found statistically significant effects of measures of political freedom on growth. However, some studies have provided ambiguous results such as Helliwell (1994) and Przeworski and Limongi (1993).

Finally, to capture this notion that finance may influence economic growth through an efficient institutional environment, we assume a linear relationship between finance and the institutional variable. An interaction term between the two is included in equation 3.6 which results in our final model in equation 3.8: The effects of the variable is largely expected to complement financial development to induce growth and development. More democratic practices will provide the protection of human rights as well as security for the business environment. This will complement the financial system to induce growth positively. However, since the measure has an ambiguous effect on growth, the interactive term could have positive or negative effect on growth. According to Gerring et al. (2005), economies with authoritarian political systems are predicted to grow as quickly as democratic regimes, may be even quicker. Therefore a negative coefficient of the interactive term could mean more autocracy is better. It could also means, the interference in the democratic process such as long process in taking decision as

well meddling with discussions by the free press could result in the negative coefficient of the interactive term.

$$lny = \alpha+\beta_i lnfindex_{i,t} + \gamma_i lnother_{i,t}+ \varphi_i ins_{i,t} + \omega_i(findex_{i,t} * ins_{i,t}) + \varepsilon_{i,t} \quad (3.8)$$

Equation 3.8 is estimated using Pooled Mean Group Estimator (PMG) proposed by Pesaran, et al. (1999). This technique is not only suitable for large panel data set with large time dimension, but also considers the heterogeneity in the panel. The time period of the study is greater than the number of countries i.e. (T > N). For small T, PMG, Mean Group estimators (MG) and Dynamic fixed effect (DFE) will be subjected to the familiar downward bias on the coefficient of the lagged dependent variable in autoregressive distributed lag (ARDL) model (Pesaran et.al., 1999). The MG procedure is average of regression coefficient across countries. It is the least restrictive and, hence, potentially inefficient. It has no restrictions on the coefficients across countries. In contrast, the DFE constraints all slope coefficients and error variances to be the same, but allows intercepts to be different across countries. This is similar to the dynamic system GMM procedure. These render the results to vary quite substantially across methodologies. The PMG is, therefore, an intermediate estimator between MG and DFE estimators.

These estimators make different assumptions about the homogeneity of the short-run and long-run coefficients. According to Pesaran and Smith (1995), the MG estimator assumes that both the short-run dynamics and lon-grun coefficients are heterogeneous across panels. Hence, each panel is estimated separately and the resulting coefficients are averaged across panels. However, the PMG estimator allows the short-run dynamics to vary across countries, but constrains the long-run slope coefficients to be the same across countries. This gives it advantage over the MG estimator as efficiency gains are obtained from lack of biasness caused by outliers (Pesaran et al., 1999). Finally, DFE estimator assumes all coefficients of the short run and long run are same.

There are several advantages to the choice of this approach. Firstly, it is well suited for the analysis of dynamic panel. Secondly, it accommodates both long run and heterogeneous dynamic adjustment process. This is done by allowing short run heterogeneous dynamics, but imposing a long run homogeneous relationship for countries in the sample. This is not possible in dynamic system estimators. Pesaran et al. (1999) argue that the dynamic system estimation

procedure can produce inconsistent and misleading coefficients of the long-run coefficients unless they are truly identical. Moreover, the problem becomes severe if the time period is greater than the number of countries i.e. (T > N). Thirdly, PMG is less sensitive to outliers and has the advantage of allowing the short-run dynamics to be data determined for each country while taking into consideration the number of time-series observation available (Pesaran et al., 1999). As such, the use of PMG is appropriate for this study.

Hence, following Pesaran et al. (1999), we have the unrestricted specification of the ARDL model for the dependent variable, $lny_{t,i}$, as *ARDL (p, q, q…q) with p and q the lag order;*

$$\Delta y_{t,i} = \emptyset_i y_{i,t-1} + \beta_i' x_{i,t} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \delta_{ij}^{*} \Delta x_{i,t-j} + \mu_i + \varepsilon_{i,t} \qquad (3.9)$$

Where the dependent variable $y_{t,i}$ is a scalar and $x_{i,t}$ is $(k \times 1)$ vector of regressors for group *i*. μ_i is the fixed effects and $\emptyset_i$ is scalar coefficients for the lagged dependent variable. β_i' is $(k \times 1)$ vector of coefficients of the explanatory variables. λ_{ij} are scalar coefficients of the lagged first-difference of the dependent variables; and δ_{ij}^{*} are $(k \times 1)$ coefficients vectors on the first-differences of the explanatory variables and their lagged values. The disturbance terms are assumed to be independently distributed across *i* and *t* with mean zero and variances $\sigma^2 > 0$. The assumption of independently distributed across *t* is not very restrictive and can be satisfied in most application by increasing the distributed lag orders on $y_{t,i}$ and $x_{i,t}$ (Pesaran et.al, 1999) [20]

Assuming the *ARDL (p, q, q….q)* is stable in that the roots of

$$\sum_{j=1}^{p} \lambda_{ij} \mathcal{Z}^{j} = 1 \qquad (3.10)$$

lie outside the unit circle. This assumption therefore ensures that $\emptyset_i < 0$. It implies that a long-run relationship exists between $y_{t,i}$ and $x_{i,t}$, which can be defined by:

$$y_{it} = -(\beta_i'/\emptyset_i) x_{it} + \eta_{it}, \quad \text{and } \eta_{it} \text{ is a stationary process} \qquad (3.11)$$

[20] See Pesaran et.al (1999) for more details.

[21] Pesaran et.al (1999) provide a general framework for testing this assumption irrespective of whether x_{it} are I(0) or I(1).

We defined $\theta_i = -\beta_i'/\emptyset_i$ and is $(k \times 1)$ vector of long-run coefficients. This implies

$$lny_{it} = \theta_i lnx_{it} + \eta_{it} \tag{3.12}$$

Hence, equation 3.9 can be written as:

$$\Delta y_{t,i} = \emptyset_i \vartheta_{i,t-1} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \delta_{ij}^{*} \Delta x_{i,t-j} + \mu_i + \varepsilon_{i,t} \tag{3.13}$$

Where $\vartheta_{i,t-1} = y_{t-1} - x_t\theta_i$ is the error correction term and $\emptyset_i$ is the error correction coefficient measuring the speed of adjustment towards the long-run equilibrium following a shock. This parameter is expected to be negative and significant, implying that variables return to a long-run equilibrium path upon disturbances. Hence, a statistically significant and negative value of $\emptyset_i$ is treated as evidence of cointegration between $y_{t,i}$ and $x_{i,t}$.

The PMG is an intermediate estimator that restricts the long run coefficients to be equal over cross-section, but allows short-run coefficients, intercepts and error variances to vary across countries. The homogeneity of the long run parameters is tested empirically using Hausman's (1978) Test against alternative of MG estimator. Pesaran et al. (1999) indicate that the PMG estimator is consistent and more efficient than the MG estimator under the homogeneity hypothesis. However, the study reports the result of MG and DFE to facilitate comparison and robustness checks with PMG.

Suppose the maximum fixed lag of every variable is one, the ARDL (1, 1, 1, 1…) model is:

$$y_{t,i} = \mu_i + \delta_{10i} x_{i,t} + \delta_{11i} x_{i,t-1} + \lambda_i y_{i,t-1} + \varepsilon_{i,t} \tag{3.14}$$

and the error correction equation which is ARDL (1, 0,0…) is

$$\Delta y_{t,i} = \emptyset_i \left(y_{i,t-1} - \theta_{0i} - \theta_{1i} x_{i,t}\right) - \delta_{11i} \Delta x_{i,t} + \varepsilon_{i,t} \tag{3.15}$$

Where $\theta_{0i} = \frac{\mu_i}{1-\lambda_i}$, $\theta_{1i} = \frac{\delta_{10i}+\delta_{11i}}{1-\lambda_i}$, $\emptyset_i = -(1-\lambda_i)$

We conduct selection of the lag order using Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC). The long run coefficients are θ_{1i} which are of primary interest.

3.3.1 Panel unit root test

We start with panel unit root test of the series. This is done to determine the order of integration of the series. This is because the PMG estimator provides consistent estimators, irrespective of whether the series are in levels I(0) or integrated of order one I(1); but not integrated of order two, I(2). According to Pesaran et al. (1999), for lon-grun relationship to exist, then $\emptyset_i \neq 0$. According to Kim et al. (2010), PMG estimation of ARDL provides consistent estimates, irrespective of whether the series are I(1) or I(0) if there is a existence of a unique vector defining the long run relationship among the variables. We tested this and the series satisfied this condition.

Univariate unit root tests are imprecise, because the power of these tests is poor and provide little reliable information. It has been proven that using panel unit root tests can increase the low power based on individual test (Maddala & Wu, 1999).

A number of panel unit roots are being proposed, however, the study uses Im et al.'s (2003)-IPS and Levin et al.'s (2002)-LLC, which are generally based on the following AR (1) specifications:

$$\Delta y_{it} = \delta_i + \lambda_i t + \rho_i y_{it-1} + \mu_{it} \quad (3.16)$$

Where t is the time trend, δ_i is the country specific fixed effects, μ is the error term and ρ_i is the autoregressive coefficient and if $|\rho_i| = 1$, then there is unit root in y_{it}. The LLC test assumes parameter homogeneity ($\rho_i = \rho$) and hence suffers from heterogeneity bias as opposed to the IPS, which allows for individual unit root processes. Therefore, IPS is the preferred test. However, LLC test is also performed. The null hypothesis states the presence of unit root in all the series and is the same for the two tests. However, the alternative differs. For the LLC, there is stationarity in all variables. In IPS, there is unit root in some of the series.

The IPS test is based on an augmented Dickey–Fuller (ADF) regressions which are then averaged for each region of each variable. Therefore, the ADF equation is given by for variable y;

$$\Delta y_{it} = \delta_i + \beta_i y_{it-1} + \sum_{j=1}^{k} \gamma_{ij} \Delta y_{it-1} + \lambda_i t + \mu_{it} \quad (3.17)$$

The moments, mean (*E)* and the variance (*var)* of the average $\bar{t}$, are obtained in IPS (2003) and the IPS test is then given by:

$$IPS = \frac{\sqrt{N}(\bar{t} - \mathrm{E}(\bar{t}))}{\sqrt{var(\bar{t})}} \quad (3.18)$$

Where N is the same as in equation 3.6

3.3.2 Measures of financial development

Bank-based measures of FSD are used. This is because stock market-based financial structures are not developed in SSA, except South Africa, Ghana, Cote d'Ivoire, Botswana, Zimbabwe, Nigeria, Swaziland, Namibia and Zambia. We followed the work of Loayza and Beck et al. (2000) and Levine et al. (2000) in choosing these indicators. Firstly, we used bank private credit to GDP *(bankprcr)* as an indicator of financial development. This is credit extended to the private sector by commercial banks and other FIs. It does not only isolate credit to the private sector, but also excludes credit to government (Levine et al., 2000). It generates increases in investment and productivity to a much larger extent than credits to the public sector, since loans are given under more stringent conditions motivated by profits drives (Levine & Zervos, 1998). Hence, this measure is a good proxy for FSD.

The second indicator is the ratio of commercial bank assets to the sum of commercial bank assets and central bank assets *(dmba).* This proxy shows the influence of the commercial banking sector in the economy. It indicates the degree to which the commercial banks and central bank allocate society's savings. As commercial banks are more likely to perform all the functions of the financial system, the measure becomes a good proxy of the financial system, especially when the proportion is greater.

The final indicator is *M3/GDP* which proxies for financial depth. This is preferred to M2/GDP because it is argued by Eita and Jordaan (2010) that M2/GDP might reflect more monetisation rather than an increase in bank deposits. *M3/GDP* provides more direct information on the extent of financial intermediation. This measure captures the overall size of the financial sector and its ability to provide financial intermediation. Even though the above proxies are selected for this thesis, the study admits that in the finance literature, the measure of FSD proved to be

controversial and that no proxy exists without shortcomings. These selected proxies are no exception.

Credit by nonbank financial sector is also important since it supplements the credit needs of the real sector. It is basically composed of credit from microfinance institutions. However there is no consistent data on this variable. Therefore this variable is not considered.

3.3.3 Data

We used annual data obtained from World Bank's *Africa Development Indicators*, 2012, and *Global Financial Development Database*, 2012. The study considered the period 1980-2011. Financial variables are obtained from the latter and the rests from the former. Financial variables are stock variables whereas GDP measures are flow. Most studies ignored this problem. *Global Financial Development Database* solves this flow-stock problem by deflating these variables with the relevant consumer price indices[22]. This gives rich and better measures of these indicators.

We capture institutions with political measure of polity2 obtained from Polity IV. This measure describes the political system by the level of autocracy and democracy by assigning negative to the former and positive for the latter. It is time-series ranging from -10 to +10 indicating total autocracy to total democracy respectively. This measure is chosen because: (i) democratic dispensation seems to be improving in the region, and (ii) the measure is available for a wide range of countries for a long time period. Therefore, unlike other measures, such as the rule of law, are available for short span and hence are not suitable for the study. (iii) Furthermore, it is broader in definition than other institutional variables like corruption index that measures only corruption. More so long data on countries in SSA is not readily available for other institutional measures from any alternative source. Political right is obtained from Freedom House.Table B.0.1 gives detailed description and sources of the data used in this chapter. Table B.0.2 shows the countries covered.

[22] This is done using this formula: $F_j = \frac{(0.5)[f_{it}/CPI(e)_{i,t-1} + f_{i,t-1}/CPI(e)_{i,t-1}]}{GDP_{it}/CPI(a)_{it}}$, where F_j is the financial variable, $CPI(e)$ is the end of period consumer price index and $CPI(a)$ average annual CPI.

3.3.4 Descriptive Statistics

The descriptive statistics is indicated on Table 3.3.1. The mean real income per capita is particularly very low for ECOWAS compare to SADC. The disaggregated form of FSD indicator shows that the two sub regions perform poorly, except *dmba* where it is about 77% of total banking assets of SADC, and 68% for ECOWAS. In both blocs, even though average bank private credit (bankprcr) is the lowest, countries in SADC perform relatively better than countries in ECOWAS. It is 15.02 % of economic activities in ECOWAS, and 18.30% in SADC. In terms of government spending and trade openness, the average figures indicate SADC as having not only more government spending, but also more open to international trade than ECOWAS. Governance system, pol, indicates that on average, SADC is slightly more democratic than ECOWAS. The descriptive statistics, therefore, reveal that on average, SADC performs better than ECOWAS. The mean composite measure of FSD seems to be the same in the two regions; however, both minimum and maximum of this variable is in favour of SADC.

Table 3.3.1: Descriptive statistics of variables used

	ECOWAS					SADC				
Variable	Obs	Mean	Std.Dev	Min	Max	Obs	Mean	Std.Dev	Min	Max
rgdppc	384	603.5	396.05	230.09	2886.2	352	1568.43	1856.6	118.64	6592
findex	384	99.96	32.66	25.74	237.64	352	100.03	27.7	39.8	251.9
govexp	384	14.05	5.77	4.8	54.52	352	17.4	7.95	2.04	42.2
openness	384	65.4	22.31	6.32	131.49	352	84.4	45.4	13.9	209
Inflation	384	10.7	17.13	-14.94	122.88	352	145.2	1311.8	-9.6	23773.1
Life expectancy	384	53.1	6.4	39.4	74.2	352	54.3	7.6	39.6	73.3
pol	384	-0.15	6.02	-9	10	352	0.81	7.1	-10	10
m3	384	25.9	13.6	0.41	84.63	352	30.1	19.3	3.3	112.8
Dmba	384	68.07	22.41	4.52	99.7	352	76.5	23	16.5	100
bankprcr	384	15.02	10.38	0.88	60.59	352	18.3	18.4	0.22	86.7

3.4 Empirical Results and Analysis

Both IPS and LLC unit root tests results are reported on Table 3.4.1. All variables, except inflation, government expenditure and life expectancy, are stationary upon first difference for both sub-regions. They are, hence, integrated of order one i.e *I(1)*. The test shows that trade openness is *I(0)* under LLC for regions at 5% significance level in ECOWAS. Even though under SADC, this variable is weakly significant at 10%, under IPS in SADC, we assumed that the variable is non-stationary and we proceeded to difference, which became stationary at 1% significance levels. Also *dmba* is *I(0)* in SADC. The test result indicates that the series are a

mixture of both *I(1)* and *I(0)*. Based on this, the results of PMG, MG and DFE are reported below in Table 3.4.2.

Table 3.4.1: Panel unit root result for the two sub-regions

	ECOWAS				SADC			
	IPS		LLC		IPS		LLC	
Variable	***Level***	***First diff***	***Level***	***First diff***	***Level***	***First diff***	***Level***	***First diff***
rgdppc	2.6224	-13.3326***	2.3465	-12.2083***	1.9916	-9.2577***	-0.6281	-8.446 ***
	(0.9956)	(0.000)	(0.9905)	(0.000)	(0.9768)	(0.000)	(0.265)	(0.000)
findex	-0.0835	-14.4868***	-0.6872	-15.5133***	0.5615	-14.41***	-0.8109	-15.01***
	(0.4667)	(0.000)	(0.2460)	(0.000)	(0.7128)	(0.000)	(0.2087)	(0.000)
findexins	1.5339	-14.5699***	-0.8300	-15.0181***	1.5343	-13.196***	-0.7318	-13.79***
	(0.9375)	(0.000)	(0.2033)	(0.000)	(0.9375)	(0.000)	(0.2322)	(0.000)
m3	0.4399	-12.412***	0.1946	-11.9246***	-0.5375	-12.99 ***	-1.0531	-12.93***
	(0.6700)	(0.000)	(0.5771)	(0.000)	(0.2954)	(0.000)	(0.146)	(0.000)
dmba	-0.0573	-14.4755***	-0.5235	-15.2456***	-2.6132***	-	-2.4837	-
	(0.4771)	(0.000)	(0.3003)	(0.000)	(0.0045)		(0.0065)	
banrprcr	-0.7665	- 9.702***	-1.4698*	-9.2491***	1.1845	-11.91***	-0.2189	-12.28***
	(0.2217)	(0.000)	(0.0708)	(0.000)	(0.8819)	(0.000)	(0.4134)	(0.000)
m3ins	1.3654	-14.7646***	-1.0334	-15.6199***	0.6479	-13.079***	-1.1887	-13.52***
	(0.9139)	(0.000)	(0.1507)	(0.000)	(0.7415)	(0.000)	(0.1173)	(0.000)
dmbains	1.5396	-14.1733***	-1.0833	-15.4247***	0.2315	-13.801***	-2.191**	-
	(0.9382)	(0.000)	(0.1393)	(0.000)	(0.5915)	(0.000)	(0.0142)	
bankprcrins	2.5529	-13.4368***	0.4211	-13.8998***	2.3758	-12.135***	1.0429	-12.87***
	(0.9947)	(0.000)	(0.6632)	(0.000)	(0.9912)	(0.000)	(0.8515)	(0.000)
traop	-1.1321	-17.811 ***	-2.1566**	-	-1.5139*	-13.73***	-2.227**	-
	(0.1288)	(0.000)	(0.0155)	-	(0.0650)	(0.000)	(0.013)	
Inflation	-21.550***	-	-8.417 ***	-	-18.603***	-	-3.93***	-
	(0.000)		(0.000)		(0.000)		(0.000)	
gov	-2.7883***	-	-3.687***	-	-3.4189***	-	-3.39***	-
	(0.0026)		(0.0001)		(0.0003)		(0.0003)	
lifeexp	-1.8279**	-	-3.213***	-	-23.59***	-	-21.87***	-
	(0.0338)	-	(0.0007)		(0.000)		(0.1417)	(0.000)
pol	0.7252	-15.0478***	-1.6484*	-17.2408***	0.0775	-9.4077***	-1.2014	-13.00***
	(0.7658)	(0.000)	(0.0496)	(0.000)	(0.5309)	(0.000)	(0.1148)	(0.000)

***significant at 1%, ** significant at 5% *significant at 10%

The search for lag order using Aikake information criteria (AIC) and Schwarz Bayesian criteria (SBIC) suggest a maximum of lag one. This indicates that ARDL (1, 1, 1, 1, 1, 1, 1,) is the most appropriate form by both tests. Table 3.4.2 displays the results on specification test and the estimation of the long run parameters linking economic growth and financial development and other conditioning variables by PMG, MG and DFE estimators. The specification test reveals that, indeed, the link between economic growth and financial development and other control factors are adequately modelled by the PMG approach as indicated by the Hausman test, which shows rejection of MG estimator for ECOWAS and SADC. This indicates that, in both regions, the long run coefficients are equal over cross-section. In addition, the convergence parameter (ecm) to the long-run equilibrium following a shock is not only negative and less than unity in absolute value, but statistically significant in both regions. This is in line with equation 3.10 and 3.11. We can, therefore, infer that that there is a long run relationship among the variables considered. We rely on this for the existence of cointegration, since test on panel cointegration do not provide overwhelming indication on long run relationship.

Even though the results of PMG, MG and DFE are also reported, we emphasise the results from the PMG estimator, since it is the right model. More so the PMG results in gain in efficiency and consistency over the other estimators when the long run homogeneity restriction holds. In addition, adjustments in the short run are predicted to vary across countries.

3.4.1 Results of growth and composite measure of financial development

Under these estimators, only the long run parameters are often the main interest. This is reported in Table 3.4.2. The Table shows evidence that financial development induces economic growth in both regions in the long run, suggesting that the impact on SADC is greater than the effects on ECOWAS demonstrated by the PMG. The coefficients are not only positive, but strongly significant at 1%. For instance, given that there is an increase of 10% in FSD, the estimates suggest that growth will increase by about 1% in ECOWAS and 1.5% in SADC in the long run. The results show that financial sector is an important growth determinant. Indeed, comparatively, the financial sector of ECOWAS is relatively underdeveloped in relation to SADC. This indicates that ECOWAS is not benefiting much from the current relatively underdeveloped financial system compare to SADC as shown by the results of PMG. In addition, the FSD variable is a broadly bank-based measure. Therefore, the relatively small positive significant results for ECOWAS seems to support the idea that the many small and

medium scaled indigenous businesses dotted all over the region are less attractive to the banking industry, and that these banks cherry-pick successful and multinational business. Cherry-picking represses the expansion of these small and medium scaled indigenous businesses, deterring their contribution to economic growth.

On the contrary, the efficient financial system of South Africa, especially the banking industry, has its extension into many countries of SADC. Specifically, Botswana, Lesotho, Swaziland, Namibia, Tanzania and so on. This may contribute the difference in the effect of the financial sector on growth in the region. Moreover, financial and economic policies of South Africa are reflected in these countries.

MG and DFE reveal statistical insignificant results in SADC even though the coefficients are all positive, and but with mixed results for ECOWAS. The results seem to suggest that the huge income differences between the two regions in favour of SADC could partly be explained by the relatively big positive impact of the financial system on economic growth and development in SADC. These findings are in line with existing studies on SSA (e.g. Spears, 1992; Levine, 1998; Levine et al., 2000; Allen & Ndikumana, 2000; Atindéhou et al., 2005; Esso, 2010; Hassan et al., 2011).

The study argues that South Africa, which has the most advanced financial sector, could be driving this significant positive effect of financial development on economic growth in SADC. To determine the validity of this claim, we re-estimated the baseline equation without this country. The result is reported in Appendix B in Table B.0.3. The Table seems to suggest that, without South Africa, the financial sector of the region still induces economic growth. Not only is the coefficient positive, but it is statistically significant at 1% level. The study thus concludes that the financial sector of South Africa is not driving this significant positive relationship between financial development and growth of the region within the period under discussion. The reason for this could be the measure of financial variables used. These are broadly bank based measures. Given that the banking sector is relatively developed in many countries of the region, the result is valid.

The speed of adjustment or (ecm) or convergence parameter to the long-run equilibrium following a shock is not only negative and less than unity in absolute value, but also statistically significant, in both regions for the three estimators. The PMG estimates indicate about 13% and 15% per year for ECOWAS and SADC, respectively. This means that following any

disturbances or shocks, it will take only 13 % to revert back to the equilibrium in ECOWAS and 15% in SADC. From this perspective, economies in SADC will be on relatively faster trajectory towards their long-run steady-state growth than ECOWAS. However, MG estimates suggest much faster adjustment to the long run equilibrium than PMG and DFE which is due to imposition of homogeneity assumption. It indicates about 47% for ECOWAS and 33% in SADC, as shown in Table 3.4.2. The low value of the error correction term is common with developing regions (Elbadawi et al., 2012).

The study also estimated the individual convergence parameter of the two regions to examine the rate of reversion to equilibrium at individual country level, following any deviation from the equilibrium path upon any shock. The estimates of ECOWAS reveal that the ecm of seven countries are not only negative, but statistically significant. This is indicated in Appendix B, Table B.0.4. The countries include Niger (4.2%), Cape Verde (12.7%), Cote d' Ivoire (13.2%), Mali (17.6%), Togo (16%), Ghana (35.8%) and Nigeria (54.7%). These estimates indicate that following a shock in the region, Nigeria will revert to her long run equilibrium path at the relatively faster rate of 54.7% per year, follow by Ghana at 35.8%. However, it will take Niger 4.2% per year, the slowest in the region. Comparing to SADC, six countries that include Botswana (4%), Tanzania (5.4%), Madagascar (12.8%), Zimbabwe (51.3%), Malawi (53.4%) and South Africa (71.2%) have statistically significant negative coefficients, as shown in Table B.0.5. This demonstrates that the South Africa economy, which is the biggest in the region, will revert to the long run equilibrium relatively faster, following disturbance in the region, at a rate of 71.2% per year. This is no surprise as the country is the only industrialised economy in the region. Malawi, which has the next highest estimate of the error correction, will revert at a rate of 53.4%, follow by Zimbabwe at 51.3%. The slowest economy in the region is Botswana. The estimates also show that countries like Lesotho and Mozambique might explode upon disturbance. This is shown in Table B.0.5.

On the impact of finance conditional on political structures and institutions on economic growth, even though the results indicate positive complementarity effects on growth for ECOWAS, only the coefficient of PMG and DFE are statistically significant. Since this variable was not logged, it indicates that a 1% increase in the development of governance will complement the financial sector to increase growth by 0.04% in ECOWAS, using the PMG results. Hence, simultaneous development in both indicators is necessary for economic development. In contrast, the complementarity term is negative and significant in SADC for

only the PMG estimator in the long run which is contrary to the expectation. This indicates that political institution does complement financial sector to impact on growth positively in SADC. The DFE estimator corroborates this result but statistically insignificant. Although MG indicates positive results, but they are all statistically insignificant.

Hence, the current political structures and democratic dispensation has a limited support for the financial sector to impact on economic growth positively on SADC. This may imply that more improvement in the governance system requires the support of suitable policies which are precondition for such institution to complement the financial system to effect growth positively. This study argues that may be political and civil freedom make it harder for government to make tough, but necessary decision that might provide support for the financial sector to influence growth positively. Hence, policies that aim to reform the political institutions and make it more efficient and attractive to the financial sector in the way of improving property rights, reduction in both uncertainty and bureaucracy.

Table 3.4.2: Results of long run PMG, MG and DFE with composite measure as financial development indicator

ARDL (1, 1, 1, 1, 1, 1, 1, 1)

	ECOWAS			SADC		
Variables	PMG	MG	DFE	PMG	MG	DFE
findex	0.108***	-0.259*	0.000447	0.153***	0.679	0.00514
	(0.0414)	(0.143)	(0.186)	(0.0518)	(9.721)	(0.539)
findexins	0.00037***	0.00015	0.000908**	-0.00016**	0.0168	-0.000116
	(0.0000568)	(0.000278)	(0.000404)	(0.0000697)	(0.0128)	(0.000740)
inflation	-0.0543	0.246	0.851	-0.295***	7.490	-1.528
	(0.0676)	(0.296)	(0.545)	(0.0402)	(7.332)	(1.131)
pol	-0.0378***	-0.0138	-0.0843**	0.0224***	-1.682	0.0954
	(0.00682)	(0.0180)	(0.0400)	(0.00728)	(1.325)	(0.0924)
traop	0.112***	0.343	0.608**	0.242***	-16.26	1.370*
	(0.0244)	(0.210)	(0.279)	(0.0402)	(17.35)	(0.812)
gov	-0.125***	-0.207	-0.174	0.0956**	-7.684	0.00263
	(0.0314)	(0.140)	(0.167)	(0.0375)	(8.116)	(0.771)
lifeexp	2.949***	2.747**	1.727*	-0.199***	-22.73	3.709*
	(0.433)	(1.186)	(0.999)	(0.0695)	(25.20)	(2.180)
ecm	-0.134***	-0.473***	-0.0543***	-0.150*	-0.33***	-0.0181*
	(0.0483)	(0.0792)	(0.0209)	(0.0796)	(0.102)	(0.00986)
Constant	-0.799***	-0.423	-0.145	0.899*	-0.529	-0.237
	(0.280)	(1.103)	(0.202)	(0.493)	(1.989)	(0.146)
Hausman Test		11.89	0.03		3.35	0.00
		(0.100)	(1.000)		(0.764)	(1.000)
Obs		372			372	.

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Where rgdppc =log of real GDP per capita, findex=log of composite measure of FSD, gov = log of government expenditure, traop=log of international trade openness, findexins = interaction term between findex and polity2 and lnlifeexp=log of life expectancy and ecm = error correction term.

Despite the outcome of the interactive term between financial development and political institutions on growth in the two regions, the results seem to suggest that political institution operating independently induces growth in SADC, but reverse growth in ECOWAS. The results of SADC are in line with a prior expectation, since more improvement in governance and its institutions are likely to allocate resources more efficiently than autocratic regimes. This is because increases in good governance results in accountability, transparency in both government spending and policy-making, provision of property rights, as well as economic freedom, which lead to economic growth. This could be the case in SADC. However, the negative effects of governance on growth in ECOWAS is corroborated by studies such as Helliwell (1992) and Sekmen and Ozkan (2012), who also obtained an inverse relationship between the two variables. This means more democratic dispensation interferes with growth and development in ECOWAS. These results may be in line with the argument of Gwartney et

al. (1996). According to Gwartney et al. (1996), a country may be liberal in a political sense, and highly democratic with major civil liberties being protected, and still adopt policies that conflict with economic freedom, which may result in the reversal of economic growth. Another possibility is that, free press as well public debate, which are some of the important pillars of governance, might expose actions of the government or the private sector activities that might lead to restrained developments in the region. Also political pluralism and civil freedom most of the time make it harder for government to make tough, but essential decision that might propel economic growth. Even though, this is in sharp contrast to the scholarly view in political science that argues economic development requires some form of democratic governance (Huntington, 2006), the examples of the so-called development dictators of South Korea, Singapore, and Taiwan validate this argument. In addition, the results may also be due to instances where there have been episodes of growth acceleration in some countries with limited political openness and democratic development

Therefore, both financial development and institutions matter for the real sector in these regions to some extent. Even though, the alternatives estimators collaborate this result, only DFE is statistically significant in ECOWAS. Hence, to propel economic growth and development, democratic dispensation and freedom are a necessary, but not actually sufficient condition in this region.

Thus, the study argues that the income difference between the two regions could be minimised or eliminated in ECOWAS through not only improving the political structures and dispensation, supported by feasible economic policies, but also through more efforts made to develop the financial sector. In the same way, SADC could also strengthen her political structures and dispensation by removing obstacles that interferes with the FSD coupled with good policies, so as to experience significant positive complementarity effect between finance and economic growth.

On the effects of other control variables, it seems clear that the two regions benefit from trade policy. The coefficient of *traop* does not only conform to the expected positive relationship with growth, but is also statistically significant at 1% levels for the two regions in the long run. This is indicated by the PMG and supported by the DFE. However, the impact in SADC is over twice the impact on ECOWAS. For instance, if trade policy results in more openness by 10% in the two regions, it will result in only 1.12% economic growth in ECOWAS, and 2.42% in SADC. The study thus argues that external trade in these two regions will result in increases in

foreign exchange reserves, as well as exchange of ideas, specialisation and imports of foreign technology. This therefore supports the idea that more openness leads to more economic growth. This finding is in line with the findings of other studies such as Nicholas et al. (2003) and Bangake and Eggoh (2011).

The PMG estimates reveal that inflation has negative effects on growth in both regions, but is statistically insignificant in ECOWAS. According to the results, if inflation increases by 10% in the long run, economic growth will suffer reduction by less than proportionately to about 3% in SADC. This is in line with many studies such as Barro (1995, 2013) and Bittencourt et al. (2015) whose findings suggest that permanent increases in the rate of inflation has significant negative effects on the long run real growth rates. However, according to Beck et.al (2000), a statistically insignificant coefficient of inflation on growth is not surprising, since it is realised in many studies. Recent studies such as Rousseau and Wachtel (2002) and Seleteng et.al (2012) confirm nonlinearity and thresholds in inflation-growth relationship, indicating that statistically significant negative effects occur beyond certain threshold levels. This could be the case in ECOWAS.

On the impact of government expenditure on growth, the results indicate different impacts for the two regions. Whereas long run increases in government expenditure by 1% reverses economic growth by 0.13% in ECOWAS, thus collaborating the findings of many earlier studies such as Barro (1991) and Bangake and Eggoh (2011), on the contrary, it will propel growth in SADC by 0.1%. This may imply that government expenditure in ECOWAS could be unproductive such as increases expenditure on recurrent expenditure. This may the opposite in SADC.

Finally, an increase in human capital development measured by life expectancy by 1% will cause economic growth in ECOWAS to increase by 2.9% (2.7% by MG and 1.7% by DFE). The PMG estimator indicates this reverses economic growth in SADC, which seems counter-productive. The DFE estimator, though, reveals the opposite. Since the study measured this indicator with life expectancy, we investigated this further by considering the visual relationship between the two variables. The outcome seems to suggest that Botswana, Lesotho, Swaziland and South Africa reveal reverse relationship between the two measures in the late 1980s. This is shown in Figure B.1 in Appendix B. The study believes that this could be the result of increasing prevalence of Human immune deficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) in these countries. This reduces the quality of

human capital. Therefore, the baseline model was re-estimated excluding, especially South Africa. This is because of prevalence of tuberculosis in addition to HIV/AIDS. The results indicate that the relationship is significantly positive as shown in Table B.0.3 in the Appendix B. Hence, the statistical positive effects of human capital development in the two regions is line with many studies (e.g. Mavrotas and Son, 2006; Apergis et al., 2007; Kagochi et al., 2013). From this perspective, member states of the bloc should channel efforts to developing human capital in order to propel economic growth.

The comparative analysis thus far hints at a why huge income disparity exists between the two sub-regions, with SADC in the better position. Since this study shows that each bloc has some peculiarities as well as different institutional environment, it suggests that studies that considered the whole SSA may result in bias and wrong policy implications.

3.4.2 Results of growth and the ratio of domestic money bank assets to the sum of domestic money bank asset and Central Bank assets

Even though the focus of the study is on the composite financial index, the study also reports the results of the individual components variable which could serve as checks. This could also have implications for specific policies on the particular measures. The study reports on PMG estimates shown in Tables 3.4.3, 3.4.4 and 3.4.5. For SADC, the Hausman test shows that the PMG estimators cannot be rejected for all three financial indicators. However, for ECOWAS, this is rejected with liquid liabilities at 1%. Table 3.4.3 reports the long run estimates using the ratio of domestic money bank assets to the sum of domestic money bank assets and Central Bank assets *(dmba)* as indicator for financial development. The results indicate that in both region, the indicator and its interaction with governance variable induce economic growth and development. This validates the effects of the composite measure of the financial development on growth. This is because the effects of this measure on growth favours SADC as indicated by PMG. Since the MG is rejected by the Hausman test, it indicates bias in the coefficients. This may also be due to the relatively small number countries in each region.

Furthermore, inflation is insignificant for all three estimates in ECOWAS, but is statistically significant in SADC under DFE. This indicates it reverses growth in the region. The result here is no different from the earlier result of the composite measure of financial development. Governance variable alone reveals significant negative relationship with growth under PMG and DFE in both regions with SADC most affected.

Trade openness and human capital development both indicate significant positive effects on growth in ECOWAS under all specifications. This suggests that more trade openness and developments in human capital in ECOWAS will induce increases in economic growth. Although trade openness is positive under this financial variable in SADC, it is not statistically significant for all estimators. Human capital, in contrast, suggests significant positive effects on growth under PMG and DFE. In addition, in both regions, government expenditure is not significant under PMG and DFE. Only the MG estimates indicate that more expenditure of the government reverses growth in both regions. Finally, the estimates suggest that following a shock, ECOWAS will be on a relatively faster reversion to equilibrium path than SADC. This is shown by the PMG estimates of the error correction terms for each region.

Table 3.4.3: Results of long run PMG, MG and DFE with dmba as a measure of financial development indicator

	ECOWAS			SADC		
	PMG	MG	DFE	PMG	MG	DFE
dmba	0.163***	0.226	0.370***	0.728*	119.0	-0.302
	(0.0340)	(0.212)	(0.0800)	(0.404)	(110.8)	(0.307)
dmbains	0.000907***	0.000390	0.000689**	0.00563**	0.114	0.00216***
	(0.000116)	(0.000627)	(0.000308)	(0.00258)	(0.125)	(0.000577)
inflation	-0.0961	0.195	0.405	-0.229	1.187	-0.779***
	(0.0602)	(0.290)	(0.345)	(0.208)	(1.929)	(0.228)
pol	-0.0477***	-0.0409	-0.0502**	-0.384**	-11.78	-0.0769**
	(0.00742)	(0.0573)	(0.0224)	(0.185)	(12.13)	(0.0313)
traop	0.159***	0.388*	0.449***	0.640	1.069	0.420
	(0.0214)	(0.207)	(0.135)	(0.429)	(1.503)	(0.293)
gov	-0.0347	-0.219**	-0.0923	0.331	-1.793*	-0.0463
	(0.0216)	(0.0895)	(0.0993)	(0.204)	(1.062)	(0.227)
lifeexp	2.803***	2.804***	1.065*	2.272*	9.344	1.969**
	(0.289)	(0.873)	(0.564)	(1.267)	(5.850)	(0.931)
ecm	-0.171***	-0.491***	-0.0848***	-0.0247**	-0.33***	-0.0367***
	(0.0655)	(0.0831)	(0.0196)	(0.0124)	(0.0951)	(0.00999)
Constant	-1.031***	-1.286	-0.0907	-0.214*	-12.64	-0.0490
	(0.378)	(1.106)	(0.196)	(0.114)	(9.427)	(0.134)
Hausman Test		2.97			6.06	
		0.812			0.4163	
Observation	372	372	372	372	372	372

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

3.4.3 Results of growth and the domestic bank credit to the private sector

Under this measure of financial development, all estimates suggest that the measure is not statistically significant in ECOWAS. In contrast, the PMG, which is the estimator of interest, suggests that this proxy induces growth in SADC albeit 10%, as demonstrated in Table 3.4.4.

The interaction term indicates that more development in the governance system will complement the financial sector to induce economic growth in both region. This is indicated by the PMG and DFE in ECOWAS and PMG in SADC. From this perspective, simultaneous increase in financial development and governance system will cause growth in both regions, with SADC benefiting more than ECOWAS.

Table 3.4.4: Results of long run PMG, MG and DFE with bank credit (%GDP) as a measure of financial development indicator

	ECOWAS			SADC		
	PMG	MG	DFE	PMG	MG	DFE
bankprcr	-0.00857	8.450	0.0909	0.149*	10.01	0.199
	(0.0228)	(8.371)	(0.0666)	(0.0826)	(9.002)	(0.226)
bankprcrins	0.000789***	-0.0404	0.00170***	0.00117***	-0.0908	0.00116
	(0.000110)	(0.0419)	(0.000614)	(0.000217)	(0.143)	(0.00105)
inflation	-0.0381	6.904	0.562	-0.411***	0.442	-0.977**
	(0.0904)	(6.533)	(0.396)	(0.0861)	(0.985)	(0.415)
pol	-0.00577**	0.159	-0.0218*	-0.00200	0.205	0.0474
	(0.00270)	(0.187)	(0.0115)	(0.00583)	(0.291)	(0.0304)
traop	0.147***	-7.917	0.472***	0.704***	-0.551	0.713
	(0.0308)	(8.273)	(0.180)	(0.142)	(0.794)	(0.498)
gov	-0.149***	8.961	-0.115	0.0512	-4.945	0.0526
	(0.0411)	(9.100)	(0.119)	(0.0498)	(5.116)	(0.318)
lifeexp	5.418***	-85.61	1.782**	0.776***	73.99	2.576*
	(0.512)	(87.01)	(0.728)	(0.259)	(83.56)	(1.457)
ecm	-0.131***	-0.451***	-0.0739***	-0.101***	-0.335***	-0.0266***
	(0.0434)	(0.101)	(0.0221)	(0.0345)	(0.0972)	(0.0101)
Constant	-2.025***	-1.537	-0.197	0.0247	0.859	-0.180
	(0.669)	(1.270)	(0.206)	(0.0191)	(1.604)	(0.132)
Hausman Test		5.61			6.21	
		0.3464			0.5156	
Observations	372	372	372	372	372	372

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

As in the previous discussion, both the PMG and DFE estimators indicate that increases in inflation has no effect on growth in ECOWAS, but can reverse growth in SADC. Both estimates reveal statistically significant negative effect of the variable on growth and development in SADC. Table also demonstrates that governance alone does not induce growth in ECOWAS. This validates the earlier assertion concerning the composite measure of financial development that a country may be liberal in a political sense, and highly democratic but still adopt policies that conflict with economic freedom, which may result in the reversal of economic growth. However, in SADC, this is not statistically significant. Furthermore, increases in government expenditure is shown by the PMG estimates to reverse growth in ECOWAS but not in SADC. All models reveal that this fiscal policy variable is not significant

in SADC. The PMG and DFE estimates also indicate significant positive effects of human capital on growth in the two regions. The effects of this measure in ECOWAS is line with the composite measure of financial development.

