

**COMPETITIVENESS OF THE BANKING INDUSTRY IN THE SOUTHERN
AFRICAN DEVELOPMENT COMMUNITY**

Thesis presented for the **Degree of Doctor of Philosophy** in the Faculty of
Commerce, Graduate School of Business at the University of Cape Town

By

SEPHOOKO IGNATIUS MOTELLE

JANUARY, 2014

SUPERVISOR: PROFESSOR NICHOLAS BIEKPE

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

DECLARATION

I, the undersigned, hereby declare that this thesis is submitted by me for the award of a PhD degree at the University of Cape Town, Graduate School of Business. I further declare that this is my own independent work and has not been previously submitted in part or its entirety to any other university.

University of Cape Town

Signed by candidate

Sephooko I. Motelle

December, 2013

ABSTRACT

The literature is replete with the determinants of economic growth and identifies financial development as one of the important drivers of growth. Financial development is viewed as a process through which financial intermediaries such as banks lubricate the economy by creating a conduit for resources to flow from surplus sectors to deficit sectors. Effective financial development depends on many factors such as financial integration which facilitates international trade and free mobility of capital. However, in order for the positive impact of financial integration to be fully felt on financial development, it must stimulate competition in the domestic banking market without eroding financial stability. Therefore, the central hypothesis of this study is that financial integration can enhance financial development if such integration makes the local banking industry more competitive without increasing its vulnerability to financial instability. The study employs various panel data techniques to test this hypothesis using the Southern African Development Community (SADC) as a case study.

The findings reveal that the banking industry in SADC is characterised by monopolistic competition. In addition, financial integration enhances banking competitiveness in the region through removal of barriers to free flow of capital between countries. Furthermore, higher competition is found to be good for financial development as it reduces the magnitude of the financial intermediation spread. Moreover, the study finds that the flipside of financial integration lies in its potential to cause financial instability in the region with negative repercussions for financial intermediation. The findings imply that, even though financial integration is good for financial development through its ability to increase the degree of competition in the banking industry and reduce the spread between lending and deposit rates, member states must put policies in place to effectively prevent the likely erosion of financial stability. No single policy is sufficient on its own to achieve this. Therefore, this study recommends that as members of SADC move towards deeper financial integration, they must ensure that they formulate and implement sound and appropriate common policies in order to ensure that financial stability is not compromised as restrictions to capital-flows are abolished or reduced. Such a policy-mix requires four ingredients, namely; sound financial liberalisation policies, competition policies, macroeconomic policies and regulatory and supervisory policies.

DEDICATION

I dedicate this work to my almighty God – Jehovah, the source of my life and the giver of wisdom; to my precious-loving wife - Mamahlako Refiloe Motelle as well as to my dear parents, Mr Motlatsi and Mrs Mamoeketsi Motelle.

University of Cape Town

ACKNOWLEDGEMENTS

Like every other journey, the arduous PhD journey also does come to an end. Getting to such a time can be a great relief, but it is also a period for reflections. I look back to the time when I requested for the opportunity to pursue a PhD from my boss at the Central Bank of Lesotho. What a request that was! Nevertheless, I was very glad to be granted the opportunity to be on a *three-year study leave* to pursue my goal. I, therefore take this opportunity to thank the management of the Bank for approving my request. I would like to single out the late Dr. Moeketsi Senaoana for his special support in this regard. If he were still alive, he would be proud that I was able to complete my studies. I would also want to thank my colleagues at the Research Department for their willingness to carry the extra work-load that arose during my absence from office, thanks guys!

This PhD tour has been interesting and at the same time very daunting. I can summarise the whole experience in the following words: *Even though you may work hard most of the time, there are times when you achieve nothing, even less than nothing, and those times when you achieve something, or even more than something; in the end it sums up to everything that a thesis needs to be.* The periods of stagnation or even regression can sometimes last long. This can be enormously frustrating! It is during such times when one realises that a responsive support system is a necessity. To this end, I would like to thank my Supervisor Professor Nicholas Biekpe for his guidance. There is nothing as important as timely and reliable feedback in the process of shaping a PhD thesis. Despite his other commitments and a very busy schedule, Prof. Biekpe always found time to read my work and provide positive feedback. I know that it was not easy and it took a great deal of sacrifice on his part. That is why, I want to say, thank you very much sir, much appreciated! In a similar vein, I want to gratefully express my deepest feelings of gratitude to Africagrowth Institute for providing the financial support for my studies as well as gave me office space to use during my studies. I appreciate the support of the team at the Institute in this regard in particular Dina, Lydia, Kirk, Roland, and Killian. I also want to express deep appreciation for all faculty members at the UCT-Graduate School of Business (GSB) for their support and constructive comments during my seminar presentations at the school. In addition, I appreciatively want to thank the GSB-library team for their excellent support with library resources that were so useful to this work. In this connection, may I directly address Mary for her tireless efforts during times when I needed data; thank you!

I would like to thank many other people for their encouragement and support. In particular, I want to direct my vote of thanks to my spiritual father - Dr. Samuel Mensah, who

set aside a lot of time to proof-read my work. As an avid and meticulous scholar, he really managed to give this thesis a significant facelift. Thank you dad! I also want to thank Professor Meshach Aziakpono for continued encouragement when days were dark. I also want to thank my friends, both young and old, for their messages of support throughout this journey. In this group, I would like to single out Tsitso Tlali who spent a lot of his time assisting me when I was writing a programming code for one algorithm that I had to contend with in one of the chapters. Thanks *mfanakethi!* In the same light, I also thank Dr. William Insaidoo and acknowledge his support through very insightful discussions about our work at the time that he was also battling his own PhD.

To my dear family: First, I want to give my dear wife a hearty thank-you-kiss. You have been more than a wife to me. I thank you for your devotion, self-sacrifice and deep love. You have proved to be a gift from above. *I love you!* Second, I would like to thank my siblings for their positive outlook on life, their constant smiles and happy faces. Such radiation of joy remained a constant reminder that life is all about adding value to other people's lives, making a difference even in small ways by helping others and always counting your own blessings. Thank you for teaching me that life is all about sharing, I doubt that this lesson would have come across so clearly if I was the only child in my family. May we continue to share our joys and troubles for as long as we live. In this case, I want to single out my dear brother Ts'eliso Motelle who demonstrated a lot of belief in my academic potential; a belief which helped me to unleash such a potential to the full. I just want you to know that I appreciate it very much! Finally, I give credit to my parents who, despite lack of education and resources, saw value in my education and invested their entire lot to make it a success. They did not only give me the best parenting in the world, but also were always there to give me emotional support. I humbly view this work and its associated impact on the development of societies, in effect as their own contribution. If only other parents, can emulate your fine example of self-sacrifice!

The fact that I lived to do this work, was blessed with talents required to take up the challenge and enjoyed a measure of good health until its completion, testifies to the fact that I am nothing, but a piece of clay in a potter's hand. The great Potter is you Jehovah my God. You who has showered your blessings upon me in ways that will amount to tonnes of PhD theses should I begin to count them. Words cannot express my feelings of appreciation adequately, I can only laud your great name in awe and encourage others to do the same: *Praise Jah, you people!*