Again, more trade openness fosters economic growth in the two regions, with the effects favouring SADC. This in line with expectation as this will not only bring in new technology, but also capital that will raise growth. Finally, the speed of adjustment to long run equilibrium upon shocks indicates that ECOWAS is likely to revert to the equilibrium path before SADC. This is shown by the PMG estimates, which indicates about 13% for ECOWAS and 10% for SADC, as shown in Table 3.4.4.

3.4.4 Results of growth and liquid liabilities as a percentage of GDP

Finally, the long run estimates of liquid liabilities as a percentage of GDP is reported in Table 3.4.5. The Table shows that the measure is not significant under PMG and MG, although there is a significant negative effect on growth in ECOWAS with DFE. Conversely, the measure reveals strong statistically significant positive effects on growth in SADC. This is revealed by the PMG estimates. Interestingly, better governance supports this measure of financial development to induce growth in ECOWAS, but this is not the case in SADC, as all estimators indicate insignificant coefficients. This suggests that only financial depth can impact positively on economic growth in ECOWAS if there is simultaneously development in both measures. This is because the financial variable alone indicates a negative effects on growth.

Based on the discussion on the effects of the individual measure of financial development as well as the composite measure on growth, one could argue that the effects of institutions and its interactive term on economic growth in SADC is unclear.

Inflation is not significant even though it reveals negative effects under PMG and DFE in ECOWAS. SADC reveals mixed results with the three estimates. The effects of governance institution and government spending corroborate the earlier result of impacting negative on growth in ECOWAS. Even though governance reveals significant negative effects on growth in SADC as in the case of the other alternative measures of FSD, government expenditure strongly induces growth in the region. Therefore one could argue that the positive results of governance variable in SADC under the model with the composite measure of financial development is not robust to alternative specifications. However, the effects of government

Table 3.4.5: Results of long run PMG, MG and DFE with Liquid liabilities (M3/GDP) as a financial development indicator

	ECOWAS			SADC		
	PMG	MG	DFE	PMG	MG	DFE
m3	-0.0213	-2.700	-0.371*	0.650***	0.346	-0.145
	(0.0696)	(2.562)	(0.214)	(0.164)	(0.407)	(0.321)
m3ins	0.000343**	0.0112	0.00161***	-0.000348	0.00178	0.000730
	(0.000172)	(0.0110)	(0.000592)	(0.000611)	(0.00199)	(0.00135)
inflation	-0.0963	0.219	-0.0686	0.184***	-0.632**	-1.371**
	(0.141)	(0.271)	(0.590)	(0.0616)	(0.270)	(0.691)
pol	-0.00880	-0.190	-0.0324*	-0.0465***	0.0458	0.0499
	(0.00615)	(0.182)	(0.0182)	(0.0135)	(0.0755)	(0.0595)
traop	0.133***	1.285	0.715**	-0.414***	-0.0629	1.335*
	(0.0430)	(0.920)	(0.287)	(0.140)	(0.262)	(0.788)
gov	-0.226***	-1.145	-0.225	0.552***	-0.406*	-0.0754
	(0.0683)	(1.010)	(0.182)	(0.130)	(0.236)	(0.433)
lifeexp	7.687***	17.72	2.677**	0.820	-1.321	3.077
	(0.900)	(15.32)	(1.132)	(0.627)	(1.583)	(2.064)
ecm	-0.0747**	-0.454***	-0.0528***	0.0157	-0.354***	-0.0203**
	(0.0295)	(0.0909)	(0.0194)	(0.0171)	(0.0950)	(0.0103)
Constant	-1.817**	-0.659	-0.291	-0.00435	3.434*	-0.201
	(0.710)	(1.295)	(0.194)	(0.0277)	(1.894)	(0.129)
Hausman Test		27.99			6.47	
		0.0001			0.3728	
Observations	372	372	372	372	372	372

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

expenditure on growth is in line with the model with composite measure of financial development in the PMG estimates.

Furthermore, more trade openness is good for growth in ECOWAS, but it can reverse growth in SADC under PMG. It is also clear that more development of human capital will induce growth in ECOWAS, but this is not significant in SADC. Lastly, the data indicates that the error correction term of PMG is not significant in SADC.

From the results above, some observations can be highlighted on the role of financial development on economic growth and development and the complementarity between governance and financial development in the two regions. It is clear that the development of the financial system robustly induces economic growth in SADC in the long run. Both the composite measure constructed as well as all the components measure are important for growth in the region. Comparing ECOWAS with SADC, although the composite measure of financial development is a significant determinant of growth, only one measure of the components

induces growth, as summarised in Table 3.4.6. This may be the concern raised that the single measures are unable to adequately cover the key functions of the financial system. Thus, the comparative analysis between the two regions indicate that although financial development is important in these regions, its positive effects is more pronounce in SADC than in ECOWAS. This begs the question, if the financial system of the two regions is important for economic growth, why is the sector underdeveloped in these regions? This question is investigated in Chapter 4.

Table 3.4.6: Showing summary of the result

	ECOWAS		SADC	
Variable	PMG		PMG	
findex	+		+	
individual financial measure	+	(only one)	+	(all)
interactive term	+	(all)	+ -	(mixed)
inflation	not sig		-	(not all sig)
pol	-	(all)	-	(all)
traop	+	(all)	+	
gov	-		+	
lifeeexp	+	(all)	+	

Table 3.4.6 also highlights that the relatively underdeveloped financial system of ECOWAS will have a robust positive impact on growth if there is more development in institutions. All measures do not only reveal positive effects on growth, but they are also all statistically significant. This implies that development in institutions supports the development of the financial sector of ECOWAS to influence growth positively. However, in SADC, the results are mixed. Additionally, it is clear that while more trade openness is good for growth in the two regions, government expenditure reverses growth in ECOWAS, but promotes growth in SADC. Finally, human capital development is one of the key indicators of growth in the two regional blocs.

3.5 Robustness and Sensitivity analysis

This section performs and discusses sensitivity analysis to ascertain the main results of this chapter. Even though three different estimators are used in the baseline estimates, as mentioned in section 3.3, to facilitate robustness checks, the study replaced the governance variable, pol, in the baseline model with political rights variable taken from the Freedom House. This political variable measures on a one-to-seven scale. One is the highest degree of freedom and

seven the lowest. Thus, the coefficient is expected to be negative. The results of the composite measure of financial development are presented in Table B.0.6 in the Appendix.

The results are broadly in line with the baseline results. In both regions, the Hausman Test indicates that the PMG estimator cannot be rejected. As in the baseline model, all estimators reveal that financial development induces growth in SADC, with only the coefficient under the PMG, which is the estimator of interest, statistically significant again at 1%. However, with ECOWAS, even though the PMG reveals a positive coefficient in all estimators, it is only the DFE that indicates that the variable is statistically significant 5% level. The interactive term between financial development and political right indicates a negative coefficient under the PMG and DFE models in ECOWAS. This implies that simultaneous development of the financial system and political right are necessary for growth. This outcome corroborates the baseline results. However, all complementarity in SADC are not statistically significant. Again, inflation is not significant under all models in ECOWAS, but only significant under PMG in SADC.

The coefficients of the political variable for the two regions confirm to the baseline results. In the baseline model, this variable retards growth under PMG and DFE in ECOWAS, and promotes growth in SADC under PMG alone. This outcome is the same under the sensitivity analysis reported in Table B.0.6. The signs of the coefficients of the other control variables are largely in line with the baseline model. However, the error correction terms for the two regions are relatively low compare to that of the baseline model. In conclusion, even though some slight differences are noted, to a larger extent, these findings reflect the outcome of the baseline model. This implies that the findings are robust to alternative measures of governance.

3.6. Summary and Conclusion

The impact of FSD on economic growth is expected to be positive. However, the results of empirical studies on this important issue continue to be inconclusive. One of the reasons for the inconclusive results is due to the use of different measures of FSD. Most studies used single measures of FSD, which cannot adequately measure the development of the financial sector. Others come with methodological issues, especially studies on panel of countries. The panel studies usually ignore the important issue of heterogeneity in the panel of countries. In the light of these observations, we constructed a composite measure of financial development and comprehensively examined a comparative study on the impact of financial development, as

well as its effects through political and democratic development on economic growth between ECOWAS and SADC.

The study employed a combination of methodologies, PMG, MG and DFE, to investigate the relationship between financial development and economic growth. Specifically, PMG is capable of addressing the issue of heterogeneity among countries in each region. The results support the existence of long run finance-led growth in both regions. In particular, the impact of FSD on growth in SADC is bigger than the effects on growth in ECOWAS. Furthermore, the impact of financial development through institutional development supports robust positive complementarity effects on growth for ECOWAS, but not in SADC. This suggests that democratic development may require the support of other enabling policies to provide support to FSD to influence growth positively in SADC.

Despite the interactive term between financial development and political institutions on growth in the two regions, the results seem to suggest that political institution alone is a driver of growth in SADC, but it can reverse growth in ECOWAS. We argue along with Gwartney et al. (1996) that while ECOWAS may be relatively liberal in a political sense and relatively democratic with major civil liberties being protected, it may adopts policies that can conflict with economic freedom, which leads to reverse economic growth in the region. Hence, democracy is an important factor but not a sufficient condition.

Furthermore, the speed of adjustment to long run path upon any shocks suggests 13% and 15% for ECOWAS and SADC respectively. This hints that economies in the latter region will be on a relatively faster reversion towards their long-run steady-state growth than the former.

On the impact of the individual financial indicators on economic growth, all measures of financial development are not significant in ECOWAS, except the development of financial depth. However, the interaction terms between the three measures of financial development and the political development indicator reveal statistically significant positive coefficients. This, therefore, implies that good governance should be a precondition for private credit, liquid liabilities and ratio of domestic bank assets to the sum of domestic bank assets and central bank asset to be effective in promoting economic growth in the regions. This argument, however, does not stand for SADC. The study indicated that all measures of financial development are important indicators needed to induce economic growth in the region. Unlike the interaction term between the composite measure of financial development and political variable, the

interaction term between bank credit and the political variable, as well as the interaction term between the political measure and bank assets as a ratio of the sum of bank asset and central bank assets, all indicate statistically significant positive coefficients. This implies that simultaneous increases in the two measures is necessary for economic growth in SADC.

Even though the application of the different econometric approaches is to serve as a robustness check, the results from the main model are also substantiated by replacing the governance variable with political rights. The results largely corroborated and confirmed the baseline results.

On the impact of control variables, the study reveals that, in the long run, government trade policies support economic growth in both regions. However, government spending supports economic growth in SADC but impairs growth in ECOWAS. Furthermore, the effects of human capital development are positive and robust in both regions.

Chapter 4

Financial sector development, inflation and openness: A comparative panel study of ECOWAS and SADC

4.1 Introduction

The late 1980s witnessed several countries in SSA moving towards economic and financial sector reforms, following the adoption of the SAP as well ERP, which were supported by the IMF and the World Bank. The poor economic performance of SSA countries was blamed on the repressive post-independent economic and financial system. The main focus of the reforms was to replace the protective economic policies with more market oriented reforms, which were deemed not only necessary to induced economic growth, but also needed to propel financial system development. Inadequate financial sector development was argued to be among other central reasons answerable for the slow growth process in the region. This is because a well-developed and efficient financial system results in mobilising and channelling resources not only to productive areas, but also to areas that are more risky albeit promising and productive and could have been left unattended without the financial sector. These processes could induce economic growth.

The argument above is supported by theory and many empirical studies. For instance, the endogenous AK model developed by Pagano (1993) and Murinde (1996) recognised a positive effect of financial development on economic growth. In terms of empirical evidence, even though ambiguity exists on the effects of FSD on growth, the general view points to financial development inducing economic growth. Collaborating this assertion, Demetriades and Andrianova (2003), Goodhart (2004), Baltagi et al. (2009), noted that the effects of financial development on the long run economic growth is now widely agreed to constitute a potential important channel. Among the many empirical studies that support finance-led economic growth include Allen and Ndikumana (2000), Beck et al.(2003), Ghirmay (2004), Ang and McKibbin (2007), Esso (2010), Kar et al. (2011) and Odhiambo (2011). More importantly, Chapter 3 of this research also revealed evidence of the existence of financial sector robustly inducing economic growth in ECOWAS and SADC. Therefore if the financial system is indeed important in the growth process, why are some countries having underdeveloped financial system? Consequently, Baltagi, et al. (2009) observes that the frontier of literature in this field

is shifting towards providing answers to the question. Hence, this is the core aim of this chapter-providing answers to the question.

Most SSA countries are among the countries with the least developed financial system. In an attempt to speed up progress in the financial sector, following the economic and financial sector reforms, most of the countries in the region moved away from the repressive economic and financial sector regimes. This led to the dismantling of credit controls and reduced or removed obligatory reserve requirements of banking system. Also, not only were state owned banks privatised, but interest rates were liberalised. Furthermore, bank entry requirements as well as capital account restrictions were relaxed in the hope of triggering development in the financial sector.

Currently, these efforts are ongoing. The growing foreign bank presence in the region since 1995 is testimony to the increasing openness of the financial sector. The percentage of foreign banks in the domestic banking system increased from around 32 % to about 55 % in 2009. This foreign banking presence is higher than other developing regions[23]. Despite the relentless efforts and bold measures taken to induce growth in the financial sector, SSA countries, except South Africa, are not as successful in achieving development in the sector as other developing economies and regions. According to Mishkin (2007), despite the benefits of the financial development, the sector's development does not occur in underdeveloped economies because their financial system face plethora of impediments to solving asymmetric information problem. The financial institution is not only much less deep and less efficient, but also less accessible compared to other regions, as shown in the discussions in Chapter 2.

Although most of the countries in SSA took the steps mentioned above towards developing their financial sector through policy reforms, aggregate indicators of financial development have, on average, either stagnated or dropped, leaving a financial sector development gap in the region.

As such, the underdeveloped state of SSA financial system raises a number of issues and questions as to what is going wrong with the financial sector policies, and what could be done to improve it. Is the financial sector insensitive to these policy measures or is it echoing policy failures? What factors have repressed or are stagnating its development to this point, and how

[23] These figures were estimated using information from Global Financial Database, 2012. Also see Chapter 2 for the details.

can they be overcome? Thus, the purpose of this chapter is twofold. Firstly, it seeks to empirically analyse the role of inflation in explaining the state of financial development. Secondly, it aims to investigate the role of access to communication as well as examine if Rajan and Zingales (2003)' hypothesis, which stipulates that simultaneous opening of both trade and financial openness are key for financial development to take place, is supported. This is done by comparing ECOWAS and SADC in SSA.

Although research in this area has seen some progress, to our knowledge there is no study conducted that provides an exclusive comparison of regional groupings, especially in SSA on the factors associated with FSD. Thus, this is the first of its kind to be studied. Moreover, this study is novel in that it extends the empirical model to include the effects of communication infrastructure on financial development. In addition, even though dynamic panel approach is used for the regions as whole, the effects of the factors on financial development on each country level is also determined in details using SURE approach. Hence, this study is dissimilar to earlier studies such as Boyd et al (2001), Chinn and Ito (2006), Detragiache et al. (2006), Baltagi et.al (2009), Law and Habibullah (2009) and Kablan (2010).

Finally, even though these earlier studies help our understanding in this area, they have some shortcomings which include (i) the use of single measure of financial development which may not be able be adequate to capture the functions of the financial system, and (ii) most of the studies are based on advanced economies like the Group of seven (G-7) and the OECD, or an amalgamation of advanced and developing economies, such as Chinn and Ito (2006), Baltagi et.al (2009), Law and Habibullah (2009). The results are generalised and may be deceptive. Since differences exist between developed and developing economies, the differences may well be the reasons for the financial sector development gap in SSA. This is policies are mostly curved out from such findings.

This chapter therefore fills in this gap by using a constructed composite measure of financial development comprising of three financial indicators as explained in Chapter 3. Accordingly, the analytical focus on these countries helps to deepen the understanding of appropriate factors responsible for the development of the financial sector of these two regions, especially SSA and other developing regions.

Using a number of methodologies, which include Least square dummy variable approach (LSDV), Feasible generalized least squares (FGLS) and Panel Corrected Standard Errors

(PCSE) approach, the study provides evidence that, in both regions, inflation reverses financial development with the effects more perverse in ECOWAS. In addition, the study indicates that even though more simultaneous opening of the financial sector and trade leads to more financial development in SADC; trade openness alone can still trigger growth in the sector, but more financial openness in the form of capital account openness alone is detrimental to financial development in the region. This evidence provides partial support to the Rajan and Zingales hypothesis. However, in ECOWAS, the hypothesis is rejected. In addition, access to communication infrastructure is an important factor that strongly promotes financial development in the two regions with SADC benefiting more than ECOWAS.

The rest of the chapter is structured as follows. Section 4.2 presents both theoretical and empirical literature review on the link between finance and factors responsible for its development. In section 4.3, the method and model specification are presented. In section 4.4, the data used in the study is discussed. Section 4.5 presents discussion of the results, and section 4.6 provides the summary, conclusion and policy recommendations of the study.

4.2 Literature Review

The question of what determines FSD theoretically is a subject of growing research. Some of the literature includes Finance-Inflation theory (macroeconomic variables) and Rajan and Zingales Interest Group theory of financial development.

4.2.1 Finance-Inflation theory:

A number of studies explain the mechanism under which predictable increases in inflation rate interfere with financial sector ability to efficiently allocate resources. Specifically, the link developed by Huybens and Smith (1998) and Huybens and Smith (1999) emphasis the importance of information asymmetries in the credit market. According to this model, increases in the rate of inflation adversely affect credit market friction, which affects FSD negatively and hence long-run real activity. The bases of these arguments are that there is informational friction whose severity is endogenous. Given this informational friction, an increase in inflation rate causes the rate of real returns on assets to fall. This worsens the credit market friction and leads to credit rationing. Low real returns on assets are disincentive for agent to lend, but incentive to borrow. This results in credit reduction as well as increases in low quality borrowers into the pool of credit seekers. The pool of low quality borrowers is swamped, informational frictions become more severe and credit becomes scarce in such an economy.

Hence, as inflation rises, financial sector makes fewer loans, which causes inefficient resources allocation and reduced intermediation.

4.2.2 Rajan and Zingales Interest Group Argument of financial development

According to this argument, interest groups, particularly industrial and financial incumbent, stand to lose from financial sector development, since this will create opportunity and chances for new firms to be established. Basically, under financial sector expansion, competition is established which tends to erode the rents of the incumbent. Significantly, the model posits that trade openness without financial openness is unlikely to yield desirable financial development. This is because it may lead to large industrial incumbents to access cheap funds to stifle competition, which will cause financial repression. In the same way, financial openness alone may not induce FSD, since it will only allow the largest firms to access such foreign funds.

Rajan and Zingales (2003) argue that financial liberalisation alone may give access to the largest incumbent firms to acquire foreign funds, which they may not need. However, it may also prevent small and promising domestic firms' access to such foreign funds. Hence, domestic financial sector may view its profitability threatened by this process. It will, therefore, call for liberalisation which will be opposed by industrial incumbents in order to prevent competition. Accordingly, cross border capital flows alone are not a sufficient condition to induce FSD and are unlikely to reconcile the interest of both groups to push for financial development. Hence, Rajan and Zingales (2003) propose that simultaneous opening of both capital accounts and international trade is a sufficient condition to curtail the incumbent's hostility to financial development. Thus, there will be FSD if there is simultaneous opening of both capital accounts and international trade.

Some contemporary empirical literature on this matter confirm a significant negative relationship between financial development and inflation. These literature include Haslag and Koo (1999) using cross-sectional approach; Boyd et al. (2001) using cross-sectional and panel data of 65 countries; BenNaceur and Ghazouani (2005); Zoli (2007) on emerging European countries; Andrianaivo and Yartey (2010) on African countries; Bittencourt (2011) using both time series and dynamic panel analysis on Brazil. In contrast to these literature, Aziakpono's (2004) study concludes that the level of income and exchange rate are the most important determinants of financial intermediation in the Southern Africa Custom Union. Detragiache et al. (2006) found that whereas corruption, inflation and foreign bank penetration have negative

effects on FSD, better contract enforcement and information on borrowers have a positive effects on FSD. A more recent study by Kablan (2010), however, shows that inflation and foreign bank penetration have negative effects on FSD[24], corroborating earlier results by Detragiache et al. (2006). Even though these studies broaden our understanding on the inflation-finance relationship, only the study by Aziakpono (2004) is directed at examining regional bloc of Southern Africa Custom Union. Additionally, these studies mostly depend on a single measure of financial development, which may not capture the financial development adequately.

With regards to finance-openness relationship, Baltagi et.al (2009), using data from developed and developing economies and dynamic panel approach, provide evidence that show that both openness are statistical significant determinants of banking sector development. However, the study provides partial support for Rajan and Zingales's hypothesis. Also, using dynamic panel approach on 27 economies including G-7, Law and Habibullah (2009) argue that trade openness is prominent in promoting capital market development and financial sector liberalisation promotes banking sector development. Svaleryd and Vlachos (2002) and Huang and Temple (2005) all indicate that trade openness induces financial development. Levine (2001), however, indicates that financial liberalisation on international portfolio flows not only induces stock market liquidity, but also attract foreign banking inflows, which tends to enhance efficiency in the domestic banking system. In addition, Chinn and Ito (2006), using a panel of 108 countries over the periods 1980 to 2000, argue that higher level of financial openness spurs equity market development, only if a threshold level of legal development has been attained. Lastly, Klein and Olivei (2008) indicate that capital accounts liberalisation has robust impact on growth through financial system deepening in industrialised economies. However, there was little evidence of such relationship for countries outside the OECD states.

Other studies focus on institutional effects on finance. Djankov et al.'s (2007) study, for example, found that both creditor protection through the legal system and information sharing institution are associated with higher private credit to GDP. Also, Yartey (2008) concludes that law and order, political risk and bureaucracy quality are important determinants of stock market development for a panel of 42 countries. However, Girma and Shortland (2008) reveal that the degree of democracy and political stability are important factors in determining the speed of FSD. Their result was corroborated by the findings of Roe and Siegel (2011). Additionally,

[24] In some selected countries of SSA

financial backwardness was significantly rooted in severe political unstable economies. Hence, current political instability explains the level of FSD more than historical legal origin. In contrast, Toroyan, and Anayiotos (2009) show that institutional factors in SSA affect financial depth and access to financial services more than asset equality and profitability. But the study of Cherif and Gazdar (2010) on Middle East and North Africa (MENA) countries shows that institutional quality is more relevant for banking sector than for stock market development.

These empirical studies indicate that no study has attempted to exclusively analyse a comparative study on FSD between two regional groupings, especially in SSA. Moreover, as the prevailing studies only considered a single measure of FSD, the results may be misleading. Also, the studies are focused on either developed countries or mixture of developed and developing countries. They do not provide information on SSA, especially on the regional groupings. This is necessary since these blocs adopt almost similar policies which may lead to dissimilar response of FSD to the set of controls variables used in each region. This study fills in this gap by not only considering a comparative study, but also using a composite measure of FSD which captures the functions of the financial system. In addition, it uses individual measures for policy implication.

4.3 Method and Model specification

We start by specifying a static empirical model which takes the form of the semi-log below. In addition, following Baltagi et.al (2009), we use lagged values of regressors to avoid simultaneity. Thus,

$$lnfindex_{it} = \alpha_i + \beta_1\, infl_{i,t-1} + \beta_2 lnrgdppc_{i,t-1} + \beta_3 lngov_{i,t-1} + \beta_4 pol_{i,t-1} + \beta_5 finop_{i,t-1} + \beta_6 lntraop_{i,t-1} + \beta_7 lncom_{i,t-1} + \beta_8 fintraop_{i,t-1} + \beta_9 trapol_{i,t-1} + \varepsilon_{i,t} \qquad (4.1)$$

Where *i* is individual country at time *t* and i=*1 ...N; t=1... T.* $\varepsilon_{i,t}$ is the error term. $infl$ is inflation, $rgdppc$ is real GDP per capita and gov is government spending. pol represents type of governance measured by Polity2, whereas $finop$ and $traop$ indicate financial and trade openness respectively. Communication infrastructure is proxied by access to mobile phones and telephone lines per thousand people and is represented by com. To measure the effects of the Rajan and Zingales hypothesis, the interaction term between financial and trade openness is included which is $fintraop$. Also, it is contended that trade openness can influence financial development through better institutional environment. We provide institutions with governance system and an interaction term between trade openness and governance system, $trapol$, is

included. Finally, $findex_{it}$ is a composite measure of FSD computed, using equation 3.7 and the same measures of financial development discussed under section 3.3.2 of Chapter 3. Even though we used the composite measure, the study also considered each individual indicator in order to determine specific policy relevant to FSD

As a macroeconomic stability variable inflation is expected to have reversed relationship with financial development, as discussed in section 4.2.1. The level of economic development as measured by real GDP per capita is a conditioning variable expected to induce development in the financial sector as incomes increase.

Government fiscal policy indicator is represented by *gov*. It shows macroeconomic stability and accounts the influence on financial development. In most developing economies, government debt, which composes mainly securities, represents relatively large proportion of government expenditure. It is usually measured by stock of domestic government debt or interest payment on government debt. However, there is no consistent data on this variable. It results in transfer of resources from the private sector to central government securities. Hence, this process impairs FSD as resources which would have been mobilised by the financial sector are instead diverted to the central government. However, if government securities pay competitive interest rates, it may offer the financial sector an attractive instrument to manage their liquidity as well as a relatively safe investment. Hence, the effect is ambiguous.

Autocratic regimes follow from revolutions and are usually characterised by expropriation and corruption. This may increase the cost of doing business and, more so, uncertainty about property rights. With this caveat, these processes impair FSD. However, good governance is expected to stimulate FSD. Hence, *pol* captures this effect in the model. This variable is described in Section 3.3.4 in Chapter 3.

Access to mobile and telephone lines are expected to induce financial development. This promotes FSD by facilitating information flows among suppliers and demanders of financial services. This may reduce information asymmetry in the financial system and subsequently lead to efficient operation of the market.

Lastly, financial openness measure and trade policy measure are expected to complement each other in order to promote financial development as envisaged by the Rajan and Zingales hypothesis. The variable alone is expected to promote FSD as more financial openness results in competition, which induces expansion of the sector. The effects of real interest rate on

financial development is also important, however, there is no consistent data on this variable. Hence, it was not included in the model. This may be shortcoming of the study. The problem is more serious in ECOWAS.

Trade policy variable is the sum of imports and exports to GDP. More trade is expected to induce financial development. This because of inflows of goods and investment. As in Ito (2006) and Baltagi et.al (2009), the study used the "de jure" financial openness index of Chinn and Ito data. This is an index of capital accounts openness (KAOPEN). It is constructed from four binary dummy variables that codify restrictions on cross-border financial flows. Even though this measure is accused of sometime overstating the measure of openness, it is broadly available for many countries in SSA for a long time period[25]. More so, data on countries in SSA is not readily available from any alternative source for a long period.

To obtain a dynamic panel model and also allow for any possible partial adjustment, we introduced the lagged dependent variable into equation 4.1 to arrive at our final model as follows:

$$lnfindex_{it} = \alpha_i + \beta_1\, infl_{i,t-1} + \beta_2 lnrgdppc_{i,t-1} + \beta_3 lngov_{i,t-1} + \beta_4 pol_{i,t-1} + \beta_5 finop_{i,t-1} + \beta_6 lntraop_{i,t-1} + \beta_7 lncom_{i,t-1} + \beta_8 fintraop_{i,t-1} + \beta_9 trapol_{i,t-1} + \beta_{10} lnfindex_{it-1} + \varepsilon_{i,t} \quad (4.2)$$

The significance of the inclusion of the past history of the dependent variable does not only capture the dynamics in the model, but also the possible omitted variables.

Given the nature of our dataset, this paper uses a number of panel data techniques to estimate the regression model of equation 4.2 which includes: Fixed effects (FE) or Random effect (RE), Feasible generalised least squares (FGLS), Panel corrected standard errors (PCSE) and Seeming unrelated regression (SURE). These techniques are applied in order that they can represent robustness checks. The techniques are appropriate since T > N. According to Beck and Katz (1995), this approach provides estimates of sampling variability which are more accurate, even under the presence of complicated panel error structure, than other approaches, such as pooled GLS[26]. Another preferred estimator for the dynamic model is the system Generalised Method Moments proposed by Arellano and Bover (1995). However, this

[25] See Ito (2006) for details of the advantages in using this index.
[26] For a detailed discussion of this approach see Beck and Katz (1995).

approach is suitable for short panels (T< N), which is not the case in this study, since N=12 and T=32.

4.3.1 The Fixed Effect estimator

Consider the following dynamic panel model;

$$y_{it} = \alpha_i + \beta_1 y_{it-1} + \beta_2 x_{it-1} + \varepsilon_{it} \quad (4.3)$$

i = 1, 2. ……N

t = 1, 2……..T

Where y_{it} is the measure of financial development, α_i are random individual-specific effects, x_{it} are the regressors as in equation 4.1 or 4.2 and ε_{it} are the errors.

The effects of α_i gives the distinction between the Fixed Effects (FE) and Random Effects (RE). In the FE estimator, α_i is permitted to correlate with x_{it}. However, in RE model, α_i is purely random and implying it is uncorrelated with x_{it} which leads to a strong assumption.

The FE estimator implies that: $E(y_{it}|\alpha_i, x_{it}) = \alpha_i + x_{it}\beta$ assuming $E(\varepsilon_{it}|\alpha_i, x_{it}) = 0$.

The advantage of the FE modelling is that consistent estimates of the regressors can be obtained if the regressors are time-varying and even endogenous to some extent (Cameron & Trivedi, 2010).

Therefore, let the error $u_{it} = \alpha_i + \gamma_t + \varepsilon_{it}$, then we have error component model with γ_t the unobserved time effect as:

$$y_{it} = \alpha_i + \beta_1 y_{it-1} + \beta_2 x_{it-1} + u_{it} \quad (4.4)$$

Including the lagged dependent variables along with FE introduces a basic problem of correlation between the regressor and the error term. This generates a bias in the estimate known as the Nickell bias[27]. However, since T > N, the Nickell bias goes to zero as *T* increases and is a problem with fixed T. To determine which model is suitable, the study used the Hausman test which supported the use of FE rather than RE. However, in some cases, for the

[27] See Nickell (1981) for details.

individual financial development measures, the RE modelling is the appropriate approach. Since T > N we use Least squares dummy variable technique.

4.3.2 Feasible Generalised Least Squares

In the pooled feasible generalised least squares, it is necessary to specify a model for serial correlation, heteroscedascity and model of contemporaneous correlation in the errors. Once heteroscedascity is present, the data cannot be pooled. This approach is preferred since in many cases the variance-covariance matrix is unknown. Hence, we cannot use Pooled generalised least squares (GLS) as it assumes known variance-covariance.

Thus, this model deals with model error complications by specifying a model of heteroscedascity, model of contemporaneous correlation and model of serial correlation in equations 4.5, 4.6 and 4.7 respectively. Hence we have:

$$E(\varepsilon_{it}^2) = \sigma_{it} \tag{4.5}$$

$$E(\varepsilon_{it}\varepsilon_{jt}) = \sigma_{ij} \tag{4.6}$$

$$\varepsilon_{it} = \rho_i \varepsilon_{it-1} + v_{it} \tag{4.7}$$

The advantage of this model is that ρ which is coefficient of the first order correlation is allowed to vary across the panel. Furthermore, the model captures short run dynamics as well as controls for simultaneity bias.

4.3.3 Seemingly Unrelated regression technique

The Seemingly Unrelated regression technique (SURE), according to Zellner (1962), takes the system of 'seemingly unrelated regression equations' as a single large equation to be estimated. Hence, by postulating a separate dynamic regressions for each individual country, we have:

$$y_{it} = \gamma_1 y_{1t-1} + \beta_1 x_{1t-1} + \varepsilon_{1t}$$

$$\vdots$$

$$y_{NT} = \gamma_N y_{NT-1} + \beta_N x_{NT-1} + \varepsilon_{NT} \tag{4.8}$$

i=1, 2 ……N

t=1, 2…….. T

The equations are simplified by stacking into a single model. Let $Y_t = [y_{it} \dots, y_{Nt}]'$, $X_t = diag(x_{1t} \dots, x_{NT})$, a blog diagonal matrix with $x_{1t} \dots, x_{NT}$ on its diagonal, $U_t = [\varepsilon_{1t} \dots, \varepsilon_{NT}]$, $\beta = [\beta_1 \dots, \beta_N]'$and $\gamma = [\gamma_1 \dots, \gamma_N]'$, . Then our final SURE model is given 4.9:

$$Y_t = \gamma Y_{t-1} + \beta X_{t-1} + U_t \quad (4.9)$$

The idea is to estimate each equation in the bloc. The main advantage of SURE over estimates using equation by equation under ordinary least squares is that there is gain in efficiency if there is contemporaneous correlation among the equations.

The underlying assumption of the Zellner (1962) method is that the equations are related through the non-zero covariances associated with the error term. Thus, while it is assumed that, statistically, the errors for each country taken separately conform to the standard linear regression model, each country's errors may also correlate with the contemporaneous errors of the other countries (Judge et al., 1988). There is reason to believe that common factors may influence macroeconomic and financial data from the SADC and ECOWAS countries, therefore increasing the chances of the presence of contemporaneous correlation in the model. This cross-sectional dependency may arise because of several reasons including spatial correlation, economic distance, and spill over effects and common unobserved shocks. To determine the existence of such contemporaneous correlation, the study used the Breuch-Pagan (LM) test.

4.3.4 Data description

We used annual data obtained from World Bank's *Africa Development Indicators*, 2012, and *Global Financial Development Database*, 2012, limited to 1980-2011. Financial variables are obtained from the latter and the rest from the former. Financial liberalisation index is obtained from Chinn-Ito Financial Index. Both ECOWAS and SADC include 12 states as shown in Table B.0.2. The sources and description of the data is given in Table C.0.1 in the Appendix C.

4.4 Empirical analysis

The empirical analysis start with a diagnostic test in order to get the right specifications.

4.4.1 Diagnostic tests

Before employing panel based approach, the study tested for serial correlation as well as heteroscedascity and the existence of contemporaneous correlation in both regions. This helps

to determine the appropriate modelling. The result is reported in Table 4.4.1. Table 4.4.1 shows that the presence of heteroscedascity is confirmed by the Likelihood ratio test and the existence of first order autocorrelation cannot be ignored as suggested by the test of serial correlation in both regions.

Table 4.4.1: Diagnostic test

Tests	**SADC**	**ECOWAS**
1. Serial correlation test	*F(1, 11) = 32.64, Pr > F = 0.0016*	*F(1, 11) = 42.745, Pr> F = 0.0000*
2.Hetroscedascity	*LR χ^2 (9) = 141.01*	*LR χ^2 (9) = 194.13*
	(Ass: homosk)Pr > = 0.0000	*Pr > χ^2= 0.0000*
3. Breuch-Pagan LM test	*χ^2 (45) = 246.828, (Pr = 0.000)*	*χ^2(45) = 353.823 , (Pr = 0.0000)*
4. FE model	*F(7, 301) = 7.19,(Pr >F = 0.0000)*	*F(11, 341) = 3.17, (Pr >F = 0.0004)*
5 Hausman test	*χ^2 = 20.04 Pr > χ^2 = 0.0289*	*χ^2 = 25.09 Pr > χ^2 = 0.0029*

The Breuch-Pagan LM test of cross-sectional dependence from the Table supports the existence of contemporaneous correlation in both regions. Based on the FE model, it shows 1% significance level. The correlation matrix of the errors in SADC and ECOWAS are shown on Tables C.0.7 and C.0.8 in the Appendix respectively. Each country's errors correlate with the contemporaneous errors of other countries. This suggests that any random shock to one country would also impact on the other countries in the regional bloc, since financial and macroeconomic data from the same regional bloc are likely to be influenced by common factors. This supports the application of Zellner's seemingly unrelated regression technique which results in gain in efficiency in the estimates as opposed to estimates of equation by equation using OLS. As the method can only estimate for a maximum of 10 countries, we dropped, Lesotho and Zambia in SADC, and Burkina Faso and Guinea Bissau in ECOWAS.

Additionally, the Hausman test confirmed that the dynamic relationship between the measure of financial development, inflation, openness, communication, government spending, and other conditioning variables for the two sub-regions is adequately modelled by the FE model rather than the RE approach, as shown in Table 4.4.1. In addition, the *F*-tests for the FE model for both sub-regions indicate heterogeneity and that the coefficients are different from zero. To control for spatial effect and error complications, dynamic FGLS as well as PCSE are also estimated. These tests are based on the dynamic panel regression of 4.2.

4.4.2 Estimated results of composite measure of financial development as a dependent variable

Table 4.4.2 reports the main results of the composite measure of financial development for the two regions. All the panel approaches used indicate that the main variable of interest, inflation, has detrimental effect on financial development of the two regions. This is not only in line with theory, but lends support to earlier studies such as Boyd et al. (2001), BenNaceur and Ghazouani (2005), Andrianaivo and Yartey (2009), and Bittencourt (2011). Among some of the studies on SSA that this result corroborates include Aziakpono (2004) on South Africa, Botswana, Namibia, Swaziland and Lesotho (SACU countries), Kablan (2010) and, more recently, the work of David et al. (2014). These studies confirm that increases in inflation reverse FSD.

The result shows that given a 10% increase in inflation in the two regions, the LSDV approach indicates 0.44% and 2.1% reduction in financial development in SADC and ECOWAS, respectively. This suggests that the effect is much felt in the latter bloc. What this means is that increases in the rate of inflation adversely affect credit market friction, which affects FSD negatively. This is because an increase in inflation rate causes the rate of real returns on assets to fall, which worsens the credit market friction and leads to credit rationing. Hence, the financial sector makes only fewer loans, causing inefficient resources allocation and reduced intermediation in the two regions. The relatively small negative effects of inflation on the financial sector of SADC could be explained by the fact that its financial sector is relatively more developed than ECOWAS. For this reason, the weak financial sector of ECOWAS is more susceptible to inflation shocks than SADC. Furthermore, the South African financial system, which is well developed in the region and ranks very high in the world, has its footprints all over the bloc especially the banking industry[28]. And given her strong monetary policy with inflation targeting frame, it is not surprising that the impact of inflation is not as strong as in ECOWAS, since these policies usually reflects in countries such as Lesotho, Swaziland, Namibia and Botswana. Therefore the absence of a major regional economic player like South Africa in ECOWAS could be the reason.

To determine the robustness of the reversed effects of inflation on financial development in the two regions, we re-estimated the LSDV regression by adding the conditioning variables one after the other, as shown in Tables C.0.2 and C.0.3 in the Appendix for SADC and ECOWAS

[28] Our measure of financial development is broadly bank based

respectively. The results seem to confirm that inflation robustly reduces financial development in both regions. Furthermore, to examine if this negative relationship was driven by Zimbabwe as well as DRC in SADC, since Zimbabwe in recent times experienced phenomenal increases in inflation and DRC during the civil conflicts in that country, we re-estimated the baseline regression by dropping one country after the other and also dropping the two at the same time. The results suggest a robust negative relationship between inflation and financial development in SADC, as shown by Table C.0.4 in the Appendix. Overall, the results indicate that the costs of inflation on financial development are genuine and not explained by a sort of omitted variable bias.

In terms of history of financial development captured by the summary of the lagged of the financial development measure, the results show this significantly promote current financial development at 1%, which is in line with *a prior* expectation. However, the level of development measured by real GDP per capita indicates mixed results. Whereas all regressions in SADC suggest a negative relationship, the LSDV, which is our main model, indicates that the relationship is statistically insignificant. However, the LSDV technique reveals real GDP per capita to have statistically positive effects on financial development in ECOWAS. This is contrary to the FGLS results as shown by Table 4.4.2.

Government spending in both regions suggests a negative effect on financial development (except FGLS in ECOWAS), but only statistically significant in SADC for all methods. It shows that a 10% increase in government spending in SADC will cause about 0.4% drop in financial development, as indicated by the LSDV method, but about 0.3% drop from the FGLS and PCSE approaches. This finding may lead us to conclude that government expenditure may serve as a channel that diverts resources away from the financial sector of SADC to the government. In this way, government expenditure interferes with the financial sector activities negatively. On average, the summary statistics indicate that government expenditure in SADC is as high as 18% against 14% of ECOWAS. This may be the reason.

In both regions, not only is the political environment variable statistically insignificant, as shown by the standard errors but also its interaction with trade openness is also insignificant. This is contrary to our expectations. This seems to suggest that the current governance system for the period under study may be weak and does not support financial development or complement trade openness to propel FSD in both regions.

The results reveal that trade openness alone reveals statistically significant positive effects on financial development for all methods in SADC, whereas financial openness enters with statistically significant negative effects. This suggests that more trade openness alone induces financial development in the bloc. This rejects the suggestion by Rajan and Zingales that trade openness without financial openness is unlikely to cause financial development. This result corroborates the findings of Kim et al. (2010). However, the same cannot be said about financial openness, as more financial openness reverses financial development. This evidence seems to supports Rajan and Zingales' assertion that cross border capital flows alone are unlikely to convince both interest groups to push for financial development. Importantly, the complementary term between trade and financial openness indicates statistically significant positive effects on financial development for all three regressions, indicating that simultaneously opening of trade and financial sectors holds the key to financial development of SADC. Hence, the evidence seems to give partial support to the hypothesis in SADC. Studies that found this results include Baltagi et al. (2009).

Comparing with ECOWAS, even though all three regressions indicate that openness measures promote financial development separately, they are not statistically significant. Furthermore, the interaction term between these measures is negative, indicating that relatively closed economies may gain from more trade openness or financial openness. However, it is statistically insignificant. The evidence therefore suggests that the hypothesis may be rejected in the case of ECOWAS as indicated in Table 4.4.2.

Table 4.4.2: Results of composite financial findex

Variables	SADC			ECOWAS		
	FE (LSDV)	FGLS	PCSE	FE (LSDV)	FGLS	PCSE
	Composite measure of FSD			Composite measure of FSD		
$findex_{t-1}$	0.811***	0.824***	0.825***	0.799***	0.823***	0.835***
	(0.0334)	(0.0254)	(0.0350)	(0.0412)	(0.0252)	(0.0331)
rgdppc	-0.00177	-0.0227***	-0.0297***	0.231***	-0.0308**	-0.0232
	(0.0306)	(0.00539)	(0.00852)	(0.0712)	(0.0122)	(0.0184)
inflation	-0.0438***	-0.0467***	-0.0400***	-0.213*	-0.0910*	-0.104
	(0.00831)	(0.0103)	(0.0136)	(0.108)	(0.0471)	(0.0671)
gov	-0.0418***	-0.0260**	-0.0305**	-0.0115	0.00367	-0.0127
	(0.0100)	(0.0105)	(0.0154)	(0.0210)	(0.0126)	(0.0211)
pol	0.00248	0.00116	0.00167	-0.00334	0.000216	0.000368
	(0.00279)	(0.00139)	(0.00245)	(0.00416)	(0.00275)	(0.00410)
traop	0.0705**	0.0346***	0.0432*	0.0102	0.00398	0.00937
	(0.0308)	(0.0129)	(0.0221)	(0.0404)	(0.0261)	(0.0446)
finop	-0.0667**	-0.0240*	-0.0364*	0.0291	0.0218	0.0244
	(0.0220)	(0.0126)	(0.0191)	(0.0343)	(0.0254)	(0.0407)
fintraop	0.000654**	0.000265**	0.000422**	-0.000314	-0.000431	-0.000495
	(0.000225)	(0.000131)	(0.000197)	(0.000523)	(0.000384)	(0.000622)
com	0.0254***	0.0202***	0.0236***	0.0118**	0.0160***	0.0156***
	(0.00661)	(0.00334)	(0.00507)	(0.00510)	(0.00430)	(0.00591)
trapol	-3.24e-05	-6.60e-06	-1.30e-05	8.29e-05	3.66e-05	2.80e-05
	(0.00018)	(0.000012)	(0.00019)	(5.42e-05)	(4.28e-05)	(5.94e-05)
Constant	0.619**	0.831***	0.840***	-0.540*	0.949***	0.864***
	(0.279)	(0.124)	(0.175)	(0.270)	(0.152)	(0.239)
Observations	372	372	372	372	372	372
R-squared	0.852		0.993	0.881		0.989
N		12	12		12	12

Robust standard errors in parenthesis ***p<0.01, **p<0.05, *p<0.1

Where rgdppc = real GDP per capita, gov = government expenditure (%GDP), pol = polity2, traop = international trade openness, finop = capital flows or financial openness, fintraop = interaction term between trade and financial openness, com = access to mobile and telephones per 1000 people and trapol =the interaction term between trade openness and polity2. All variables are logged except pol, finop and trapol.

Lastly, more access to mobile and telephones is an important factor that induces financial sector development in the two regions as indicated in the Table. All regressions in the two blocs do not only indicate a positive coefficient, but also they are statistically significant. Given that there is a 10% increases in access to mobile and telephone in both regional blocs, it will provoke over 0.2% and over 0.1% financial development for SADC and ECOWAS, respectively, for the three regressions. This therefore suggests that SADC's financial system stands to benefit more from additional access to mobile and telephones than ECOWAS. This is in line with our expectations as more access to these facilities will make it easier to access information in the financial system. The analysis, thus far, seems to suggest that the relatively more developed

financial sector of SADC could be explained by many factors influencing it as opposed to ECOWAS.

4.4.3 Estimated results of Liquid liabilities (M3/GDP) as a dependent variable

On the individual components of financial development measure, we report the results from Tables 4.4.3, 4.4.4 and 4.4.5. Table 4.4.3 reports the results of liquid liabilities as percentage of GDP. It shows that the RE model is indeed the appropriate model as reported by the Hausman test. In both blocs, the history of the financial development has a statistically significant positive coefficient on financial depth. This is in line with our expectations.

Table 4.4.3: Results of Liquid liabilities as a percentage of GDP

Variables	SADC			ECOWAS		
	RE(AR (1))	FGLS	PCSE	RE (AR (1))	FGLS	PCSE
	Liquid liabilities as a percentage of GDP			Liquid liabilities as a percentage of GDP		
$M3_{t-1}$	0.931***	0.929***	0.932***	0.836***	0.846***	0.849***
	(0.0169)	(0.0137)	(0.0202)	(0.0249)	(0.0241)	(0.0410)
rgdppc	0.0149	0.00886	0.00964	0.0613*	0.0448**	0.0564*
	(0.0114)	(0.00660)	(0.00915)	(0.0316)	(0.0197)	(0.0333)
inflation	-0.0414**	-0.0505***	-0.0402**	-0.293***	-0.214***	-0.278**
	(0.0165)	(0.0119)	(0.0170)	(0.106)	(0.0507)	(0.117)
gov	-0.0325	-0.0328***	-0.0276	-0.0392	-0.0319	-0.0726
	(0.0217)	(0.0127)	(0.0197)	(0.0347)	(0.0205)	(0.0474)
pol	-0.00169	-0.000855	0.000334	0.0105*	0.011***	0.0172**
	(0.00329)	(0.00170)	(0.00241)	(0.00634)	(0.00361)	(0.00678)
traop	0.0784**	0.0583***	0.0691**	0.00864	-0.0372	-0.0244
	(0.0315)	(0.0204)	(0.0347)	(0.0628)	(0.0354)	(0.0733)
finop	-0.0935***	-0.0596***	-0.0795**	0.0595	0.0728**	0.0885
	(0.0284)	(0.0212)	(0.0345)	(0.0569)	(0.0352)	(0.0645)
fintraop	0.000727**	0.000450**	0.000637**	-0.000816	-0.0011**	-0.00128
	(0.000305)	(0.000202)	(0.000313)	(0.00086)	(0.00053)	(0.00099)
com	0.0104	0.0107***	0.0128***	0.00971	0.012***	0.00726
	(0.00658)	(0.00338)	(0.00491)	(0.00785)	(0.00450)	(0.00954)
trapol	0.00032	0.00028*	0.000159	-0.000101	-0.0001***	-0.0002**
	(2.87e-05)	(1.53e-05)	(2.07e-05)	(8.83e-05)	(5.03e-05)	(9.16e-05)
Constant	-0.171	-0.0249	-0.120	0.223	0.452***	0.443
	(0.135)	(0.0884)	(0.139)	(0.285)	(0.160)	(0.329)
Hausman test		11.99			15.57	
		(0.213)			(0.1128)	
Observations	372	372	372	372	372	372
R-squared			0.978			0.970
N	12	12	12	12	12	12

Robust standard errors in parenthesis ***p<0.01, **p<0.05, *p<0.1

Real GDP per capita, which is a proxy for economic development, reveals positive coefficient, but only statistically significant in ECOWAS for all regression. This means as incomes of this

region increase, more financial services are demanded, which can lead to the expansion of the financial sector. This is in line with the expectations and it corroborates existing studies (see, Boyd et al., 2001; Law & Habibullah, 2009; Law & Azman, 2012). Like the composite measure of financial development, inflation present detrimental effects on financial depth of the two regions with the effects in ECOWAS over five times that of SADC as indicated by all models. In the same direction, government expenditure reveals a negative effects on financial depth of both regions, but only statistically significant in SADC with the FGLS regression.

However, governance system is not statistically significant in SADC. On the contrary, it is an important determinant of financial depth in ECOWAS. The coefficient is not only positive, but statistically significant under all regressions. This is intuitive because a more democratic governance results in protection of private property, and hence an incentive to the financial sector to grow. However, the complementarity between trade and governance system reveals that more democratic governance results in trade openness to promote financial depth in SADC, but this is statistically significant under only the FGLS regression. In contrast, this complementarity term is negatively related to financial depth in ECOWAS, indicating that less democratic governance complement trade to promote financial development. This argument may be intuitive since democracy is a necessary condition, but not as sufficient condition to promote FSD, as evidenced by development dictators of South Asia.

Additionally, more trade openness alone promotes financial depth, but financial openness alone retards the development in all regressions in SADC. The complementarity term reveals that more financial and trade openness are important determinants of financial depth in SADC. This finding corroborates the findings of the composite measure and, therefore, gives a partial support for the Rajan and Zingales assertion. On the contrary, in ECOWAS, the complementarity term indicates a negative coefficient, which suggests that relatively closed economies stand to benefits from opening up trade or their financial sector; however, it is only the FGLS regression that shows the coefficient is significant. It also indicates that financial openness alone induces financial development of the region.

Finally, access to communication shows positive coefficients in all regressions, but only statistically significant in FGLS and PCSE in SADC. In ECOWAS, it is only the FGLS that reveals that the variable is significant at 1%. The magnitude of the impact is almost similar in the two regions.

4.4.4 Estimated results of ratio of domestic money bank assets to the sum of domestic money bank assets and Central Bank assets as a dependent variable

Table 4.4.4 reports the results of the ratio of bank assets to the sum of bank assets and central bank assets as a measure of financial development. It indicates that the relationship under investigation is adequately modelled by the FE representation as confirmed by the Hausman test. Hence, we implement the LSDV approach. The results show that even though the coefficient of finance-inflation relationship is negative in SADC for the three methods, which is in line with the earlier results, the coefficient under PCSE approach is statistically insignificant. This important finding reiterates the detrimental effect of inflation on financial development of the region. On the contrary, in ECOWAS inflation-finance coefficient for the three models does not only reveals mixed results, but are all statistically insignificant. This is not surprising because theories such as those proposed by Azariadis and Smith (1996) and Choi et al. (1996) argue that a threshold effect between inflation and finance exists. Under these theories, certain level of inflation is desirable for FSD and above which its effects will results in their detrimental impact on FSD. This may be the case when this type of measure of financial development is used.

More and better governance system promotes financial development as indicated by the FGLS and PCSE approaches in SADC, but this contracts financial development in ECOWAS. However, for the interaction term between governance and trade openness, the LSDV approach confirms a statistically significant positive effect on financial development in ECOWAS. This is opposite in SADC, as indicated by FGLS method.

The Table also indicates that even though there is partial support for Rajan and Zingales' hypothesis in SADC, thus confirming the earlier assertion of composite results, only the results in FGLS is significant. However, this is again rejected in ECOWAS. Finally, more access to communication infrastructure is again important in promoting financial development in these regions.

Table 4.4.4: Results of ratio of domestic money bank assets to the sum of domestic money bank assets and central bank assets

Variables	SADC			ECOWAS		
	FE(LSDV)	FGLS	PCSE	FE(LSDV)	FGLS	PCSE
	Bank assets to the sum of bank assets and central bank assets			Bank assets to the sum of bank assets and central bank assets		
$dmba_{t-1}$	0.615***	0.897***	0.850***	0.782***	0.906***	0.898***
	(0.0622)	(0.0205)	(0.0385)	(0.0349)	(0.0193)	(0.0329)
rgdppc	-0.0652	-0.00204	-0.00869	0.172**	-0.0211**	-0.0166
	(0.0485)	(0.00467)	(0.0140)	(0.0793)	(0.00951)	(0.0310)
inflation	-0.026***	-0.0249*	-0.0175	0.0423	-0.0208	-0.0306
	(0.00585)	(0.0130)	(0.0197)	(0.0937)	(0.0448)	(0.0885)
gov	0.0236	0.00792	0.0237	0.0115	0.00287	-0.00252
	(0.0249)	(0.00845)	(0.0247)	(0.0331)	(0.0112)	(0.0264)
pol	0.00648	0.00551***	0.00807*	-0.0126**	-0.00143	0.000476
	(0.00375)	(0.00131)	(0.00433)	(0.00575)	(0.00232)	(0.00550)
traop	0.0565	0.0222***	0.0315	0.0388	0.0215	0.0292
	(0.0396)	(0.00795)	(0.0313)	(0.0528)	(0.0243)	(0.0509)
finop	-0.0342	-0.0208***	-0.0453	0.0302	0.0155	0.0355
	(0.0240)	(0.00681)	(0.0342)	(0.0456)	(0.0221)	(0.0448)
fintraop	0.000381	0.000170**	0.000359	0.000154	-0.000106	-0.000355
	(0.000216)	(6.99e-05)	(0.000313)	(0.000677)	(0.000327)	(0.000649)
com	0.0221*	0.00531*	0.0121	0.0173**	0.00908***	0.0110**
	(0.0117)	(0.00295)	(0.00905)	(0.00698)	(0.00336)	(0.00520)
trapol	-0002.31	-0.0003***	-0.000479	0.000264***	0.000365	0.000161
	(3.13e-05)	(1.05e-05)	(3.10e-05)	(9.05e-05)	(3.30e-05)	(7.94e-05)
Constant	1.661**	0.319***	0.441***	-0.380	0.427***	0.401
	(0.618)	(0.0686)	(0.170)	(0.437)	(0.117)	(0.260)
Hausman test		77.86			20.57	
		(0.0000)			(0.0147)	
Observations	372	372	372	372	372	372
R-squared	0.909		0.992	0.903		0.981
N		12	12		12	12

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

4.4.5 Estimated results of bank private credits (percentage of GDP) as a dependent variable

Table 4.4.5 reports bank private credit as a percentage of total economic activities of the two regions. The diagnostic test indicates that the FE is the appropriate model in both regions. However, in ECOWAS random effect approach was rejected at 10% level of significance. Hence, we report the results of both approaches, which give almost similar results.

From Table 4.4.5, like the earlier discussions, inflation presents detrimental effects on private credit as a percentage of GDP in both regions with the effects in ECOWAS the much more. The LSDV presents statistically significant reverse relationship between government

expenditure and financial development in SADC, whereas its coefficients in all models in ECOWAS are not significant.

Furthermore, the results indicate that whereas individually, trade openness is statistically insignificant, financial openness reverses financial development in SADC. However, simultaneous opening of trade and financial sector raises financial development as evidenced by the three models. Hence, this confirms full support for Rajan and Zingales hypothesis in terms of private credit as a percentage of total economic activities of the region. However, this hypothesis is rejected in ECOWAS. Finally, access to communication infrastructure robustly promotes private credit as a measure of financial development in SADC at 1% significance levels, but is only statistically significant at 10% in ECOWAS under the LSDV approach.

In conclusion, it can be observed that, the individual measures of financial development indicate mixed response to the set of controls in the models. This validates the idea of the use of the composite measure of financial development.

Table 4.4.5: Results of Bank private credits as a percentage of GDP

Variables	SADC			ECOWAS			
	FE(LSDV)	FGLS	PCSE	FE(LSDV)	RE(AR 1)	FGLS	PCSE
	Bank private credits as a percentage of GDP			Bank private credits as a percentage of GDP			
$Bankprcr_{t-1}$	0.819***	0.906***	0.902***	0.845***	0.875***	0.875***	0.871***
	(0.0489)	(0.0158)	(0.0269)	(0.0274)	(0.0212)	(0.0194)	(0.0235)
rgdppc	-0.0307	0.0195	0.00522	0.342***	0.0642*	0.0741***	0.0650*
	(0.0464)	(0.0123)	(0.0212)	(0.100)	(0.0386)	(0.0256)	(0.0353)
inflation	-0.0729***	-0.0648***	-0.0524	-0.294***	-0.380***	-0.364***	-0.373***
	(0.0203)	(0.0187)	(0.0345)	(0.112)	(0.108)	(0.0717)	(0.112)
gov	-0.0952***	-0.0174	-0.00843	0.0215	0.0162	0.0128	-0.000366
	(0.0234)	(0.0190)	(0.0413)	(0.0408)	(0.0423)	(0.0243)	(0.0394)
pol	0.000639	0.00292	0.00594	-0.00625	-0.00403	-0.000959	0.000172
	(0.00552)	(0.00256)	(0.00555)	(0.00655)	(0.00728)	(0.00437)	(0.00641)
traop	0.0515	0.0103	0.0747	0.0246	0.0630	0.0332	0.0134
	(0.0645)	(0.0215)	(0.0520)	(0.0630)	(0.0728)	(0.0437)	(0.0778)
finop	-0.0884**	-0.0617***	-0.113***	-0.0356	-0.0677	-0.0339	1.93e-05
	(0.0329)	(0.0191)	(0.0429)	(0.0545)	(0.0656)	(0.0402)	(0.0701)
fintraop	0.000889**	0.000562***	0.00109**	0.000317	0.000760	0.000269	-0.000345
	(0.000334)	(0.000196)	(0.000445)	(0.000810)	(0.000989)	(0.000615)	(0.00107)
com	0.0550***	0.0368***	0.0424***	0.0142*	0.0147	0.00589	0.0138
	(0.0141)	(0.00592)	(0.0131)	(0.00824)	(0.00960)	(0.00745)	(0.0102)
trapol	-0.000629*	-0.000248	-0.0006	0.00089	0.000754	0.000422	0.000386
	(3.41e-05)	(2.16e-05)	(4.53e-05)	(9.86e-05)	(0.000103)	(6.71e-05)	(8.98e-05)
Constant	0.527	0.00490	-0.227	-1.921***	-0.395	-0.308	-0.135
	(0.353)	(0.0972)	(0.214)	(0.604)	(0.341)	(0.209)	(0.354)
Hausman test		20.98				14.87	
		(0.0212)				(0.0946)	
Observations	372	372	372	372	372	372	372
R-squared	0.970		0.946	0.938			0.959
N		12	12		12	12	12

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

4.4.6 Estimated results using SURE for composite measure of financial development as a dependent variable

As mentioned above, the presence of cross-section dependence as evidence by the Breusch-Pagan (LM) test cannot be overlooked. In light of this, we present the SURE estimates in Tables C.0.5 and C.0.6 in the Appendix for SADC and ECOWAS respectively. Table C.0.5 provides disaggregated analysis of individual countries. It provides strong evidence that inflation reverses financial development in four countries, which include Madagascar, Mauritius, Zimbabwe and DRC, with Mauritius highly affected (-0.307). Others include South Africa and Swaziland, but their coefficients are statistically insignificant. This lends support to the fact that South Africa and Swaziland belong to the Common Monetary Area (CMA) under which South Africa's monetary policy continue to influence and reflect in the group. In countries such as Botswana, Malawi, Tanzania and Mozambique, inflation presents positive impact on financial sector development, but with the coefficient in Botswana being statistically

significant. The reason for this insignificant effect of inflation on FSD could be threshold effects of inflation on financial development.

Comparing with countries in ECOWAS, the results show that the negative effects of inflation on financial development are found to be statistically significant in five countries. These countries are Cape Verde, Niger, Nigeria, Senegal and Togo with Niger experiencing the biggest effect of 0.97. This indicates that a 10% increase inflation will results in almost a 10% fall in the development of the financial sector. Others that reveal negative but statistically insignificant coefficients include Cote d' Ivoire, The Gambia, Ghana and Mali. The study, therefore, argue that the disaggregated analysis gives support to the reason why the impact of inflation in ECOWAS is greater than in SADC using LSDV, FGLS and PCSE.

On trade and financial openness and their interaction term, the result seems to suggest partial support for Rajan and Zingales' hypothesis in four countries in SADC, which includes Malawi, Mauritius, Tanzania and DRC. However, trade and financial openness alone promotes financial development in Botswana and Zimbabwe respectively, leading to a rejection of the hypothesis. Hence, in SADC, there is no country that provides full support for the hypothesis. However, in ECOWAS, only Cote d' Ivoire seems to provide evidence of full support for the hypothesis. The results indicate that more opening of the financial sector alone will reverse financial development. On the contrary, simultaneous opening of trade and financial sector will promote financial development. This is in line with the theory. Other countries in the region that provide partial support for the hypothesis include Benin, Cape Verde, the Gambia, Ghana, Mali, Niger, Nigeria and Togo.

Furthermore, communication access accelerates financial development in five out of the ten countries in SADC which includes Botswana, Madagascar, Swaziland, Tanzania and DRC. In Malawi and Mozambique, a positive relationship is presented, but the coefficients are statistically insignificant. In South Africa and Zimbabwe, an inverse relationship is established. Comparing with ECOWAS, 60% of the countries reveal statistically significant positive relationship between communication infrastructure and financial development, which includes Benin, Cape Verde, Cote d' Ivoire, Niger, Senegal and Togo.

The system of governance and its interaction with trade openness also reveal mixed results in the two regions. Whereas governance system promotes financial development in Madagascar, Mauritius and Mozambique, it reverses financial development in Malawi. The interactive term

(i.e *pol* and *traop*) indicates a reversed relationship with finance in Botswana, Madagascar and Mauritius, but positive effects in countries like Malawi, South Africa and DRC. For ECOWAS, the system of governance promotes finance in Cape Verde and the Gambia, but retards financial development in Cote d' Ivoire, Mali and Togo. However, the interactive term is negative in Cape Verde and the Gambia, but positive in Mali and Togo.

Finally, as expected, the lagged dependent variable promotes financial development in seven countries of the two regions, whereas the measure of economic development promotes financial development in only six countries in SADC and five countries in ECOWAS. Government spending presents mixed results in the two regions. In SADC, it reverses financial development in seven countries, only the results of one country is statistically significant (i.e. Tanzania). The financial sector of Mozambique benefits from more government expenditure. Unlike SADC, the effects of government spending on financial development is negative in six countries with the coefficient of Gambia and Ghana statistically significant. This is not surprising, since in these countries, especially Ghana, government keep issuing treasury bills and Eurobond which channel resources away from the financial sector. Like SADC, only one country's financial system in ECOWAS, that is Cote d' Ivoire, seems to benefit from more government expenditure.

4.5 Summary and Conclusion

In this chapter, the study provided an empirical analysis of a comparative study between ECOWAS and SADC on the role of inflation in explaining the state of financial development of the two regions. Furthermore, the study investigated the role of access to communication infrastructure on financial development and examined whether the Rajan and Zingales hypothesis, which posits that simultaneous opening of both trade and financial sector is the key for financial development, is supported in the two regions. Using dynamic panel approaches and a composite measure of financial development, the findings provided evidence that, in both regions, inflation robustly reversed financial development with the effects in ECOWAS more.

In addition, the study indicated that even though more simultaneous opening of the financial sector and trade lead to more financial development in SADC, trade openness alone can still induce development in the sector. However, more financial openness alone is detrimental to financial development of the region. This provides partial support for the hypothesis. In ECOWAS, the hypothesis is rejected.

Furthermore, the communication variable, which is in the form of access to mobile and telephones per thousand people, indicated statistically strong positive effects on financial development in both regions. The results indicated that the financial system of both regions will expand more from increased access to mobile and telephones, with SADC benefiting more than ECOWAS.

Other conditioning variables include government expenditure. More government expenditure reverses financial development in SADC, but not in ECOWAS. Governance system and its interaction term were all statistically insignificant. The study, therefore, argues that the main factors explaining financial development in SADC are inflation, trade and financial openness and their complementarity term, government spending, and access to mobile and telephones. However, in ECOWAS, inflation, access to mobile and telephones and measure of economic development are the main factors influencing the development of the financial system.

On disaggregated country-level analysis using SURE, the results presented mixed evidence. The evidence showed support to the dynamic panel approach, which posits that inflation is a credible threat to financial development in many countries of the two regions. Furthermore, whereas access to communication induces financial development in many countries of the two regions, many countries revealed partial support for the Rajan and Zingales theory, with Cote d' Ivoire in ECOWAS revealing full support for the theory.

Chapter 5

Financial sector development and threshold effect of inflation in ECOWAS and SADC: A Panel smooth transition regression approach

5.1 Introduction

The basic aim of financial sector policies is to induce growth and stability in the sector. This is a grave concern in SSA and many other developing regions after series of financial sector reforms of the 1980s and 1990s. To cause development in the financial sector, financial sector policies mostly aim at inducing competition that will promote efficiency and subsequent expansion of the sector. However, despite measures being taken both in the past and present, the financial sector of SSA is still relatively under developed, revealing FSD deficit. From this perspective, this chapter argues that these policies are essential, but need the support of other enabling macroeconomic conditions to induce commendable development in the sector. Further investigations are thus required, particularly, on the optimal level of macroeconomic policy variable of inflation, which is essential for promoting financial development.

Existing models, such as by Huybens and Smith (1998), indicate that macroeconomic policy variable of inflation has a detrimental effect on the financial sector's ability to operate efficiently. This is because it interferes with the development process of the sector. The models postulate that, increases in the rate of inflation erode returns on investment, which adversely affect credit market friction. This, in turn, impacts on FSD negatively and hence, long-run real activity. Studies such as those conducted by Boyd et al. (2001), BenNaceur and Ghazouani (2005), Detragiache et al. (2006) and Kablan 2010) as well as Chapter 4 of this study, and many others provide empirical evidence in supported of this theory.

However, other theories argue that there is existence of threshold effects of inflation on FSD, as in Azariadis and Smith (1996) and Choi et al. (1996). These theories propose that some amount of inflation is desirable for FSD up to certain threshold level. Beyond this threshold level will witness the detrimental effects of inflation on the sector's development. Hence, it is important, especially for policy makers to understand the dynamic relationship between inflation and FSD in order to make sound and achievable policies that will increase development in the sector. Consequently, exploring further the link between inflation and financial development in terms of threshold effects is vital. As a precondition, policy makers

should aim at low rates of inflation so as to avoid the detrimental effect of this variable in the process of financial development. The question to ask then is 'What is the optimal level of inflation that is required and suitable for FSD?'

The main objective of this chapter is to determine this optimal level (threshold level) of inflation suitable for FSD. This is done by considering a comparative study between ECOWAS and SADC which is crucial since it reveals the peculiarities in each bloc and the extent by which this macroeconomic policy variable is beneficial for FSD in each bloc and why if there are any differences between the two regions. Moreover, it is observed in Chapter 4 that inflation presents detrimental effects on financial development in both regions.

Existing empirical studies on threshold effects of inflation on FSD is relatively limited and few, if not nothing exists, especially on SSA. However, some progress is being made. Some of the few studies include Boyd et al. (2001). This study determined the optimal level of inflation suitable for financial development for combination of developed and developing countries. Even though the study deepens our understanding on the behavior of inflation on financial development, it had the following weaknesses. The study imposed an a *prior* threshold of inflation instead of endogenously estimating it. In addition, no formal test is done to establish whether there exists such threshold effect in the data between inflation and financial development. Other studies like that of Rousseau and Wachtel (2002), Rousseau and Yilmazkuday (2009) and Jude (2010) did not examine the threshold of inflation directly on FSD but an indirect effect of inflation on finance-economic growth relationship. Furthermore, these studies only used single measures of financial development instead of composite measure that captures broadly the basic functional forms of the financial sector. Finally, the data used in these studies are usually made up of developed and developing economies. For instance, Boyd et al. (2001) used 97 countries of both developed and developing economies, whereas Rousseau and Watchtel (2002) as well as Jude (2010) used 84 and 71 respectively. The findings are generalised for both developed and developing economies and may be deceptive.

Based on the above gap in the literature, this chapter makes three main contributions. Firstly, the study used a composite measure of FSD that is constructed using three measures of financial development indicators. Secondly, although the previous studies provide some evidence that inflation has some threshold effects on FSD, they are based on non-linear models that are not adequate to model non-linearities properly as in some cases the threshold value is imposed such as in Boyd et al. (2001) and no formal test to establish the existence of such non-linearity is

conducted as in Boyd et al. (2001) and Abbey (2013). Hence, in this chapter, the study contributes to the inflation-financial development literature by not only testing for the existence of thresholds effects of inflation on financial development but use a more robust and novel Panel Smooth Transition Regression (PSTR) approach recently developed by González et al. (2005) that endogenously estimates the threshold value of inflation. Even though PSTR has been used in some studies such as inflation-growth nexus, as in Bessec and Fouquau (2008), Omay and Kan (2010), Ibarra and Trupkin (2011) and Seleteng et al. (2012), its application in inflation-finance relationship directly is not given attention and has yet to be analyzed. Lastly, the study is conducted on the direct effects of inflation threshold on financial development in the context of comparing regional blocs in SSA.

To our knowledge this is the first study conducted that: (i) provides an exclusive comparison of regional groupings in (especially in SSA) to determine the thresholds effects of inflation on financial development that is appropriate to induce FSD; (ii) apply the novel technique of PSTR to panel data that endogenously determines the threshold level of inflation on FSD in the two regions. Hence, this study is dissimilar to earlier studies like Boyd et al. (2001), Khan and Ssnhadji 2001), Aziakpono (2004) and Rousseau and Yilmazkuday (2009). The PSTR approach has an advantage of estimating the threshold value rather than imposing it by *a prior*. In addition, it allows for speed of transition from one regime to another depending on the threshold variable.

As a preview of the results, the PSTR approach does not only confirm a single threshold of 17.9% and 14.5% of inflation for ECOWAS and SADC respectively, but also reveals statistically significant negative effects of inflation on financial development for inflation rates above the thresholds. These results suggest that countries in ECOWAS and SADC can prevent inflation from interfering with the efficient operation of the financial system in the two regions if only they can obtain and maintain inflation rates below their respective inflation thresholds.

The rest of the chapter is organized as follows: Section 5.2 discusses the literature review. Section 5.3 contains the methods and model specification which gives description of PSTR. The data used is described in Section 5.4. The analysis and discussion of results are done in Section 5.5. Section 5.6 gives summary and conclusion of the chapter.

5.2 Literature Review

Existing theories on the threshold effect of inflation on financial development propose that a negative relationship between financial development and inflation is only noticed when inflation rate exceeds certain threshold, thereby suggesting a nonlinearity between finance and inflation (Azariadis and Smith, 1996). The models developed by Azariadis and Smith (1996) and Choi et al. (1996) argue that when inflation is suitably low, credit market frictions may be "nonbinding" which renders inflation incapable of distorting the flow of information in the financial market. With this, the effects of increases in inflation is powerless in impeding financial sector's ability to allocate resources efficiently. The models explain that under this low inflation condition, coupled with sufficiently high real rates of returns on savings, adverse selection in the credit markets is not binding. This implies that credit rationing is not required to induce lenders to lend rather than borrow. This thus suggests that increases in inflation induces agents to substitute cash for investment in physical or human capital or both which will stimulate long run growth.

Moreover, the theories posit that when inflation increases excessively, real rates of returns on assets will be pushed down, resulting in credit market frictions becoming binding. If increases in inflation exceed this threshold level or critical value, subsequent increases in inflation will cause credit rationing to intensify. This is capable of distorting information flows and, as a consequence, harm the efficient workings of the financial system. The transmission mechanism implies that lower rates of returns caused by increases in inflation will induce severity of adverse selection, which will necessitate widespread credit rationing in the economy. Hence, this effects result in reduction in financial system expansion. Thus, an important conclusion of these models is that threshold effects exist between inflation and financial development.

The theories further predict a second threshold effects of inflation on finance. They contend that if inflation exceeds this critical value, perfect foresight dynamics are related with endogenous oscillations in all variables, causing inflation to be highly correlated with inflation variability and assets return volatility[29]. In addition, a third threshold effect is confirmed by other models[30]. When inflation reaches this critical value all the harm to financial system

[29] See Boyd et al. (2001) for more details.
[30] Boyd and Smith (1998) and Huybens and Smith (1998, 1999) have provided more details

development has already been done and further increases in inflation have no extra impact for financial development or growth.

On a broader empirical literature relating inflation to financial development, contemporary empirical literature has mostly recorded a significant negative relationship. These studies include Haslag and Koo (1999), BenNaceur and Ghazouani (2005), Detragiache et al. (2006), Zoli (2007) and Kablan (2010). Studies on SSA include Aziakpono (2004) on Southern Africa Custom Union (SACU), McDonald and Schumacher (2007) and Andrianaivo and Yartey (2010). All these studies documented evidence that increases in inflation reverse FSD.

Empirical literature on threshold effects of inflation has largely been devoted to explaining inflation-growth nexus and finance-growth nexus. Relatively few studies are directed to the determination of the direct effect on inflation-finance relationship. Studies that attempted to find the threshold effects of inflation on growth include Vaona and Schiavo (2007), Omay and Kan (2010), López-Villavicencio and, Mignon (2011), Ibarra and Trupkin (2011) and Seleteng et al. (2012). These studies argue that the debilitating effects of inflation on economic growth is only observed after certain threshold level.

On the nascent empirical literature directed at finding the threshold effects of inflation on finance-growth relationship, studies are usually a broad mixture of both developing and developed economies. These studies attempt to estimate the threshold value of inflation suitable for the financial sector to induce economic growth. Among such studies include the study of Rousseau and Wachtel (2002). Rousseau and Wachtel (2002) used five-year averages of measures of financial development (M3 and M3 less M1 and total credit to GDP), inflation, and economic growth rates of 84 countries for the period 1960 to 1995. The study concluded that there is an inflation threshold for the finance-growth relationship that lies between 13% and 25%. This implies that, above these thresholds, the financial sector is powerless in inducing economic growth in these countries. In a similar way as the study of Rousseau and Wachtel (2002), Lee and Wong (2005) obtained single threshold value of 7.25% in Taiwan and double thresholds of 2.5% and 9.66% in Japan. The study employed a threshold autoregression (TAR) model

Further studies in this area include Rousseau and Yilmazkuday (2009) and Jude (2010). Rousseau and Yilmazkuday (2009) posit that higher levels of financial development, combined with low-inflation, are related to higher rates of economic growth, especially in lower income

countries. However, financial development looses much of its explanatory power in the presence of high-inflation. The study found double threshold of inflation between 4% and 19%. Jude (2010) used PSTR on data of 71 panel of countries that include both developed and developing countries for the period 1960–2004. The conclusion of the study is that there is a double threshold of inflation of 9.5 % and 24 % for finance-growth relationship beyond which the finance-growth coefficients are negatives. These findings are in line with the existing theory. The implication is that when inflation rates are high, financial intermediation becomes more difficult, since this high inflation exacerbates information asymmetry and, consequently, render the FSD powerless to induce economic growth, if not retard it. Also in line with the studies of Rousseau and Yilmazkuday (2009) and Jude (2010), Huang et al. (2010) applied Caner and Hansen's (2004) instrumental-variable threshold regression approach and found 7.3% and 7.7% respectively for policy variables alone and for full sample. The study used private credit as a measure of FSD and followed Rousseau and Wachtel (2002) in using the period-averaged inflation as a candidate threshold variable. The study used the dataset of Levine et al. (2000).

Even though the above empirical studies broaden our understanding on the threshold effects of inflation on financial development, these studies focused mainly on specific threshold value beyond which financial sector loses its growth inducing power on economic growth. Thus, these group of studies failed to inform us about the asymmetric effects of inflation directly on FSD

Studies that directly estimated the threshold effects of inflation on financial development as mentioned earlier are relatively few. No study is specifically done on SSA in this area. The available studies attempted to determine at what threshold level does increase in inflation reverse FSD. Among the few known studies is the work of Boyd et al. (2001). This study obtained a double digit inflation threshold of 15% for FSD for a number of developing and developed countries. The study indicates that the relationship between finance and inflation is nonlinear for the 97 countries in their sample for the period 1960–1995. However, as indicated, the main weakness of the study is the imposition of threshold by *a prior* and also lack of test of existence of nonlinearity. This study presented results on three different measures of FSD, which include liquid liabilities, bank assets and private credit. Also in the same year, Khan and Senhadji (2001) used a sample of large cross-country and found evidence of the existence of threshold of inflation between 3% and 6% a year. These findings depend on the specific

measure of financial depth used. The measures are domestic credit to the private sector, summation of domestic credit and stock market capitalization and summation of the second indicator with private and public sector bonds market capitalization[31]. However, this study is made up of 168 countries that included both developed and developing economies. Hence, generalization of the threshold value for both developed and developing economies may be misleading, since there are significant differences between these groups of countries.

Finally, on a single country analysis, Abbey (2013) argues that inflation threshold rates between 11-16% per annum is observed in the inflation-finance relationship in Ghana. The study used the cointegration approach and the Granger causality testing procedure coupled with Conditional Least Squares technique to address the relationship between inflation and FSD. The study thus recommended price stability for inflation rates between 11-16% in support of financial development in Ghana. The study relied on ratio of private sector credit to GDP and the market capitalization ratio separately as measures of FSD.

From the ongoing discussion on the empirical literature, we can thus highlight the following observations or gaps from the above literature: (i) that no study has been conducted on the direct effects of inflation threshold on financial development in the context of comparing regional blocs; (ii) some studies that attempted to examine the threshold effect directly on financial development imposed the threshold value by an *a prior* which can either be too low or too high. (iv) all the studies discussed used a single measure of financial development which are unlikely to capture broadly the financial sector. Therefore, the main contributions of this paper is not only to examine the direct effects of inflation threshold on financial development in the context of regional comparison of ECOWAS and SADC in SSA, but also to create a composite measure of FSD and apply a novel PSTR that has the advantage of endogenously determining the threshold value.

5.3 Method and Model specification

To capture the threshold effect of inflation on financial development, we follow the approach of González et al. (2005) by specifying the PSTR model. The advantage of this model is that it can estimate the threshold parameter endogenously. This approach allows the relationship between financial development and inflation to depend on the level of the threshold variable. The PSTR is a fixed effect model with exogenous regressors and caters for heterogeneity

[31] The authors acknowledged that this last variable was only available for advanced countries.

problem in the model. According to González et al. (2005), the model permits parameter heterogeneity by assuming that the regression coefficients are continuous function of an observable variable through a bounded function of this variable, called transition function, and fluctuates between regimes.

The PSTR has some advantages over other earlier approaches such as the Panel Threshold Regression (PTR) of Hansen (1999) that also estimates the threshold effect. According to Hansen (1996, 1999), the PTR model divides the observations into two or more regimes and these regimes are separated by different regression slopes. PTR approach requires that different groups of observations can clearly be distinguished from each other based on the value of the threshold variable with sharp or discontinuous 'borders' or thresholds separating each group. In practice, this is more restrictive and may not always be feasible. Hence, an advantage of PSTR is the generalization of the PTR model that relaxes this restriction of the approach. In particular, PSTR allows the regression coefficients to change gradually when moving from one group to another. This permits smooth transition from one regime to another which is not possible in the Hansen (1999) approach.

A simple two-regime PSTR model with a single transition function is specified in equation 5.1 but can be generalized to allow for more than two different transition functions as in equation 5.2:

$$y_{it} = \alpha_i + \beta_0 x_{it} + \beta_1 x_{it}\varphi(q_{it};\, \gamma, \delta) + \varepsilon_{it} \tag{5.1}$$

$$y_{it} = \alpha_i + \beta_0 x_{it} + \sum_{j=1}^{r} \beta_j\, x_{it}\, \varphi_j\left(q_{it}^{j};\, \gamma, \delta\right) + \varepsilon_{it} \tag{5.2}$$

The dependant variable y_{it} is a scalar and represents indicator of financial development *(findex),* which is a composite measure constructed in Chapter 3. Individual country is represented *i* at time *t* and i=*1 ……N; t=1…….. T*. $\varepsilon_{i,t}$ is the error term. The variable x_{it} is a k-dimensional vector of regressors. We modeled finance-inflation relationship using inflation rate *(inflation),* ratio of government expenditure to GDP *(gov)*, financial openness *(finop)*, trade openness *(traop)* and real GDP per capita *(rgdppc)* defined by x_{it} following studies by Boyd et al. (2001) and Baltagi et al. (2009). The study extend this model to include communication infrastructure as defined in Chapter 4. An important issue, namely endogeneity problem that may lead to biased coefficients is addressed considering lags of the variables as in Baltagi et al. (2009) and Jude (2010).

The α_i is fixed country effects and q_{it} is the threshold variable which is the rate of inflation. The threshold parameter is δ and $j = 1 \ldots r$. γ is slope parameter and denotes the smoothness of the transition from one regime to the other. The transition function is $\varphi(q_{it};\ \gamma, \delta)$, which is a continuous function of the observable variable q_{it}. It is a normalized to be bounded between 0 and 1, and these extreme values are associated with β_0 and $\beta_0 + \beta_1$. In general, the value of q_{it} determines the value of $\varphi(q_{it};\ \gamma, \delta)$. More precisely, the coefficient of inflation is equal to β_0 if it is smaller than δ and $\beta_0 + \beta_1$ if it is larger than δ. In this study, the coefficient β_0 can be positive or negative. If it is positive, it can be statistically significant or may be insignificant. If $\beta_0 < 0$, we expect it to be statistically insignificant. $\beta_0 + \beta_1$ is expected to be negative and statistically significant.