TABLE OF CONTENTS

DECLARATION	I
ABSTRACT.....	II
DEDICATION	I
ACKNOWLEDGEMENTS.....	II
TABLE OF CONTENTS.....	IV
LIST OF TABLES.....	VIII
LIST OF FIGURES	IX
LIST OF APPENDICES.....	X
ACRONYMS.....	XII
CHAPTER ONE.....	13
INTRODUCTION	13
1.1 BACKGROUND TO THE STUDY	13
1.2 THE RESEARCH PROBLEM	14
1.3 JUSTIFICATION AND MOTIVATION OF THE STUDY	18
1.4 OBJECTIVES OF THE STUDY	19
1.5 ORGANISATION OF THE STUDY	20
1.6 MEASUREMENT OF CONCEPTS AND CAVEATS.....	21
REFERENCES	25
LIST OF APPENDICES.....	27
CHAPTER TWO.....	29
OVERVIEW OF THE FINANCIAL SYSTEM IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY	29
2.1 INTRODUCTION.....	29
2.2 FINANCIAL REFORMS.....	29
2.3 MARKET STRUCTURE AND COMPETITION	31
2.4 FINANCIAL INTEGRATION	32
2.5 FINANCIAL INTERMEDIATION	34
2.6 FINANCIAL DEVELOPMENT	35
2.6.1 Financial Deepening.....	35
2.6.2 Liquidity Management.....	36
2.6.3 Stock market development	37
2.7 FINANCIAL INCLUSION	39
2.8 FINANCIAL STABILITY	40
2.8.1 Probability of default.....	40
2.8.2 Bank Profitability.....	41
2.9 CONCLUSION.....	41
REFERENCES	43
LIST OF APPENDICES.....	45

CHAPTER THREE	50
BANKING SECTOR COMPETITIVENESS IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY: DOES FINANCIAL INTEGRATION MATTER?	50
3.1 INTRODUCTION.....	50
3.2 LITERATURE REVIEW	51
3.2.1 Competitiveness of the banking industry	51
3.2.2 Competitiveness of the banking industry and financial integration	57
3.2.3 Other determinants of bank competitiveness	61
3.3 METHODOLOGY	63
3.3.1 Measuring competitiveness in the banking industry	63
3.3.2 The relationship between banking competitiveness and financial integration	65
3.4 DATA ANALYSIS	67
3.4.1 Data and variable description	67
3.4.2 Discussion of results.....	67
3.5 CONCLUSION.....	76
REFERENCES	79
LIST OF APPENDICES.....	85
CHAPTER FOUR.....	97
COMPETITIVENESS AND STABILITY OF THE BANKING INDUSTRY IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY	97
4.1 INTRODUCTION.....	97
4.2 THE RELATIONSHIP BETWEEN COMPETITIVENESS AND FINANCIAL STABILITY: LITERATURE REVIEW	98
4.3 METHODOLOGY	105
4.3.1 Panel unit root tests	105
4.3.2 Panel Causality Test	106
4.4 DATA ANALYSIS	109
4.4.1 Data and variable description	109
4.4.2 Presentation and discussion of results	109
4.5 CONCLUSION.....	116
REFERENCES	117
CHAPTER FIVE	123
COMPETITIVENESS OF THE BANKING INDUSTRY AND FINANCIAL INTERMEDIATION SPREAD IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY	123
5.1 INTRODUCTION.....	123
5.2 LITERATURE REVEIW	124
5.3 METHODOLOGY	129

5.3.1	Unit root tests	129
5.3.2	Panel Granger Causality Test	130
5.4	DATA ANALYSIS	132
5.4.1	Data and variable description	132
5.4.2	Discussion of results.....	133
5.5	CONCLUSION.....	138
	REFERENCES	139
	LIST OF APPENDICES.....	143
CHAPTER SIX.....		144
FINANCIAL INTEGRATION AND BANKING INTERMEDIATION SPREAD IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY		144
6.1	INTRODUCTION.....	144
6.2	LITERATURE REVIEW.....	144
6.3	METHODOLOGY	150
6.3.1	Description of data and variables	150
6.3.2	Presentation of econometric techniques	150
6.4	DATA ANALYSIS	153
6.4.1	Panel Unit root Tests	153
6.4.2	The impact of financial integration on the financial intermediation spread in SADC as a bloc.....	153
6.4.3	The impact of financial integration on the financial intermediation spread in individual members of SADC.....	156
6.5	CONCLUSION.....	157
	REFERENCES	159
	LIST OF APPENDICES.....	162
CHAPTER SEVEN		172
FINANCIAL INTEGRATION - STABILITY NEXUS THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY		172
7.1	INTRODUCTION.....	172
7.2	LITERATURE REVIEW.....	172
7.3	METHODOLOGY	180
7.3.1	Panel unit root tests	180
7.3.2	Estimation techniques.....	180
7.4	DATA ANALYSIS	183
7.4.1	Description of data and variables	183
7.4.2	Unit root test results	184
7.4.3	Discussion of results.....	184
7.5	CONCLUSION.....	191
	REFERENCES	193
	LIST OF APPENDICES.....	196

CHAPTER EIGHT	205
FINANCIAL INTERMEDIATION SPREAD AND STABILITY OF THE BANKING SYSTEM IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY.....	205
8.1 INTRODUCTION.....	205
8.2 LITERATURE REVIEW	206
8.3 METHODOLOGY	211
8.3.1 Data and Description of variables	211
8.3.2 Analytical Techniques	212
8.4 DATA ANALYSIS	214
8.4.1 Unit root test results	214
8.4.2 Discussion of panel causality results	214
8.5 CONCLUSION.....	220
REFERENCES	222
LIST OF APPENDICES.....	225
 CHAPTER NINE.....	 228
CONCLUSION.....	228
9.1 INTRODUCTION.....	228
9.2 SUMMARY OF KEY FINDINGS AND POLICY RECOMMENDATIONS ...	228
9.2.1 Synthesis of key findings	228
9.2.2 Policy implications and recommendations	230
9.3 PROPOSED AGENDA FOR FUTURE RESEARCH	232
REFERENCES	234

LIST OF TABLES

Table 1.1: Measurement of key concepts.....	22
Table 2.1: Financial deepening in SADC	36
Table 2.2: Bank liquidity management in SADC	37
Table 2.3: Stock Market Development in SADC.....	38
Table 2.4: Financial inclusion in SADC	39
Table 2.5: Bank profitability in SADC (2000-2010)	41
Table 3.3: Determinants of competition in SADC.....	75
Table 4.1: Causality between banking competitiveness and financial instability in SADC.....	110
Table 4.2: Causality between banking competitiveness and financial instability in SADC when controlling for profitability and financial integration.....	112
Table 4.3: Causality between competition and financial instability in SADC when controlling for presence of credit bureau	113
Table 4.4: Causality between banking market power and financial instability in SADC.....	115
Table 5.1: Causality between competition and financial instability in SADC when controlling for financial integration.....	135
Table 5.2: Causality between competition and financial instability in SADC when controlling for competition policies.....	137
Table 6.1: Financial integration and the financial intermediation spread in SADC	155
Table 7.1: Measures of financial stability	174
Table 7.2: Financial integration and the stability of the banking industry in SADC.....	187
Table 7.3: Financial integration and the stability of the banking industry in SADC.....	188
Table 7.4: Financial integration and the stability of the banking industry in SADC controlling for South African monetary policy.....	189
Table 7.5: Causality between financial integration and stability in individual members of SADC controlling for the bank rate (Real Sector)	191
Table 8.1: Financial stability and the financial intermediation spread in SADC.....	217
Table 8.2: Financial stability and the financial intermediation spread in SADC.....	218
Table 8.3: Financial stability and the financial intermediation spread in SADC controlling for monetary policy.....	219

LIST OF FIGURES

Figure 2.1: Banking Industry Concentration (2000-2010 average).....	32
Figure 2.2: Financial integration in SADC	33
Figure 2.3: Interest rate spread in SADC (2000-2010 average)	35
Figure 2.4: Probability of default (z-score)	40

University of Cape Town

LIST OF APPENDICES

Appendix 1A: Background of SADC and prospects for deeper integration.....	27
Appendix 2A: Correlation between lending rates in SADC	45
Appendix 2B: Enactment and enforcement of competition laws in SADC.....	46
Appendix 2C: International experience with economic unions: Lessons from the Eurozone crisis	47
Appendix 3A: Some common measures of <i>de jure</i> financial integration	85
Appendix 3B: Common measures of <i>de facto</i> financial integration	86
Appendix 3C: Derivation of the reduced form equations	87
Appendix 3E: Description of variables	90
Appendix 3F: Description of variables	91
Appendix 3G: Unit root test results	92
Appendix 3J: Determinants of bank competitiveness in the SADC	95
Appendix 3K: Correlation between variables used in the models	96
Appendix 4A: Description of variables.....	120
Appendix 4B: Panel unit root test results.....	120
Appendix 4C: Causality between banking competitiveness and financial instability in SADC	121
Appendix 4D: Causality between market power and financial instability in SADC when controlling for profitability and financial integration	122
Appendix 5A: Description of variables.....	143
Appendix 5B: Panel unit root test results.....	143
Appendix 6A: The Definition of variables	162
Appendix 6B: Feasible Generalised Least Squares (FGLS).....	163
Appendix 6C: SUR Procedure	164
Appendix 6D: BP test for independent errors	165
Appendix 6E: Unit root test results	165
Appendix 6F: Correlation between the variables.....	166
Appendix 6G: Financial integration and the financial intermediation spread in SADC (using inflation rate).....	167
Appendix 6H: Financial integration and the financial intermediation spread in CMA member countries	168
Appendix 6I: Financial integration and the financial intermediation spread in other SADC member countries	169
Appendix 6I: Financial integration and the financial intermediation spread in other SADC member countries (ctd).....	170
Appendix 6I: Financial integration and the financial intermediation spread in other SADC member countries (ctd).....	171
Appendix 7A: Measures of financial instability	196
Appendix 7B: BGARCH model.....	197
Appendix 7C: Test for contemporaneous correlation	200

Appendix 7D: Description of variables	200
Appendix 7E: Results for Unit root Tests	200
Appendix 7F: Panel unit root test results	201
Appendix 7G: Results for BGARCH (1, 1, 1) model	202
Appendix 7H: Financial integration and the stability of the banking industry in SADC	203
Appendix 7I: Causality between financial integration and stability in individual members of SADC controlling for the bank rate (Monetary Sector)	204
Appendix 8A: Description of variables	225
Appendix 8B: Unit root test results	225
Appendix 8C: Financial stability and the financial intermediation spread in SADC controlling for liquidity levels	226
Appendix 8D: Financial stability and the financial intermediation spread in SADC (controlling for presence of a credit bureau)	227

University of Cape Town

ACRONYMS

AIC	Akaike Information Criterion
AU	African Union
BGARCH	Bilinear GARCH
GARCH	Generalised autoregressive conditional heteroscedasticity
GDP	Gross domestic product
CMA	Common monetary area
CU	Customs Union
CV	Conjectural variation
DRC	Democratic Republic of Congo
EH	Efficiency hypothesis
FE	Fixed effects
FDI	Foreign direct investment
FGLS	Feasible generalised least squares
FTA	Free trade area
GLS	Generalised least squares
GMM	Generalised method of moments
IMF	International Monetary Fund
MC	Monopolistic competition
OLS	Ordinary least squares
PCSE	Panel corrected standard errors
PW	Prais Winsten
RISDP	Regional Indicative Strategic Development Plan
RMA	Rand monetary area
SACU	Southern African Customs Union
SACUA	Southern African Customs Union Agreement
SADC	Southern African Development Community
SARB	South African Reserve Bank
SCP	Structure conduct performance
SIC	Schwartz information criterion
SUR	Seemingly unrelated regression
VAR	Vector autoregression

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

The important role of financial institutions in the economy cannot be overemphasised. There is a huge literature that supports the finance-growth nexus pioneered by Bagehot in 1873 and later Schumpeter in 1912 and more recent theoretical studies such as Bencivenga and Smith (1991). In addition, empirical studies such as McKinnon (1973) and King and Levine (1993) find evidence for the positive role of financial development in economic growth. The arguments that support the positive role that finance plays in driving economic growth hinge on the functions served by financial intermediaries in the economy. For example, Levine (1997) states that financial institutions mobilise and allocate domestic resources (savings), support trade and provide avenues for diversification and hedging to mitigate financial risk as well as allow easier access to opportunities for investment. Financial intermediaries collect and process information and reduce information asymmetries and transaction costs. This enables them to mobilise resources and allocate them to the most promising projects thereby boosting capital accumulation and growth. However, this important role can be undermined by low competition in the market. Therefore, in their pursuit of economic development and growth, many developing countries have implemented a series of policy reforms targeted at improving the degree of competitiveness in the financial sector.

The late 1980s, throughout the 1990s, saw similar attempts being made by members of the Southern African Development Community (SADC)¹. In this case the reform process has involved amongst other things: the liberalisation of interest rates and credit allocation, introduction of new indirect monetary policy tools, the strengthening of prudential supervision and regulation through the enactment of Central Bank statutes, the restructuring and privatisation of state-owned banks, and the liberalisation of the capital account. The

¹ SADC countries include South Africa, Lesotho, Namibia, Swaziland, Botswana, Angola, Democratic Republic of Congo (DRC), Malawi, Mozambique, Mauritius, Seychelles, Tanzania, Zambia and Zimbabwe. Madagascar which was been suspended in 2009 has been reinstated in January, 2014. See Appendix 1A for a brief background of SADC.

degree of competition in the banking industry is seen to be good for productive efficiency (Maudos and de Guavara, 2007). It is also believed to improve welfare in the economy through financial stability (Schaeck et al, 2009). Consequently, many governments undertook reforms such as capital account liberalisation in order to improve competition in the domestic financial sector and take advantage of the benefits that stem from international capital flows. Edison et al (2002:1) states lucidly that: “capital flows can foster a more efficient allocation of resources, provide opportunities for risk diversification, and help promote financial development.” Globalisation of financial markets and increased integration has been accompanied by new telecommunications and computer technologies that have facilitated the cross-border transfer of funds (Kasekende, 2001). However, Pasricha (2009) cautions that countries may not reap full benefits from financial integration if the domestic financial systems lack competition. He argues that this happens because lack of competition prevents countries from integrating in a meaningful way i.e. through price equalisation.

Forbes (2005:153) shows that the initial results for emerging markets economies that embraced capital account liberalisation were positive overall. These countries realised increased capital inflows, investment booms, and high growth rates. However, the countries that implemented capital account liberalisation - Mexico, Thailand, Korea, Russia and Argentina - later suffered a series of acute financial crises while China and India on the contrary had maintained more stringent capital controls and survived the Asian crisis (Forbes, 2005). The stark contrast in the results realised by countries which have adopted capital account liberalisation and those that did not, indicates that integration of financial markets is related to financial stability. The success of financial integration on the enhancement of the efficacy of financial intermediation depends on whether such a process does not open integrating economies to financial instability. There is, therefore, a link between the degree of competitiveness in the financial sector, financial integration, risk of financial instability and the efficacy of financial intermediation.

1.2 THE RESEARCH PROBLEM

There are significant disparities in the levels of economic development of individual members of SADC. They have different levels of monetary and financial development as well as real and financial integration (Aziakpono et al., 2007). This is not surprising because SADC members have different economic characteristics. For example, countries such as Angola, the DRC and Zimbabwe remain adversely affected by internal political instability. In

addition, although Botswana and Mauritius record steady and promising rates of growth, their economies remain undiversified. Mozambique, Tanzania and Zambia are still characterised by state dominance in the economy. Consequently, SADC economic integration faces several challenges. Member countries have adopted a Regional Indicative Strategic Development Plan (RISDP) which maps the road for regional integration. According to the RISDP, SADC sought to establish a free trade area (FTA) in 2008, a customs union (CU) in 2010, a common market in 2015, a monetary union in 2016 and a single currency economic union in 2018. To this end, individual members were expected to meet specific macroeconomic targets. Although the tariff-phase-down schedule was completed in 2012 (Kalenga, 2012), progress towards deeper regional integration is generally slow. Kalenga (2012) identifies two possible reasons for the sluggish progress. The first problem is a likely lack of commitment by member states, perhaps due to reluctance to forfeit national sovereign policies in favour of common regional policies. The second one is the “spaghetti-bowl effect” that arises from multiple memberships of other regional blocs by some SADC members. For example, four members of SADC namely South Africa, Lesotho, Namibia and Swaziland belong to the common monetary area (CMA). In addition, Botswana joins the CMA to form another regional grouping called the Southern African customs union (SACU). Under the arrangement, Botswana forms a customs union with the CMA and has an autonomous exchange rate system with an indirect link with the *rand* through a currency basket of which the *rand* accounts for about 70 percent.