The transition function $\varphi(q_{it};\ \gamma, \delta)$, follows a logistic function or exponential function. Thus, following the work of Granger and Terasvirta (1993) for time series Smooth Transition Autoregressive (STAR) models, González et al. (2005) consider the following logistic specification function:

$$\varphi(q_{it};\ \gamma, \delta) = \left[1 + exp\left(-\gamma \prod_j^m (q_{it} - \delta_j)\right)\right]^{-1},\ \gamma > 0,\ \delta_1 \leq \delta_2 \leq \cdots \delta_m \qquad (5.3)$$

Where $\delta = (\delta_1 \ldots \ldots \delta_m)'$ is a vector of *m*-dimensional location parameters and the restrictions $\gamma > 0$ and $\delta_1 \leq \delta_2 \leq \cdots \delta_m$ are imposed for identification purposes. According to González et al. (2005), it is usually sufficient in practice to consider *m = 1* or *m =2* as these values allow for commonly encountered types of variation in the parameters. If *m = 1,* the model implies two regimes with low and high values of q_{it}.

In general, if the transition variable q_{it} is different from inflation, the sensitivity of finance to inflation for *ith* country at time *t* is defined as follows from equation 5.1:

$$e_{it} = \frac{\partial y_{it}}{\partial x_{it}} = \beta_0 + \beta_1 \varphi(q_{it};\ \gamma, \delta) \qquad \forall i,\ \forall t \qquad (5.4)$$

By definition of the transition function $\beta_0 \leq e_{it} \leq \beta_0 + \beta_1$, if $\beta_1 > 0$ or $\beta_0 + \beta_1 \leq e_{it} \leq \beta_0$, if $\beta_1 < 0$, since $0 \leq \varphi(q_{it};\ \gamma, \delta) \leq 1, \forall q_{it}$.

Another advantage of the PSTR model is that the inflation-finance coefficient may be different from estimated parameters of the extreme regions i.e. β_0 and β_1. As demonstrated by equation

5.4, these parameters do not directly correspond to the direct impact of inflation on finance. Parameter β_0 refers to the direct effects of inflation on finance if the transition function $\varphi(q_{it};\ \gamma, \delta)$ tends towards 0. On the contrary, the sum of $\beta_0 + \beta_1$equals' inflation-finance coefficient only if the transition function $\varphi(q_{it};\ \gamma, \delta)$ tends to 1. In between these two extremes, there are infinite number of inflation-finance coefficients which are weighted average of the parameters β_0 and β_1. It is therefore important to observe that in the PSTR model, it is generally difficult to interpret directly the values of these parameters as in Logit and Probit models. It is generally preferable to interpret the signs of the coefficients as either an increase or decrease depending on the value of the transition variable. Therefore a negative/positive sign of the parameter β_j means that an increase in the transition variable involves a decrease/increase of the inflation-finance coefficient[32].

Following the procedure described by González et al. (2005), we test linearity against the PSTR model and determine the number of *r* transition functions. This is important since PSTR is not identified if the data-generating process is linear. We follow Colletaz and Hurlin (2006) and used three tests: Wald Test, Fischer Test and Likelihood Test. Once the PSTR model is established, the next stage is to identify the number of transition functions. A sequential methodological test is used. For linearity test, the null hypothesis is: $H_0: \gamma = 0$ or $H_0: \beta_1 = 0$. However, in these cases the test is non-standard since the PSTR contains unidentified nuisance parameters under the null hypothesis and a possible answer is to replace the transition function $\varphi(q_{it};\ \gamma, \delta)$ by its first-order Taylor expansion around $\gamma = 0$ in equation 5.1 which leads to the following reparameterized auxiliary regression in equation 5.5:

$$y_{it} = \alpha_i + \beta_0' x_{it} + \beta_1' x_{it} q_{it} + \cdots + \beta_m' x_{it} q_{it}^m + \varepsilon_{it}' \qquad (5.5)$$

$\beta_1' \ldots . \beta_m'$ are multiples of γ, ε_{it}' is $\varepsilon_{it} + Z_m \beta_1' x_{it}$ and Z_m is the remainder of the Taylor expansion. Hence, in this way testing the null hypothesis $H_0: \gamma = 0$ in equation 5.1 is equivalent to testing $H_0: \beta_1' = \ldots . = \beta_m' = 0$ in equation 5.5.

A similar approach is adopted to test the number of transition functions in the model if linearity test is rejected. Hence, we test the null of no remaining non-linearity in the transition function. Suppose we want to test whether there is one transition function ($H_0: r = 1$) against at least two transition functions ($H_0: r = 2$), thus we have:

[32] Gonzalez et al. (2005) provide more details.

$$y_{it} = \alpha_i + \beta_0 x_{it} + \beta_1 x_{it}\varphi_1(q_{it}^{(1)};\ \gamma_1, \delta_1) + \beta_2 x_{it}\varphi_2(q_{it}^{(2)};\ \gamma_2, \delta_2) + \ \varepsilon_{it} \quad (5.6)$$

The null hypothesis of no remaining heterogeneity can be formulated around $\gamma_2 = 0$ in equation 5.6. Again this testing problem is complicated by the presence of nuisance parameter under the null hypothesis and this is avoided by replacing the transition function $\varphi_2(q_{it}^{(2)};\ \gamma_2, \delta_2)$ by Taylor expansion around $\gamma_2 = 0$ in equation 5.7 leading to the auxiliary regression below:

$$y_{it} = \alpha_i + \beta_0' x_{it} + \beta_1' x_{it}\varphi_1\left(q_{it}^{1};\ \hat{\gamma}_1,\ \hat{\delta}_1\right) + \beta_{21}' x_{it} q_{it}^{(2)} + \cdots + \beta_{2m}' x_{it} q_{it}^{(2)m} + \varepsilon_{it}' \quad (5.7)$$

Where $\hat{\gamma}_1$ and $\hat{\delta}_1$ are estimates under the null hypothesis. The testing of null hypothesis of no remaining non-linearity is defined as H_0: $\beta_{21}' = \ldots = \beta_{2m}' = 0$ in equation 5.7. In summary, the testing procedure is as follows: Given PSTR model we test the null hypothesis that the model is linear. We proceed to two-regime PSTR if the null is rejected. With two-regime PSTR model, we test the null of no remaining non-linearity in the model and if it is rejected we move to test three-regime model. The testing continues until we cannot reject the null of no remaining non-linearity. To avoid excessive large models, at each step in the sequential procedure, the significance level must be reduced by a constant factor $0 < \tau < 1$ and we consider $\tau = 0.5$ following González et al. (2005).

Also, the time series properties of the variables used were considered since in PSTR model the variables should be stationary. This was done using Im et al. (2003) and Levin et al. (2002) approaches as shown in Chapter 3 section 3.3.1.

5.3.1 Data

The data is obtained from the World Bank's *Africa Development Indicators* (2012) and *Global Financial Development Database* (2012) and limited it to the periods 1980–2011. These are annual series. Financial variables are obtained from the latter and the rest of the data from the former. The study used the "de jure" financial openness measure obtained from Chinn and Ito index data explained in Chapter 4 (see Table D.0.1 in the appendix for details of the data used).

As recommended by Hansen (1999), the study used balanced panel. Data is available for only twelve countries in each bloc[33]. However, PSTR is sensitive to extreme observations. As Zimbabwe, the Democratic Republic of Congo (DRC) and Ghana all experienced high inflationary periods, the study excluded these countries from the calculation in order to avoid extreme observations which can potentially distort the regression results. In addition, considering that the number of countries in each region are relatively few, inclusion of the outliers have leverage on the results significantly. Furthermore, the results will not be reflective of the sample.

The data indicates that Ghana has experienced high inflation rates, ranging from double to three digits, throughout the sample period 1980–2011. Year 2011 is the exception with mean of 30.1 and maximum of 122.9. These figures are conspicuously larger than the mean and maximum (8.9 and 80.8 respectively) for the eleven countries in ECOWAS as shown in Table 5.3.1. For the mean of DRC and Zimbabwe, the data indicates 1102.5 and 374.4 respectively. This greatly contrasts with the mean of the ten other countries (17.93) in SADC as in Table 5.3.1. The maximum is 183.3 (see Table 5.3.1) against the maximum of 23,773.1 for the twelve countries. These countries thus have significant influence, which is why they serve as outliers. As PSTR is sensitive to their inclusion, the study reports the results of the sample without these countries as the main results. However, Table D.0.4 in Appendix D provides results that indicate the effects of the outliers on the threshold values in each region. The descriptive statistics of the data used for the 11 countries in ECOWAS and the 10 countries in SADC is presented in Table 5.3.1.

5.3.2 Descriptive statistics

Table 5.3.1 provides summary statistics of the variables used in the study without Ghana, DRC and Zimbabwe. The mean inflation of ECOWAS is 8.9% and that of SADC is 17.9% for the period 1980–2011. The standard deviation suggests that the dispersion from the mean in ECOWAS is relatively smaller than that of SADC. The individual country averages are also shown below the Table indicating that on average DRC and Guinea Bissau has the highest inflation rate in SADC and ECOWAS respectively. Comparing Guinea Bissau to Ghana, the data indicates that the former only experienced few years of high inflation, whereas the latter

[33] **ECOWAS** includes: Benin, Burkina Faso, Cape Verde, Cote d' Ivoire, Gambia, Ghana, Guinea Bissau, Mali, Niger, Nigeria, Senegal and Togo
SADC: Botswana, Democratic Republic Congo (DRC), Lesotho, Malawi, Mauritius, Madagascar, Mozambique, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe

country experienced high inflation almost throughout 1980–2011. Thus, making Ghana having influence on the threshold effects of inflation on financial development of ECOWAS. The other conditioning variables indicate that on average SADC performs relatively better than ECOWAS.

Table 5.3.1: Showing descriptive statistics

	ECOWAS					SADC				
Variable	Obs	Mean	Std.Dev	Min	Max	Obs	Mean	Std.Dev	Min	Max
findex	352	99.96	31.2	25.7	237.6	320	100.03	23.97	39.8	212.2
inflation	352	8.9	14.8	-14.9	80.8	320	17.93	20.9	-9.6	183.3
gov	352	14.4	5.9	4.8	54.5	320	18.3	7.8	6.3	42.2
rgdppc	352	618.7	409.5	230.09	2886.2	320	1710.5	1890.7	141.8	6592.7
traop	352	65.8	21.4	27.8	131.5	320	87.1	45.06	13.9	209.9
finop	352	-0.7	0.89	-1.9	2.4	320	-0.63	1.19	-1.9	2.43
com	352	101.3	200.7	0.68	940.8	320	151.2	277.04	2.11	1501.8

Note: Individual summary statistics of inflation;
ECOWAS: Benin = 4.3, Burkina Faso = 4.0, Cape Verde = 5.2, Cote d' Ivoire = 5.1, Gambia = 9.5, Ghana = 30.1(max=122.9), Guinea Bissau = 32.2 (max=80.8), Mali = 4.1, Niger = 3.4, Nigeria = 20.7, Senegal = 4.3, Togo = 4.9
SADC: Botswana = 10.0, DRC =1102.5, Lesotho = 10.5, Madagascar = 15.1, Malawi = 19.6, Mauritius = 8.02, Mozambique = 28.7, South Africa = 9.7, Swaziland = 10.5, Tanzania = 19.0, Zambia = 48.1 and Zimbabwe = 374.4

The panel unit roots test indicates that inflation, government expenditure and financial openness are stationary at levels whiles the rest of the variables are stationary with first difference in both regions as revealed by Table 5.3.2. However access to communication infrastructure is stationary at levels with IPS approach in SADC but LLC indicates it is only stationary at first difference. As indicated in Chapter 3, the study rely on IPS.

Table 5.3.2: Panel unit root result for the two sub-regions

	ECOWAS				SADC			
	IPS		LLC		IPS		LLC	
Variable	*Level*	*First diff*	*Level*	*First diff*	*Level*	*First diff*	*Level*	*First diff*
rgdppc	2.6224	-13.3326***	2.3465	-12.2083***	1.9916	-9.2577***	-0.6281	-8.446 ***
	(0.9956)	(0.000)	(0.9905)	(0.000)	(0.9768)	(0.000)	(0.265)	(0.000)
findex	-0.0835	-14.4868***	-0.6872	-15.5133***	0.5615	-14.41***	-0.8109	-15.01***
	(0.4667)	(0.000)	(0.2460)	(0.000)	(0.7128)	(0.000)	(0.2087)	(0.000)
traop	-1.1321	-17.811 ***	-2.1566**	-	-1.5139*	-13.73***	-2.227**	-
	(0.1288)	(0.000)	(0.0155)	-	(0.0650)	(0.000)	(0.013)	
inflation	-21.550***	-	-8.417 ***	-	-18.603***	-	-3.93***	-
	(0.000)		(0.000)		(0.000)		(0.000)	
gov	-2.7883***	-	-3.687***	-	-3.4189***	-	-3.39***	-
	(0.0026)		(0.0001)		(0.0003)		(0.0003)	
finop	-3.057***		-3.54***		-1.81***	-	-2.07**	-
	(0.0011)		(0.0002)		(0.0352)		(0.019)	
com	-1.5719*	-10.9***	-0.4466	-10.98***	-1.93**		-0.8099	-8.44***
	(0.0580)	(0.0000)	(0.3276)	(0.0000)	(0.0268)		(0.2090)	(0.0000)

***significant at 1%, ** significant at 5% *significant at 10%

5.4 Analysis of Results

To determine whether there is non-linearity between financial development and inflation in the eleven and ten countries in ECOWAS and SADC respectively, Table 5.4.1 reports the linearity test. It supports the rejection of the null hypothesis that the model is linear for all the three tests at 1% significance level in both regions, indicating that the relationship between finance and inflation is indeed nonlinear.

Table 5.4.1: Test of linearity against non-linearity for ECOWAS and SADC

	ECOWAS		SADC	
Test	Statistics	p-value	Statistics	p-value
Wald Test (LM)	19.529	(0.003)	30.445	(0.000)
Fisher Test (LMF)	3.280	(0.004)	5.336	(0.000)
Likelihood RT (LR)	20.110	(0.000)	32.046	(0.000)

H0: Linear Model, H1: PSTR model with at least one Threshold Variable (r=1)

In line with the procedure outlined by Gonzalez et al. (2005), we proceeded to test whether there is existence of remaining non-linearity after assuming two regimes model and the test

results are reported in Table 5.4.2. The null hypothesis which states that the PSTR is adequately modeled by only one threshold cannot be rejected in the two sub-regions, implying that we have one threshold or two regimes that separate low and high inflation regimes, as indicated by the probability values of the various tests.

Table 5.4.2: Testing the number of regimes: Tests of no remaining non-linearity

	ECOWAS		SADC	
Test	Statistics	p-value	Statistics	p-value
Wald Test (LM)	10.791	(0.095)	7.635	(0.266)
Fisher Test (LMF)	1.699	(0.121)	1.187	(0.313)
Likelihood RT (LR)	10.966	(0.089)	7.731	(0.258)

H0: PSTR with r = 1 against H1: PSTR with at least r = 2

We, therefore, report the estimated model parameters of our main estimates of PSTR in Table 5.4.3. The results suggest evidence of a single threshold of inflation in both regions. The endogenously estimated threshold values by PSTR reveals relatively lower figure for SADC. Particularly, the threshold level of inflation above which inflation significantly slows down the development in the financial sector is estimated at 17.9% for ECOWAS and 14.4% for SADC. The implications of this threshold results is that it indicates inflationary rate at which the transition function reaches an inflexion point beyond which inflation will be detrimental to financial development. Hence, the significance of the results is that below 17.9% and 14.9% of inflationary rate, inflation may or may not influence the financial sector ability to expand and also to allocate resources efficiently in ECOWAS and SADC respectively[34]. Therefore the results have considerable effects for the conduct of monetary policy.

Therefore, as expected, the inflation-finance coefficient is not only negative in both regions beyond this threshold, but statistically significant at 1% level, which is in line with the existing theory as shown in Table 5.4.3. This suggests that increases inflation above these thresholds present significant detrimental effects for financial development in both regions. As indicated, only the estimated signs of the coefficients can be interpreted given one transition function. What this implies is that beyond this threshold when inflation increases, the link between

[34] For the sample of twelve countries in each region, the PSTR results indicate threshold of 23.6% and 21.3% for ECOWAS and SADC respectively in Table D.0.4 in Appendix D reflecting the impact of higher inflationary regimes in DRC and Zimbabwe and Ghana.

finance and inflation becomes more negative. This means that above these thresholds, inflation may exacerbate informational friction in the financial system and erode returns on assets. This interferes with the expansion of the financial sectors of the two regions. The implication is that policies in the two regions should aim at rates below these thresholds since high inflation is economically costly for financial development.

Furthermore, the inflation-finance coefficient at the lower regime or below the threshold is positive but statistically insignificant in ECOWAS, as indicated by the standard errors. This means increases in inflation below the threshold does not interfere with financial sector activities in that region, which is also in line with theory. In contrast, the inflation-finance coefficient in SADC is not only positive, but also statistically significant at 1% level. The implication of this result is that increases in inflation below the threshold support financial development, meaning inflation-finance coefficient becomes more positive. This outcome may be in line with English (1999) arguments that increases in inflation rate encourages households to substitute purchased transaction services for money balances and thereby induce FSD.

The difference in the results between the two regions may be explained by the role of South Africa which is the leading economy in the SADC region. Monetary policy of this country, which includes inflation targeting framework, affects countries such as Lesotho, Swaziland, Namibia and Botswana. Moreover, the financial sector of South Africa, especially, the banking industry has footprints all over the region which may implement financial policies of South Africa in their destination. However, in ECOWAS, Nigeria and Cote d' Ivoire which are seen as the leading economies in the region are not playing such an important role as South Africa even though the banking sector of Nigeria is penetrating the region.

The results have certainly considerable meaning for the conduct of monetary policy. The study, therefore, argues that price stability policies with inflation targeting framework should be the primary objective in monetary policy, since high inflation is economically costly to financial development of the two regions.

As indicated earlier, literature in this area is limited. The results presented here is in line with earlier findings, such as that of Rousseau and Wachtel (2002) who found the threshold to lie between 13 % and 25% (this indicates that the estimated thresholds of this study for both regions fall in this range); Boyd et al. (2001) who found threshold of 15% of inflation for FSD (which suggests that the threshold of SADC is slightly below it, while that of ECOWAS is

above it); Rousseau and Yilmazkuday (2009) who found inflation between 4% and 19%; and Abbey (2013) who found a threshold ranging from 11% to 16 % on a single country study on Ghana. The thresholds of both regions fall in the threshold range of Rousseau and Yilmazkuday (2009). While SADC threshold falls at the range of Abbey (2013), the threshold of ECOWAS is slightly above it. Most of these studies, however, only estimated an indirect threshold effect of inflation on finance-growth relationship and not directly on financial development. Given the existing relationship between financial development and growth and that financial development is a potential channel in inducing growth, our result is consistent, since it falls within this range of results.

Furthermore, the findings of this study are in line with the broader existing studies on the effects of inflation on FSD. Some of these studies include Aziakpono (2004) on South Africa, Botswana, Namibia, Swaziland and Leshoto (SACU countries); McDonald and Schumacher (2007), Andrianaivo and Yartey (2009) and Kablan (2010) on SSA. All these studies indicate that increases in inflation reverse FSD. More importantly, Chapter 4 of this thesis also indicated a strong negative effects of inflation on FSD of ECOWAS and SADC with the effects more perverse in ECOWAS. Kim et al. (2010) further argue that there is a negative long run relationship between inflation and FSD, but a positive relationship in the short run. Their study was made up of 16 countries from both ECOWAS and SADC[35]. Similarly, Odhiambo's (2005) study indicated a negative inflation effects on FSD in Tanzania and Kenya and an insignificant effects on the financial sector of South Africa. In another study in 2012, Odhiambo (2012) found negative coefficient in Zambia.

[35] Ghana, Nigeria, Niger, Malawi, Sierra Leone, Cote d' Ivoire, Gambia, Zambia, Madagascar, Mauritius Seychelles. The others are Swaziland, Togo, Burkina Faso, South Africa and Senegal.

Table 5.4.3: PSTR Result of finance-inflation rate

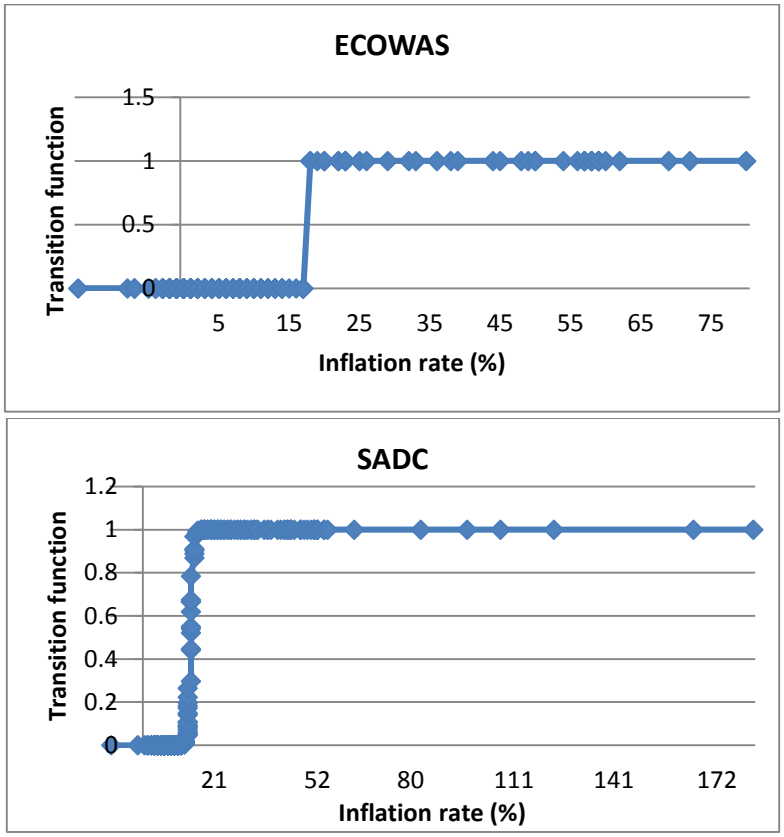
	ECOWAS		SADC	
Variables	$\tilde{\beta}_0$	$\tilde{\beta}_1$	$\tilde{\beta}_0$	$\tilde{\beta}_1$
inflation	0.073	-0.922***	0.6709***	-0.7229***
	(0.2439)	(0.3018)	(0.3282)	(0.3191)
gov	0.829***	-1.371***	0.1843	-1.7006***
	(0.2478)	(0.3942)	(0.3431)	(0.3545)
rgdppc	0.083***	0.042*	0.0086***	0.0141***
	(0.0100)	(0.0215)	(0.0025)	(0.0022)
traop	-0.147	0.492***	0.1321**	0.3424***
	(0.0978)	(0.1805)	(0.0653)	(0.0609)
finop	1.633	3.072	-2.0536	7.4981***
	(1.8618)	(5.8010)	(1.7221)	(2.5476)
com	0.050***	-2.537**	0.0386***	-0.4631***
	(0.0086)	(1.2368)	(0.0069)	(0.1010)
Threshold (δ)	17.9		14.5	
Slope (γ)	443.95		2.28	

*** /**/*show significant at 1%, 5% and 10% respectively and values in parentheses are standard errors corrected for heteroscedascity

Where rgdppc = real GDP per capita, gov = government expenditure (%GDP), traop = international trade openness, finop = capital flows or financial openness, com = access to mobile and telephones per 1000 people. Variables are not in logs

The estimate of the slope γ for ECOWAS is such that the transition from lower regime inflation to higher regime is very rapid, as demonstrated by Figure 5.1 which shows the plot of the estimated transition function against inflation. The estimated slope is 443.9 which is relatively large as shown in Table 5.4.3. In contrast, the transition from lower regime to higher regime inflation is relatively smooth in SADC. The slope parameter for SADC is low (2.28), revealing that the change in the effect of inflation on finance is relatively smooth from a low inflation regime to a high inflation regime than ECOWAS as shown in the Figure. This means that the regression coefficients change gradually when transitioning from low regime to high regime inflation. The Figure for ECOWAS indicates that the majority of the observations lie in either of the one of the extreme regimes. In contrast, even though the majority of the observations lie in both regimes in SADC, some lie in-between these two extreme regimes as shown by Figure 5.1.

Figure 5.1: Estimated transition function of ECOWAS and SADC



Regarding the control variables, it is observe that most of the results are consistent with the theory as shown in Table 5.3.5**.** At low inflation regime, the coefficient associated with government expenditure *(gov)* is positive in both regions but only statistically significant in ECOWAS (that is, at1% statistically significant level). This suggests that increases in inflation results in increases in finance-government expenditure coefficient. This is intuitive because at lower inflation rate, increases in government consumption may serve as attractive avenue for the financial sector of the region to manage their liquidity. However, expectedly, beyond the threshold, increases in inflation in both regions will result in statistically significant negative coefficient of government expenditure. This implies that government expenditure affects financial development negatively at high inflation rate regime in both regions**.**

The implication of negative coefficient at high inflation regime in both regions is that, it leads to reduction in financial development. This means that beyond the inflation threshold levels of these regions, there is a tendency that high level government expenditure may result in diversion of productive resources from the financial sector, hence impeding financial sector

development. Moreover, this may also indicate that increases in government spending at high inflation regime further fuels the high inflation, leading to erosion of real returns on assets.

The coefficients of the level of economic development measured by real GDP per capita is positive at both low and high inflation regimes in the two regions at 1% significant level with the exception of ECOWAS, where it is statistically significant at 10% level at high inflation regime. Intuitively, low inflation rate could be an incentive for the demand of financial products since returns on asset may be attractive. Therefore, increases in the threshold variable in the low inflation regime may still cause increases in demand for financial services by the real sector thus leading to financial development. This is because the increases in inflation may not be enough to erode returns on assets completely. In the high inflation regime, the expectation is that, the coefficient should be negative to indicate that increases in inflation decreases real sector coefficient. However, the results indicate positive coefficient, thus revealing that increases in inflation results in increases in the coefficient of real GDP per capita. This means that, in both regions, there is demand for financial services as inflation increases at the high regime. Intuitively, this may mean that agents do not care much about the effects of inflation on returns to assets in the two regions. Furthermore, most Central Banks and Monetary Policy Committee of member states usually adjust interest rates in response to increases in inflation in order to maintain returns on asset and this could be another possible reason. However, this is a costly approach since high interest rates may lead to reduction in borrowing by the private sector.

Furthermore, both coefficients of trade and financial openness are positive at 1% significance level at high inflation regime in SADC. However, only trade openness is statistically significant at 5% in low inflation in the same region. This implies that, in both low and high inflation regimes in SADC, more trade openness alone is related to FSD but this is only true at high inflation regime with more financial openness. Since these are structural policy variables, more trade and financial openness separately may lead to inflows of capital that will induce financial development. This may suggest that at high inflation rate above the threshold, Rajan and Zingales's (2003) hypothesis that require simultaneous opening of both trade and financial sector may not be supported. Quite the contrary, this study shows that both trade and financial openness coefficient are statistically insignificant at low regime inflation and only the former is statistically significant at high inflation regime in ECOWAS at 1% statistically significant level.

Finally, access to communication infrastructure in both regions indicates statistically significant positive coefficient at low inflation regime at 1% and statistically significant negative coefficient at the high inflation regime at 1% significance level in SADC and 5% in ECOWAS. What this means is that low inflation regime is good for access to communication infrastructure to exert positive effect on financial development and the reverse is true at the high inflation regime. Intuitively, low inflation rate may make it less costly for access of information from the financial sector through communication infrastructure. However, at high inflation this may seem costly, resulting in negative coefficient of access communication on financial development.

5.5 Robustness and Sensitivity analysis

In addition to the base line regressors in equation 5.1, the study added gross domestic saving (% of GDP) as a robustness checks and the results are reported in Table D.0.7 in Appendix D. This variable is shown to cause financial development as in Odhiambo (2008). As indicated, our findings of nonlinearity are again supported by the linearity test which confirmed a single threshold in both regions as shown by Tables D.0.5 and D.0.6. The threshold values are similar to those obtained in the base line equation, indicating 17.87% and 14.40% for ECOWAS and SADC respectively. These findings are in contradiction to the argument of Omay and Oznur (2010) who contend that the threshold value are decreasing significantly as new explanatory variables are added, but in line with the study of Khan and Senhadji (2001). The results in both regions indicate that, statistically, there is significant negative coefficient of inflation above the threshold, revealing that high inflation is costly to financial development. The slope parameters again indicates relatively smooth transition from low regime to high regime for SADC (γ=2.3), but rapid transition in ECOWAS (γ=429.9), as indicated by the transition graphs of Figure D.1 in the Appendix D. Furthermore, we replaced domestic saving with exchange rate which is another important conditioning variable. The results suggest no significant difference with the baseline equation[36].

5.6 Summary and Conclusion

Financial sector development is an important potential channel for economic growth. Hence, several efforts are being made in many developing regions such as SSA to raise growth in the

[36] The details of the results are not reported here and will be provided upon request. The threshold and slope for SADC are 14.9% and 1.89 respectively whereas it is 17.87% and 432.6 for ECOWAS

sector with little or no success. One of the important policy variables that retard financial development is increases in inflation. Existing theories contend that the detrimental effect of inflation on financial development is only observed after certain inflationary level is reached and thus threshold effects exist between inflation and financial development. In this chapter, the thesis provided a comparative study between ECOWAS and SADC on the threshold effects of inflation on financial development for the period 1980–2011 using a novel Panel Smooth Transition Regression technique. In particular, the study examined the inflation level at which it is detrimental to financial development. Unlike previous studies that impose the threshold value exogenously, this approach has the advantage of endogenously determining the threshold value.

The results suggested a robust single threshold of 17.9% and 14.5% of inflation for ECOWAS and SADC respectively. The significance of the results is that below 17.9% and 14.5% of inflationary rate, inflation may not interfere with the financial sector's ability to expand and also to allocate resources efficiently in ECOWAS and SADC respectively. However, above these thresholds, inflation may exacerbate informational friction in the financial system and hence interfere with its expansion. The PSTR results supported this argument with statistically significant negative inflation-finance coefficient above the threshold in both regions, but with only statistically significant positive coefficient at the lower inflation regime in SADC. Therefore paying attention to these low and high inflation phenomena will result in significant gain to be achieved in the financial sector of both regions.

On the control variables, the estimated coefficients are largely consistent with existing theory. It revealed that government spending is positive at lower inflation regime in both regions but only statistically significant in ECOWAS, indicating that increases in this policy variable raises FSD. However, it is significantly negative at higher inflation in both regions. This implies that more government spending reversed financial development when inflation is above the threshold. This is in line with a prior expectation as more government expenditure in high regime inflation will not only fuels the increases inflation but direct resources away from the financial system to the government. These process retard the development of the financial sector.

The coefficient of the measure of economic development is both positive at low and high regimes inflation showing that demand for financial services increases in both regimes in the two regions. Moreover, trade and financial openness are both positive at high regime in SADC

with only the former indicating statistically significant positive coefficient in ECOWAS. Finally, access to communication infrastructure indicated statistically significant positive and negative coefficients in low and high regimes respectively for the two regions.

Chapter 6

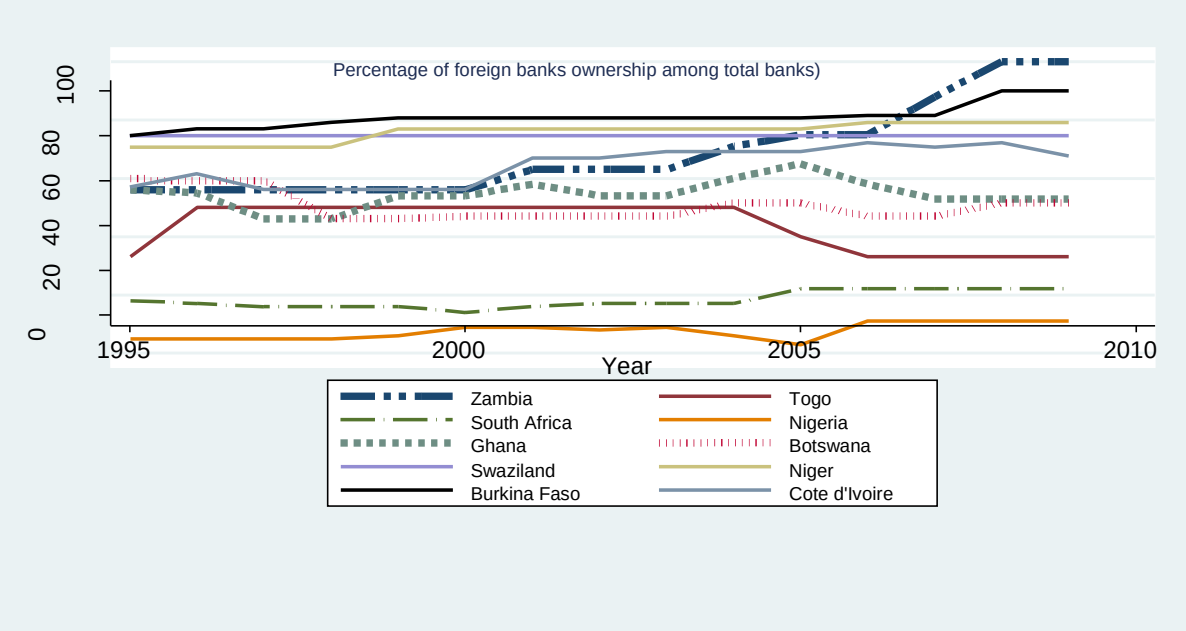
Financial sector development, banking stability and foreign banking inflows in ECOWAS and SADC: A panel approach

6.1 Introduction

The financial system of SSA is broadly bank based. The stock market sector is underdeveloped and even absent or at the infancy in many countries with only South Africa having well advanced market. Supporting the claim of the banking sector dominancy of the financial system of SSA, Quintyn and Taylor (2007) provided evidence that the sector has the highest percentage in terms of total financial sector assets in many countries of the region, standing at almost 90%. They argue that, the financial system is likely to remain bank-dominated for the foreseeable future. The study further revealed that countries such as Gambia, Madagascar and Mali have the banking sector representing 97% and 98% and 98.7% of the total financial sector assets respectively. Others include Malawi, 71%, Nigeria, 90%, Lesotho, 91.8%, Mozambique, 95%, and Mauritius, 95%, with exceptional cases in Botswana and South Africa whose banking sector contributes only 40% and 25% respectively (Quintyn & Taylor, 2007).

However, as noted in Section 2.3.1, the region's financial system which is broadly bank based is dominated by foreign banks. The region has the highest foreign bank presence among other developing regions. Considering some selected countries in both SADC and ECOWAS for the period 1995–2009, Figure 6.1 suggests that on average eight countries have foreign ownership around 64%. These countries include Botswana, Burkina Faso, Cote d' Ivoire, Ghana, Swaziland, Togo, Niger and Zambia. However Nigeria has the least which is below 12%. The figure seems to reveal the dominancy of foreign ownership in the industry in these selected economies. Do these foreign banks contribute to greater financial stability since they constitute fundamental part of the banking system?

Figure 6.1: Percentage of foreign bank ownership among total banks



Author' own construct with data from Global Financial Data Base, 2014.

Given the importance and crucial role foreign banks play in the domestic banking industry of the host country, and considering the relatively under developed and fragile nature of the region's financial system which is bank based, the main objective and focus of this chapter is to examine the impact of foreign banking inflows on the banking sector stability . This objective is motivated by a series of financial crisis such as the Chilean crisis[37] of the 1970s as well as the East Asian crisis of the 1997/8, both of which have their roots directly linked to the banking system. In addition, financial stability is closely related to the activities of foreign banks in the domestic economy through the volatility of credit supply, the probability of banking crises and the potential for contagion. Furthermore, whether developing economies should welcome foreign ownership of banks is an important question, particularly as the proportion of overall banking assets controlled by foreign banks soar in Africa, Latin America, and Eastern Europe in recent years (World Bank, 2001). Moreover, Demirgüç-Kunt et al. (1998) noted that if foreign banks increase the probability that a country will experience severe banking crisis, then this would make policymakers cautious of easing entry restrictions. However, policymakers concern about foreign banks will reduce if foreign banks do not raise the possibility of banking crisis.

[37] Diaz-Alejandro (1985) has a comprehensive discussion of the Chilean crisis.

One important concern is that foreign banks are accused of lacking long term commitments to the host country and might leave the domestic banking system upon any signal of trouble (Demirgüç-Kunt & Detragiache, 2005). This stimulates capital flight which may lead to financial sector instability. In addition, possible potential risks may include over competition, exposure of a host country's economy to widespread shocks, profit remittances and less credit allocation to certain market segments such as small and medium-sized firms. Peek and Rosengren (2000) as well as Chava and Purnanandam (2011) argue that shocks to parent banks can be transmitted to the foreign subsidiaries resulting in contagion with negative implication for lending. Further concerns are raised by studies, such as Beck and Martinez Peria (2008), Detragiache et al. (2008) and Murinde (2012), which posit that foreign banks tend to "cherry-pick" lucrative businesses and multinational companies. This leaves more risky businesses that are prone to information asymmetry to local banks. This, according to Van Horen and Claessens (2012), can undermine and worsen overall access to the services of the financial system, since cherry picking worsen the remaining credit pool and interferes with the financial development, especially in low income countries where relationship lending is important. In addition regulatory complications may ensue if foreign banks comply with both foreign and domestic rules.

Based on the arguments above, and given the significant proportion of foreign banks in the banking system of many countries in SSA, this situation could serve as a source of banking sector instability and, hence, the total financial sector instability of the region.

Despite the above concerns about foreign banks in the domestic banking sector, an increase of such banks in the host country may have the advantage of causing improvement in efficiency in the local banking sector through diffusion of modern technology. It may also result in healthy competition and economic growth. According to Grubel (2014), foreign banks often introduce superior lending technologies and marketing know-how developed for domestic use at low marginal cost in emerging markets. In addition, De Haas (2014) contends that these banks are not only efficient themselves, but also generate positive spill-overs to domestic banks which may, for instance, copy the risk management methodologies of new foreign competitors, and this may lead to banking stability. Others such as De Haas and Van Lelyveld (2010) and Navaretti et al. (2010) show that global banks support their foreign subsidiaries during financial stress through internal capital market.

Furthermore, it will not only generally increase access to financial services and improve the financial and economic performance of borrowers, but also instil greater financial stability (Clarke et al. 2003; Classens, 2006; Cull & Martinez Peria 2010). According to Claessens et al. (2001), the presence of foreign banks leads to lower costs of financial intermediation and lower profitability. Others such as Levine (1996), Dobson (2005) and Mishkin (2006) argue that foreign banks are likely to pressure host governments to improve regulations and supervision, increase transparency and propel domestic reforms which can all lead to banking stability. The above argument, therefore, leaves the debate on the link between foreign banking inflows and banking stability open for more empirical investigations and verification. SSA countries have experienced a series of bank crisis before and during the financial sector reforms of the 1980s. The next section discusses briefly the banking crisis of the region.

6.1.1 A brief account of banking crises in Africa

Banking crises can either be systemic or non-systemic. A systemic banking crisis occurs when a relatively large proportion of the banking system are financially distressed. This is usually characterised by widespread insolvency of banks, resulting in closures, takeovers and mergers. According to Laeven and Valencia (2012), a banking crisis is systemic when the following requirements are met: (i) a significant signs of financial distress in the banking system (as evidenced by significant bank runs, losses in the banking system, and/or bank liquidations); (ii) significant banking policy intervention measures in response to significant losses in the banking system. Non-systemic banking crisis results from bad macroeconomic conditions usually external to the banking system.

SSA has experienced a number of banking crises due to a series of external and internal shocks in the late 1980s. The external shocks emanated from worsened terms of trade as well as currency depreciation in the 1980s. The region's high raw material export experienced an overall decline in terms of trade, and faced volatile exchange rates, culminating into loss and drop in export revenue. This situation was further fuelled by poor weather condition, especially in West Africa, which resulted in low output of agricultural products. This means loans contracted could not be repaid, which caused non-performing loans to accumulate, resulting into bank failure.

In addition, most SSA countries argued that the operations of the financial system, especially the banking sector, under the colonial regime were not growth-enhancing. Thus, new

independent SSA countries adopted financial sector controls aimed at directing credit to areas deemed relevant for overall national development. Accordingly, Brownbridge (1998) argues that the main aim was to create an environment where the new governments can exercise substantial control over the financial system and safeguard that credit allocations in line with the national agenda of the overall economic development of the government. To achieve this, state-own banks were created and some banks nationalised. However, this policy was marred by credit directives to not only inefficient government parastatals, but also to politically connected corporations at preferential rate usually below the market rates. Hence, poor credit appraisals and poor loan recovery strategy, which was frustrated by the authority, resulted in accumulation of non-performing loans. Brownbridge (1998) noted that in instances were politicians had shareholding in a bank, they exerted their political power on regulators and supervisors to prevent them sanctioning the banks for violations of the regulations. Consequently, this translated into bank failure in many post independent states.

The post-independent financial sector interventions, which led to unprecedented bank failures, resulted in many countries accepting financial sector reforms of the SAP of the IMF and the World Bank as a solution to the banking instability. However, the replacement of the protectionist economic policies with financial sector liberalisation came with cost – the return of banking instability. These crises were largely systemic in nature. Table E.0.2 in the Appendix indicates a summary of banking crises using information provided by Laeven and Valencia (2012) from 1980 to 2011. It is clear that the period under discussion was characterised with unprecedented banking crises, with DRC experiencing the highest crises. An additional reason for this could possibly be the political instability DRC experienced. Countries such as Nigeria and Cameroun are among troubled banking countries. However, countries like Uganda and Madagascar experienced single crisis. The former benefited from financial reforms as the reforms allowed weaker banks to exit the financial market leading to stability in the sector. More so, the financial reforms improved banking supervision and the sale of public-owned banks that were malfunctioning and operating at losses.