The CMA began as the Rand Monetary Area (RMA) which included Botswana. It combines features of a currency board and a monetary union because domestic issuance of currency is backed by foreign assets and the agreement forbids monetisation of fiscal deficits (Guma, 1985). The domestic central banks are mandated by the respective governments to perform the conventional central banking functions including conduct of national monetary policies. Economic aspects of the agreement deal with intra-CMA transfers, access to capital markets, foreign exchange transactions and the compensatory seigniorage revenue foregone by Lesotho, Namibia and Swaziland (LNS) for the parallel circulation of the rand with national currencies (Tjirongo, 1995). The agreement has important implications for both the monetary and fiscal policies of respective members. The 1:1 peg which eases convertibility requires that the LNS central banks hold foreign assets to defend the peg. This arrangement makes it possible for the South African currency –*rand* to co-circulate with local currencies in the other CMA countries. In this way, South Africa’s monetary policy regime becomes an

anchor for inflation in the entire CMA. In principle, this implies no financing of fiscal deficits through printing of money. Furthermore, the exchange rate policy is relinquished and interest rates are purely determined by the money and capital markets of a giant economy of South Africa due to the free flow of capital within the CMA. Owing to the fact that the CMA member-countries have varied economic structures, the capitulation of national exchange rate policy to South Africa, as well as capital account liberalisation by member-countries may expose them to adverse external shocks.

SACU is the oldest regional integration arrangement in Sub-Saharan Africa. Its evolution began in 1889 with the Customs Union Convention between Cape Colony and Orange Free State Republic which was over time enlarged to include the Transvaal, Natal, Sothern Rhodesia, North-Western Rhodesia and the High Commission territories of Bechuanaland, Basotholand and Swaziland in 1906. The formation of the Union of South Africa in 1910 saw a new agreement between the Union of South Africa and the high Commission territories - the Southern African Customs Union Agreement (SACUA). In 1969, the agreement was renegotiated following the independence of the High Commission territories and became SACU (Tjirongo, 1995). SACU provides duty-free flow of goods and services between member countries with a common external tariff and an arrangement of sharing the tariff revenue. This arrangement has benefited the small economies in terms of revenue especially because the revenue sharing formula has a significant development component to cater for possible trade diversion. The disadvantage is the possibility of industrial polarisation since South Africa is more developed than the other member countries.

Other SADC countries have varying exchange rate regimes. Aziakpono et al. (2007) reported that, as in the case of South Africa, some countries such as Angola, Mozambique and Zambia use a floating exchange rate system while Mauritius, Malawi and Tanzania use a managed float system. In addition, almost all members of SADC impose no restrictions on the current account. Moreover, Botswana, Mauritius and Zambia do not restrict flows of capital. Members of the CMA have full capital account convertibility for all transactions within the CMA, but they impose some limits on flows beyond the CMA. Angola, Tanzania and Zimbabwe have some restrictions on the capital account.

The process of financial liberalisation is dichotomised into internal and external liberalisation. The former relates to removal of restrictions on interest rates and credit controls. Its objective is to reduce financial repression by allowing the markets to competitively determine the clearing interest rate and the optimal and efficient allocation of

resources (King and Levine (1993). External liberalisation focuses on the opening of the capital account by removing controls on capital flows (Schneider, 2001). The free cross-border flow of capital intensifies financial integration and introduces foreign competition into the domestic markets. Many developing countries, including many members of SADC, have also embarked on capital account liberalisation. Claessens and Laeven (2004) show that financial reforms improve the competitiveness of the financial sector and enhance its role to mobilise and allocate resources. This finding in no way lends support to an unbridled process of external financial liberalisation because as Allen and Gale (2000) argue financial reforms have a potential to disrupt financial markets and increase their vulnerability to crisis. Hence, there is a link between financial sector competitiveness, financial integration and financial stability.

A plethora of methodologies has been developed to measure the degree of competitiveness in the financial sector such the Panzar and Rosse H-statistic, conjectural variation coefficient, persistence of profitability and Lerner index. However, the literature tends to have neglected the link between bank competition, financial integration and stability. It is, therefore, necessary to study the relationships between competitiveness of the financial sector in a risky and financially integrated environment. To the best of my knowledge, no prior study has investigated this critically important issue and this study intends to fill this gap in the context of SADC.

Against this background, the study raises the following research questions: *First*, What is the degree of competition in the banking industry in SADC? Does financial integration empirically determine the level of competitiveness in the banking industry? *Second*, does high competitiveness in the banking sector cause financial instability in the region? *Third*, does the degree of competitiveness in the banking industry hinder financial intermediation by enlarging the spread between lending and deposit rates? *Fourth*, does financial integration determine the magnitude of the financial intermediation spread in the banking industry? *Fifth*, does financial integration threaten the stability of the banking sector? *Sixth*, what implications does financial instability have for the size of the financial intermediation spread in SADC? This study tests the central hypothesis that financial integration improves the degree of competitiveness in the financial sector which in turn enhances the efficacy of financial intermediation, provided that such integration does not increase the risk of financial instability.

1.3 JUSTIFICATION AND MOTIVATION OF THE STUDY

Several attempts have been made to measure the depth of financial integration in SADC. For example, Aziakpono et al. (2007) finds evidence of financial integration in SADC. The CMA countries manifest the deepest roots of financial integration and there is also some emerging convergence-club in SADC where the CMA is the centre. Seychelles and Malawi tend to move towards this core group. For SACU, Aziakpono (2006a) finds a high degree of financial integration especially among the CMA countries. However, the benefits for financial intermediation and growth remain diverse and low. Aziakpono (2006b) argues that lack of competition in the banking industry especially in Botswana, Lesotho, Namibia and Swaziland may be one reason why there are no significant benefits from financial integration for economic performance in SACU. Pasricha (2009) also argues that a meaningful process of financial integration must translate into price-equalisation. This calls for competition in the banking system. However, to the best of my knowledge, no study has actually given attention to the impact of financial integration on the degree of competitiveness of the banking industry. This study fills this knowledge gap by using SADC as a case study.

The SADC trade, industry, finance and investment cluster enshrines three protocols, namely; trade protocol, finance and investment protocol and the mining protocol. Having come into effect in 2010, the finance and investment protocol has the objective of monetary integration in the region through, among other things, development of financial and capital markets as well as prudent monetary and fiscal policies. SADC has aspired to deepen its regional integration efforts by using the CMA as a launch-pad (Masson and Pattillo, 2004). Thus there is need to understand the full impact of financial integration in the CMA, SACU and the rest of SADC. This study focuses on measuring the level of competitiveness in the banking industry by taking into account the effect of financial integration. Furthermore, it assesses the web of relationships between financial integration, bank competition, financial stability and development. Therefore, the findings will assist in guiding policy on regional integration issues in Southern Africa and the continent as a whole given the aspirations of the African Union (AU).

This study contributes to research in several ways. *First*, it measures the degree of competitiveness in the SADC banking industry and investigates the impact of financial integration on banking competitiveness in the union. *Second*, although a number of studies focus on the relationship between competition and financial stability, to the best of my knowledge no study has examined the causality between the two especially in a developing

country context. Furthermore, this study adds a new dimension to the study of the competition-stability hypothesis by incorporating the role of financial integration. *Third*, owing to the importance of the spread to effective financial development, a study of the causal relationship between competition and the financial intermediation spread is crucial. *Fourth*, the study investigates the impact of such integration on the financial intermediation spread in the region. *Fifth*, the concept of financial instability tends to be difficult to quantify in the literature, and therefore, the study proposes a dynamic volatility measure which is used to estimate financial instability using a bilinear generalised autoregressive conditional heteroscedasticity (BGARCH) model. In addition, the study investigates the causality between financial integration and stability in SADC. *Sixth*, the study further seeks to test the hypothesis that financial instability enlarges the size of the financial intermediation spread.

1.4 OBJECTIVES OF THE STUDY

The main objective of the study is to determine the relationship between competitiveness, integration and stability of the banking industry in SADC as well as their impact on financial intermediation in the union. More specifically, the study sets out to achieve the following objectives:

- To measure the degree of competitiveness in the banking industry in the SADC region;
- To establish the empirical relationship between banking competitiveness and financial integration in SADC;
- To test the competition-fragility hypothesis in the region;
- To test the causal relationship between the financial intermediation spread and competition in the SADC banking industry;
- To test the causal effect of competition on the financial intermediation spread;
- To determine the impact of financial integration on the magnitude of the financial intermediation spread;
- To assess the causality between financial integration and the stability of the banking industry; and
- To determine the direction of causality between financial stability and the financial intermediation spread.

1.5 ORGANISATION OF THE STUDY

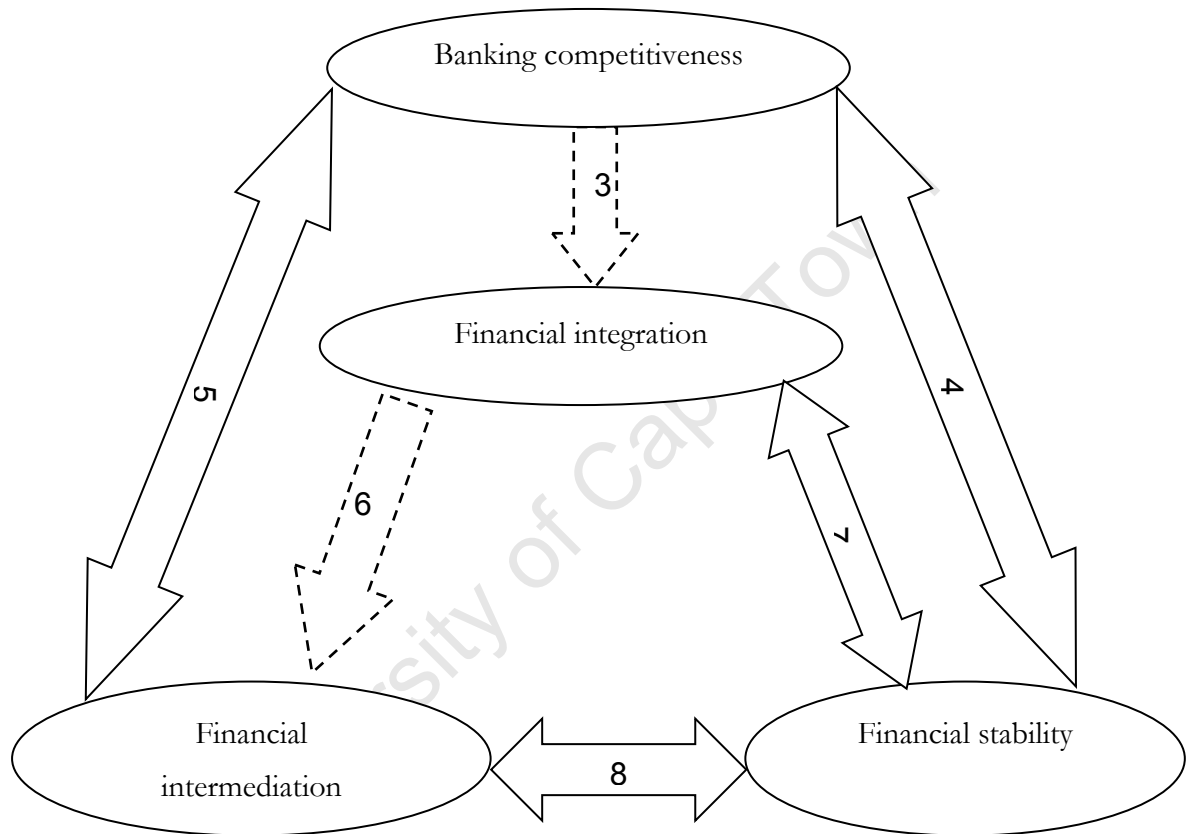
This introductory chapter is followed by *chapter two* which provides an overview of key aspects of the financial system of the SADC region around seven important issues, namely; financial reforms, market structure and competition, financial integration, financial development, financial intermediation, financial inclusion and stability. The indicators of financial integration confirm that CMA member countries are the most financially integrated. However, the characteristics of the individual economies reflect a relatively polarised system, with South Africa as a giant economy boasting well developed financial markets and the rest of the countries effectively its satellites.

The rest of the chapters can be conceptualised according to Figure 1.1 which shows the relationships between four concepts, namely; banking competitiveness, financial integration, financial stability and financial intermediation. The numbers on the arrows depict the relevant chapter that provides the analysis of the relationship between the respective concepts. Therefore, *Chapter three* uses dynamic panel data techniques to test the hypothesis that the banking industry in SADC is characterised by perfect competition. The findings reject this hypothesis in favour of monopolistic competition. In addition, the study finds that financial integration enhances banking competitiveness in the region through elimination of restrictions on free flow of capital between countries. *Chapter four* tests the hypothesis that there is a causal relationship between banking competition and financial stability using systems-GMM approach. The findings confirm this hypothesis and suggest that competition policies have a bearing on financial stability. In *Chapter five*, the study tests the hypothesis that higher competition leads to narrow financial intermediation spread. The findings support this hypothesis and indicate that competitive conduct augurs well for the efficiency of financial intermediation.

Using feasible generalised least squares (FGLS) technique, *Chapter six* tests the hypothesis that financial integration enhances financial intermediation by narrowing the financial intermediation spread in the region. The findings are not uniform between member states and tend to distinguish between countries within the CMA and the rest of SADC. *Chapter seven* tests the hypothesis that deeper financial integration causes financial instability in the domestic financial systems. The findings validate the hypothesis and reveal the importance of effective monetary policy, real interest rate and exchange rate policies to curb financial instability and achieve a narrow financial intermediation spread. *Chapter eight* tests the hypothesis that there is a causal relationship between financial instability and the

financial intermediation spread. The findings support this hypothesis and underscore the importance of implementing sound macroeconomic policies for high and stable growth as well as effective monetary policy to attain and maintain low and stable prices in order to narrow the financial intermediation spread in SADC. *Chapter nine* concludes the study and offers some policy recommendations.

Figure 1.1: The Conceptual Framework



Source: Author

1.6 MEASUREMENT OF CONCEPTS AND CAVEATS

In order to investigate the relationships between the concepts in Figure 1.1, namely; banking competitiveness, financial integration, financial stability and financial intermediation, it is necessary to find appropriate variables to measure each concept. Table 1 describes all variables that were used for this purpose. *Financial intermediation* is measured by an ex-ante measure computed as the disparity between lending and deposit rates (Tennant and Felawewo, 2009). The strength of this measure lies in its simplicity and availability of time-series data on lending and deposits rates for many SADC countries. Even though it fails to account for the

interest rate spread resulting from the actual revenue made from loans versus interest costs on deposits which can be captured using an ex-post measure of Demirguc-Kunt and Huizinga (1998), that is, the net interest rate margin (NIM).