The cost of banking crises is immeasurable. These include cost of recapitalisation of these troubled banks by the government in order for them to reimburse depositors. Also, it results in output loss to the economy. As mentioned, in this study, we seek to test whether the unprecedented increases in foreign ownership of domestic bank, which resulted from the reforms, is capable of increasing the likelihood of crisis or not in ECOWAS and SADC.

Even though there is relatively vast literature relating to banking stability, most studies focus on developed economies and the role of financial liberalisation on bank stability. Such studies include Caprio and Klingebiel (1996), Hellmann et al. (2000), Bordo et al (2001), Caprio and Honohan (2009) and Angkinand et al. (2010). A few studies have attempted to examine the impact of the growing foreign banking inflows on the host country's banking sector and hence, the financial sector stability. These studies include Demirgüç-Kunt et al. (1998), Hull, (2002), Herrero and Simón (2006). These studies are usually on advanced economies or a mixture of advanced and developing economies. Hence, empirical evidence specifically on SSA is limited. This study contributes to current literature by extending previous studies to include the influence of the growing presence of foreign banking in SSA. Specifically, it analyses its causal impact on the banking stability of ECOWAS and SADC[38]. The study applies two different econometric approaches and two different measures of bank fragility which makes it different to the earlier studies. These two measures are adopted to ascertain the robustness of the relationship between foreign banks and other control variables.

Since the banking sector in the region accounts for almost 90% of financial sector assets, the stability is imperative and a major concern for the overall financial development. From this perspective, this chapter could be seen as analysing financial sector development and stability given the presence of foreign banking in the region. Hence, this study uses the two term interchangeably.

By employing two econometric approaches, namely the multivariate logit and the two-step system generalised method of moment (SGMM) and using bank crisis measure constructed by Laeven and Valencia (2012) and bank z-score (Bankscope), the results of the two methods indicate evidence that the presence of foreign banks in the domestic banking sector robustly reduces the probability of bank crisis. The results lend no support to the widely held view that foreign banks' penetration into domestic banking sector induces the likelihood of banking system instability. The logit approach indicates that financial openness and increases in credit are responsible for bank crisis. This is opposite when bank z-score is considered. Finally, the

[38] This will be done by considering 22 countries in the two blocs which include Benin, Botswana, Burkina Faso, Cote d' Ivoire, Ghana, Lesotho, Madagascar, Malawi, Mali, Mauritius, and Mozambique. The others Namibia, Niger, Nigeria, Senegal, Togo, Tanzania, South Africa, Swaziland, Zambia and Zimbabwe. These countries were selected due to data availability.

approaches revealed that improvement in political institutions reduces the probability bank crisis.

The rest of the chapter is organised as follows. Section 6.2 discusses the literature review, while section 6.3 outlines the method and model specification. In section 6.4, the data is presented. Section 6.5 discusses the results and section 6.6 gives the conclusion and policy recommendation.

6.2 Literature Review

This section gives an overview of both banking crises theories and empirical studies. The review is not exhaustive. Rather, it highlights the relevant works significant to this study

6.2.1 Diamond and Dybvig model of bank runs /Panic model

There are a number of models that explain reasons for banking crisis. One of the basic models is the panic based models or bank runs. The focus is on liquidity shocks and the fractional nature of the banking operations. According to Kindleberger (1978), these models are unrelated to changes in the economy and it construes banking crises as random actions that ensue spontaneously as a result of mob mind-set or panic among depositors. The model explains that bank run is a rational response to depositors' beliefs that bank run will occur resulting in banks facing wide-scale withdrawals due co-ordination failure amongst the depositors or shift in expectations. Depositors panic and withdraw their deposits for fear that other depositors will withdraw their deposits. Conversely, banking system operate under fractional reserve arrangements in which a fraction of deposits collected are put in long term investments. This results in bank balance sheet making up maturity mismatch of liabilities, which are short-term, and assets, which are long-term, and thus illiquid. Considering the nature of the bank balance sheet, unanticipated rise in liquidity demands from depositors may compel banks to liquidate their assets at a loss resulting in banking crisis. This crisis becomes self-fulfilling prophecies in this equilibrium. Equally, another equilibrium exists if no one expects a crisis, no crisis occurs and this is also self-fulfilling. In this equilibrium, agents withdraw their funds according to their consumption needs. In this case, their demand can be met without costly liquidation of assets.

The Diamond and Dybvig (1983) model offers an explanation of how banks subject to bank runs attract deposits. According to the model, illiquidity of assets provides the rational both for

the existence of banks and the bank vulnerability to runs and these runs are costly. They reduce social welfare through the interruption of production and destruction of optimal risk sharing among depositors. In addition, bank runs have real economic consequences because even "strong" banks can fail, causing the recall of loans and the termination of productive investment.

The model analyses bank contracts and its optimality which can prevent bank runs. Diamond and Dybvig (1983) argue that bank deposit contracts can provide allocations superior to those of the exchange market by providing better risk sharing among people who need to consume at different random times. It contends that there is a feasible contract that permits banks to prevent both runs and to provide risk sharing by converting illiquid assets. The model posits that deposit contract enables the bank to insure depositors against uncertainty pertaining to their demand for liquidity.

6.2.2 Banking Crises and Foreign banks

The mechanisms through which foreign banks may affect the stability of the host country banking system can be identified. Most theoretical mechanisms explain that subsidiaries of foreign bank are not completely independent institutions from the parent bank or a larger bank holding company. This implies, this parent bank will act like the lender of resort during period of financial turmoil. According to Stein (1997) such parent bank do have and manages an internal capital market and centralised treasury operations to allocate capital and liquidity over its subsidiaries. This implies foreign banks are insulated against the adverse effects of a host country bank capital or liquidity shocks and will keep up their credit supply during domestic crises.

However, foreign banks can induce crises if they are more procyclical to changes in the host country macroeconomic environment. When the economic activities of the host country declines, the activities of the foreign bank in this country may be scaled down in favour of other regions whose economies are upturn. Alternatively, foreign bank could also react to changes in the parent banks home country. Worsening economic conditions in the home country can force a capital-constrained, compelling the foreign bank to reduce their credit at the destination. This is described as wealth effect. Wealth effect could induce crises at the destination.

On the other hand, it can be argued that when economic conditions in the home country worsen, parent banks will increase their efforts to expand their activities abroad, since investment opportunities in the home market are scarce. This is substitution effects. When home country conditions improve, the opportunity costs of limiting home country lending increase and banks may therefore allocate less capital to their foreign subsidiaries (Molyneux & Seth, 1998; Moshirian, 2001). This scenario indicates that there is a negative relationship between the home country business cycle and the foreign subsidiary's credit supply.

6.2.3 Business cycle models

These models consider banking crises as an inherent component of natural outgrowth of business cycles (Babus et al., 2009). Unlike the panic models, business cycle theory interpret banking crises as not a random event, but a response of depositors to the arrival of sufficiently negative information to unfold the economic conditions. This model posit that an economic downturn will cause reduction in the value of assets which will result in the high likelihood that banks will be unable to meet their commitments to depositors. Depositors, upon receiving information about impending economic downturn in the cycle, will respond by anticipating financial difficulties in the banking system, which will lead to withdrawals of funds from the banks and culminate into crisis (Jacklin & Bhattacharya, 1988).

Furthermore, one strand of the business cycle model as explained by Chari and Jagannathan (1988) emphasis the signal extraction problem, where some portion of the population receives information on the future asset payoffs. This model explains the role asymmetry of information plays in triggering banking crisis. In this view, a panic is a form of monitoring. Chari and Jagannathan (1988) argue that some depositors withdraw money for consumption purposes, while others withdraw money because they know that the bank is about to fail. In this model, the proportion of early consumers is uncertain. Therefore, there is aggregate liquidity risk in the economy. Like Diamond and Dybvig (1983), deposit contract is such that, agents with investment in period 0 receive a return of one in period 1, and an equal share of bank profit in period 2. Early consumers withdraw in period 1, but late consumers can either withdraw some or all their deposit in period 1. However, uninformed agents rely on the number of observed early withdrawals and attempt to infer whether withdrawals occur as a result of bad signals observed, or as a result of high liquidity demands. In this environment, they may fail to recognise whether long lines to withdraw at banks is because of consumption needs or because informed depositors have received bad news. In this case, they all rush to withdraw their funds

which triggers a bank runs. Hence, Chari and Jagannathan (1988) contend that crises occur not only when the economic outlook is poor or gives a bad signal but also when liquidity needs are high despite no one receiving information on future returns.

Another strand of information-based model is by Morris and Shin (2001). This model introduced some information uncertainty in the Diamond and Dybvig framework by assuming a common knowledge pertaining to economic fundamentals which contributes to co-ordination failure and multiple equilibria. In this model, agents are assumed to have some idiosyncratic uncertainty about economic fundamentals. The result is a unique equilibrium, where bank runs occur with a positive probability.

Furthermore, Kindleberger's (1978) model contends that bank runs are endogenous to business cycle, which occurs at the peak of the expansionary stage of the cycle. The model argues that in an economic upturn, the banking sector anticipate a stronger economic growth in the future and, therefore, serves as an incentive for credit expansion to the real sector. This leads to the banking sector becoming highly leveraged. However, following a sudden downturn in the economy, the real sector may fail to repay loans. This can result in accumulations of non-performing loans as depositors demand their funds. Hence, banks liquidate their assets at a losses which leads to systemic bank crises from the exposure to economic shocks.

Empirical evidence on the effects of foreign banks on domestic banking sector stability and financial stability is mixed and limited. In a study by Demirgüç-Kunt et al. (1998) on a bank-level data for a broad cross section of countries using multivariate logit approach, the study found that not only does the presence of foreign banks in the domestic banking sector of a country lower the probability of banking crisis, but it also induces economic growth and lowers overhead costs and profits of domestic banks. In line with the findings of Demirgüç-Kunt et al. (1998), Levine (1999) also indicate that foreign banking reduces the probability of banking crisis.

Furthermore, Levine (2001) argues that more foreign bank presence in the domestic financial system is negatively associated with bank profits and bank overhead costs. The study use weighted least-squares pooling on bank level data across 80 countries for the 1988-95 period. Levine (2001) concluded that foreign banks tend to induce competition and render domestic banking markets more efficient. Increased foreign entry forces domestic banks to eliminate excess overhead and accept lower profits.

However, relatively recent work of Beck et al. (2003) on bank concentration and crises using data from 70 countries for the period 1980 to 1997 indicates that countries with more concentration as well as less regulatory restrictions and institutions that encourage competition are less likely to experience crises. Foreign ownership of banks, even though reveals that it reduces the likelihood of crises, it was not significant. Hence, no evidence of direct relationship between foreign banking activities and the probability of banking crisis.

In another study, Detragiache and Gupta (2004) compare the performance of domestic banks and a long-established group of foreign banks during the Malaysian crisis. Their study provides evidence that foreign banks outside Asia perform better during the crisis than domestic ones. Contrary to the widely held view that foreign banks have less commitment and will leave the domestic financial sector upon least danger, these banks did not abandon the domestic market during the crisis, despite receiving less support from the government compared to their domestic counterparts. The study relies on OLS and heteroscedascity-consistent standard errors are used to compute t-statistics.

Arena et al. (2007) on lending channel in emerging economies contend that the presence of foreign banks contribute somewhat to overall bank lending stability in a dataset covering 20 emerging markets. They suggest that this could reduce the probability of bank crisis. The study argues that this is possible if the population of foreign banks in a country is sufficiently diverse in terms of home countries. This diversity may make aggregate lending more stable.

De Haas and van Lelyveld (2006, 2010) find that foreign banks in Eastern Europe have less of a need to rein their credit supply during a financial crisis. Moreover, the stabilising impact on credit growth depends on the relative strength and soundness of the respective parent banks (De Haas & van Lelyveld, 2006; 2010). The former result echoes an earlier argument by Dages et al. (2000) who explored foreign and domestic bank participation in emerging markets of Mexico and Argentina, using bank-specific data on lending by domestic and foreign-owned banks. Dages et al. (2000) reveal that foreign banks generally do not only have higher credit growth rates than domestic banks, but this credit growth is less volatile, and, in both countries, foreign banks show notable credit growth during crisis periods. By contrast, the stabilising impact has been more subdued and diverse in Latin America and Asia (Arena et al., 2007).

Vogel and Winkler (2010) examine whether increases in market share of foreign banks in many emerging markets since the mid-1990s contribute to financial stability in the respective host

countries in the global financial crisis. The study suggests that the stabilising impact of foreign banks was limited to the cross-border component of financial globalisation and to two regions, Eastern Europe and SSA. Only in the latter region was this translated into more stable credit growth. Thus, hopes that a stronger presence of foreign banks might help host countries in isolating domestic credit from international shocks did not materialise in the current crisis.

Other studies such as Barth et al. (2004) on how bank regulation and supervision affects banking crises, developed a comprehensive survey database on measures of regulation and supervision. They noted that regulatory and supervisory practices that force accurate information disclosure, empower private sector monitoring of banks, and foster incentives for private agents to exert corporate control work best to promote bank performance and stability. The study further observes that poorly designed explicit deposit insurance leads to greater probability of banking crises, even after controlling for regulation and supervision. Barth et al. (2004) further indicate that although there was no evidence of a strong association between restrictions on bank entry and bank efficiency in the 107 countries of the study, the results found that barriers to foreign-bank entry and foreign ownership are positively associated with bank fragility.

In terms of bank crises and financial liberalisation, large proportion of empirical studies lend support to the assertion that liberalisation increases the likelihood of bank crises. These studies include: Hellmann et al. (2000), Noy (2004, 2005), and Angkinand et al. (2010). The result is the same in Demirgüç-Kunt and Detragiache (1998a) who argue that banking crises are more likely to occur in countries that have liberalised financial systems, even when controlling for other country characteristics. However, the study contends that the effect is lessened by a strong institutional environment, especially respect for the rule of law, low corruption and good contract enforcement. Other empirical studies with similar findings are Mehrez and Kaufmann (2000), Glick and Hutchison (2000), Eichengreen and Arteta (2002), and Noy (2004).

Nevertheless, other studies have found contrary results, which suggest financial liberalisation may reduce the chances of crises. These studies include the work of Shehzad and De Haan (2009) who argue that conditional on an effective banking supervision, financial liberalisation tends to reduce the chances of banking crises. Furthermore, some studies suggest no evidence of any relationship between liberalisation and bank crises. These studies include Bordo et al. (2001) and Eichengreen and Arteta (2002).

Finally, Demirgüç-Kunt and Detragiache (1998b) on the determinants of banking crises using data for the period 1980-1994 for both developed and developing economies, argue that crises occur in countries with weak macroeconomic environment. In particular, economies with high inflation, high interest rate and balance payment problem are vulnerable to systemic crises. In addition, countries with weak law implementation as well deposit insurance were at risk of bank failure.

From the empirical literature discussed above, it is evident that, there is no study exclusively done on SSA where foreign banks are fundamental part of the banking system, rather they involve a mixture of countries from SSA and other developing and advanced countries. This chapter offers an exclusive study on SSA to determine if the unprecedented level of foreign banks in the region provides threat to banking stability.

6.3. Method and Model specification

The study tests the hypothesis that foreign banking inflows in the domestic banking sector increase the probability of the occurrence of banking crises in the host country. We modelled banking crises as linear function of foreign banking inflows and other conditioning variables following the works of Demirgüç-Kunt et al. (1998) and Claessens et al. (2001). Thus, the chapter estimate the following model:

$$y_{it} = \alpha_i + \beta_i x_{it} + \varepsilon_{it} \qquad (6.1)$$

Where *i* is individual country at time *t* and i=*1 ……..N; t=1…….. T*. $\varepsilon_{i,t}$ is the error term. The variable y_{it} refers to banking stability or crisis. In this study, two measures are used to indicate banking stability or crisis. The first measure is a binary variable (*bankcrisis*) showing 1 for banking crisis in a particular year of a country and 0 for no crisis. The other measure is bank *z*-score (*z*-score). The bank z-score measure is used to ascertain the robustness of the results. It measures the soundness of the banking sector. The *z*-score is a risk measure and is commonly used in the empirical banking literature to reflect a bank's probability of insolvency. Hence, this is a *distance-to-insolvency* indicator. Z-score plays an important role in the assessment of both individual bank risk as well as overall financial stability (Lepetit & Strobel 2013).

Banking crises variables, *bankcrisis* can either be systemic and non-system. In this study, due to data limitation since banking crises are rare events and more so our main control variable of

interest, that is foreign banks[39], we consider the analysis of systemic crisis as is in Beck et al. (2006). This is because crisis incidences experienced in SSA were largely systemic in nature due to credit directives and controls especially to areas described as priority areas that induce economic growth.

The data reveals eighteen bank crises, as shown in Table E.0.2 in the Appendix. The countries that were hit are Nigeria, Swaziland, Zambia and Zimbabwe. In addition, we follow Demirgüç-Kunt et al. (1998) and Demirgüç-Kunt and Detragiache (2005) in including the non-crisis countries as controls, and allowing for the errors to be correlated within each country by clustering the errors.

The x_{it} variable is a k-dimensional vector of regressors which are capable of explaining bank stability and include our main variable of interest: foreign banking inflows or foreign banks (fbi_{it}) at time *t* and for country *i*. The others are: financial finopenness (*finop*), inflation, credit, real GDP per capita *(rgdppc*), real GDP growth (*rgdppcgr*), exchange rate (*exrate*), governance indicator (*pol*), deposit insurance (*depinss*). Countries which introduced deposit insurance are Nigeria, Tanzania and Zimbabwe. M2 to reserves (*M2/res*) measures bank fragility. Therefore, the probability that a crisis will occur at a particular time in the banking sector in a country is modelled by equation 6.1. β_i is slope coefficients. All variables are in levels.

Foreign bank (fbi_{it}), which is any bank in the domestic banking sector whose ownership is over 50%, is expected to reduce the likelihood of banking crises. Foreign banks do this through the improvement in banking services. They also bring in new and better skills, management techniques and technology to the domestic banking system. On the contrary, foreign banks are accused of lacking long term assurance and their presence could generate banking crises.

Real GDP per capita *(rgdppc)* controls for economic development. The implication is that increases in real GDP per capita means increase in economic development which is expected to reduce the tendency of banking crises in the region. It also implies the opinion that poor countries naturally have incompetent legal system, weak enforcement of contracts and ineffective prudential regulations is controlled for. The study included real GDP growth *(rgdppcgr)* to control for cyclical output effects.

[39] The available data on foreign banking inflows into the domestic banking sector is from 1995 -2009.

Furthermore, to test whether banking crisis occurs as a result of sudden capital outflows or vulnerability to run on currency, we include the ratio of M2 to foreign exchange reserves *(m2/res)*. We expect a positive relationship between this banking variable and banking crisis. Credit to the private sector as a ratio of GDP *(credit)* is expected to correlate positively with banking crisis. Intuitively, this suggests that countries with high banking sector exposure to credit to private sector borrowing will be more vulnerable to banking crisis, especially during an economic downturn when this will result in loan default. Moreover in recession,

The most crucial challenge in testing any hypothesis in a developing region is the issue of availability of consistent data. Financial data in developing economies are usually sparse. This presents a special difficulty in getting this information. In light of this, some measures are not included in this study. Domestic financial liberalisation data are inconsistent and absent in most of countries in this study. Even though this presents a short coming to the essay, the study mitigate this problem by using the measure of financial openness. According to Baltagi et al. (2009), domestic financial liberalization contribute to financial openness and that removing entry barriers and regulations may induce more competition. Moreover, financial openness measures the level of financial integration. Some of the financial liberalisation indices used in studies such as the Adiad and Mody measure, which comprises six aspects of liberalisation measures includes international transaction, which is an indicator of openness. Furthermore, studies such as Demirgüç-Kunt and Detragiache (1998b) that used financial liberalisation to determine banking crises have been accused of not distinguishing domestic from international financial liberalisation which critiques blame for crises (Eichengreen and Areta, 2002). Finally, the focus of this essay is to test the effects of foreign banking on domestic banking crises and not specifically on financial liberalisation.

Financial openness *(finop)* is expected to reduce the risk of on banking crises. Financial openness creates the opportunity for banks to access funds abroad and strengthen their liquidity position. This may lead to the reduction in the likelihood of bank failure and financial instability. However, if there is unexpected depreciation of the domestic currency, it will lead to increase the likelihood of bank crises. This was the experience that led to the Chilean crises in 1981 and the Mexican crises of 1995. It may also expose the banking sector to possibly capital flight which may see the sector being vulnerable to crisis. Hence, an ambiguous effect could be expected.

Political institution *(pol)* is supposed reduce the likelihood of banking crisis Institutional development, which we proxy with political development will lead to improvement in the legal system and thus the protection of the banking system.

Following the Diamond and Dybvig model, this study included explicit deposit insurance *(depinss)* as a regressor. The *aprior* expectation of this variable is ambiguous. Deposit insurance reduces banking crisis after liberalisation by eliminating possibility of self-fulfilling panic analysed in the model. However, increase deposit insurance can lead to moral hazards and bank risk taking.

Finally, to capture loss of monetary control, the study included inflation. Increases inflation *(inflation)* is expected to increase the likelihood of banking crises. Inflation fuels information asymmetry in the financial market which causes high risk credit seekers, who are likely to default, to remain in the market. Exchange rate *(extrate)* is also included to measure the impact of currency movement on bank fragility.

To measure the effects of the presence of foreign banks and other control variables on the domestic banking sector stability, the study used two econometric approaches: the Multivariate Logit and the dynamic System generalised method of moments (SGMM) which are discussed in sections 6.3.1 and 6.3.2 respectively.

6.3.1 The Multivariate Logit Method

Banking crisis measure is proxied by using binary variable (1= crisis and 0 = no crisis). According to Demirguc-Kunt and Detragiache (1997) and Honohan and Laeven (2005), banking crisis occurs when at least one of the following occurs (i) when non-performing assets to total assets in the banking system exceeds 10% (ii) banking sector problems result in a large-scale nationalisation of banks (iii) the cost of rescue operation is at least 2% of GDP and finally (iv) extensive bank runs take place.

The banking crisis indicator which is the dependent variable in this study is based on the studies of Laeven and Valencia (2012). The study applied multivariate logit approach to estimate equation 6.1 since the variable is binary outcome following Demirgüç-Kunt et al. (1998). In this approach, the probability that a crisis occurs is assumed to be a function of vector of the explanatory variables and estimates of the crisis probability is obtained by maximising the likelihood function. This study differs from the study of Demergue-kunt and Detragiache

(1997) and Shehzad and De Haan (2009) in the following ways. (i) It focuses exclusively on SSA. (ii) It includes recent information on foreign banking inflows as explanatory variable (iii) Different measures are used to proxy banking crisis.

More formally, in each period, a country experiencing a crisis (=1) or no crisis (=0). Suppose the outcome, y_{it}, takes the following:

$$y_{it} = \begin{cases} 1 & \text{with probability } \mathrm{p(i,t)} \\ 0 & \text{with probability } 1 - \mathrm{p(i,t)} \end{cases} \tag{6.2}$$

Equation 6.1 is estimated by parameterising p to depend on an index function $\beta' x$. The conditional probability in the binary outcome model is given by:

$$P(i,t) = (y_{it} = 1|x) = F(\beta' x(i,t)) \tag{6.3}$$

If $P(i,t)$ denotes banking crisis dummy variable, β vector of n unknown coefficients to be estimated and $F(\beta' x(i,t))$ indicates the cumulative probability distribution function evaluated at $\beta' x(i,t)$, then the log likelihood function of the model from equation 6.1 is:

$$lnL = \sum_{t=1\ldots T} \sum_{i=1\ldots n} \{ P(i,t) \ln\left[F\left(\beta' x(i,t)\right)\right] + \left(1 - P(i,t)\right)\ln[1 - F\left(\beta' x(i,t)\right)]\} \tag{6.4}$$

From equation 6.4, the probability distribution F(.) is assumed to be logistic and is given by:

$$F(.) = \frac{e^{\beta' x}}{1 + e^{\beta' x}} \tag{6.5}$$

Therefore, the estimated coefficients reflect the effect of a change in the explanatory variables on $\ln P(i,t)/(1 - P(i,t))$. It is important to note that an increase in the probability depends upon the original probability and initial values of all independent variables and their coefficients. According to Beck et al. (2006), the estimated coefficients for each explanatory variables indicate whether an increases of that explanatory variable increases or reduces the probability of crisis. These estimated coefficients do not reveal the magnitude of the impact of the marginal change in the explanatory variables on the probability of bank crisis. Therefore,

we present marginal effects estimates which show the magnitudes of the relationship between the explanatory variables and banking crisis evaluated at sample mean.

However, Detragiache (2005) argues that there could be feedback effects from the banking crisis to some of the explanatory variables and, therefore, suggests the exclusion from the sample years where the crisis were unfolding. Furthermore, Angkinand et al. (2010) propose using lagged explanatory variables and dropping years following the onset of the crisis. To deal with this simultaneity bias, this study implements the same approach by using one period lag of the explanatory variables[40].

In this model, South Africa was dropped for the following reasons. Firstly, the country has small percentage of foreign banking presence (see Figure 6.1). Secondly, South Africa (and Nigeria) is an important source of pan-African networks. South African banks are dotted across the region and more especially in SADC. Thirdly, the financial sector of the country is not bank dominated. Unlike other countries such as Malawi, Nigeria and Lesotho where banking sector represents, 71%, 90%, 91.8% respectively of the total financial sector assets, it is only 25% in South Africa (Quintyn & Taylor (2007). However, the study includes Nigeria because the financial system is dominated by the banking system and, moreover, the period under investigation witnessed banking crisis in the country.

6.3.2 The System GMM

The alternative measure of banking crisis variable is bank *z-score.* This is not a binary variable. Relating these indicators to foreign banking inflows and other control variables may face the following problems. Firstly, potential endogeneity bias that may arise from the control variables. For example, a more stable banking sector could result in not only economic development but price stability, increases in foreign banking inflows and stability in exchange rate. The reverse is true if there is banking crisis. Secondly, equally important problem is an unobserved heterogeneity which is likely to occur due to omitted variables. This problem results in correlation between some of the control variables and the error term. In addition, the dataset used in the study has a short dimension and a relatively large country dimension i.e. (N > T).

[40] According to Green (2008), variables that are predetermined in a model can be treated at least asymptotically as if they were exogenous in the sense that consistent estimators can be obtained when they appear as regressors.

To address the above potential problems, the study uses dynamic system generalised method of moment (SGMM) developed by Arellano and Bover (1995) to relate the banking crisis variable to foreign banking inflows and other control variables as indicated by equation 6.1. More formally, the study relates in SGMM model an indicator of banking crisis measure to its one-period lagged value, foreign banking presence and other control variables. The main advantage of this econometric approach is that, it accounts for simultaneity bias, inverse causality and omitted variables by using the lagged dependent variable as instruments. The approach combines the first difference and level equations, which yield better estimates than the original GMM developed by Arellano and Bond (1991) that results in inefficient results due to the use of lagged levels as instruments for first difference equation. Lagged levels are poor instruments for first difference equation. More specifically, the Arellano-Bond approach considers the autoregressive model with additional regressors from equation 6.1 in the specification as follows:

$$y_{it} = \gamma y_{it-1} + \beta_0 x_{it} + u_{it} \tag{6.6}$$

Where u_{it} is error component term given by equation 6.7 below:

$$u_{it} = v_i + \varepsilon_{it} \tag{6.7}$$

Where y_{it} measures bank *z*-score for country *i* at time *t* and u_{it} which is the error component term includes unobserved panel effect v_i and the error term ε_{it} with $E(\varepsilon_{it}) = E(v_i) = E(v_i \varepsilon_{it}) = 0$ for all *i* and *t*. One period lagged of the dependent variable is represented by y_{it-1} and x_{it} denote the same meanings as in equation 6.1.

To remove the panel specific heterogeneity effect, the GMM uses first differences to transform equation 6.6 to equation 6.8 below leading to its name difference GMM:

$$\Delta y_{it} = \gamma \Delta y_{it-1} + \beta_0 \Delta x_{it} + \beta_1 \Delta fbi_{it} + \Delta u_{it} \tag{6.8}$$

By transforming the regressors through first differencing, the fixed country-specific effect is removed, since it does not vary with time as in equation 6.9. The lagged dependent variable, however, is still potentially endogenous. This is because y_{it-1} term in $\Delta y_{it-1} = y_{it-1} - y_{it-2}$ is correlated with ε_{it-1} in $\Delta \varepsilon_{it} = \varepsilon_{it} - \varepsilon_{it-1}$ and this applies to x_{it} variables too (Roodman, 2009).

$$u_{it} - u_{it-1} = (v_i - v_i) + (\varepsilon_{it} - \varepsilon_{it-1}) = \varepsilon_{it} - \varepsilon_{it-1}$$
$$\Delta u_{it} = \Delta \varepsilon_{it} \quad (6.9)$$

Hence the Arellano-Bond estimator is based upon the following orthogonality conditions:

$$E(y_{it-s}\Delta\varepsilon_{it}) = (x_{it-s}\Delta\varepsilon_{it}) = 0 \quad for\ t = 3, \dots T \quad and\ \ 2 \leq s \leq T - 1 \quad (6.10)$$

Where y_{it-s} is suitable lags of the dependent variable which are used as instruments for the residuals of the differenced equation (equation 6.8). However, Blundell and Bond (1998) point out that lagged levels are poor instruments for first difference equation as it often results in bias estimates and hence inefficient results of the GMM estimator of Arellano and Bond. To mitigate this problem, Arellano and Bover (1995) and Blundell and Bond (1998) developed the SGMM. The SGMM estimator uses the level equation in 6.6 to obtain a system of two equations: one differenced and the other in levels which leads to additional instruments. By applying the SGMM estimator, this problem is overcome by using the lagged levels as instruments for first difference equations and the lagged first differences as instruments for level equations. This usually leads to efficiency.

Furthermore, Blundell and Bond (1998) have also developed a two-step GMM estimator to address the problem of heteroscedascity. To obtain this two-step GMM, firstly, they proposed getting residuals from the (one-step) first-step estimation. Secondly, they recommend using them in order to perform a robust estimation of the variance-covariance matrix. By Monte Carlo simulations, they show that this two-step estimator is asymptotically more efficient than the one-step method. This study, therefore, uses the two-step SGMM.

According to Roodman (2009), Arellano and Bover and Blundell and Bond (1998) estimator arguments the Arellano and Bond (1991) by including additional assumption that first differences of instrument variables are uncorrelated with the fixed effects and this allows the introduction of more instruments that dramatically improve efficiency. Therefore, in addition to the moment condition specified in equation 6.10, SGMM uses the following moment conditions:

$$E(\Delta y_{it-1}(u_{it})) = 0 \quad E(\Delta x_{it-1}(u_{it})) = 0 \ \ for\ t = 3, \dots T \quad (6.11)$$

Equation 6.11 implies that lagged first-differences of the dependent variable are used to construct orthogonality conditions for the error tem of equation 6.6 in levels. And, additional

moment conditions arise from lags explanatory variables in levels. However, the number of instruments tends to increase exponentially with the number of periods.

GMM consistency depends on the validity of the instruments used, as well as the error term of autoregressive one, AR (1) and AR (2). The study thus uses two tests proposed by Arellano and Bond (1991). The first test is Sargan /Hansen tests for over-identifying restrictions which is applied to obtain the validity of the instrument. The null hypothesis is that instruments as group are exogenous. Therefore the higher the *p*-values of the Sargan statistics, the better. The second test is to determine whether there exists first and second order serial correlations. The Arellano-Bond test is used. The null hypothesis is that there is no autocorrelation. The test in AR (1) process is expected in first difference to reject the null hypothesis since: $\Delta\varepsilon_{it} = \varepsilon_{it} - \varepsilon_{it-1}$ and $\Delta\varepsilon_{it-1} = \varepsilon_{it-1} - \varepsilon_{it-2}$ both have ε_{it-1}. On the contrary, the test for AR (2) is expected to accept the null hypothesis.

Finally, Bond (2002) observes that asymptotic standard errors of the two-step system GMM estimators tend to be too small, while *t*-ratios are too big compared to equivalent tests for similar sample sizes based on one-step estimators. To eliminate this potential bias, Windmeijer (2005) recommends a finite sample correction for the variance-covariance matrix when using the two-step GMM estimator. Following this, the study uses finite-sample correction for the two-step SGMM estimator asymptotic variance provided by Windmeijer (2005).

6.3.3 Data

The data for the study is annual and covers the period 1995-2009 for 22 countries of both ECOWAS and SADC. Bankcrisis and *z*-score[41] are from Laeven and Valencia (2012) and Bankscope which is compiled by Global Financial Development Database. Macroeconomic data on real GDP per capita, credit to the private sector (%GDP), ratio of M2 to reserve, inflation, and exchange rate are obtained form WDI for the same period. *Pol* (Polity2) which measures the level of democracy and autocracy is obtained from Polity IV and financial liberalisation index is obtained Chinn and Ito. Finally, deposit insurance is obtained Demirgüç-Kunt et al. (2014). Detail description of the data used is shown in Table E.0.1 in the appendix E.

[41] It is estimated as (ROA+ (equity/assets))/sd (ROA); sd (ROA) is the standard deviation of ROA. ROA, equity, and assets are country-level aggregate figures calculated from underlying bank-by-bank unconsolidated data from Bankscope.

6.4. Analysis of results

This section discusses the results of both the multivariate logit approach and the two-step system GMM estimates of bankcrisis and z-score in sections 6.4.1 and 6.4.2 respectively. The descriptive statistics of the variables used are shown below in Table 6.4.1.

Table 6.4.1: Descriptive statistics

Variables	obs	mean	std dev	Min	Max
Bankcrisis	374	0.05	0.21	0	1
z-score	299	13.7	9.0	-4.5	41.5
fbi	330	57.3	24.2	3	100
inflation	366	62.8	342.3	-9.6	4145.11
rdgppc	374	1386.4	1663.95	188.2	6592.8
pol	374	3.1	5.8	-9	10
exrate	374	1792.9	25031.9	0.003	480097
rgdppcgr	374	2.0	3.9	-17.95	18.5
finop	374	-0.7	1.1	-1.9	2.4
m2res	369	3.3	5.4	0.19	72.99
credit	373	24.1	29.2	2.014	167.5
depinss	374	0.14	0.34	0	1

All variables are in levels. Fbi is percentage of foreign banks among domestic banks, credit is private credit, finop is the financial liberalisation. The variable exrate is exchange rate, m2res is the ratio of M2 to reserves. Finally, rgdppc is the real GDP per capita and rgdppcgr is the real GDP growth

From the Table, it is evidenced that on average the percentage of foreign banking presence in the domestic banking industry is about 57%, whereas the maximum is 100% for the period of the study. The mean values of the ratio of M2 to reserves and credit to the private sector indicate about 3% and 24% respectively. However, the maximum indicates about 73% for ratio of M2 to reserves and 168% for credit to the private sector. The mean z-score is about 14. This reveals relatively low stability in the banking system of the two regions.

6.4.1 Analysis of the results of Bank crisis obtained from Multivariate logit model

In this section, the study presents the results of the marginal effects of the multivariate logit model, which is shown in Table 6.4.2. This can be interpreted as elasticities. The coefficient estimates are also shown in Table E.0.3 in the Appendix. The estimates seems to corroborate the results of the marginal effects. The pseudo R square ranges from 0.03 to 0.49.

From the Table, foreign banking presence in the region reveals an inverse relationship with probability of bank crisis. It shows a negative and significant marginal probability effects on

banking crisis. It implies that increases in the presence of foreign banking in the region robustly and significantly reduces the probability of bank crisis, as shown from columns 1 to 10. From columns 1 to 9, the coefficients of foreign ownership of domestic banks remain robustly negative and statistically significant after each control variable is added to the model one after the other. This suggests that there is no indication that foreign banks increase the likelihood of bank crisis and fragility. The specifications indicate that on average, increases in foreign banking inflows by one unit, it will reduce the probability of banking crisis by 0.001 (0.1%).

The results therefore provide evidence that support the argument that foreign banks reduce incidence of bank crisis (e.g. Demirgüç-Kunt et al., 1998; De Haas and Van Lelyveld, 2006, 2010). Thus, the result rejects the widely held conventional wisdom that foreign banks stir banking crisis and financial sector instability as they are said to lack commitment to domestic banking system. This finding is also supported by the evidence existence of some foreign banks in the continent for many decades (e.g. Barclays, Standard Chattered). Overall, these results indicate that the long-run benefits from the presence of foreign banks in the financial system are genuine and not explained by a sort of omitted variable bias.

It is worth noting that the findings are in line with the argument that foreign banks may introduce know-how and good banking practices that might lead to stability in the sector. Additionally, it implies that the presence of foreign banks in the domestic banking sector for the period under study may have resulted in improvement in regulations and supervision, increase transparency and instigation of domestic reforms which are all key to financial stability. Thus, foreign presence reduces the probability of crisis and therefore strengthen financial stability.

Furthermore, political development *(pol),* real GDP per capita *(rgdppc)* and deposit insurance *(depinss)* all suggest inverse relationship with bankcrisis as suggested by economic theory. The result indicates that these control variable have a robust effect in reducing bank crisis. This is in line with a prior expectation. Development in political institutions indicates statistical significance at 1% level from the all specifications. This suggests strong evidence that it reduces the probability of bank failure. The results indicate that an improvement in democratic structures reduces the probability of bank crisis on average by 1%. The baseline model, which is column 10, indicates that democratic development decreases the likelihood of bank failure by about 1.2%. Intuitively, democratic development will include development in the rule of law and civil rights. This may go a long way in protecting the banking industry from default

either from borrowers or the bank itself. In the same direction, Table 6.4.2 indicates that increases in real GDP per capita, which proxies for the level of development, reduces the chances of bankcrisis. This seems to suggest that poor countries are likely to face banking crisis. However, the probability is very small. Therefore, countries in these two sub-regions may reduce the likelihood of banking crisis through economic development. Intuitively, economic development, which is link to the development in the legal system, may reduce the level of loan default in the banking industry which is usually blame for bank crises. Studies such as García-Herrero and Del Rio Lopez (2003) and Komulainen and Lukkarila (2003), Beck et al. (2006), Shehzad and De Haan (2009) also found such relationship between real GDP per capita and bank crises.

The result of explicit deposit insurance is in line with the expectation of the Diamond and Dybvig (1983) model. It indicates a reverse relationship with banking crisis variable. This suggests that it reduces the likelihood of bank failure by 7% from the baseline estimates. This means the presence of explicit deposit insurance in the countries that introduced it into their banking system minimise the possibility of self-fulfilling panics. This finding is in contradiction to earlier studies by Demirgüç-Kunt and Detragiache (2005), Cull et al. (2005) and Beck et al. (2006).

Table 6.4.2: Results of Marginal effects of multivariate logit

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
fbi	-0.001*	-0.0010**	-0.00129**	-0.00145**	-0.00136***	-0.000709**	-0.000728**	-0.000711**	-0.00120**	-0.0010*
	-0.000544	-0.000466	-0.000547	-0.000569	-0.000489	-0.00028	-0.000289	-0.000288	-0.000503	-0.000553
pol		-0.00915***	-0.0124***	-0.0124***	-0.0123***	-0.0127***	-0.0130***	-0.0130***	-0.0139***	-0.0117***
		-0.00292	-0.00413	-0.0039	-0.0037	-0.00366	-0.00379	-0.00376	-0.00375	-0.00346
finop			0.0328**	0.0322**	0.0278	0.0364**	0.0373**	0.0379**	0.0380**	0.0239**
			-0.0154	-0.0155	-0.0193	-0.0173	-0.018	-0.0172	-0.0167	-0.0119
m2res				-0.004	-0.00611*	-0.0141*	-0.0145*	-0.0150**	-0.0172**	-0.0101*
				-0.0026	-0.00341	-0.00746	-0.00784	-0.00715	-0.00767	-0.00555
credit					0.00171***	0.00395***	0.00406***	0.00415***	0.00487***	0.00492***
					-0.00064	-0.00108	-0.00113	-0.00106	-0.00117	-0.00144
rgdppc						-0.00004***	-0.00004***	-0.00004***	-0.00005***	-0.00006***
						-1.29E-05	-1.36e-05	-1.28e-05	-1.52e-05	-1.79e-05
inflation							1.57e-06	2.95e-06	4.31e-06	-0.000314
							-1.58e-05	-1.66e-05	-1.36e-05	-0.00034
rgdppcgr								-0.00176	-0.00217	-7.54e-05
								-0.00404	-0.00401	-0.00495
depinss									-0.0424	-0.0730*
									-0.0259	-0.04
exrate										-0.00022***
										-6.98e-05
Prob>chi2	0.0756	0.0002	0.0076	0.0091	0.0057	0.0013	0.0019	0.0000	0.0000	0.0000
Pseudo R^2	0.033	0.212	0.268	0.293	0.338	0.402	0.398	0.400	0.406	0.491
log likelihood	-51.75	-42.17	-39.19	-37.743	-35.350	-31.93	-31.923	-31.83	-31.50	-26.99

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Fbi is percentage of foreign banks among domestic banks, credit is private credit, finop is the financial openness. The variable exrate is exchange rate, m2res is the ratio of M2 to reserves. Finally, rgdppc is the real GDP per capita, depinss is explicit deposit insurance and rgdppcgr is the real GDP per capita growth

Furthermore, from Table 6.4.2, credit to the private sector as well as financial openness variables indicate positive correlation with bank crisis. Increases in credit robustly induces bank crisis, as indicated in Table 6.4.2 from columns 5 to 10 at 1% statistically significant levels. In column 10, the results suggest that increases in credit delivery by the banking industry may increase the likelihood of bank crisis by almost 0.5%. From this perspective uncontrolled increases in credit to the private sector has the power to induce bank crisis which is in line with Kindleberger's (1978) model that argues that expansion of credit in upturn in the economy results in accumulation non-performing loans which causes crisis. The findings of this study also corroborates findings of earlier studies by Demirguc-Kunt and Detragiache (2005) and Klomp (2010). Most banking crisis are blamed on uncontrolled credit to the private sector, since they usually result in growth of non-performing loans which induce bank crisis. In line with this view, Brownbridge and Gockel (1998) argue that prior to the financial liberalisation, many state owned banks accumulated non-performing loans as a results of uncontrolled credit issuance to some sectors that were deemed growth enhancing priority areas at below market interest rates. This was brought about by non-repayment of loans by the sectors.