Table 1.1: Measurement of key concepts

<i>Concept</i>	<i>Variable</i>	<i>Description</i>
<i>Banking competitiveness</i>	H-statistic	This is computed as the sum of gross revenue input price elasticities
	Boone Indicator	The degree of competition based on profit-efficiency in the banking market. It is calculated as the elasticity of profits to marginal costs. An increase in the indicator implies a deterioration in competitive conduct of financial intermediaries
<i>Financial integration</i>	Financial liberalization index	A rule-based measure of financial integration captured by the Chinn-Ito financial liberalization index
	Foreign direct investment	Ratio of foreign direct investment assets to GDP
	Offshore bank deposits	Percentage of offshore bank deposits to total bank deposits
<i>Financial intermediation</i>	Financial intermediation spread	The difference between lending and deposit rates
<i>Financial stability</i>	Volatility of output	Volatility of GDP generated using BGARCH (1, 1, 1) model
	Volatility of inflation	Volatility of inflation rate generated using BGARCH (1, 1, 1) model
	Volatility of real interest rates	Volatility of real interest rates generated using BGARCH (1, 1, 1) model
	Volatility of credit	Volatility of credit to the private sector generated using BGARCH (1, 1, 1) model
	Volatility of real exchange rates	Volatility of real exchange rates generated using BGARCH (1, 1, 1) model
	Z-score	This measures the distance to default and captures the probability of default of a country's financial system, calculated as weighted average z-scores of individual banks, that is the weights are based on the individual bank's total assets. It compares a bank's buffers with the volatility of the returns

Source: Author

The study uses the H-statistic and the Boone indicator to measure *banking competitiveness*. Panzar and Rosse (1987) use the H-statistic to indicate the type of market structure. $H \leq 0$ implies a neoclassical monopolist, $H = 1$ denotes a competitive price-taking

bank in long-run equilibrium and $0 < H < 1$ suggests that a bank is operating under monopolistic competition. This approach has two advantages. First, it does not require huge data to implement. Second, it yields results that are robust regardless of any market definition (Shaffer, 2004). However, the approach is criticised for its requirement of long-run equilibrium in its determination of market structure. Moreover, although the sign of the H-statistic is very informative, Shaffer (2004) argues that its value, for H not equal to one, has an ambiguous interpretation in theory. The Boone indicator has benefits such as the ability to measure competition on specific and distinct product market or in particular type of banks. This indicator requires small datasets to compute and is theoretically robust. Nevertheless, the indicator has a disadvantage of assuming that banks pass their efficiency gains to their customers and ignores the differences in product quality (Van Leuvensteijn, 2006).

Financial integration is measured by three variables, namely; the financial liberalization index, ratio of foreign direct investment to GDP and ratio of offshore deposits to total deposits. The Chinn and Ito (2007) financial liberalization index was developed to measure the extent to which countries are open to cross-border financial transactions. This is a rule-based measure of financial integration which takes into account all restrictions to free flow of capital between countries. It provides a good measure of *de jure* financial integration and data on it is readily available. Its drawback is that on its own it cannot it is a poor measure of *de facto* financial integration. As a way of mitigating this limitation, the study also uses two quantity-based measures of financial integration namely; the ratio of foreign direct investment to GDP and ratio of offshore deposits to total deposits. Both indicators capture the actual volume or quantity of capital flows between countries. The ratio of foreign direct investment to GDP is a form of international portfolio penetration indicator (Adam *et al.*, 2002) which measures the quantity of putty flows of capital between countries. The ratio of offshore deposits to total deposits is some kind of the home-bias indicator developed by Adam *et al.* (2002) which measures the extent of cross-border interbank activity. A lower ratio indicates that most of the deposits are held domestically.

Unlike the static measures of *financial stability*² such as the coefficient of variation (Delechat *et al.*, 2009) which fail to capture the dynamic nature of the phenomenon, this

² Financial stability and instability are measured as two sides of the same coin, that is, both of them cannot co-exist at the same time. Hence, financial instability can simply be perceived as absence of financial stability.

study uses the BGARCH (1, 1, 1) model developed by Biekpe (1996). This model is capable of capturing both the dynamism inherent in financial instability and the covariance between independent variables which may be important in determining market volatility (Biekpe and Moore, 2000). The volatility measure is computed from several macroeconomic variables that are often used as single-dimension measures of financial instability. The single-dimensionality may be a disadvantage of this type of measures of financial instability. However, this study mitigates this limitation by using five of this type of proxies such as volatility of output to capture the unsustainability of output, volatility of inflation to capture macroeconomic instability, volatility of real interest rates to capture the probability of default risk, volatility of credit to capture vulnerability to default risk and volatility of real exchange rates to capture the risk of reversals in capital flows or loss of export competitiveness.

REFERENCES

- Adam, K., Jappelli, T., Menichini, A., Padula, M., and Pagano, M., (2002), –Analyse, Compare, and Apply Alternative Indicators and Monitoring Methodologies to Measure the Evolution of Capital Market Integration in the European Union,” Centre for Studies in Economics and Finance Working Paper, University of Salerno, Italy
- Allen, F. and D. Gale (2000), –Financial Contagion,” *The Journal of Political Economy*, 108 (1): 1-33
- Aziakpono, M. J., (2006a), –Financial Integration amongst the SACU Countries: Evidence from Interest Rate Pass-through Analysis,” *Journal for Studies in Economics and Econometrics*, 30 (2): 1-23.
- Aziakpono, M.J., (2006b), –*Financial Integration among the SACU Countries: An Exploration of the Depth and Its Effects*,” Paper presented at the 33rd Annual Meeting of Academy of Economics and Finance, February 8-11 2006. Houston, Texas, USA.
- Aziakpono, M., S. Kleimeier, and H. Sander (2007), –Banking market integration in the SADC countries: Evidence from interest rate analysis,” Paper No. RM/07/047, Maastricht Research School of Economics of Technology and Organisations, University Maastricht
- Bencivenga, V. R. and B. D. Smith (1991), –Financial intermediation and endogenous growth,” *Review of Economic Studies*, 58: 195-209
- Biekpe, N (1996), –Measuring currency volatility and returns”, PhD Thesis, The Queen’s University of Belfast, UK
- Biekpe, N. and M. J. Moore (2000), –Measuring volatility using bilinear GARCH models.” *Investment Analysis Journal*, 52(2000): 7-10
- Chinn, M. D. and Ito. H. (2007), –Capital account liberalisation, institutions and financial development: Cross country evidence,” NBER working paper No. 8967, Cambridge Massachusetts
- Claessens, S. and L. Laeven (2004), –What Drives Bank Competition? Some International Evidence,” *Journal of Money, Credit, and Banking*, 36 (2): 563-584.
- Demirguc-kunt, A. and Huizinga, H. (1998), –Determinants of commercial bank interest margins and profitability: Some international experience.” World Bank Policy Research working paper No. WPS1900
- Edison, H., Levine, R., Ricci, L., and T. Slok (2002), –International Financial Integration and Economic Growth,” *Journal of International Monetary and Finance*, 21(6): 749-776
- Forbes, J. K. (2005), –Capital controls: Mud in the wheels of market efficiency,” *Cato Journal*, 25(1): 153-166
- Guma, X. (1985), –The Rand Monetary Area Agreement,” *The South African Journal of Economics*, 53(2): 166-183
- Kalenga, P. (2012), –Regional integration in SADC: retreating or forging ahead?”, Tralac Working Paper No. D12WP08/2012, Stellenbosch, South Africa
- Kasekende, A. (2001), –Capital Account Liberalisation: The Ugandan Experience,” *Development policy Review*, 19(1): 101-120.
- King R. G. And R. Levine (1993), –Finance and growth: Schumpeter might be right,” *Quarterly Journal of Economics*, 108: 717-737
- Levine R. (1997), –Financial development and economic growth: Views and agenda,” *Journal of Economic Literature*, 35: 688-726
- Masson, P. R., and Pattillo, C., (2004). **The Monetary Geography of Africa.**