In addition, the openness indicator like credit variable also enters in the model with positive coefficient, suggesting that it induces the chances of bank crisis. It presents relatively strong evidence of increasing the likelihood bank fragility. The variable indicates statistical significance at 5%, even though loose significance at model 5. On average, the coefficient suggests that the variable increases the probability of crisis by 3%. Even though the baseline estimates indicate that openness induces the chances of bank crisis, it is only statistically significant at 5% level, but robust to almost all the specifications. This introduces fragile domestic bank to intense competition. This may lead to some banks failing due to exposure to liquidity risk, credit risk and exchange rate risk. In addition, the result could mean financial openness exposes developing countries vulnerable to financial shocks through increase capital flows and its vulnerability. exposure to In addition, the results seem to suggest that financial liberalisation does not improve banking stability by enabling them to better diversity their assets portfolio and widening depositor base.

This is in line with the widely held view that there are increases in bank fragility in more competitive banking markets from more financially liberalised markets. The results lend support to the works of Demirgüç-Kunt and Detragiache (1998), Glick and Hutchison (2000) and Noy (2005).

However, inflation, which measures the level of control of monetary policy, is not statistically significant. In the same vein, real GDP per capita growth, despite indicating the expected sign of reducing the likelihood of banking crisis, is statistically insignificant. This indicates that the growth rate is impotent in combating banking crisis. Implying, poor countries are prone to crisis.

Finally, the baseline estimates suggest that the vulnerability to sudden capital outflows measured by the ratio of M2 to foreign exchange reserves is marginally significant, but enters the estimates with a negative coefficient. This means an increase in M2 reduces bank crisis as shown in Table 6.4.2 which seems counter-intuitive. Adoption of flexible exchange rate suggests negative correlation with bank crisis, with probability almost zero.

Therefore, the study concludes that, increases in foreign banking presence in the domestic banking industry, development in democratic institutions, increases in economic development and implementation of deposit insurance reduce the likelihood of bank failure and crises. These measures induce financial stability. However, financial liberalisation and increases in credit deliverance to the private are most important factors that trigger bank crisis and financial sector instability.

The next section discusses the estimates of the two-step system GMM approach when bank z-score is the dependent variable.

6.4.2 Analysis of the results of Bank *z*-score obtained from two-step system GMM

In this section we discuss to what extent bank insolvency or stability measured by bank *z*-score can be captured by the dynamics of both bank specific and macroeconomic variables. In this analysis, explicit deposit insurance was dropped because including time-invariant regressor may cause the estimates to be biased. According to Roodman (2009), any dummy that is 0 or 1 for most might cause bias, especially if T is very small. In addition, using the SGMM, the number of instruments increase exponentially according to the time period. This might result in finite sample bias and the likelihood of the specification test, such the Hansen (1982) J-test, having a relatively high pass rate (Roodman, 2009). Therefore, following Roodman (2009), the instruments are collapsed and two lags for the SGMM is employed. This approach was also adopted by Heid et al. (2012). As mentioned in section 6.3.2, the standard errors are corrected using Windmeijer (2005) finite-sample correction of the standard errors.

Table 6.4.3, as with Table 6.4.2, we have seven estimates. This is because the candidate variable, foreign banks, was not statistically significant in the first three specifications. We therefore report were its start to be statistically significant. The Table suggest that in all the estimates, the instruments are valid, as is evidenced by the *p*-values of the Sargan and Hansen *J*-tests for overidentification restrictions. The null hypothesis for these tests state the validity of the overidentification restrictions and each specification, the null is not rejected. In addition, the test for the first and second order autocorrelation in the disturbance reported by AR (1) and AR (2) suggest there is first order autocorrelation, and no evidence for significant second order autocorrelation. This is in line with our expectations. Based on these tests, we can conclude that we have the right specification.

From Table 6.4.3, the coefficient of lagged *z*-score indicates strong persistence. As expected, it confirms significant positive relationship with the present *z*-score. This suggests that previous bank probability of default is highly related to the current probability of default by banks in the region. As lagged z-score depicts the bank's capital buffer built in the past, this measure confirms its significant positive relationship with the current z-score.

Foreign banks variable indicates statistically significant positive correlation with the z-score. This implies more foreign banks entry into the domestic banking sector will increase the

distance-to-insolvency of the domestic banking sector of the region. This corroborates our earlier discussion under section 6.4.2.

Table 6.4.3: Results of two-step system GMM for bank z-score

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$zscore_{t-1}$	0.673***	0.702***	0.704***	0.668***	0.694***	0.663***	0.555***
	(0.113)	(0.125)	(0.127)	(0.0802)	(0.121)	(0.110)	(0.0935)
fbi	0.0576**	0.0604*	0.0669*	0.102*	0.114**	0.105**	0.0909**
	(0.0290)	(0.0314)	(0.0369)	(0.0573)	(0.0537)	(0.0509)	(0.0418)
credit	0.0447*	0.0413*	0.0396*	0.0280	0.0271	0.0611	0.0854***
	(0.0251)	(0.0235)	(0.0214)	(0.0212)	(0.0341)	(0.0496)	(0.0298)
pol	0.174	0.198	0.244	0.732**	0.579	0.587**	0.505**
	(0.412)	(0.362)	(0.271)	(0.313)	(0.372)	(0.230)	(0.243)
finop		-0.0433	-0.0936	-0.0239	-0.223	0.729	2.470*
		(0.675)	(0.645)	(0.766)	(0.816)	(1.467)	(1.453)
exrate			-0.000733	-0.00141	-0.00219	-0.00378	-0.00465*
			(0.00165)	(0.00248)	(0.00252)	(0.00284)	(0.00251)
inflation				0.0210*	0.0133	0.0112	0.00645
				(0.0121)	(0.00970)	(0.00711)	(0.00579)
m2res					-0.392	-0.419	-0.878**
					(0.277)	(0.291)	(0.353)
rgdppc						-0.00119	-0.00229*
						(0.00118)	(0.00121)
rgdppcgr							0.178
							(0.138)
Constant	-0.863	-1.333	-1.683	-5.491	-4.714*	-0.944	5.508
	(2.378)	(2.069)	(2.013)	(4.025)	(2.795)	(4.196)	(5.524)
AR(1)	-2.17	-2.09	-2.17	-2.25	-2.33	-2.46	-2.03
	(0.030)	(0.036)	(0.030)	(0.024)	(0.020)	(0.014)	(0.042)
AR(2)	-1.11	-1.13	-1.14	-0.91	-1.00	-0.99	-1.11
	(0.266)	(0.257)	(0.253)	(0.361)	(0.317)	(0.324)	(0.266)
Sargan test	1.05	1.04	1.05	1.39	6.75	5.84	4.34
	(903)	(0.959)	(0.984)	(0.986)	(0.563)	(0.755)	(0.931)
Hansen[42]	0.44	0.85	0.86	1.97	4.95	4.15	1.73
J-test	(0.979)	(0.974)	(0.990)	(0.962)	(0.763)	(0.901)	(0.998)
Obs	213	213	213	211	211	211	211
N	20	20	20	20	20	20	20

Windmeijer-Corrected robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1

fbi is percentage of foreign banks among domestic banks, credit is private credit, finop is the financial openness. The variable exrate is exchange rate, m2res is the ratio of M2 to reserves. Finally, rgdppc is the real GDP per capita and rgdppcgr is the real GDP growth

[42] The difference-in-difference Hansen-j also confirmed these results.

Again the same reasons of foreign banks bringing in know-how and other good practices given in section 6.4.2 for such a relationship can be assigned for this result. However, the result is relatively stronger when z-score is used than when bank crisis variable is employed. The estimates of the six specifications reported in Table 6.4.3, suggest that foreign banks presence in the region robustly increase the domestic bank *distance-to-insolvency.* The result is robust to each of the seven specifications indicated in Table 6.4.3. The implication of the findings obtained from these two approaches is that the presence of foreign banks in the region is an important integral part of factors responsible for the reduction of probability of bank crises and financial sector instability.

In line with the discussion under 6.4.2, development in political institutions reveals statistically significant positive correlation with bank *distance-to-solvency at* 5% level, as shown by the baseline specification. We can thus give credence to these findings that in order to reduce the likelihood of bank crises in this region, more improvement needs to occur in the political institutions and other institutions

However, unlike the discussion in section 6.4.2, openness of the financial sector indicates a positive correlation with z-score, but marginally significant at 10% level with specification 7. Specifications 2 up to 6 indicate that the coefficients are not statistically significant. This implies that the impact is not robust to the different specification. Thus, much credence cannot be assigned to this result.

Considering the banking variable, the ratio of M2 to exchange rate reserves, the data indicates that it reduces bank *distance-to-insolvency* at 5% statistical significance level under the baseline specification. This suggests that bank exposure to currency vulnerability induces banking crises in the region. An increase in bank exposure to currency vulnerability in the region by 10% will result in decreases in bank distance-to-insolvency by about 9%. This corroborates earlier findings by Eichengreen and Arieta (2002), Demirguc-Kunt and Detragiache (2005) and Klomp (2010).

However, inflation which is expected to indicate a reverse correlation with z-score is again statistically insignificant with the baseline specification. Real GDP per capita growth indicates its expected sign, but is not statistically significant. Real GDP per capita reveals a negative relationship with z-score and marginally significant at 10% with relatively very low coefficient of 0.002.

Finally, credit to the private sector indicates positive relationship with distance-to-insolvency with the baseline specification. The data also suggests that in specification 1, 2 and 3, it is positive and marginally significant at 10% levels. However, it loses significance when inflation, M2 to exchange rate reserves, inflation and real GDP per capita are added progressively. The *a prior* expectation of the relationship between credit and z-score should be negative but the data indicates contrary. The reason could be inter bank credits. However, the results are not robust to the different specifications. Study of Worrell et al. (2007) also obtained such results.

6.5 Robustness and sensitivity analysis

This section of the chapter discusses robustness and sensitivity tests of the results from the logit model. This is done by investigating the sensitivity of the results to alternative model specification. To test if the results are sensitive to alternative specification and distributional properties as well as the functional forms of p as a function of the regressors, the multivariate probit model is specified. The probit model has a different logistic distribution. The probability distribution is specified as $F(.) = \int_{-\infty}^{\acute{x}} \emptyset(z)dz$. The errors in probit are standard normally distributed but they are logistically distributed in logit model. Table E.0.4 provides the results.

The result largely corroborates the baseline estimates and reassures that it is robust. It indicates that the coefficients of foreign banking inflows are still negative and statistically significant throughout the ten specifications. This reveals that more banking inflows into the region reduces the likelihood of banking crisis during the period under study. The overall results point towards the effects of the presence of foreign banks in reducing the likelihood of banking crisis in the banking sector. It is robust and genuine and not explained by a sort of omitted variable bias or model specification problem.

Furthermore, like the multivariate logit results, more development in political institutions strongly reduces the chances of financial instability. On the contrary, more openness of the financial system as well as increases in credit tend to be detrimental, and enhances the chances of banking crisis. The coefficients of real GDP per capita are again negative and statistically significant. This implies that more economic development reduces banking crisis. Deposit insurance reduces the chances of crisis, but unlike the logit specification, the variable became statistically insignificant when exchange rate is added to the specification.

6.6 Summary and conclusion

Foreign banks play a progressively important role in the banking sector and thus the financial system development in many developing countries. Foreign banks hold relatively greater proportion of banking assets in many countries of these regions. In SSA, it is more than 50%. Banks constitute over 90% of the financial system's assets in the region. Given the crucial role that foreign play in the domestic banking, the issue concerning their entry continue to be question, especially in relation to banking stability. In this study, given the relatively under developed and fragile nature of the Sub-Saharan Africa's financial system which is broadly bank based, we examined the impact of foreign banking inflows on the banking sector stability in countries of ECOWAS and SADC for the period 1995-2009.

To capture this relationship, the study employs two econometric approaches, namely, the multivariate logit and the two-step system generalised method of moment using bank crisis measure constructed by Laeven and Valencia (2012) and bank z-score. The results of the two methods indicate evidence that the presence of foreign banks in the domestic banking sector robustly reduces the probability of bank crisis. The study, therefore, cautiously interprets the results as foreign banks being a panacea to banking crises. However, the logit approach indicates that financial openness and increases in credit are key determinants responsible for bank crisis. This is opposite when bank z-score is considered. Finally, the approaches revealed that improvement in political institutions reduces the probability bank crisis.

Chapter 7

Conclusion and Policy Implications

7.1 Summary

This thesis offers a detailed analysis of the effects of financial development on economic growth and the role of foreign banks, inflation and openness in the process of financial sector development. These issues are examined in four empirical essays where each essay constitutes a chapter centred on the main objectives of the research. Specifically, the thesis considered a comparative study between ECOWAS and SADC in three essays. The fourth essay combined the two regions. This study is the first of its kind to be studied in SSA. The two regional economic blocs were chosen because they do not only seem to be one of the oldest regional economic groupings in SSA, but constitute more than half of SSA. The study included 12 countries in each region which was determined by the availability of data. The first three empirical essays cover the period 1980 to 2011 whiles the last essay is from 1995 to 2009.

The thesis is discussed in seven chapters. Chapter one is the introduction which included the background with motivation, justification and objectives of the study. In chapter 2, the study provided detailed discussions of economic performances as well as the financial sector landscape of ECOWAS, SADC and SSA. Furthermore, chapters 3, 4, 5 and 6 provided the empirical essays and chapter 7 gave the summary, conclusion and policy implications of the findings of the research.

One of the critical issues in financial development literature is the problem of proxy for financial system development. This issue usually leads to inconclusive results in many empirical studies. Motivated by this observation, this thesis addressed this problem by constructing a composite measure of financial development using three indicators: liquid liabilities, ratio of domestic bank asset to the sum of central bank asset and domestic bank assets and, finally, bank private credit. This, new measure of financial system development is used in Chapters 3, 4 and 5. The individual measures of this new measure are also considered in the studies.

Chapter 3 presented the first empirical essay. It investigated the effects of financial development on economic growth between the two regions. Specifically, the chapter investigated both the effects of financial development on economic growth and its effect

through the development in governance on economic growth. Apart from the use of the composite measure of financial development, the chapter contributed to the current literature by examining a comprehensive comparative study between the two regional blocs. More importantly, the chapter addressed the issue of heterogeneity in the two regions, which is usually ignored in panel studies, by adopting a more robust econometric approach, the PMG, developed by Pesaran et al. (1999). Other methodologies used to examine the robustness of the results are the MG and DFE approaches.

The main findings of the essay indicated evidence of a long run statistically significant positive effect of the financial development on economic growth in both regions. Specifically, it showed that the effects in SADC are stronger than that for ECOWAS for the period under study. In addition, the individual measures of the FSD also indicated a robust positive effect on growth in SADC, but with only one measure indicating positive effect on that for ECOWAS. This implies that the relatively underdeveloped financial system of ECOWAS does not induce economic growth in the same way as the financial system of SADC. Furthermore, more political development supported the financial sector to impact on growth positively in ECOWAS, but not in SADC. This suggests that democratic development in SADC may be weak and do not complement financial development to influence growth positively in that region.

The speed of adjustment to the long run path indicated by the ecm following a shock, suggested 13% and 15% per year for ECOWAS and SADC respectively. This hints that economies in SADC will be on a relatively faster trajectory towards their long-run steady-state growth than countries in ECOWAS. For country-level, error correction model (ECM) estimates showed that South Africa will quickly recover following a shock to SADC, then Malawi and Zimbabwe. The rest of the countries revealed relatively slower speed of adjustment in the region. Comparing ECOWAS with SADC, only two countries, Nigeria and Ghana, indicated relatively faster reversion to the equilibrium path when there is disturbance in the region. The rest of the economies, like those in SADC, indicate relatively slow recovery rate to their equilibrium path in the event of any shock in ECOWAS.

Sensitivity analysis to ascertain the robustness of the estimates was done by re-specifying the baseline model with the replacement of governance variable with political rights. The results from the main model are substantiated.

The second essay, presented in Chapter 4, investigated the issues concerning the underdeveloped state of the financial system of the two blocs, with specific focus on the effects of inflation and openness (Rajan and Zingales Hypothesis) on financial development. The contribution of this chapter is not only an exclusive comparison between the two blocs and the use of composite measure of financial development, but also the inclusion of measure of communication infrastructure in the finance equation. More importantly, as a contribution, the chapter applied a number of panel approaches which included SURE. It gave detailed analysis of the issues at country-level and addressed the problems of contemporaneous correlation among countries in each bloc. The main findings provided evidence that, in both regions, inflation strongly reversed financial development with the effect in ECOWAS more than that of SADC. This is indicated by the three panel approaches applied. Country-level analysis also corroborated these findings in the two regions. Financial systems of countries such as Mauritius (SADC) and Cape Verde (ECOWAS) are heavily affected.

In addition, the study indicated that even though more simultaneous opening of the financial sector and trade led to more financial development in SADC, trade openness alone can still cause development in the sector. However, more financial openness alone is detrimental to financial development of the region. This provides partial support for the hypothesis. However, the hypothesis is rejected in ECOWAS. Finally, increases in access to communication will benefit the financial system of both regions but with SADC benefitting more if there is an equal percentage increases in the measure.

The third essay, presented in Chapter 5, sought to investigate the asymmetric relationship between inflation and financial development, since inflation is shown to reverse financial development. This chapter is motivated by the existing theories that argue that the detrimental effects of inflation on the financial development are only observed beyond certain threshold level. This chapter contributed to the existing literature by not only being the first study to investigate such threshold effects of inflation on financial development in SSA (on regional blocs), but also, in contrast to existing studies, it used a more robust approach that test and estimated the threshold level endogenously. The principal results suggested the existence of a robust single threshold of inflation in both regions. Specifically, it indicated 17.9% and 14.5% of inflation for ECOWAS and SADC respectively. This suggested that inflation above these thresholds presents statistically significant detrimental effects for financial development in both regions. Sensitivity analysis to ascertain the robustness of the estimated thresholds was

carried out by re-specifying the baseline model with the inclusion of savings and exchange rate. The estimates largely confirmed the main results.

Finally, the fourth empirical study, presented in Chapter 6, focused on financial sector stability via banking sector stability. This is motivated by the evidence that the financial system of the two regions are broadly bank based with over 50% foreign bank dominated. Thus, the essay specifically investigated the effects of foreign banking inflows on banking crisis (financial instability) of both regions from 1995 to 2009. This follows from the widely held conventional wisdom that foreign banks lack commitment and may leave the domestic banking sector on the least suspicion which could stir instability in the sector. The study employed two econometric approaches, namely, the multivariate logit and the two-step system generalised method of moment using bank crisis measure constructed by Laeven and Valencia (2012) and bank z-score (Bankscope). The main results of the two methods indicated that the presence of foreign banks in the domestic banking sector robustly reduces the probability of bank crisis. Thus, foreign banks contribute positively to banking stability and, consequently, financial sector stability and development. Thus, the study rejected the widely held conventional view that foreign banks are mostly blameable for banking crisis. Financial openness and credit increase, though, are found responsible for the likelihood of crisis.

7.2 Policy Implications of the findings

The study has significant implication for policy formulation since it is the first study on comparative analysis between two regional economic groups. The findings in Chapter 3 argues that policy makers should continue the effort to improve both their financial sector and governance system. Measures should be taken to improve the current supervisory and regulatory role of Central Banks over the financial system. The formation of financial stability department by monetary authorities can go a long way to help. In this direction, South Africa has already created such department in the Reserve Bank.

Furthermore, more steps need to be taken specially to improve democratic institutions. Democratic impediments that impair governance from providing support or complement the financial sector to influence growth positively should be removed. This could be abstinence by political authorities from interfering in the financial system. Furthermore, good governance system supported by good and sound macroeconomic policies should be at the centre stage of policy design as good governance alone may not necessarily promote economic growth.

Finally, as a policy measure, more trade openness is necessary for economic growth and development as envisage by theory. Developing economies especially SSA and its regional economics blocs should further takes steps to remove impediment on trade.

The study also advocate for a discrete increase in government spending. A more discipline fiscal policies should take the centre stage of policies so as to mitigate the detrimental effect of government expenditure on economic growth. This could be in the form of cutting expenditures on unproductive areas such as spending on recurrent expenditures. Even though measures are being taken to improve the healthcare delivery, education and training, the study argues that this should take more attention in policy formulation and implementation since it robustly propels economic growth. More schools and hospitals should be made accessible.

Furthermore, the findings in Chapter 4 generally suggests that price stability policies and measures to increases access to communication infrastructure can help expand the financial system. The main policy recommendation is attainment of low and single digit inflation, since high inflation is economically costly to the FSD. The study, therefore, indorses the adoption of monetary policy that will stabilise the general price level.

In the light of the findings in Chapter 4, Chapter 5 determines the level of inflation rate policy makers should target in order to avoid the detrimental effects of inflation on financial development. The chapter proposes that inflation of the two regions should be maintained below the estimated threshold of 17.9% and 14.5% for ECOWAS and SADC respectively. To achieve this, monetary policy of the Central Banks of these two regions can adopt inflation targeting framework, as is done in some countries such as Ghana and South Africa. The inflation targets of the two countries fall below the estimated low regime threshold of inflation in this study. South Africa has adopted a flexible inflation targeting regime where inflation band is set. Currently, the band is 3%-6%, which is in line with the lower inflation regime in this study. However, Ghana's current medium term target band is set at 8% plus or minus 2%. Hence, inflation targeting monetary framework may be adopted by all member states in regional blocs, since they strive towards common macroeconomic goals in order to reach the convergence criteria. This can be replicated in other regional blocs of SSA.

The study therefore argues that continued reforms in the monetary, fiscal and financial institutions will help keep inflation under control if inflation targeting is adopted.

Also more investment in the telecommunication industry and easing imports duties on Smart phones (as is demonstrated in 2015 budget of Ghana) can reduce the impediments to financial development. Since many countries have demonstrated partial support for the Rajan and Zingales hypothesis, it is necessary for developing economies especially, SSA to consider optimal opening of trade and capital account flows. For Cote d' Ivoire though, more simultaneous opening of the two holds the key to financial development of the country.

Finally, on the empirical evaluation on the impact of foreign banks on financial stability discussed in Chapter 6, the findings implied foreign banks reduce the probability of financial crises and therefore beneficial to the financial system. This study indorses a more cautious approach towards attracting more foreign banks as well as more opening of the financial sector. In terms of policy recommendations, the main policy response proposed by this essay is the improvement in the financial system through improving supervisory and regulatory framework. This can go a long way in sustaining and controlling the activities of foreign banks and the overall banking development.

7.3 Suggestions for future research

Considering future research, studies can focus and investigate smaller regional groupings such as WAEMU in ECOWAS. WAEMU includes Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo. The group has a common accounting system, periodic reviews of member countries' macroeconomic policies based on convergence criteria, a regional stock exchange, and legal and regulatory framework for a regional banking system. Other sub-groups include SACU which is made up of Botswana, Lesotho, Namibia, South Africa and Swaziland. SACU arrangement requires free duties on goods locally produced within member states, but a common restriction to goods imported from the rest of the world. Other smaller groups include CMA. This is monetary and exchange rate arrangement between South Africa, Lesotho, Swaziland and Namibia. A comparative study can, therefore, be conducted between these subgroups on the same issues relating growth, financial and foreign banking inflows. Others are CEMAC and EAC.

Furthermore, since the hypothesis of Rajan-Zingales is not fully supported in this study, further investigations on the role of financial and trade openness on the financial sector development should be the focus. The financial openness variable is partially blamed for such outcome. Even though this study acknowledged the weakness of the Chin-Ito openness variable, alternative

openness variable is not readily available. Thus, effort should be made to obtain such alternative measure to test this hypothesis. Also, the absence of any effects of trade openness on the financial sector development of ECOWAS merits further investigations.

Lastly, as part of further studies, the effects of political openness on financial development of both regions should be investigated using an alternative political openness variable. Even though different econometric approaches have been used in this study, this measure seems to present no effects on the development of the system.

References

Abbey, E.N. 2013, "Inflation and financial development: evidence", *American Journal of Economics and Business Administration,* vol. 4, no. 4, pp. 227.

Abu-Bader, S. & Abu-Qarn, A.S. 2008, "Financial development and economic growth: The Egyptian experience", *Journal of Policy Modeling,* vol. 30, no. 5, pp. 887-898.

Abu-Bader, S. & Abu-Qarn, A.S. 2008, "Financial development and economic growth: empirical evidence from six MENA countries", *Review of Development Economics,* vol. 12, no. 4, pp. 803-817.

Aboudou, M.T. 2009, "Causality tests between stock market development and economic growth in West Africa", *Economia Seria Management,* vol.12, Nr. 2/2009,

Acemoglu, D., Johnson, S. & Robinson, J.A. 2005, "Institutions as a fundamental cause of long-run growth", *Handbook of economic growth,* vol. 1, pp. 385-472.

Adu, G., Marbuah, G. & Mensah, J.T. 2013, "Financial development and economic growth in Ghana: Does the measure of financial development matter?", *Review of Development finance,* vol. 3, no. 4, pp. 192-203.

Agbetsiafa, D. 2004, "The finance growth nexus: evidence from Sub-Saharan Africa", *Savings and Development,* , pp. 271-288.

Ahmed, A. D. 2010, "Financial liberalization, financial development and growth linkages in Sub-Saharan African Countries, An empirical investigation", *Studies in Economics and Finance,* vol. 27 no. 4, pp. 314–39.

Ahmed, A.D. & Wahid, A.N. 2011, "Financial structure and economic growth link in African countries: a panel cointegration analysis", *Journal of Economic Studies,* vol. 38, no. 3, pp. 331-357.

Akinboade, O. & Makina, D. 2006, "Financial sector development in South Africa, 1970-2002", *Journal for Studies in Economics and Econometrics,* vol. 30, no. 1, pp. 101.

Akinboade, O.A. 1998, "Financial development and economic growth in Botswana: a test for causality/développement financier et croissance économique au botswana: un test de causalité", *Savings and Development,* , pp. 331-348.

Akinlo, E. A., & Egbetunde, E. 2010, "Financial development and economic growth: the experience of ten Sub-Saharan African Countries Revisited", *The Review of Finance and Banking* Vol 02, Issue 1, Year 2010, pp 017—028S print ISSN 2067-2713*, online ISSN 2067-3825*

Allen, D.S. & Ndikumana, L. 2000, "Financial intermediation and economic growth in Southern Africa", *Journal of African Economies,* vol. 9, no. 2, pp. 132-160.

Allen, F., Otchere, I. & Senbet, L.W. 2011, "African financial systems: A review", *Review of Development Finance,* vol. 1, no. 2, pp. 79-113.

Al-Yousif, Y.K. 2002, "Financial development and economic growth: another look at the evidence from developing countries", *Review of Financial Economics,* vol. 11, no. 2, pp. 131-150.

Andrés, J., Hernando, I. & López-Salido, J.D. 2004, "The role of the financial system in the growth–inflation link: the OECD experience", *European Journal of Political Economy,* vol. 20, no. 4, pp. 941-961.

Andrianaivo, M. & Yartey, C.A. 2010, "Understanding the Growth of African Financial Markets*", *African Development Review,* vol. 22, no. 3, pp. 394-418.

Ang, J.B. 2011, "Financial development, liberalization and technological deepening", *European Economic Review,* vol. 55, no. 5, pp. 688-701.

Ang, J.B. 2008, "What are the mechanisms linking financial development and economic growth in Malaysia?", *Economic Modelling,* vol. 25, no. 1, pp. 38-53.

Ang, J.B. & McKibbin, W.J. 2007, "Financial liberalization, financial sector development and growth: evidence from Malaysia", *Journal of Development Economics,* vol. 84, no. 1, pp. 215-233.

Angkinand, A.P., Sawangngoenyuang, W. & Wihlborg, C. 2010, "Financial Liberalization and Banking Crises: A Cross-Country Analysis*", *International Review of Finance,* vol. 10, no. 2, pp. 263-292.

Apergis, N., Filippidis, I. & Economidou, C. 2007, "Financial deepening and economic growth linkages: a panel data analysis", *Review of World Economics,* vol. 143, no. 1, pp. 179-198.

Arellano, M. & Bover, O. 1995, "Another look at the instrumental variable estimation of error-components models", *Journal of Econometrics,* vol. 68, no. 1, pp. 29-51.

Arellano, M. & Bond, S. 1991, "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations", *The review of economic studies,* vol. 58, no. 2, pp. 277-297.

Arena, M., Reinhart, C.M. & Vazquez, F. 2007, "The Lending Channel in Emerging Economies: Are Foreign Banks Different?", *IMF Working Papers,* , pp. 1-52.

Arestis, P., Demetriades, P.O. & Luintel, K.B. 2001, "Financial development and economic growth: the role of stock markets", *Journal of Money, Credit and Banking,* , pp. 16-41.

Atindéhou, R.B., Gueyie*, J.P. & Amenounve, E.K. 2005, "Financial intermediation and economic growth: evidence from Western Africa", *Applied Financial Economics,* vol. 15, no. 11, pp. 777-790.

Azariadis, C. & Smith, B.D. 1996, "Private information, money, and growth: Indeterminacy, fluctuations, and the Mundell-Tobin effect", *Journal of Economic Growth,* vol. 1, no. 3, pp. 309-332.

Aziakpono, M. 2004, "Determinants of financial intermediation in the SACU countries: Preliminary evidence from a panel data analysis", *Journal for Studies in Economics And Econometrics,* vol. 28, no. 3, pp. 113-132.

Babus, A., Carletti, E. & Allen, F. 2009, "Financial crises: theory and evidence", *Available at SSRN 1422715,*

Bagehot, W. 1873, "Lombard Street, Homewood, IL: Richard D", *Irwin,(1962 Edition),* .

Baltagi, B.H., Demetriades, P.O. & Law, S.H. 2009, "Financial development and openness: Evidence from panel data", *Journal of Development Economics,* vol. 89, no. 2, pp. 285-296.

Bangake, C. & Eggoh, J.C. 2011, "Further evidence on finance-growth causality: A panel data analysis", *Economic Systems,* vol. 35, no. 2, pp. 176-188.

Barro, R.J. 2013, "Inflation and economic growth", *Annals of economics and finance,* vol. 14, no. 1, pp. 121-144.

Barro, R.J. 1996, "Democracy and growth", *Journal of economic growth,* vol. 1, no. 1, pp. 1-27.

Barro, R.J. 1995, "Inflation and economic growth", *National Bureau of Economic Research*.

Barro, R.J. 1991, "Economic growth in a cross section of countries", *Quarterly Journal of Economics,* vol 106 no. 2, pp.407-444, .

Barro, R. & X. Sala-i-Martin. 1995, "1995. Economic growth", *Boston, MA,* .

Barth, J.R., Caprio, G. & Levine, R. 2004, "Bank regulation and supervision: what works best?", *Journal of Financial intermediation,* vol. 13, no. 2, pp. 205-248.

Beck, N. & Katz, J.N. 1995, "What to do (and not to do) with time-series cross-section data", *American political science review,* vol. 89, no. 03, pp. 634-647.

Beck, T. 2002, "Financial development and international trade: Is there a link?", *Journal of International Economics,* vol. 57, no. 1, pp. 107-131.

Beck, T., Demirguc-Kunt, A. & Levine, R. 2003, *Bank concentration and crises,* National Bureau of Economic Research .

Beck, T., Demirgüç-Kunt, A. & Levine, R. 2006, "Bank concentration, competition, and crises: First results", *Journal of Banking & Finance,* vol. 30, no. 5, pp. 1581-1603.

Beck, T., Demirgüç-Kunt, A. & Levine, R. 2003, "Law and finance: why does legal origin matter?", *Journal of Comparative Economics,* vol. 31, no. 4, pp. 653-675.

Beck, T. & Levine, R. 2004, "Stock markets, banks, and growth: Panel evidence", *Journal of Banking & Finance,* vol. 28, no. 3, pp. 423-442.

Beck, T., Levine, R. & Loayza, N. 2000, "Finance and the Sources of Growth", *Journal of Financial Economics,* vol. 58, no. 1, pp. 261-300.

Beck, T. & Martinez Peria, M.S. 2008, "Foreign bank acquisitions and outreach: Evidence from Mexico", *World Bank Policy Research Working Paper Series, Vol,* .

gurley, V.R., Smith, B.D. & Starr, R.M. 1995, "Transactions costs, technological choice, and endogenous growth", *Journal of Economic Theory,* vol. 67, no. 1, pp. 153-177.

BenNaceur, S. & Ghazouani, S. 2005, "Does Inflation Impact on Financial Sector Performance in the MENA Region?", *Review of Middle East Economics and Finance,* vol. 3, no. 3, pp. 219-229.

Besley, T. & Prat, A. 2006, "Handcuffs for the grabbing hand? Media capture and government accountability", *The American Economic Review,* , pp. 720-736.

Bessec, M. & Fouquau, J. 2008, "The non-linear link between electricity consumption and temperature in Europe: a threshold panel approach", *Energy Economics,* vol. 30, no. 5, pp. 2705-2721.

Bittencourt, M. 2011, "Inflation and financial development: Evidence from Brazil", *Economic Modelling,* vol. 28, no. 1, pp. 91-99.

Bittencourt, M., Eyden, R. & Seleteng, M. 2015, "Inflation and Economic Growth: Evidence from the Southern African Development Community", *South African Journal of Economics,* .

Blundell, R. & Bond, S. 1998, "Initial conditions and moment restrictions in dynamic panel data models", *Journal of Econometrics,* vol. 87, no. 1, pp. 115-143.

Bond, S.R. 2002, "Dynamic panel data models: a guide to micro data methods and practice", *Portuguese economic journal,* vol. 1, no. 2, pp. 141-162.

Bordo, M. "others. 2001."Financial Crises: Lessons from the Last 120 Years."", *Economic Policy,* vol. 16, no. 32, pp. 51-82.

Boyd, J.H., Levine, R. & Smith, B.D. 2001, "The impact of inflation on financial sector performance", *Journal of Monetary Economics,* vol. 47, no. 2, pp. 221-248.

Brownbridge, M. 1998, "The causes of financial distress in local banks in Africa and implications for prudential policy", United Nations Conference on Trade and Development,.

Brownbridge, M. & Gockel, A.F. 1998, *Banking in Africa: the impact of financial sector reform since independence,* Africa World Press.

Campbell, A. 1960, "Surge and decline: A study of electoral change", *Public opinion quarterly,* vol. 24, no. 3, pp. 397-418.

Calderón, C. & Liu, L. 2003, "The direction of causality between financial development and economic growth", *Journal of Development Economics,* vol. 72, no. 1, pp. 321-334.

Caner, M. & Hansen, B.E. 2004, "Instrumental variable estimation of a threshold model", *Econometric Theory,* vol. 20, no. 05, pp. 813-843.

Caprio, G. & Klingebiel, D. 1996, "Bank insolvency: bad luck, bad policy, or bad banking?", *Annual World Bank conference on development economics* Washington, DC, World Bank,

Caprio Jr, G. & Honohan, P. 2009, " Banking crises", The Oxford Handbook of Banking *(Oxford University Press)*.

Chari, V. & Jagannathan, R. 1988, "Banking Panics, Information, and Rational Expectations Equilibrium", *The Journal Of Finance,* vol. 43, no. 3.

Chava, S. & Purnanandam, A. 2011, "The effect of banking crisis on bank-dependent borrowers", *Journal of Financial Economics,* vol. 99, no. 1, pp. 116-135.

Cherif, M. & Gazdar, K. 2010, "Macroeconomic and institutional determinants of stock market development in MENA region: new results from a panel data analysis", *International Journal of Banking and Finance,* vol. 7, no. 1, pp. 8.

Chinn, M.D. & Ito, H. 2006, "What matters for financial development? Capital controls, institutions, and interactions", *Journal of Development Economics,* vol. 81, no. 1, pp. 163-192.

Choi, S., Smith, B.D. & Boyd, J.H. 1996, "Inflation, Financial Markets, and Capital Formation", *Federal Reserve Bank of St.Louis Review,* vol. 78, pp. 9-35.

Čihák, M., Demirgüç-Kunt, A., Feyen, E. & Levine, R. 2012, "Benchmarking financial systems around the world", .

Claessens, S. 2006, *Competitive implications of cross-border banking,* World Scientific

Claessens, S., Demirgüç-Kunt, A. & Huizinga, H. 2001, "How does foreign entry affect domestic banking markets?", *Journal of Banking & Finance,* vol. 25, no. 5, pp. 891-911.

Clarke, G., Cull, R., Peria, M.S.M. & Sanchez, S.M. 2003, "Foreign bank entry: experience, implications for developing economies, and agenda for further research", *The World Bank Research Observer,* vol. 18, no. 1, pp. 25-59.

Cling, J. P. 1998, "Afrique Australe: Integration Regionale et Ancrage a l'Union Europenne"economie internationale, 74 (2): 121-45

Colletaz, G. & Hurlin, C. 2006, "Threshold effects of the public capital productivity: an international panel smooth transition approach", .

Cull, R. & Martinez Peria, M.S. 2010, "Foreign bank participation in developing countries: what do we know about the drivers and consequences of this phenomenon?", *World Bank Policy Research Working Paper Series, Vol,* .

Cull, R., Senbet, L.W. & Sorge, M. 2005, "Deposit insurance and financial development", *Journal of Money, Credit and Banking,* , pp. 43-82.

Dages, B.G., Goldberg, L.S. & Kinney, D. 2000, "Foreign and Domestic Bank Participation in Emerging Markets: Lessons from Mexico and Argentina", *Economic Policy Review,* vol. 6, no. 3.

David, A.C., Mlachila, M. & Moheeput, A. 2014, "Does Openness Matter for Financial Development in Africa?", .

De Gregorio, J. & Guidotti, P.E. 1995, "Financial development and economic growth", *World Development,* vol. 23, no. 3, pp. 433-448.

De Haas, R. 2014, "The Dark and the Bright Side of Global Banking: A (Somewhat) Cautionary Tale from Emerging Europe", *Comparative Economic Studies,* vol. 56, no. 2, pp. 271-282.

De Haas, R. & Van Lelyveld, I. 2010, "Internal capital markets and lending by multinational bank subsidiaries", *Journal of Financial Intermediation,* vol. 19, no. 1, pp. 1-25.

De Haas, R. & Van Lelyveld, I. 2006, "Foreign banks and credit stability in Central and Eastern Europe. A panel data analysis", *Journal of banking & Finance,* vol. 30, no. 7, pp. 1927-1952.

Deidda, L. & Fattouh, B. 2008, "Banks, financial markets and growth", *Journal of Financial Intermediation,* vol. 17, no. 1, pp. 6-36.

Demetriades, P.O. & Andrianova, S. 2003, "Finance and growth: what we know and what we need to know", .

Demetriades, P.O. & Hussein, K.A. 1996, "Does financial development cause economic growth? Time-series evidence from 16 countries", *Journal of Development Economics,* vol. 51, no. 2, pp. 387-411.

Demetriades, P.O. & James, G.A. 2011, "Finance and growth in Africa: The broken link", *Economics Letters,* vol. 113, no. 3, pp. 263-265.

Demirgüç-Kunt, A. & Detragiache, E. 2005, "Cross-country empirical studies of systemic bank distress: a survey", *National Institute Economic Review,* vol. 192, no. 1, pp. 68-83.

Demirgüç-Kunt, A. & Detragiache, E. 1998a, "Financial liberalization and financial fragility", IMF Working paper.

Demirgüç-Kunt, A. & Detragiache, E. 1998b, "The Determinants of Banking Crises in Developing and Developed Countries", *IMF Staff Papers,* vol. 45, no. 1.

Demirgüç-Kunt, A., Kane, E. & Laeven, L. 2014, "Deposit Insurance Database", *Development Research,* .

Demirgüç-Kunt, A. & Levine, R. 1996, "Stock market development and financial intermediaries: stylized facts", *The World Bank Economic Review,* vol. 10, no. 2, pp. 291-321.

Demirgüç-Kunt, A., Levine, R. & Min, H. 1998, "Opening to foreign banks: Issues of stability, efficiency, and growth", .

Detragiache, E. & Gupta, P. 2004, "Foreign banks in emerging market crises: evidence from Malaysia", IMF working paper.

Detragiache, E., Gupta, P. & Tressel, T. 2006, "Finance in lower-income countries: An empirical exploration", .

Detragiache, E., Tressel, T. & Gupta, P. 2008, "Foreign banks in poor countries: theory and evidence", *The Journal of Finance,* vol. 63, no. 5, pp. 2123-2160.

Diamond, D.W. & Dybvig, P.H. 1983, "Bank runs, deposit insurance, and liquidity", *The journal of political economy,* , pp. 401-419.

Diaz-Alejandro, C. 1985, "Good-bye financial repression, hello financial crash", *Journal of Development Economics,* vol. 19, no. 1, pp. 1-24.

Diekmann, K. & Westermann, F. 2010, "Financial development and sectoral output growth in 19th century Germany", . Center for Economic Studies and Ifo Institute, CESifo

Djankov, S., McLiesh, C. & Shleifer, A. 2007, "Private credit in 129 countries", *Journal of Financial Economics,* vol. 84, no. 2, pp. 299-329.

Dobson, W. 2005, *Background paper–Trade in Financial Services,* . Mimeo, World Bank, Trade Division

Elbadawi, I.A., Kaltani, L. & Soto, R. 2012, "Aid, real exchange rate misalignment, and economic growth in Sub-Saharan Africa", *World Development,* vol. 40, no. 4, pp. 681-700.

Eichengreen, B. & Arteta, C. 2002, "Banking crises in emerging markets: presumptions and evidence", *Financial policies in emerging markets,* , pp. 47-94.

Eita, J.H. & Jordaan, A.C. 2010, "A causality analysis between financial development and economic growth for Botswana", *African Finance Journal,* vol. 12, no. 1, pp. 72-89.

English, W.B. 1999, "Inflation and financial sector size", *Journal of Monetary Economics,* vol. 44, no. 3, pp. 379-400.

International Monetary Fund, 2015, "Pan-African Banks: Opportunities and Challenges for Cross-Border Oversight", *International Monetary Fund.*

International Monetary Fund, 2014, "Regional Economic Outlook: Sub-Saharan Africa", Chapter 3, The Financing of Infrastructure in Sub-Saharan Africa: A Changing Landscape, Washington: International Monetary Fund, October.

Esso, L.J. 2010, "Re-examining the finance-growth nexus: structural break, threshold cointegration and causality evidence from the ECOWAS", *Journal of Economic Development,* vol. 35, no. 3, pp. 57-79.

Favarra, G. 2003, *An empirical reassessment of the relationship between finance and growth,* International Monetary Fund.

Fenno, R.F. 1978, *Home style: House members in their districts,* Pearson College Division.

Fiorina, M. 1981, "Retrospective Voting in American National Elections New Haven: Yale; Michael S. Lewis-Beck. 1988", *Economics & Elections: The Major Western Democracies,* .

Focarelli, D. & Pozzolo, A.F. 2000, "The determinants of cross-border bank shareholdings: an analysis with bank-level data from OECD countries", *Federal Reserve Bank of Chicago Proceedings*.

Fowowe, B. 2011, "The finance-growth nexus in Sub-Saharan Africa: Panel cointegration and causality tests", *Journal of International Development,* vol. 23, no. 2, pp. 220-239.

Frankel, J.A. 1999, *No single currency regime is right for all countries or at all times,* National Bureau of Economic Research.

Garcia, M., Moore, C.G. & Moore, C.M. 2012, *The cash dividend: the rise of cash transfer programs in sub-Saharan Africa,* World Bank Publications.

García-Herrero, A. & Del Rio Lopez, P. 2003, "Financial stability and the design of monetary policy", Banco de Espana Working Paper.

Gelbard, E. & Leite, S.P. 1999, *Measuring financial development in sub-Saharan Africa,* International Monetary Fund.

Gerring, J., Bond, P., Barndt, W.T. & Moreno, C. 2005, "Democracy and economic growth: A historical perspective", *World Politics,* vol. 57, no. 03, pp. 323-364.

Ghali, K.H. 1999, "Financial development and economic growth: the Tunisian experience", *Review of Development Economics,* vol. 3, no. 3, pp. 310-322.

Ghirmay, T. 2004, "Financial Development and Economic Growth in Sub-Saharan African Countries: Evidence from Time Series Analysis", *African Development Review,* vol. 16, no. 3, pp. 415-432.

Girma, S. & Shortland, A. 2008, "The political economy of financial development", *Oxford Economic Papers,* vol. 60, no. 4, pp. 567-596.

Glick, R. & Hutchison, M.M. 2000, "Banking and currency crises: how common are the twins?", HKIMR Working Paper .

Goldsmith, R. W. 1969, "Financial Structure and Development. New Haven", CT: Yale University Press.

González, A., Teräsvirta, T. & Dijk, D.v. 2005, *Panel smooth transition regression models,* .

Goodhart, C.A. & British Association for the Advancement of Science 2004, *Financial development and economic growth: explaining the links,* Palgrave Macmillan.

Granger, C.W. & Terasvirta, T. 1993, "Modelling non-linear economic relationships", *OUP Catalogue,* .

Green, W.H. 2000, Econometric analysis .prentice Hallinternational, Co., London, Uk

Greenwood, J. & Smith, B.D. 1997, "Financial markets in development, and the development of financial markets", *Journal of Economic Dynamics and Control,* vol. 21, no. 1, pp. 145-181.

Gries, T., Kraft, M. & Meierrieks, D. 2009, "Linkages between financial deepening, trade openness, and economic development: causality evidence from Sub-Saharan Africa", *World Development,* vol. 37, no. 12, pp. 1849-1860.

Gros, D. 1995, *Winds of change: economic transition in Central and Eastern Europe,* Longman Sc & Tech.

Grubel, H.G. 2014, "A theory of multinational banking", *PSL Quarterly Review,* vol. 30, no. 123.

Gwartney, J., Lawson, R. & Block, W. 1996, "Economic freedom of the world", *Canada: Fraser Institute,* .

Hansen, B.E. 1999, "Threshold effects in non-dynamic panels: Estimation, testing, and inference", *Journal of Econometrics,* vol. 93, no. 2, pp. 345-368.

Hansen, B.E. 1996, "Inference when a nuisance parameter is not identified under the null hypothesis", *Econometrica: Journal of the econometric society,* , pp. 413-430.

Haslag, J.H. & Koo, J. 1999, *Financial repression, financial development and economic growth,* .

Hassan, M.K., Sanchez, B. & Yu, J. 2011, "Financial development and economic growth: New evidence from panel data", *The Quarterly Review of economics and finance,* vol. 51, no. 1, pp. 88-104.

Hausman, J.A. 1978, "Specification tests in econometrics", *Econometrica: Journal of the Econometric Society,* , pp. 1251-1271.

Hausmann, R., Pritchett, L. & Rodrik, D. 2005, "Growth accelerations", *Journal of Economic Growth,* vol. 10, no. 4, pp. 303-329.

Heid, B., Langer, J. & Larch, M. 2012, "Income and democracy: Evidence from system GMM estimates", *Economics Letters,* vol. 116, no. 2, pp. 166-169.

Helliwell, J.F. 1994, "Empirical linkages between democracy and economic growth", *British journal of political science,* vol. 24, no. 02, pp. 225-248.

Hellmann, T.F., Murdock, K.C. & Stiglitz, J.E. 2000, "Liberalization, moral hazard in banking, and prudential regulation: Are capital requirements enough?", *American economic review,* , pp. 147-165.

Herrero, A.G. & Simón, D.N. 2006, "Foreign banks and financial stability in the new Europe", *Publishing Company" Business Perspectives" Banks and Bank Systems International Research Journal,* , pp. 49.

Hicks, J.R. 1969, "A theory of economic history", *OUP Catalogue,* .

Honohan, P. & Laeven, L. 2005, "Systemic financial distress: Containment and resolution", Cambridge: Cambridge University Press.

Huang, H., Lin, S., Kim, D. & Yeh, C. 2010, "Inflation and the finance–growth nexus", *Economic Modelling,* vol. 27, no. 1, pp. 229-236.

Huang, Y. & Temple, J.R. 2005, "Does external trade promote financial development?", .

Hull, L. 2002, "Foreign-owned banks: Implications for New Zealand's financial stability", *Reserve Bank of New Zealand Discussion Paper No.DP2002/05,* .

Huntington, S.P. 2006, *Political order in changing societies,* Yale University Press.

Huybens, E. & Smith, B.D. 1999, "Inflation, financial markets and long-run real activity", *Journal of Monetary Economics,* vol. 43, no. 2, pp. 283-315.

Huybens, E. & Smith, B.D. 1998, "Financial market frictions, monetary policy, and capital accumulation in a small open economy", *Journal of Economic Theory,* vol. 81, no. 2, pp. 353-400.

Ibarra, R. & Trupkin, D. 2011, "The relationship between inflation and growth: A panel smooth transition regression approach for developed and developing countries", *Banco Central del Uruguay Working Paper Series,* , pp. 006-2011.

Im, K.S., Pesaran, M.H. & Shin, Y. 2003, "Testing for unit roots in heterogeneous panels", *Journal of Econometrics,* vol. 115, no. 1, pp. 53-74.

Ito, H. 2006, "Financial development and financial liberalization in Asia: Thresholds, institutions and the sequence of liberalization", *The North American Journal of Economics and Finance,* vol. 17, no. 3, pp. 303-327.

Jacklin, C.J. & Bhattacharya, S. 1988, "Distinguishing panics and information-based bank runs: Welfare and policy implications", *The Journal of Political Economy,* , pp. 568-592.

Jude, E.C. 2010, "Financial development and growth: A panel smooth regression approach", *Journal of Economic Development,* vol. 35, no. 1, pp. 15.

Judge, G.G., Hill, R.C., Griffiths, W., Lutkepohl, H. & Lee, T. 1988, "Introduction to the Theory and Practice of Econometrics.", .

Jung, W.S. 1986, "Financial development and economic growth: international evidence", *Economic Development and cultural change,* , pp. 333-346.

Kablan, S. 2010, *Banking efficiency and financial development in sub-saharan africa,* International Monetary Fund.

Kagochi, J.M., Al Nasser, O.M. & Kebede, E. 2013, "Does financial development hold the key to economic growth?: the case of sub-Saharan Africa", *The Journal of Developing Areas,* vol. 47, no. 2, pp. 61-79.

Kar, M., Nazlıoğlu, Ş. & Ağır, H. 2011, "Financial development and economic growth nexus in the MENA countries: Bootstrap panel granger causality analysis", *Economic Modelling,* vol. 28, no. 1, pp. 685-693.

Khan, M.S. & Ssnhadji, A.S. 2001, "Threshold effects in the relationship between inflation and growth", *IMF Staff papers,* , pp. 1-21.

Kim, D., Lin, S. & Suen, Y. 2010, "Dynamic effects of trade openness on financial development", *Economic Modelling,* vol. 27, no. 1, pp. 254-261.

Kindleberger, C. 1978, "Manias, panics and crashes: a history of financial crises", London [etc.]: MacMillan.

King, R.G. & Levine, R. 1993, "Finance, entrepreneurship and growth", *Journal of Monetary Economics,* vol. 32, no. 3, pp. 513-542.

King, R. & Levine, R. 1996, "Finance and Growth: Schumpeter Might Be Right', Quarterly Journal of Economics, CVIII (3), August, 717-37", *International library of critical writings in Economics,* vol. 68, pp. 413-433.

King, R.G. & Levine, R. 2004, *Finance and Growth Schumpter Might Be Right,* World Bank Publications.

Kirkpatrick, C., Murinde, V. & Tefula, M. 2008, "The measurement and determinants of x-inefficiency in commercial banks in Sub-Saharan Africa", *The European Journal of Finance,* vol. 14, no. 7, pp. 625-639.

Klein, M.W. & Olivei, G.P. 2008, "Capital account liberalization, financial depth, and economic growth", *Journal of International Money and Finance,* vol. 27, no. 6, pp. 861-875.

Klomp, J. 2010, "Causes of banking crises revisited", *The North American Journal of Economics and Finance,* vol. 21, no. 1, pp. 72-87.

Komulainen, T. & Lukkarila, J. 2003, "What drives financial crises in emerging markets?", *Emerging Markets Review,* vol. 4, no. 3, pp. 248-272.

Kormendi, R.C. & Meguire, P.G. 1985, "Macroeconomic determinants of growth: cross-country evidence", *Journal of Monetary Economics,* vol. 16, no. 2, pp. 141-163.

Laeven, L. & Valencia, F. 2012, "Systemic banking crises database: An update", IMF working paper 12/163.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. & Vishny, R.W. 1997, "Legal determinants of external finance", *National Bureau of Economic Research.*

Law, S.H. & Habibullah, M.S. 2009, "The determinants of financial development: Institutions, openness and financial liberalisation", *South African Journal of Economics,* vol. 77, no. 1, pp. 45-58.

Law, S.H. & Azman-Saini, W. 2012, "Institutional quality, governance, and financial development", *Economics of Governance,* vol. 13, no. 3, pp. 217-236.

Lee, C. & Wong, S.Y. 2005, "Inflationary threshold effects in the relationship between financial development and economic growth: evidence from Taiwan and Japan", *Journal of Economic Development,* vol. 30, no. 1, pp. 49.

Lepetit, L. & Strobel, F. 2013, "Bank insolvency risk and time-varying Z-score measures", *Journal of International Financial Markets, Institutions and Money,* vol. 25, pp. 73-87.

Levin, A., Lin, C. & James Chu, C. 2002, "Unit root tests in panel data: asymptotic and finite-sample properties", *Journal of Econometrics,* vol. 108, no. 1, pp. 1-24.

Levine, R. 2005, "Finance and growth: theory and evidence", *Handbook of economic growth,* vol. 1, pp. 865-934.

Levine, R. 2001, "International financial liberalization and economic growth", *Review of international Economics,* vol. 9, no. 4, pp. 688-702.

Levine, R. 1999, "Foreign bank entry and capital control liberalization: effects on growth and stability", *University of Minnesota, mimeo,* , pp. 743-761.

Levine, R. 1998, "The legal environment, banks, and long-run economic growth", *Journal of Money, Credit and Banking,* , pp. 596-613.

Levine, R. 1997, "Financial development and economic growth: views and agenda", *Journal of economic literature,* , pp. 688-726.

Levine, R. 1996, "Foreign banks, financial development, and economic growth", *International financial markets: Harmonization versus competition,* vol. 7, pp. 224-254.

Levine, R., Loayza, N. & Beck, T. 2000, "Financial intermediation and growth: Causality and causes", *Journal of Monetary Economics,* vol. 46, no. 1, pp. 31-77.

Levine, R. & Zervos, S. 1998, "Stock markets, banks, and economic growth", *American economic review,* , pp. 537-558.

Limongi, F. & Przeworski, A. 1997, "Modernization: Theories and Facts", *World Politics,* vol. 49.

López-Villavicencio, A. & Mignon, V. 2011, "On the impact of inflation on output growth: Does the level of inflation matter?", *Journal of Macroeconomics,* vol. 33, no. 3, pp. 455-464.

Lucas, R.E. 1988, "On the mechanics of economic development", *Journal of Monetary Economics,* vol. 22, no. 1, pp. 3-42.

Luintel, K.B. & Khan, M. 1999, "A quantitative reassessment of the finance–growth nexus: evidence from a multivariate VAR", *Journal of Development Economics,* vol. 60, no. 2, pp. 381-405.

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,* vol. 61, no. S1, pp. 631-652.

Mavrotas, G. & Son, S. 2006, "Financial Sector Development and Growth: Re-examining the Nexus'", *Transparency, governance and markets,* , pp. 221.

McDonald, C.A. & Schumacher, L.B. 2007, "Financial deepening in Sub-Saharan Africa: Empirical evidence on the role of creditor rights protection and information sharing", *IMF Working Papers,* , pp. 1-25.

McKinnon, R.I. 1973, *Money and capital in economic development,* Brookings Institution Press.

McKinnon, R.I. 1993, *The order of economic liberalization: Financial control in the transition to a market economy,* JHU Press.

Mehrez, G. & Kaufmann, D. 2000, "Transparency, liberalization, and financial crisis", *World Bank Policy Research Working Paper,* , no. 2286.

Menyah, K., Nazlioglu, S. & Wolde-Rufael, Y. 2014, "Financial development, trade openness and economic growth in African countries: New insights from a panel causality approach", *Economic Modelling,* vol. 37, pp. 386-394.

Mirdala, R. 2011, "Financial deepening and economic growth in the European transition economies", *Journal of Applied Economic Sciences (JAES),* , no. 2 (16, pp. 177-194.

Mishkin, F.S. 2007, "Is financial globalization beneficial?", *Journal of Money, Credit and Banking,* vol. 39, no. 2-3, pp. 259-294.

Mishkin, F.S. 2006, *The next great globalization: how disadvantaged nations can harness their financial systems to get rich,* Princeton University Press.

Molyneux, P. & Seth, R. 1998, "Foreign bank profits and commercial credit extension in the United States", *Applied Financial Economics,* vol 8, pp. 533-539.

Morris, S. & Shin, H.S. 2001, "Rethinking multiple equilibria in macroeconomic modelling" in *NBER Macroeconomics Annual 2000, Volume 15* MIT Press, , pp. 139-182.

Moshirian, F. 2001, "International Investment in Financial Services", *Journal of Banking and Finance*, Vol. 25, pp. 317-337

Murinde, V. & Mullineux, A. 1999, "Introductory overview: issues surrounding bank and enterprise restructuring in Central and Eastern Europe", *Economic Performance and Financial Sector Reform in Central and Eastern Europe, Edward Elgar, Cheltenham,* , pp. 1-20.

Murinde, V. 2012, "Bank Regulatory Reforms in Africa". Palgrave MacMillan, January 2012.

Murinde, V. 2012, "Financial development and economic growth: Global and African evidence", *Journal of African Economies,* vol. 21, no. suppl 1, pp. i10-i56.

Murinde, V. (1996) 'Financial Markets and Endogenous Growth: An Econometric Analysis for Pacific Basin Countries', in: N. Hermes and R. Lensink (eds) Financial Development and Economic Growth. London and New York: Routledge, pp. 94–114.

Navaretti, G.B., Calzolari, G., Pozzolo, A.F. & Levi, M. 2010, "Multinational banking in Europe–financial stability and regulatory implications: lessons from the financial crisis", *Economic Policy,* vol. 25, no. 64, pp. 703-753.

Nelson, M.A. & Singh, R.D. 1998, "Democracy, economic freedom, fiscal policy, and growth in LDCs: a fresh look", *Economic Development and Cultural Change,* vol. 46, no. 4, pp. 677-696.

Neusser, K. & Kugler, M. 1998, "Manufacturing growth and financial development: evidence from OECD countries", *Review of economics and statistics,* vol. 80, no. 4, pp. 638-646.

Nickell, S. 1981, "Biases in dynamic models with fixed effects", *Econometrica: Journal of the Econometric Society,* , pp. 1417-1426.

Noy, I. 2005, "Banking crises in East Asia: the price tag of liberalization?", *Asian Pacific Issues No 78.*

Noy, I. 2004, "Financial liberalization, prudential supervision, and the onset of banking crises", *Emerging Markets Review,* vol. 5, no. 3, pp. 341-359.

Odedokun, M.O. 1996, "Alternative econometric approaches for analysing the role of the financial sector in economic growth: Time-series evidence from LDCs", *Journal of Development Economics,* vol. 50, no. 1, pp. 119-146.

Odhiambo, N.M. 2012, "The Impact Of Inflation On Financial Sector Development: Experience From Zambia", *Journal of Applied Business Research (JABR),* vol. 28, no. 6, pp. 1497-1508.

Odhiambo, N.M. 2011, "Financial deepening, capital inflows and economic growth nexus in Tanzania: A multivariate model", *Journal of social sciences,* vol. 28, no. 1, pp. 65-71.

Odhiambo, N.M. 2008, "Financial depth, savings and economic growth in Kenya: a dynamic causal linkage", *Economic Modelling,* vol. 25, no. 4, pp. 704-713.

Odhiambo, N.M. 2005, "Financial Liberalisation and Financial Deepening: Evidence from Three sub-Saharan African (SSA) Countries", *African review of money finance and banking,* , pp. 5-23.

Odhiambo, N.M. 2004, "Is financial development still a spur to economic growth? A causal evidence from South Africa", *Savings and Development,* , pp. 47-62.

Odhiambo, N.M. 2007, "Supply-leading versus demand-following hypothesis: Empirical evidence from three SSA countries", *African Development Review,* vol. 19, no. 2, pp. 257-280.

Oluwatosin, A . O & Festus, E. O. 2012, "Foreign Direct Investment, Economic Growth and Financial Sector Development in Small Open Developing Economies"*, Economic Analysis & Policy,* vol. 42 No. 1, march 2012

Omay, T. & Kan, E.Ö. 2010, "Re-examining the threshold effects in the inflation–growth nexus with cross-sectionally dependent non-linear panel: Evidence from six industrialized economies", *Economic Modelling,* vol. 27, no. 5, pp. 996-1005.

Pagano, M. 1993, "Financial markets and growth: an overview", *European Economic Review,* vol. 37, no. 2, pp. 613-622.

Patrick, H.T. 1966, "Financial development and economic growth in underdeveloped countries", *Economic development and Cultural change,* , pp. 174-189.

Peek, J. & Rosengren, E.S. 2000, "Implications of the globalization of the banking sector: the Latin American experience", *Conference Series-Federal Reserve Bank Of Boston* Federal Reserve Bank of Boston; 1998, , pp. 145.

Pesaran, M.H., Shin, Y. & Smith, R.P. 1999, "Pooled mean group estimation of dynamic heterogeneous panels", *Journal of the American Statistical Association,* vol. 94, no. 446, pp. 621-634.

Pesaran, M.H. & Smith, R. 1995, "Estimating long-run relationships from dynamic heterogeneous panels", *Journal of Econometrics,* vol. 68, no. 1, pp. 79-113.

Petersen, M.A. & Rajan, R.G. 1994, "The benefits of lending relationships: Evidence from small business data", *The journal of finance,* vol. 49, no. 1, pp. 3-37.

Przeworski, A. & Limongi, F. 1997, "Modernization: Theories and facts", *World Politics,* vol. 49, no. 02, pp. 155-183.

Quintyn, M. & Taylor, M. 2007, *Building Supervisory Structures in Sub-Saharan Africa:An Analytical Framework,* International Monetary Fund.

Rajan, R.G. & Zingales, L. 2003, "The great reversals: the politics of financial development in the twentieth century", *Journal of Financial Economics,* vol. 69, no. 1, pp. 5-50.

Rajan, R.G. & Zingales, L. 1996, *Financial dependence and growth,* . National bureau of economic research (NBER)

Roe, M.J. & Siegel, J.I. 2011, "Political instability: effects on financial development, roots in the severity of economic inequality", *Journal of Comparative Economics,* vol. 39, no. 3, pp. 279-309.

Rodriguez, F. & Rodrik, D. 2001, "Trade policy and economic growth: a skeptic's guide to the cross-national evidence" in *NBER Macroeconomics Annual 2000, Volume 15* MIT Press, , pp. 261-338.

Roodman, D. 2009, "A note on the theme of too many instruments*", *Oxford Bulletin of Economics and Statistics,* vol. 71, no. 1, pp. 135-158.

Roubini, N. & Sala-i-Martin, X. 1995, "A growth model of inflation, tax evasion, and financial repression", *Journal of Monetary Economics,* vol. 35, no. 2, pp. 275-301.

Rousseau, P.L. 1998, "The permanent effects of innovation on financial depth:: Theory and US historical evidence from unobservable components models", *Journal of Monetary Economics,* vol. 42, no. 2, pp. 387-425.

Rousseau, P.L. & Sylla, R. 2005, "Emerging financial markets and early US growth", *Explorations in Economic History,* vol. 42, no. 1, pp. 1-26.

Rousseau, P.L. & Wachtel, P. 2002, "Inflation thresholds and the finance–growth nexus", *Journal of International Money and Finance,* vol. 21, no. 6, pp. 777-793.

Rousseau, P.L. & Wachtel, P. 2000, "Equity markets and growth: cross-country evidence on timing and outcomes, 1980–1995", *Journal of Banking & Finance,* vol. 24, no. 12, pp. 1933-1957.

Rousseau, P.L. & Yilmazkuday, H. 2009, "Inflation, financial development, and growth: A trilateral analysis", *Economic Systems,* vol. 33, no. 4, pp. 310-324.

Schumpeter, J.A. 1939, *Business cycles,* Cambridge Univ Press.

Scully, G.W. 1988, "The institutional framework and economic development", *The Journal of Political Economy,* , pp. 652-662.

Seleteng, M., Bittencourt, M. & van Eyden, R. 2013, "Non-linearities in inflation–growth nexus in the SADC region: A panel smooth transition regression approach", *Economic Modelling,* vol. 30, pp. 149-156.

Sekmen, F. & Ozkan, F. 2012, "Relationship between democracy and economic growth: A panel data analysis", *African Journal of Business Management,* vol. 6, no. 4, pp. 1270-1275.

Seth, J.C.1997, "Internal capital markets and the competition for corporate resources", *Journal of Finance*, vol. 52, pp. 111-134

Shan, J. 2005, "Does financial development 'lead'economic growth? A vector auto-regression appraisal", *Applied Economics,* vol. 37, no. 12, pp. 1353-1367.

Shan, J.Z., Morris, A.G. & Sun, F. 2001, "Financial Development and Economic Growth: An Egg-and-Chicken Problem?", *Review of International Economics,* vol. 9, no. 3, pp. 443-454.

Shan, J. & Morris, A. 2002, "Does financial development'lead'economic growth?", *International Review of Applied Economics,* vol. 16, no. 2, pp. 153-168.

Shaw, E.S. 1973, "Financial deepening in economic development, 1973", .

Shehzad, C.T. & De Haan, J. 2009, "Financial Liberalization and Banking Crises", *Conference of the Royal Economic Society, University of Surrey (April 20–22, 2009)*.

Spears, A. 1992, "The role of financial intermediation in economic growth in Sub-Saharan Africa", *Canadian Journal of Development Studies/Revue canadienne d'études du développement,* vol. 13, no. 3, pp. 361-380.

Svaleryd, H. & Vlachos, J. 2002, "Markets for risk and openness to trade: how are they related?", *Journal of International Economics,* vol. 57, no. 2, pp. 369-395.

Tachiwou, A.M. 2009, "Causality tests between stock market development and economic growth in West African Monetary Union", *Economia.Seria Management,* vol. 12, no. 2, pp. 14-27.

Toroyan, H. & Anayiotos, G.C. 2009, *Institutional factors and financial sector development: evidence from Sub-Saharan Africa,* International Monetary Fund.

Trabelsi, M. 2002, "Finance and Growth: empirical evidence from developing countries, 1960-1990", *Center for Interuniversity Research in Quantitative Economics (CIREQ), under number 13-2002.*

Van Horen, N. 2007, "Foreign banking in developing countries; origin matters", *Emerging Markets Review,* vol. 8, no. 2, pp. 81-105.

Van Horen, N. & Claessens, S. 2012, *Foreign Banks: Trends, Impact and Financial Stability,* International Monetary Fund.

Van Nieuwerburgh, S., Buelens, F. & Cuyvers, L. 2006, "Stock market development and economic growth in Belgium", *Explorations in Economic History,* vol. 43, no. 1, pp. 13-38.

Vaona, A. & Schiavo, S. 2007, "Nonparametric and semiparametric evidence on the long-run effects of inflation on growth", *Economics Letters,* vol. 94, no. 3, pp. 452-458.

Vogel, U. & Winkler, A. 2010, *Foreign banks and financial stability in emerging markets: Evidence from the global financial crisis,* Working paper series//Frankfurt School of Finance & Management .

Wang, E.C. 1999, "Externalities between financial and real sectors in the development process", *International Advances in Economic Research,* vol. 5, no. 1, pp. 149-150.

Windmeijer, F. 2005, "A finite sample correction for the variance of linear efficient two-step GMM estimators", *Journal of Econometrics,* vol. 126, no. 1, pp. 25-51.

World Bank, 2006, Global Development Finance. World Bank, Washington

World Bank, 2001, *Finance for growth: policy choices in a volatile world,* World Bank Publications.

Worrell, M.D., Maechler, A.M. & Mitra, M.S. 2007, *Decomposing financial risks and vulnerabilities in Eastern Europe,* International Monetary Fund.

Xu, Z. 2000, "Financial development, investment, and economic growth", *Economic inquiry,* vol. 38, no. 2, pp. 331-344.

Yartey, C.A. 2008, *The determinants of stock market development in emerging economies: is South Africa different?* International Monetary Fund.

Zang, H. & Kim, Y.C. 2007, "Does financial development precede growth? Robinson and Lucas might be right", *Applied Economics Letters,* vol. 14, no. 1, pp. 15-19.

Zellner, A. 1962, "An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias", *Journal of the American statistical Association,* vol. 57, no. 298, pp. 348-368.

Zoli, E. 2007, "Financial development in emerging Europe: the unfinished agenda", *IMF Working Papers,* , pp. 1-36.

APPENDICE

APPENDIX A

Appendix for chapter 2

Table A.0.1: Regional comparison of foreign banking inflows into the banking system

	1995			2000			2005			2009		
Region	**Domestic**	**Foreign**	**total**	**Domestic**	**Foreign**	**total**	**Domestic**	**Foreign**	**total**	**Domestic**	**Foreign**	**total**
All countries	3120	774	3894	2993	1058	4051	2805	1175	3980	2576	1334	3910
Fraction	0.8	0.2		0.74	0.26		0.7	0.3		0.66	0.37	
East Asia and Pacific	254	57	311	272	64	336	289	69	358	282	95	377
Fraction	0.82	0.18		0.81	0.19		0.81	0.19		0.75	0.25	
Latin America and Caribbean	596	198	794	479	256	735	395	217	612	367	232	599
Fraction	0.75	0.25		0.65	0.35		0.65	0.35		0.61	0.39	
SSA	213	94	307	229	135	364	209	152	361	152	181	333
Fraction	0.69	**0.31**		0.63	**0.37**		0.58	**0.42**		0.46	**0.54**	
SSA/Developing Economies		54%			50%			46.10%			47%	

Source: Own construction using Claessens and Horen (2012). Foreign Banks: Trends, Impact and financial stability. IMF Working paper WP/12/10

Figure A.1: Inflation in SADC

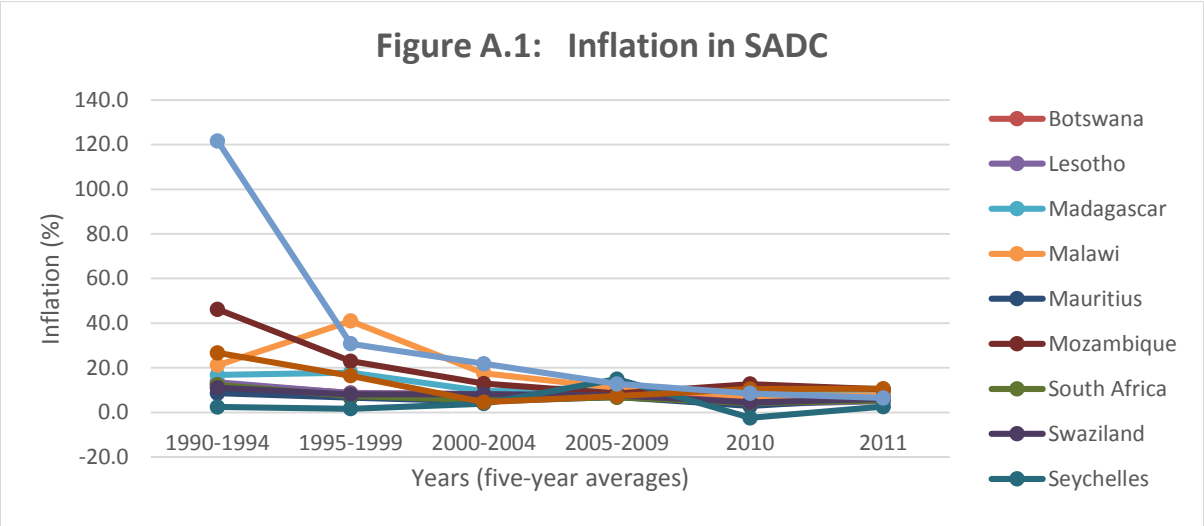
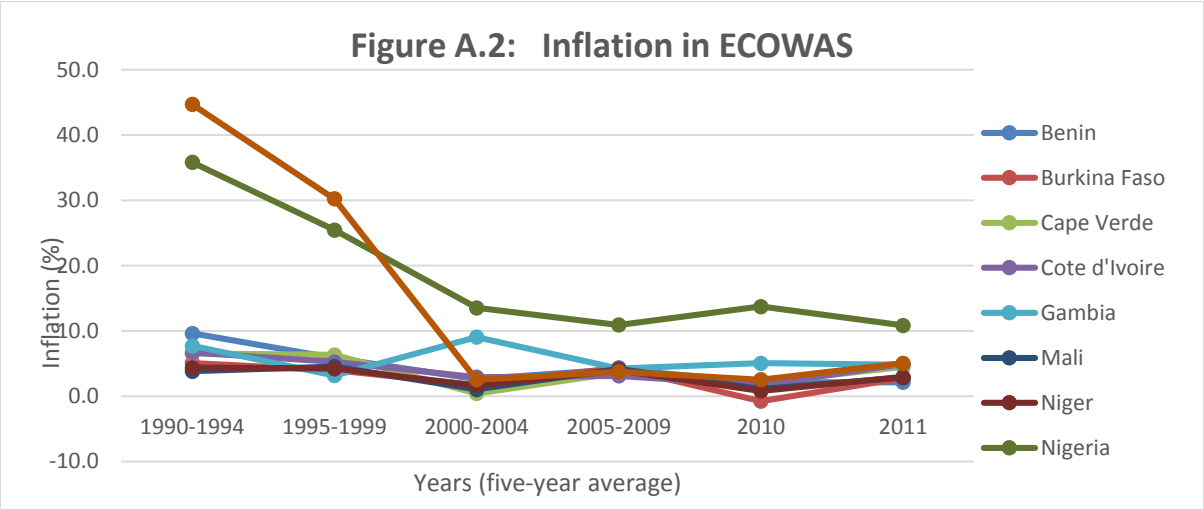


Figure A.2

Figure A.2: Inflation in ECOWAS



APPENDIX B

Appendix for chapter 3

Table B.0.1: Showing description of data and source

Variable	Description	source
bankprcr	Ratio of bank private to GDP.	Global Financial Development Database,
dmba	ratio of deposit money bank assets to the ratio of deposit money bank assets to the sum of deposit money bank assets and Central Bank assets	2012 Global Financial Development Database, 2012
Life expectancy	Number of years a new born infant will live ratio of liquid liabilities (M3) to GDP	World development Indicators, 2012
m3	liquid liabilities (% GDP)	Global Financial Development Database, 2013
gov	government expenditure as a percentage of GDP	World Bank's *Africa Development Indicators*, 2012,
rgdppc	real GDP per capita (at 2005 US $)	World Bank's Africa Development Indicators, 2012,
inflation	annual percent change of the consumer price index	World Bank's Africa Development Indicators, 2012,
traop	Trade openness which is the sum of Exports and imports as a ratio of GDP	World Bank's Africa Development Indicators, 2012,
Political Right	Measures from 1 showing total right and 7 demonstrates absence of these rights	Freedom House
Polity2	Measures system of governance. -10 means total autocracy and +10 is total democracy	Polity IV

Table B.0.2: Showing countries used in sample of both regions

ECOWAS	SADC
Benin	Botswana
Burkina Faso	Democratic Republic of Congo
Cape Verde	Lesotho
Cote d' Ivoire	Malawi
Gambia	Mauritius
Ghana	Madagascar
Guinea Bissau	Mozambique
Mali	South Africa
Niger	Swaziland
Nigeria	Tanzania
Senegal	Zambia
Togo	Zimbabwe

Table B.0.3: Long run estimates without South Africa

	SADC		
Variables	PMG	MG	DFE
lnfindex	0.436***	0.862	0.0171
	(0.0706)	(10.65)	(0.589)
findexins	0.000933***	0.0182	-0.000143
	(0.000125)	(0.0139)	(0.000826)
inflation	-0.0401	8.300	-1.603
	(0.0564)	(7.983)	(1.251)
pol	-0.0649***	-1.823	0.0977
	(0.0125)	(1.443)	(0.103)
traop	0.142***	-17.76	1.350
	(0.0485)	(18.94)	(0.878)
gov	0.0406	-8.389	-0.0257
	(0.0322)	(8.857)	(0.861)
lnlifeexp	0.651***	-24.80	4.767**
	(0.199)	(27.52)	(2.370)
ecm	-0.104**	-0.307***	-0.0169*
	(0.0451)	(0.110)	(0.00966)
Constant	0.129**	-1.254	-0.291**
	(0.0563)	(2.029)	(0.133)
Hausman Test		5.55	
		(0.4758)	
Observations		341	.