- Washington DC: Brookings Institution Press.
- Maudos, J., and J. Fernandez de Guevara (2007), –The Cost of Market Power in Banking: Social Welfare Loss vs. Cost Inefficiency,” *Journal of Banking and Finance*, 31: 2103 -2125.
- McKinnon, R. I. (1973), **Money and capital in economic development**. Washington D.C.: Brookings Institution
- Obstfeld, (2004), –Globalisation, macroeconomic performance and the exchange rates in emerging economies,” Center for International and Development Economics Research Working paper No.C04-137, University of California, Berkeley
- Panzar, j. and J. Rosse (1987), –Testing for monopoly equilibrium,” *Journal of Industrial Economics*, 35: 443-456
- Pasricha, G. K. (2009), –Bank Competition and International financial Integration: Evidence Using a New Index,” Hong Kong Institute for Monetary Research Working Paper No. 24/2009
- Schaeck, K., Cihak, M., and S. Wolfe (2009), –Are more competitive banking systems more stable?” IMF working paper No. 06/143
- Schmukler, S. L (2004), –Financial Globalization: Gain and pain for Developing Countries,” *Second Quarter Economic Review*, Federal Reserve Bank of Atlanta
- Schneider, B. (2001), –Issues in Capital Account Convertibility in Developing Countries,” *Development Policy Review*, 19(1): 31-82.
- Shaffer, S. (2004), –Patterns of competition in banking,” *Journal of Economics and Business*, 56(2004): 287-313
- Tennant, D and A. Folawewo, (2009), –Macroeconomic and Market Determinants of Interest Rate Spreads in Low and Middle Income Countries,” *Applied Financial Economics*, 19(6): 489-507.
- Tjirongo, M.T. (1995), –Short term stabilisation versus long term price stability: Evaluating Namibia’s membership of the Common Monetary Area,” CSAE Working paper No. 35.
- Van Leuvensteijn, M., Bikker, J.A., Van Rixtel, A.A.R.J.M. and C. Kok-Sorensen, (2006), –A new approach to measuring competition in the loan markets of the euro area.” ECB Working Paper 768, European Central Bank.

LIST OF APPENDICES

Appendix 1A: Background of SADC and prospects for deeper integration

The genesis of SADC is linked to the Lusaka summit of April 1, 1980 at which nine states, Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe, adopted a declaration. The Lusaka declaration was adopted under the Southern African Development Coordination Conference (SADCC) under the theme –Southern-Africa: Toward economic liberation.” This approach to regional cooperation did not require any robust legal and institutional apparatus. Its main objective was to reduce economic reliance on apartheid South Africa. Over time, DRC, Namibia, Mauritius, Seychelles, South Africa and Madagascar joined the group and the number of members increased from 9 to 15 even though Madagascar which was subsequently suspended in 2009 has been reinstated in January, 2014. In 1992, the Southern African Development Community (SADC) was born as the informal association SADCC was transformed into a legally binding arrangement called the SADC Treaty in Windhoek Namibia. The purpose of this move was to deepen economic integration in the region (Kalenga, 2012). To this end, the Regional Indicative Strategic Development Plan (RISDP) was developed.

The RISDP states the various stages of regional integration in SADC from a free trade area in 2008, a customs union in 2010, a common market in 2015, a monetary union in 2016 and an economic union in 2018. There are some macroeconomic convergence indicators that were designed to monitor progress towards the set stages. Process towards this can be traced along two axis; macroeconomic convergence and financial integration. According to Aziakpono et al. (2007: 5) the CMA is characterised by the –highest degree of macroeconomic convergence especially with respect to inflation.” Botswana closely imitates the CMA-countries while other members of SADC are quite diverse even though there is evidence of dis-inflation in some countries. This can be explained to some extent by the exchange rate policies adopted by each member country.

Monetary unification with a single central bank, a single currency and common monetary policy is possible for SACU. This assertion is supported by evidence of a high degree of dependence of Lesotho, Namibia, Swaziland and Botswana on South Africa’s financial system (Aziakpono, 2006b). Moreover, Aziakpono (2006b) finds that monetary unification would benefit Botswana, Lesotho and Swaziland more than Namibia in the sense that the interest rate pass-through from South Africa is already very high for Namibia. In addition, Aziakpono et al. (2007) find evidence of a convergence-club with the CMA as the core and

Malawi and Seychelles as the closest periphery. It is in the light of the above that Aziakpono et al. (2007:29) recommends –a selective and cautionary expansion of the CMA.” In this way, countries such as Malawi, Seychelles, Zambia and Botswana can join the CMA first followed by the remaining members of SADC. This expansion will require monetary policy coordination and elimination of imperfections in financial markets.

University of Cape Town

CHAPTER TWO

OVERVIEW OF THE FINANCIAL SYSTEM IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY

2.1 INTRODUCTION

This chapter provides an overview of key aspects of the financial system of the SADC region. The analysis covers seven important themes, namely; financial reforms, market structure and competition, financial integration, financial intermediation, financial development, financial inclusion and financial stability. The reforms included restructuring of commercial banks, interest rate liberalisation, and improvement of the regulatory and supervisory apparatus and the payment system. The indicators of financial integration used suggest that in the SADC region, financial integration is deeper in the CMA financial system. However, the characteristics of the individual economies in the CMA reflect a relatively polarised system, with South Africa as a giant economy boasting well developed financial markets and the rest of the countries in the CMA effectively its satellites. Genesis (2004) refers to peripheral economies of Botswana, Lesotho, Swaziland and Namibia (BLSN) as “monetary provinces” of South Africa in order to underscore the extent of their dependence on South Africa. Other SADC countries also remain financially underdeveloped with shallow stock markets.

2.2 FINANCIAL REFORMS

Many countries in SADC inherited much of the inadequate infrastructure from colonial administrations. The financial systems after independence were characterised by foreign-owned financial institutions which were intended to serve businesses owned by Europeans and Asians often at the expense of development of domestic economies (Harvey, 1991). These initial conditions shaped the current financial sector landscape in SADC. In many of these countries, banks still dominate the financial sector in terms of size and coverage of services. In addition, in countries such as Tanzania, Mozambique and Angola, the government is still an important player in the market controlling all or the majority of banks in the industry. This means that the insurance industry is still small and the stock markets are shallow as in the case of Swaziland or even non-existent in countries such as Lesotho. Foreign bank participation is also high in some of these countries. An interesting feature of

foreign bank participation in SADC is the penetration of South African banks in other member countries. This feature shows the significant role played by South Africa in the region. Mowatt (2001) shows that presence of South African banks is not only very high in the CMA and SACU, but reaches other member countries such as DRC, Malawi, Mozambique, Mauritius and Tanzania.

SADC countries have implemented a number of policies over the years. Many financial reforms came as part of the structural adjustment program which started in the 1980s. *First*, they eliminated interest rate controls and restrictions on credit allocation in countries such as Malawi (Soyibo, 1997) and Lesotho (Motelle and Masenyetse, 2012). Brownbridge and Harvey (1998) indicate that governments kept interest rates very low in an endeavour to boost investment. However, this only resulted in financial repression, and directed credit led to subsidies or credit extension to politically favoured borrowers. In addition, repressed interest rates enabled government to finance its deficits at low costs amounting to an implicit tax on the financial system. *Second*, several countries relaxed controls on the current and capital accounts allowing their residents to operate foreign currency accounts and hold some funds offshore as is the case in countries such as Zambia, South Africa, Mauritius and Botswana. Nevertheless, this still varies considerably from country to country, with full convertibility of the capital account in Botswana and limited convertibility in other countries such as South Africa.

The *third* financial reform was the restructuring of banks and relaxation of entry requirements. This resulted in reduced state involvement in the financial system as well as encouraged new entrants into the markets in countries such as Malawi, Mozambique, Zambia and Zimbabwe. *Fourth*, reforms associated with strengthening of prudential regulation and supervision. This entailed promulgation of specific statutes such as Financial Institutions Acts in countries such as Lesotho and Namibia as well as enforcement of requirements of Basel II Accord in South Africa. In Zambia, the reform process involved tightening of bank regulations intended to combat money-laundering.

Even after the implementation of the reforms, the financial sector in SADC remains dichotomised into formal and informal sections. Mainstream banking has failed to provide services to the poor even after implementation of financial liberalisation reforms. For example, foreign banks have concentrated on the upper tier of the markets such as corporate banking (Brownbridge and Harvey, 1998) and neglected small, micro and medium-sized enterprises. As a result, microfinance institutions responded to meet this demand. The

subsequent sections discuss other aspects of the SADC financial system such as underdevelopment of the financial sector; shallow stock markets, wide interest rate spread and high levels of financial exclusion.