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table B.0.4: Short-run Pooled mean group for ECOWAS individual countries

Variables	Benin	Burkina	Cape Verde	Cote d' Ivoire	Gambia	Ghana	Mali	Niger	Nigeria	Senegal	Togo	Guinea Bissau
findex	0.13***	0.170	-0.0453	-0.370**	0.00178	-0.0183	0.121	-0.111	-0.0627*	-0.0600	-0.0346	-0.0708
	(0.0472)	(0.108)	(0.0501)	(0.187)	(0.0385)	(0.0287)	(0.175)	(0.114)	(0.0362)	(0.0995)	(0.0796)	(0.0668)
findexins	-0.00009	0.000393*	7.18e-05	-0.000207	0.00026	-0.00065	-0.0003	0.00008	-0.0001**	0.000394	-0.000105	0.000100
	(0.0001)	(0.000205)	(0.000848)	(0.000136)	(0.0007)	(0.0004)	(0.0004)	(0.0007)	(0.00067)	(0.000254)	(0.000412)	(0.000134)
inflation	-0.0905**	0.0183	-0.0798	-0.139	0.0151	-0.0414*	-0.121	0.0467	-0.0444	-0.000977	0.0779	0.232**
	(0.0416)	(0.0911)	(0.132)	(0.0898)	(0.0818)	(0.0231)	(0.112)	(0.118)	(0.0361)	(0.0674)	(0.0889)	(0.0947)
pol	0.0112	-0.0290	-0.00503	0.0152	-0.00104	-0.00366	0.0292	-0.00432	0.0180***	-0.0312	-0.00806	-0.000126
	(0.00973)	(0.0202)	(0.00392)	(0.0113)	(0.00650)	(0.00341)	(0.0326)	(0.00648)	(0.00648)	(0.0212)	(0.0427)	(0.0128)
traop	0.180***	-0.0841	0.00766	-0.0518	-0.0209	0.0132	-0.00819	-0.113	-0.0252	-0.0784*	0.189**	0.0253
	(0.0388)	(0.0585)	(0.0512)	(0.0669)	(0.0336)	(0.0244)	(0.0706)	(0.110)	(0.0311)	(0.0436)	(0.0826)	(0.0550)
gov	0.00836	0.00524	-0.0145	-0.0262	0.0413**	0.0216	0.0182	0.115	0.0572***	-0.0473	-0.100**	-0.0973
	(0.0353)	(0.0484)	(0.0290)	(0.0514)	(0.0202)	(0.0350)	(0.0402)	(0.0827)	(0.0158)	(0.0601)	(0.0469)	(0.0762)
lifeexp	-2.583**	0.716	-4.895	0.00889	1.384	-2.924*	0.532	2.053	2.507	0.197	-1.132	11.26
	(1.058)	(1.026)	(3.718)	(0.643)	(2.978)	(1.632)	(2.099)	(5.352)	(2.035)	(1.029)	(1.585)	(9.774)
ecm	0.0200	0.00759	-0.127*	-0.132***	-0.0371	-0.358***	-0.176***	-0.0415*	-0.547***	-0.0192	-0.160**	-0.0372
	(0.0303)	(0.0706)	(0.0730)	(0.0399)	(0.0528)	(0.0742)	(0.0649)	(0.0228)	(0.0866)	(0.0370)	(0.0622)	(0.0607)
Constant	0.147	0.0602	-0.680	-0.706**	-0.244	-2.331***	-1.077***	-0.304**	-3.021***	-0.120	-1.034**	-0.283
	(0.191)	(0.449)	(0.488)	(0.283)	(0.355)	(0.682)	(0.408)	(0.151)	(0.773)	(0.228)	(0.455)	(0.403)
Obs	372	372	372	372	372	372	372	372	372	372	372	372

Table B. 0.5: Short-run Pooled mean group for SADC individual countries

Variables	Botswana	Lesotho	Madagascar	Malawi	Mauritius	SA	Swaziland	Zambia	Zimbabwe	Tanzania	Mozambique	DRC
findex	0.251	-0.0105	-0.175	-0.0419	0.877***	1.413***	0.555	-0.0423	-0.0280	0.234***	-0.166**	0.0118
	(0.233)	(0.0462)	(0.114)	(0.0629)	(0.275)	(0.320)	(1.015)	(0.0497)	(0.122)	(0.0428)	(0.0766)	(0.0274)
findexins	-0.000272	2.12e-05	1.57e-05	0.000442***	-0.000919***	-0.00159***	0.000883	2.42e-05	4.05e-05	0.00101***	8.39e-05	-4.05e-05
	(0.000297)	(6.40e-05)	(0.000161)	(0.000125)	(0.000275)	(0.000358)	(0.00107)	(6.96e-05)	(0.000279)	(0.000169)	(0.000143)	(3.63e-05)
inflation	0.133	-0.0559	-0.131*	0.0288	-0.174*	-0.0499	-0.0799	0.116***	0.0262	-0.115***	-0.393***	-0.00345
	(0.228)	(0.0447)	(0.0678)	(0.0589)	(0.101)	(0.121)	(0.142)	(0.0349)	(0.0613)	(0.0236)	(0.130)	(0.00575)
pol	0.0399	-0.00245	-0.000464	-0.0527***	0.0534**	0.135***	-0.0979	-0.00390	-0.00153	-0.114***	0.00407	-0.00666
	(0.0296)	(0.00667)	(0.0167)	(0.0147)	(0.0255)	(0.0339)	(0.110)	(0.00698)	(0.0282)	(0.0184)	(0.0103)	(0.00431)
openness	0.223**	0.00542	0.115***	-0.0479	0.0914	-0.0472	-0.0724	-0.117**	-0.128	0.00872	0.181***	0.0766***
	(0.0869)	(0.0443)	(0.0317)	(0.0488)	(0.0660)	(0.0409)	(0.0754)	(0.0463)	(0.0979)	(0.00621)	(0.0426)	(0.0182)
govexp	-0.240***	-0.0290	-0.0233	-0.104***	0.0623	-0.00223	-0.00838	0.0337	-0.0271	-0.0351***	-0.132**	0.0542***
	(0.0816)	(0.0282)	(0.0428)	(0.0402)	(0.0673)	(0.0636)	(0.0810)	(0.0215)	(0.0275)	(0.00678)	(0.0605)	(0.0209)
lifeexp	0.416	0.138	-2.728	-4.461**	1.259	3.555***	0.249	0.989***	1.401*	1.067***	2.293	6.392***
	(0.467)	(0.177)	(1.671)	(1.835)	(1.697)	(0.599)	(0.495)	(0.325)	(0.774)	(0.302)	(2.793)	(1.333)
ecm	-0.0398**	0.0502*	-0.128***	-0.534***	0.0125	-0.712***	-0.0216	-0.0291	-0.513***	-0.0542***	0.158**	0.0140
	(0.0156)	(0.0264)	(0.0404)	(0.130)	(0.0125)	(0.116)	(0.0293)	(0.0345)	(0.135)	(0.0144)	(0.0790)	(0.0143)
Constant	0.323***	-0.221*	0.608***	2.292***	-0.0495	5.250***	0.156	0.153	2.792***	0.271***	-0.691**	-0.0961
	(0.109)	(0.133)	(0.219)	(0.646)	(0.0878)	(0.908)	(0.183)	(0.185)	(0.831)	(0.0761)	(0.340)	(0.0672)
Observations	372	372	372	372	372	372	372	372	372	372	372	372

Figure B.1: Real GDP and Life expectancy

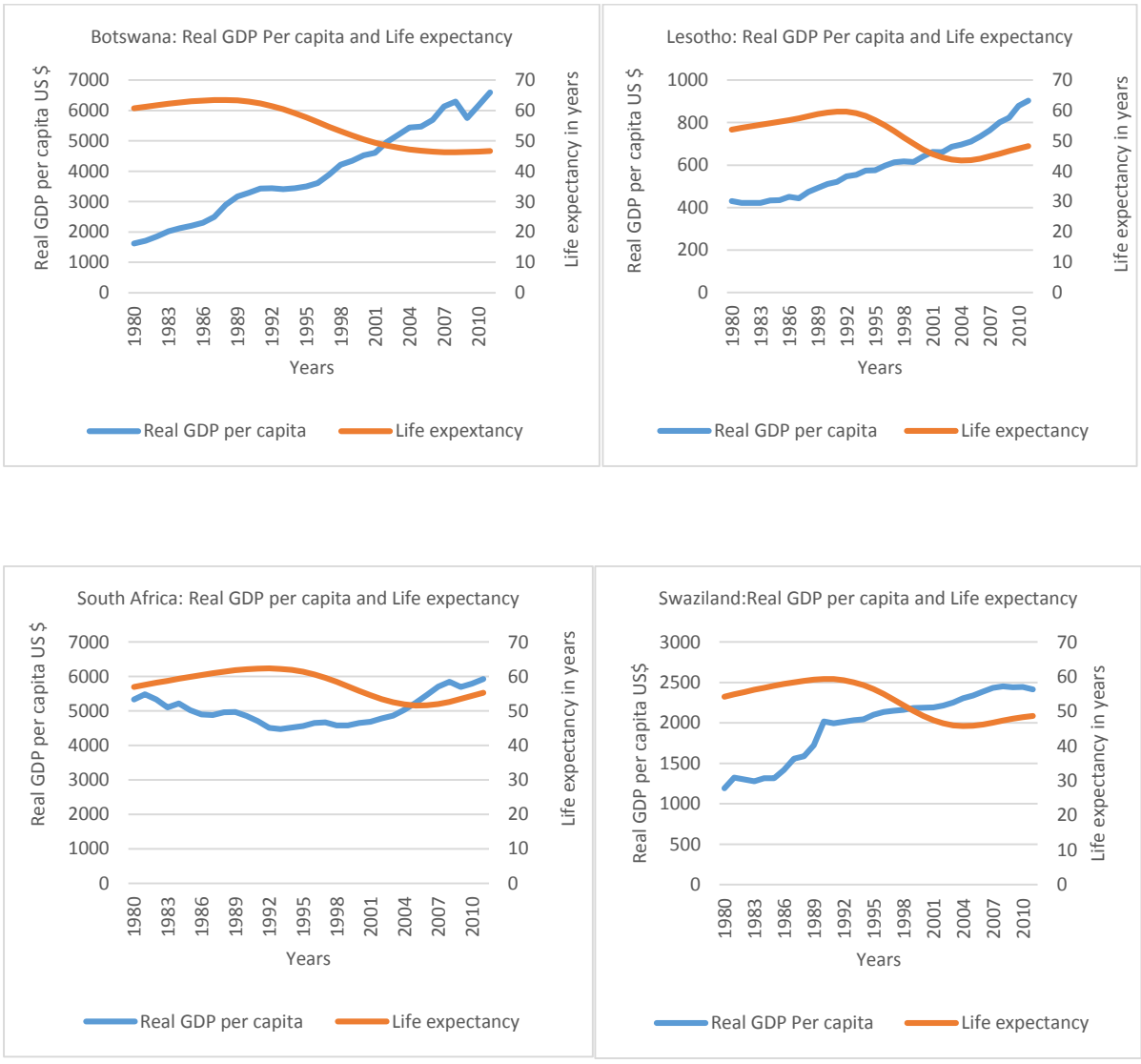


Table B.0.6: Robustness test using different governance indicator (political right).

	ECOWAS			SADC		
	PMG	MG	DFE	PMG	MG	DFE
findex	0.149	3.089	0.851**	0.791***	2.390	0.737
	(0.379)	(2.841)	(0.348)	(0.306)	(2.560)	(0.656)
finpol	-0.0024**	-0.0053	-0.0022*	-0.000838	-0.00315	-0.00121
	(0.000947)	(0.0056)	(0.0012)	(0.000722)	(0.00482)	(0.00108)
inflation	0.222	1.449	0.576	-0.389**	-0.743	-0.815
	(0.447)	(1.207)	(0.698)	(0.169)	(1.356)	(0.558)
polright	0.186*	0.326	0.203**	-0.171**	0.170	-0.0941
	(0.108)	(0.321)	(0.097)	(0.0803)	(0.517)	(0.192)
traop	1.241***	2.481	0.666**	0.208	-0.301	0.891**
	(0.316)	(2.564)	(0.282)	(0.129)	(0.931)	(0.441)
gov	0.247**	0.653	-0.154	0.645***	0.248	0.139
	(0.126)	(0.555)	(0.21)	(0.151)	(0.425)	(0.517)
lifeexp	5.013***	5.639*	1.967	0.981***	1.709	1.400*
	(1.177)	(3.366)	(1.441)	(0.378)	(3.028)	(0.737)
ecm	-0.051***	-0.597***	-0.053**	-0.0245*	-0.0925	-0.030**
	(0.0184)	(0.119)	(0.0253)	(0.0143)	(0.0672)	(0.0135)
Constant	-1.005***	-3.530**	-0.403	-0.0638	-0.158	-0.152
	(0.371)	(1.795)	(0.308)	(0.0427)	(2.022)	(0.184)
Hausman Test		4.73			6.66	
		0.5794			0.3539	
Observations	372	372	372	372	372	372

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

APPENDIX C

Appendix for chapter 4

Table C.0.1: Showing variables used in the study with description and sources

Variable	Description	Source
Bankprcr	Private credit provided banks to GDP	Global Financial Development database (GFDD)
Dmba	Ratio of deposit money bank assets to the sum of deposit money bank asset and Central Bank assets	GFDD
m3	Ratio of liquid liabilities to GDP (m3)	(GFDD)
Gov	Government expenditure to GDP	World Bank's Africa Development Indicators, 2012,
Inflation	This inflation calculated as annual percent change of the consumer price index	World Bank's Africa Development Indicators, 2012,
Com	Telephone lines per 1000 people	World Bank's Africa Development Indicators, 2012,
pol	negative ten for extreme autocratic regime and positive ten for extreme democracy	Polity IV
Traop	This trade openness which is the sum of imports and exports	World Bank's Africa Development Indicators, 2012,
Finop	Financial openness index	Chinn and Ito index:http://web.pdx.edu/~ito/Chinn-Ito_website.htm
Rgdppc	Real GDP per capita (at 2005 US $)	World Bank's Africa Development Indicators, 2012,

Table C.0.2: Results of SADC

	Composite measure of financial development					
Variables	(1)	(2)	(3)	(4)	(5)	(6)
$findex_{t-1}$	0.903***	0.864***	0.861***	0.852***	0.812***	0.811***
	(0.0275)	(0.0202)	(0.0217)	(0.0239)	(0.0336)	(0.0334)
rgdppc	0.0293	0.0398	0.0377	0.0344	-0.00756	-0.00177
	(0.0510)	(0.0445)	(0.0463)	(0.0470)	(0.0324)	(0.0306)
inflation	-0.0319***	-0.0346***	-0.0348***	-0.0367***	-0.0442***	-0.0438***
	(0.00510)	(0.00427)	(0.00386)	(0.00443)	(0.00927)	(0.00831)
gov	-0.0476***	-0.0402***	-0.0393***	-0.0403***	-0.0488***	-0.0418***
	(0.0101)	(0.0108)	(0.0105)	(0.0108)	(0.00958)	(0.0100)
traop		0.0719***	0.0724***	0.103***	0.0761**	0.0705**
		(0.0187)	(0.0185)	(0.0299)	(0.0298)	(0.0308)
finop			0.00237	-0.0307	-0.0675**	-0.0667**
			(0.0105)	(0.0214)	(0.0239)	(0.0220)
fintraop				0.000372*	0.000681**	0.000654**
				(0.000202)	(0.000249)	(0.000225)
com					0.0246***	0.0254***
					(0.00686)	(0.00661)
pol						0.00248
						(0.00279)
trapol						-3.24e-05
						(1.89e-05)
Constant	0.401	0.184	0.206	0.136	0.650*	0.619**
	(0.288)	(0.284)	(0.317)	(0.292)	(0.296)	(0.279)
Observations	372	372	372	372	372	372
R-squared	0.834	0.839	0.839	0.841	0.851	0.852

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Table C.0.3: Results of ECOWAS

	Composite measure of financial development					
Variables	(1)	(2)	(3)	(4)	(5)	(6)
$findex_{t-1}$	0.830***	0.827***	0.829***	0.828***	0.816***	0.799***
	(0.0381)	(0.0416)	(0.0441)	(0.0470)	(0.0481)	(0.0412)
rgdppc	0.290***	0.279***	0.276***	0.281***	0.229***	0.231***
	(0.0601)	(0.0566)	(0.0615)	(0.0697)	(0.0653)	(0.0712)
inflation	-0.288***	-0.270**	-0.272**	-0.271**	-0.222*	-0.213*
	(0.0787)	(0.0942)	(0.0983)	(0.0977)	(0.104)	(0.108)
gov	-0.0276*	-0.0297*	-0.0314**	-0.0339*	-0.00945	-0.0115
	(0.0142)	(0.0159)	(0.0138)	(0.0164)	(0.0200)	(0.0210)
traop		0.0373	0.0359	0.0221	0.00463	0.0102
		(0.0301)	(0.0327)	(0.0339)	(0.0325)	(0.0404)
finop			-0.00388	0.0112	0.0264	0.0291
			(0.00842)	(0.0381)	(0.0327)	(0.0343)
fintraop				-0.000238	-0.000416	-0.000314
				(0.000510)	(0.000462)	(0.000523)
com					0.0133**	0.0118**
					(0.00443)	(0.00510)
pol						-0.00334
						(0.00416)
trapol						8.29e-05
						(5.42e-05)
Constant	-0.936***	-1.002***	-0.985***	-0.946***	-0.594**	-0.540*
	(0.253)	(0.247)	(0.273)	(0.223)	(0.215)	(0.270)
Observations	372	372	372	372	372	372
R-squared	0.877	0.877	0.877	0.878	0.880	0.881

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table C.0.4: LSDV results without Zimbabwe and DRC

Variables	No Zimbabwe (1)	No DRC (2)	No Zimbabwe and DRC (3)
$findex_{t-1}$	0.829***	0.824***	0.848***
	(0.0332)	(0.0322)	(0.0223)
rgdppc	-0.00475	0.0434	0.0612**
	(0.0344)	(0.0242)	(0.0226)
inflation	-0.0340***	-0.0540***	-0.164**
	(0.00860)	(0.0122)	(0.0605)
gov	-0.0457**	-0.0493**	-0.0323
	(0.0152)	(0.0160)	(0.0194)
pol	0.00293	0.000941	0.00262
	(0.00321)	(0.00261)	(0.00240)
traop	0.0662*	0.0729*	0.0714*
	(0.0327)	(0.0367)	(0.0381)
finop	-0.0643**	-0.0524**	-0.0625**
	(0.0220)	(0.0189)	(0.0240)
fintraop	0.000609**	0.000498**	0.000550**
	(0.000219)	(0.000195)	(0.000206)
com	0.0251**	0.0182***	0.0111*
	(0.00843)	(0.00542)	(0.00590)
trapol	-3.53e-05	-2.38e-05	-3.41e-05**
	(2.03e-05)	(1.77e-05)	(1.40e-05)
Constant	0.585*	0.291	0.0532
	(0.312)	(0.166)	(0.176)
Hausman test	17.13	19.01	24.78
prob	(0.0468)	(0.0401)	(0.0032)
Observations	341	341	310
R-squared	0.870	0.856	0.883

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Table C.0.5: SURE estimates of SADC (composite measure of financial development)

Variables	Botswana	Madagascar	Malawi	Mauritius	S. Africa	Swaziland	Zimbabwe	Tanzania	Mozam	DRC
$findex_{t-1}$	0.354***	0.454***	0.587***	0.504***	0.745***	0.601***	-0.519***	0.0590	0.242**	0.224
	(0.118)	(0.0994)	(0.125)	(0.102)	(0.0801)	(0.171)	(0.188)	(0.184)	(0.113)	(0.156)
rgdppc	0.113	0.454***	0.815***	0.285**	0.606***	-0.312*	-0.0364	-4.897***	0.671***	0.350*
	(0.114)	(0.134)	(0.232)	(0.120)	(0.126)	(0.172)	(0.268)	(1.154)	(0.223)	(0.204)
gov	-0.124	0.0500	-0.108	-0.115	0.0650	-0.0221	-0.00455	-0.344***	0.364***	-0.0316
	(0.0967)	(0.0478)	(0.0793)	(0.0703)	(0.101)	(0.132)	(0.0554)	(0.120)	(0.0997)	(0.0815)
inflation	1.889***	-0.225***	0.0604	-0.307***	-0.118	-0.167	-0.244**	0.0494	0.172	-0.0543**
	(0.393)	(0.0817)	(0.169)	(0.113)	(0.302)	(0.271)	(0.110)	(0.358)	(0.188)	(0.0256)
com	0.0793**	0.0259***	0.0130	-0.00751	-0.0561**	0.0495**	-0.408***	0.600***	0.0102	0.110***
	(0.0316)	(0.00902)	(0.0226)	(0.0319)	(0.0236)	(0.0225)	(0.0935)	(0.116)	(0.0363)	(0.0318)
finop	0.0514	-0.0538	-0.928*	0.132***	-0.0149	0.112	0.468**	0.638*	0.0457	-0.0791
	(0.0893)	(0.0814)	(0.495)	(0.0386)	(0.0983)	(0.169)	(0.235)	(0.329)	(0.246)	(0.201)
traop	2.803**	0.0550	0.981*	1.643**	-0.250	-1.245	0.117	-0.369*	-0.213	0.499*
	(1.207)	(0.0552)	(0.516)	(0.811)	(0.235)	(0.943)	(0.259)	(0.218)	(0.289)	(0.275)
fintraop	-0.000237	0.000239	0.0115*	-0.00094***	-0.000122	-0.000927	-0.00256	-0.0134**	0.00324	0.00767*
	(0.00097)	(0.00166)	(0.00653)	(0.000309)	(0.00210)	(0.00109)	(0.00273)	(0.00563)	(0.0047)	(0.00441)
pol	0.278	0.0140***	-0.0656***	0.184**	-0.00587	0.0550	-0.0341	-0.0117	0.0367**	-0.0360
	(0.191)	(0.00526)	(0.0169)	(0.0796)	(0.0191)	(0.103)	(0.0223)	(0.0642)	(0.0164)	(0.0274)
trapol	-0.00330*	-0.000190*	0.00088***	-0.00140**	0.000627*	-0.000690	0.000527	-0.000802	-0.00027	0.0011***
	(0.00177)	(9.95e-05)	(0.000294)	(0.000684)	(0.000343)	(0.000643)	(0.00048)	(0.00094)	(0.0003)	(0.00041)
Constant	-10.61*	-0.450	-6.563***	-7.698**	-3.093**	9.832*	8.403***	33.38***	0.0597	0.0537
	(5.888)	(0.587)	(2.381)	(3.824)	(1.435)	(5.810)	(2.199)	(6.823)	(1.076)	(1.506)
Observations	31	31	31	31	31	31	31	31	31	31
R-squared	0.950	0.893	0.868	0.994	0.935	0.880	0.679	0.976	0.927	0.897

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table C.0.6: SURE estimates of ECOWAS (composite measure of financial development)

Variables	Benin	Cape Verde	Cote d' Ivoire	Gambia	Ghana	Mali	Niger	Nigeria	Senegal	Togo
$findex_{t-1}$	0.560***	0.638***	0.0640	0.642***	-0.306**	0.368*	0.884***	0.623***	0.505***	0.110
	(0.153)	(0.0758)	(0.0417)	(0.137)	(0.152)	(0.192)	(0.0626)	(0.125)	(0.0560)	(0.139)
rgdppc	0.925	-1.209**	0.225***	1.943	2.077***	1.010***	0.658***	0.0380	1.132***	0.237
	(0.777)	(0.541)	(0.0584)	(1.227)	(0.516)	(0.338)	(0.171)	(0.338)	(0.138)	(0.258)
gov	0.0979	-0.141	0.327***	-0.494***	-0.325***	-0.0783	-0.0523	-0.00698	0.0472	0.0964
	(0.0978)	(0.148)	(0.0358)	(0.191)	(0.110)	(0.0597)	(0.0941)	(0.0525)	(0.0288)	(0.130)
inflation	0.0236	-1.434**	-0.152	-0.664	-0.0572	-0.261	-0.966***	-0.413***	-0.397***	-0.857***
	(0.301)	(0.658)	(0.113)	(0.410)	(0.102)	(0.168)	(0.151)	(0.133)	(0.0891)	(0.259)
com	0.0902**	0.375**	0.0482***	-0.0494	0.0242	-0.0335	0.0447**	0.0299	0.0122***	0.0212*
	(0.0390)	(0.162)	(0.00516)	(0.0488)	(0.0375)	(0.0233)	(0.0178)	(0.0243)	(0.00415)	(0.0124)
finop	1.591**	0.00866	-0.348***	1.347***	0.349***	-1.084***	-0.219*	0.283	0.0404	-13.60**
	(0.771)	(0.0402)	(0.112)	(0.484)	(0.118)	(0.239)	(0.117)	(0.209)	(0.424)	(5.383)
traop	-0.845*	-3.250***	0.273	1.421**	-0.0210	1.095***	0.269*	-0.406*	0.0956	-4.318**
	(0.476)	(1.094)	(0.192)	(0.553)	(0.120)	(0.206)	(0.162)	(0.226)	(0.130)	(1.877)
fintraop	-0.0257**	-0.037***	0.00537***	-0.014***	-0.0064***	0.0185***	0.00500**	-0.00505*	0.000131	-0.0551**
	(0.0125)	(0.0118)	(0.00179)	(0.00508)	(0.00216)	(0.00463)	(0.00238)	(0.00305)	(0.00695)	(0.0216)
pol	0.00753	0.101***	-0.0505**	0.177***	-0.00849	-0.0622**	0.0151	0.00440	0.0156	-0.290***
	(0.0431)	(0.0379)	(0.0243)	(0.0672)	(0.0112)	(0.0276)	(0.00990)	(0.0120)	(0.0589)	(0.0978)
trapol	-0.000259	-0.000883*	0.000536	-0.0017**	0.000213	0.000939*	-0.000179	0.000179	-0.000224	0.00288***
	(0.000747)	(0.000475)	(0.000331)	(0.000703)	(0.000218)	(0.000549)	(0.000247)	(0.000257)	(0.000942)	(0.00105)
Constant	-0.678	19.91***	0.564	-15.29**	-5.902**	-7.206***	-4.098***	3.132	-5.678***	0.2.677
	(3.787)	(5.588)	(0.821)	(6.857)	(2.854)	(2.499)	(1.080)	(2.148)	(1.010)	(2.851
Obs	31	31	31	31	31	31	31	31	31	31
R-squared	0.903	0.987	0.986	0.662	0.965	0.876	0.978	0.897	0.971	0.735

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table C.0.7: Correlation matrix of residuals of SADC

	Botswana	Madagascar	Malawi	Mauritius	S. Africa	Swaziland	Zimbabwe	Tanzania	Mozambique	DRC
Botswana	1.000									
Madagascar	-0.0672	1.000								
Malawi	0.3309	0.5564	1.000							
Mauritius	-0.1484	-0.5842	-0.5081	1.000						
S. Africa	-0.028	0.2235	0.611	-0.0646	1.000					
Swaziland	0.3989	0.6514	0.8125	-0.7558	0.3118	1.000				
Zimbabwe	-0.6122	0.6154	0.2692	-0.2905	0.399	0.2106	1.000			
Tanzania	0.0743	-0.7427	-0.5503	0.6343	-0.1222	-0.6866	-0.5211	1.000		
Mozambique	0.0842	-0.4107	-0.1203	-0.0545	0.202	-0.2085	-0.1845	0.4682	1.000	
DRC	0.536	-0.3834	0.111	0.1129	0.1123	0.0315	-0.53	0.3671	0.1522	1.000

Breusch-Pagan LM test of independence: chi2(45) = 246.828, Pr = 0.0000

Table C.0.8: Correlation matrix of residuals of ECOWAS

	Benin	C.Verde	C` Ivoire	Gambia	Ghana	Mali	Niger	Nigeria	Senegal	Togo
Benin	1.000									
C.Verdi	-0.3461	1.000								
C.D'voire	0.04	-0.862	1.000							
Gambia	0.2692	0.004	-0.3525	1.000						
Ghana	-0.023	0.8043	-0.8771	0.1592	1.000					
Mali	-0.086	0.147	-0.4021	0.3044	0.3763	1.000				
Niger	0.4375	-0.8396	0.7562	0.0414	-0.7799	-0.3779	1.000			
Nigeria	0.2617	-0.277	0.1822	0.3715	-0.2134	-0.3062	0.5999	1.000		
Senegal	0.5323	-0.6039	0.3794	0.2198	-0.4524	-0.0227	0.7984	0.6362	1.000	
Togo	0.4286	-0.8275	0.6818	0.6818	-0.6515	-0.1267	0.8182	0.5324	0.7836	1.000

Breusch-Pagan LM test of independence: chi2 (45) = 353.823, Pr = 0.0000. C.D'voire =Cote d' Ivoire, C.Verde= Cape Verde

APPENDIX D
Appendix for chapter 5

Table D.0.1: Showing description of data and source

Variable	Description	Sources
bankprcr	Ratio of bank private to GDP.	Global Financial Development Database (GFDD), 2012
dmba	Ratio of deposit money bank assets to the sum of deposit money bank and Central Bank assets	Global Financial Development Database (GFDD), 2012
M3	ratio of liquid liabilities (M3) to GDP	Global Financial Development Database (GFDD), 2012
gov	Government expenditure (%GDP)	World Bank' Africa Development Indicators, 2012
rgdppc	real GDP per capita (at 2005 US $)	World Bank' Africa Development Indicators, 2012
Inflation	annual percent change of the consumer price index	World Bank' Africa Development Indicators, 2012
traop	This is trade openness which is the sum of exports and imports to GDP	World Bank' Africa Development Indicators, 2012
com	Telephone lines per 1000 people	World Bank' Africa Development Indicators, 2012
gdsav	gross domestic savings as a percentage of GDP	World Bank' Africa Development Indicators, 2012
finop	financial openness (KAOPEN)	Chinn and Ito Index

Appendix D: Results that include DRC Ghana and Zimbabwe

Table D.0.2 indicates that linearity is rejected at 1% significance levels both regions. However, Table D.0.3 reveals the relationship is adequately modeled by a single threshold (two regime), hence, rejecting double threshold at 1% and 5% significance level.

Table D.0.2: Test of linearity against non-linearity

	ECOWAS		SADC	
Test	Statistics	p-value	Statistics	p-value
Wald Test (LM)	23.621	(0.001)	41.450	(0.000)
Fisher Test (LMF)	4.000	(0.001)	7.398	(0.000)
Likelihood RT (LR)	24.404	(0.000)	43.946	(0.000)

H0: Linear model H1: PSTR with at least one threshold variable (r=1)

Table D.0.3: Testing the number of regimes: Tests of no remaining non-Linearity

	ECOWAS		SADC	
Test	Statistics	p-value	Statistics	p-value
Wald Test (LM)	4.449	(0.616)	12.343	(0.055)
Fisher Test (LMF)	0.690	(0.658)	1.956	(0.071)
Likelihood RT (LR)	4.476	(0.613)	12.553	(0.051)

H0: PSTR with r = 1 against PSTR with at least r = 2

Table D.0.4: PSTR results with DRC Ghana and Zimbabwe

	ECOWAS		SADC	
Variables	$\tilde{\beta}_0$	$\tilde{\beta}_1$	$\tilde{\beta}_0$	$\tilde{\beta}_1$
inflation	-0.091	-0.085***	0.573**	-0.575**
	(0.2189)	(0.2355)	(0.2735)	(0.2736)
gov	0.918***	-2.572***	-0.345	-0.793*
	(0.2393)	(0.4353)	(0.3157)	(0.4093)
rgdppc	0.078****	0.014	0.010***	0.050**
	(0.0102)	(0.0204)	(0.0024)	(0.0195)
traop	0.086	0.332*	0.544***	-0.144
	(0.1107)	(0.1843)	(0.1023)	(0.0993)
finop	4.200*	15.852***	-2.445	11.200***
	(2.1517)	(4.9133.)	(1.5816)	(2.316)
com	0.054***	0.830***	0.039***	-0.072***
	(0.0082)	(0.2230)	(0.0071)	(0.0158)
Threshold (δ)	23.6		21.3	
Slope (γ)	74.8		1.25	

***/**/*show significant at 1%, 5% and 10% respectively and values in parentheses are standard errors corrected for heteroscedascity.

Where rgdppc = real GDP per capita, gov = government expenditure (%GDP), traop = international trade openness, finop = capital flows or financial openness, com = access to mobile and telephones per 1000 people. Variables are not in logs

Sensitivity Analysis

The test of linearity suggests that the relationship is not linear from Table D.0.4 and hence we tested for no remaining nonlinearity and results on Table D.0.5 supports the existence of one threshold as indicated by the p-values

Table D.0.5: Test of linearity against non-linearity-savings

	ECOWAS		SADC	
Test	Statistics	p-value	Statistics	p-value
Wald Test (LM)	20.026	(0.006)	31.739	(0.000)
Fisher Test (LMF)	2.879	(0.006)	4.774	(0.000)
Likelihood RT (LR)	20.638	(0.000)	33.484	(0.000)

H0: Linear model H1: PSTR with at least one threshold variable (r=1)

Table D.0.6: Testing the number of regimes: Tests of no remaining non-linearity

	ECOWAS		SADC	
Test	Statistics	p-value	Statistics	p-value
Wald Test (LM)	11.098	(0.134)	8.391	(0.299)
Fisher Test (LMF)	1.485	(0.172)	1.109	(0.358)
Likelihood RT (LR)	11.282	(0.127)	8.507	(0.290)

The PSTR results are reported on Table D.0.6 which shows evidence of single threshold for the two regions similar to the baseline results.

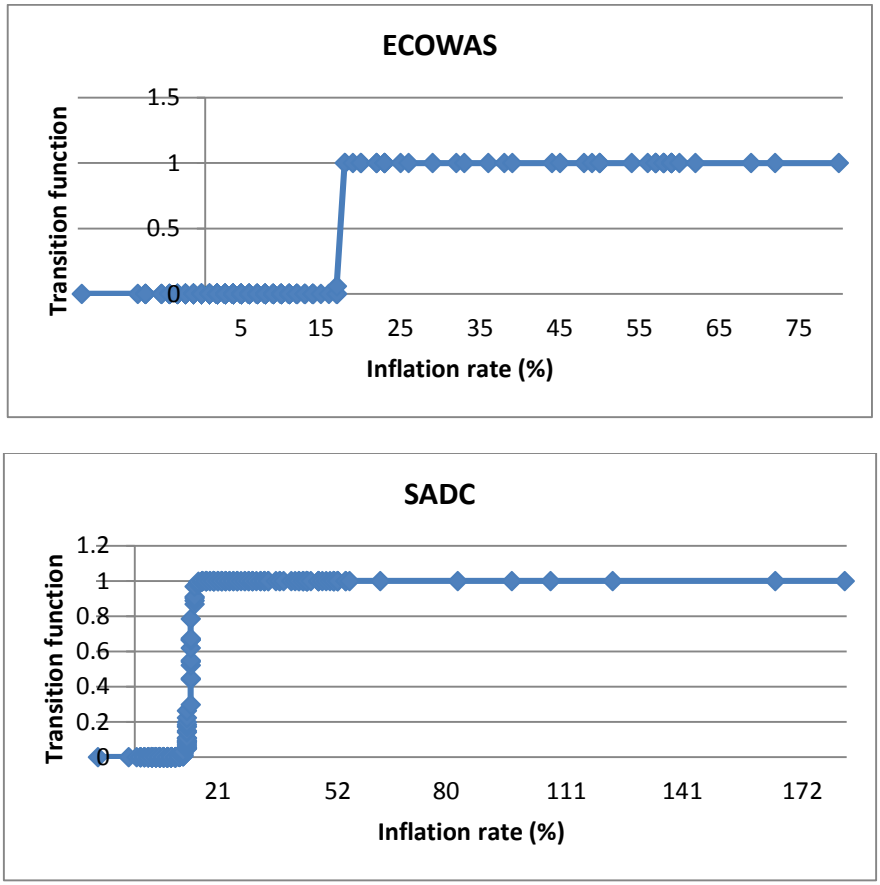
Table D.0.7: Sensitivity analysis of PSTR results without DRC Ghana and Zimbabwe

	ECOWAS		**SADC**	
Variables	$\tilde{\beta}_0$	$\tilde{\beta}_1$	$\tilde{\beta}_0$	$\tilde{\beta}_1$
inflation	-0.0508	-0.9414***	0.6891**	-0.7523**
	(0.2463)	(0.3054)	(0.3336)	(0.3228)
gov	1.226 ***	-1.2341	-0.7523	-1.7479***
	(0.4272)	(1.3335)	(0.3429)	(0.3435)
rgdppc	0.0803***	0.0433**	0.009***	0.013***
	(0.0100)	(0.0214)	(0.0026)	(0.0026)
traop	-0.1575	0.4914***	0.1310**	0.3585***
	(0.0993)	(0.1800)	(0.0652)	(0.0585)
finop	1.1622	3.5255	-2.1058	7.3755***
	(1.9662)	(6.0652.)	(1.6723)	(2.4884)
com	0.0505***	-2.5945***	0.0377***	-0.4555***
	(0.0088)	(1.2538)	(0.0075)	(0.1040)
gdsav	-0.4209	-0.1256	-0.0692	0.0632
	(0.3625)	(1.1874)	(0.1302)	(0.1037)
Threshold ($\boldsymbol{\delta}$)	17.87		14.4	
Slope ($\boldsymbol{\gamma}$)	429.9		2.3	

***/**/*show significant at 1%, 5% and 10% respectively and values in parentheses are standard errors corrected for heteroscedascity

gdsav= gross domestic savings as percentage of GDP

Figure D.1: Transition function of the two regions



APPENDIX E

Appendix for chapter 6

Table E.0.1: Variables, sources and description

Variable	Description	Source
Bankcrisis	Dummy: 1 = Bank crisis, 0 = no crisis	Laeven and Valencia (2012), GFDD
Foreign banks	Percentage of the number of foreign owned banks to the number of total banks in an economy. Foreign bank is a bank where 50% or more of its shares are owned by foreigners.	Neeltje van Horen (2012), GFDD
Z-score	Captures the probability of default of the banking system	Bankscope, Bereau van Dijk (2012), GFDD
Pol	Measures political institution with -10 extreme autocratic and +10 total democracy as in Chapter 3	Polity IV
Credit to the private sector	Domestic credit provided by financial sector (% of GDP) enterprises and nonfinancial public entities	World Development Indicators,WDI (2012)
m2 to reserves	Broad money to total reserves ratio	WDI (2012)
Inflation	Inflation, consumer prices (annual %)	WDI (2012)
Real GDP per capita	GDP at constant US (2005)	WDI (2012)
Exchange rate	Official exchange rate (LCU per US$, period average)	WDI (2012)
Deposit insurance	Dummy: 1 =a country has explicit deposit insurance, 0 = otherwise	Demirguc-Kunt, et.al. (2012),
Finop	This measures financial openness as explained in Chapter 4	Chinn-Ito
Real GDP per capita growth	GDP per capita growth (annual %)	WDI (2012)

Table E.0.2: Showing banking crises for the period 1980-2011 in SSA

Country	Episode of bank crises from 1980-2011								
Burundi	1994	1995	1996	1997	1998				
Benin	1988	1989	1990	1991	1992				
Burkina Faso	1990	1991	1992	1993	1994				
Central African Republic	1995	1996							
Cote d'Ivoire	1988	1989	1990	1991	1992				
Cameroon	1987	1988	1989	1990	1991	1995	1996	1997	
Congo, Rep.	1992	1993	1994						
Djibouti	1991	1992	1993	1994	1995				
Eritrea	1993								
Ghana	1982	1983							
Guinea	1985	1993							
Guinea-Bissau	1995	1996	1997	1998					
Equatorial Guinea	1983								
Kenya	1985	1992	1993	1994					
Liberia	1991	1992	1993	1994	1995				
Madagascar	1988								
Mali	1987	1988	1989	1990	1991				
Mozambique	1987	1988	1989	1990	1991				
Niger	1983	1984	1985						
Nigeria	1991	1992	1993	1994	1995	2009	2010	2011	
Senegal	1988	1989	1990	1991					
Sierra Leone	1990	1991	1992	1993	1994				
Swaziland	1995	1996	1997	1998	1999				
Chad	1983	1992	1993	1994	1995	1996			
Togo	1993	1994							
Tanzania	1987	1988							
Uganda	1994								
DRC	1983	1991	1992	1993	1994	1995	1996	1997	1998
Zambia	1995	1996	1997	1998					
Zimbabwe	1995	1996	1997	1998	1999				

Source: Author' own compilation using data from Laeven and Valencia (2012)

Table E.0.3: Showing results of multivariate logit model of bank crisis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
fbi	-0.0221*	-0.0247**	-0.0363**	-0.0417***	-0.0416**	-0.0243***	-0.0242***	-0.0237***	-0.0402***	-0.0415*
	(0.0124)	(0.0113)	(0.0149)	(0.0161)	(0.0164)	(0.00843)	(0.00837)	(0.00871)	(0.0142)	(0.0227)
pol		-0.248***	-0.347***	-0.356***	-0.375***	-0.434***	-0.433***	-0.433***	-0.464***	-0.450***
		(0.0702)	(0.123)	(0.122)	(0.133)	(0.160)	(0.162)	(0.160)	(0.154)	(0.174)
finlib			0.919**	0.926*	0.851	1.246*	1.243*	1.261*	1.268**	0.915*
			(0.459)	(0.485)	(0.623)	(0.701)	(0.711)	(0.668)	(0.645)	(0.555)
m2res				-0.115*	-0.187*	-0.482	-0.481	-0.499*	-0.575*	-0.388
				(0.0691)	(0.101)	(0.303)	(0.311)	(0.277)	(0.297)	(0.236)
credit					0.0523**	0.135**	0.135**	0.138**	0.163***	0.188**
					(0.0230)	(0.0584)	(0.0594)	(0.0548)	(0.0577)	(0.0734)
rgdppc						-0.00136**	-0.00136**	-0.00139**	-0.00167**	-0.00240***
						(0.000650)	(0.000665)	(0.000623)	(0.000689)	(0.000902)
inflation							5.21e-05	9.82e-05	0.000144	-0.0120
							(0.000535)	(0.000563)	(0.000471)	(0.0130)
rgdppcgr								-0.0586	-0.0724	-0.00289
								(0.123)	(0.120)	(0.189)
depinss									-1.416*	-2.798*
									(0.769)	(1.617)
exrate										-0.00843***
										(0.00148)
Constant	-1.895***	-1.813***	-0.719	-0.0625	-0.948	-0.841	-0.846	-0.744	0.604	1.828
	(0.667)	(0.701)	(0.821)	(0.950)	(0.972)	(0.973)	(0.973)	(0.944)	(1.443)	(1.871)
Obs	300	300	300	297	297	297	289	289	289	289
Prob>chi2	0.0756	0.0002	0.0076	0.0091	0.0057	0.0013	0.0019	0.0000	0.0000	0.0000
Pseudo R2	0.0330	0.2120	0.2677	0.2930	0.3378	0.4019	0.3979	0.3996	0.4058	0.4909
log likelihood	-51.750503	-42.17	-39.19	-37.743	-35.350	-31.93	-31.923	-31.83	-31.50	-26.99

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Fbi is percentage of foreign banks among domestic banks, credit is private credit, finlib is the financial liberalisation. The variable exrate is exchange rate, m2res is the ratio of M2 to reserves. Finanally, rgdppc is the real GDP per capita, depinss is explicit deposit insurance and rgdppcgr is the real GDPper capita growth

Table E.0.4: Results of Marginal effects of multivariate probit

Variables	1	2	3	4	5	6	7	8	9	10
fbi	-0.00089*	-0.000967**	-0.00119**	-0.00135**	-0.00123***	-0.000784***	-0.000810***	-0.000787***	-0.00124***	-0.000951*
	(0.00053)	(0.000471)	(0.000535)	(0.000537)	(0.000470)	(0.000286)	(0.000296)	(0.000303)	(0.000435)	(0.000490)
pol		-0.00848***	-0.0103***	-0.0105***	-0.0106***	-0.0111***	-0.0114***	-0.0116***	-0.0126***	-0.0108***
		(0.00252)	(0.00345)	(0.00335)	(0.00320)	(0.00309)	(0.00322)	(0.00315)	(0.00329)	(0.00291)
finlib			0.0244*	0.0232	0.0191	0.0266	0.0271	0.0304*	0.0309**	0.0188*
			(0.0144)	(0.0146)	(0.0163)	(0.0168)	(0.0177)	(0.0157)	(0.0156)	(0.0105)
m2res				-0.00423*	-0.00599**	-0.0103*	-0.0104*	-0.0129***	-0.0144**	-0.00839**
				(0.00235)	(0.00291)	(0.00570)	(0.00606)	(0.00497)	(0.00581)	(0.00410)
creddit					0.00151**	0.00338***	0.00345***	0.00371***	0.00438***	0.00463***
					(0.000650)	(0.00102)	(0.00108)	(0.00107)	(0.00115)	(0.00124)
rgdppc						-0.00033***	-0.00034**	-0.000036***	-4.41e-05***	-5.95e-05***
						(00001275)	(000014)	(0.000015)	(0.0000151)	(1.61e-05)
inflation							-0.00000574	-0.00000207	0.000000217	-0.000314
							(0.0000154)	(0.00002755)	(0.00001785)	(0.000240)
rgdppcgr								-0.00455	-0.00479	-0.00259
								(0.00385)	(0.00396)	(0.00447)
depinss									-0.0405*	-0.0637
									(0.0215)	(0.0391)
exrate										-0.000230***
										(0.000075)
Prob>chi2	0.0799	0.0001	0.0048	0.0071	0.0026	0.0009	0.0007	0.0000	0.0000	0.0000
Pseudo R^2	0.032	0.212	0.251	0.279	0.311	0.359	0.355	0.368	0.375	0.480
Log likelihood	-51.79	-42.15	-40.08	-38.52	-36.77	-34.21	-34.2	-33.50	-33.13	-27.56

Robust errors in parentheses*** p<0.01, ** p<0.05,* p<0.1