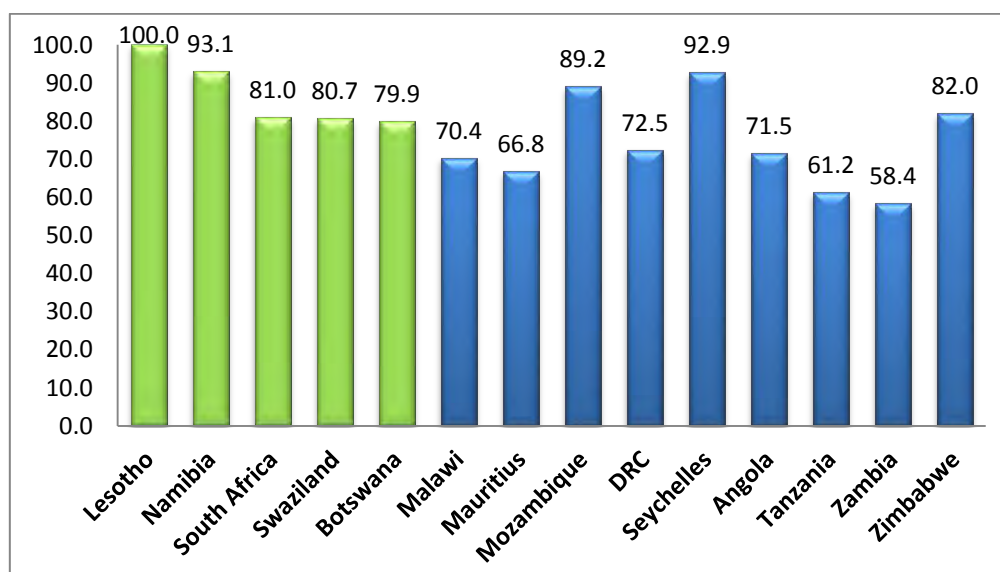
2.3 MARKET STRUCTURE AND COMPETITION

The financial system in SADC is highly concentrated as reflected by the bank concentration ratio in Figure 2.1. The SACU countries record the highest concentration levels with 100 percent in Lesotho – the highest in SADC. Zambia records the lowest average banking market concentration of 58.4 percent for the period 2000-2010. Mauritius and Tanzania both register an average banking market concentration of 61.2 and 66.8 percent, respectively. Seychelles and Mozambique record concentration levels that are comparable to those observed for members of the SACU club. For the rest of SADC, the concentration levels hover above 70 percent. The evidence indicates that banking markets in the whole of SADC, especially in SACU are highly concentrated. For example, the concentration ratio is highest in Lesotho, followed by Namibia at 93.1 per cent, Swaziland is next with 80.7 percent; South Africa stood at 81.0 percent while Botswana registered an average of 79.9 percent.

South Africa has a total number of 88 various forms of banking intermediaries comprising 19 banks, 15 controlling companies, 13 branches of foreign banks, and 41 representative offices of foreign banks (South Africa Reserve Bank, 2010). In Botswana there is a total of 10 licensed banking institutions. However, even in South Africa the market is dominated by 4 big banks that control 84.6 per cent of the total assets of the banking sector (South African Reserve Bank, 2010). The Namibian banking sector comprises 5 banking institutions, of which 4 are commercial banks (Bank of Namibia, 2011). Swaziland has 5 banking institutions comprising 3 commercial banks, 1 development and savings bank and 1 building society. Only 3 commercial banks and 1 post office savings bank are serving the public in Lesotho. Consequently, the banking market structure in the SACU is oligopolistic in nature. Moreover, the majority of the banks in Botswana, Lesotho, Namibia and Swaziland are foreign owned. For instance, all the 3 dominant commercial banks in Lesotho and Swaziland are fully SA-owned. In Zambia, there are around 20 banks in the industry comprising both foreign and domestic private banks and state-owned banks (Mowatt, 2001). The high concentration levels in SADC may indicate very low levels of competition among

banks with serious repercussions in terms of financial exclusion. This situation prevails even for countries that have enacted competition laws and established a competition authority to promote fair trade and competition. In most cases, competition authorities are still young except for Zambia, Zimbabwe, Malawi and South Africa which were established in the 1990s (Appendix 2B).

Figure 2.1: Banking Industry Concentration (2000-2010 average)



Source: World Bank Global Financial Development Database

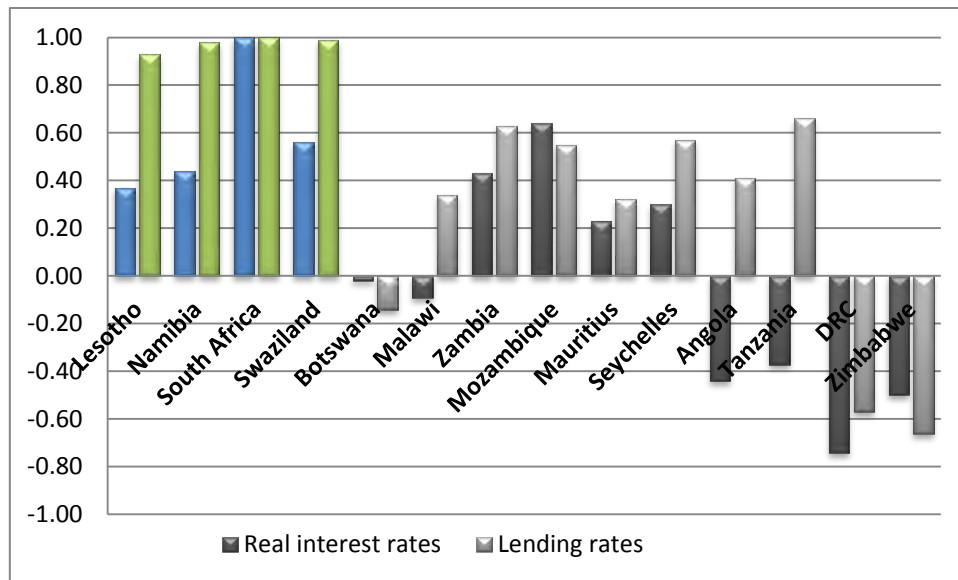
2.4 FINANCIAL INTEGRATION

The degree of financial integration is measured by the correlation coefficient between the lending rates and real interest rates³ for each SADC country relative to South Africa (See Figure 2.2). In addition, cross correlations between various member countries are also carried out (see Appendix 2A). Figure 2.2 indicates that financial integration is deeper in the CMA. In fact, the correlation between the lending rates of respective CMA member countries and South Africa is high. Swaziland reports the highest correlation of 99 percent, followed by Namibia with 98 percent and then Lesotho with 93 percent. The real interest rates also depict a similar order indicating the deepest level of financial integration between South Africa and Swaziland, followed by Namibia and then Lesotho. This is expected because South African

³ Real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator. The terms and conditions attached to lending rates differ by country, however, limiting their comparability.

monetary policy is dominant in the CMA due the 1:1 currency peg between the South African rand and the national currencies of other members. South Africa determines a monetary policy stance and other member countries simply import such a policy stance. The role of individual central banks in other member countries is simply to defend the currency peg.

Figure 2.2: Financial integration in SADC⁴



Source: World Bank Global Financial Development Database

Other SADC countries such as Zambia, Mozambique, Seychelles and Mauritius also depict a high degree of financial integration with South Africa. These facts indicate that it may be easier to use the CMA as a launch-pad for deeper financial integration in SADC as long as the individual member countries are willing to embrace a common monetary policy environment as well as harmonised fiscal policy implementation. Botswana, a member of SACU, surprisingly appears to be weakly integrated with the CMA-club which indicates a degree of monetary policy autonomy. Malawi is also weakly integrated with South Africa. There is evidence of a high degree of financial fragmentation between South Africa and Angola, Tanzania, DRC and Zimbabwe.

Cross-country evidence of financial integration also shows that financial integration is deepest among CMA countries. Swaziland and Namibia have a correlation of 98 percent in lending rates, followed by Swaziland and Lesotho with 92 percent and then Lesotho and

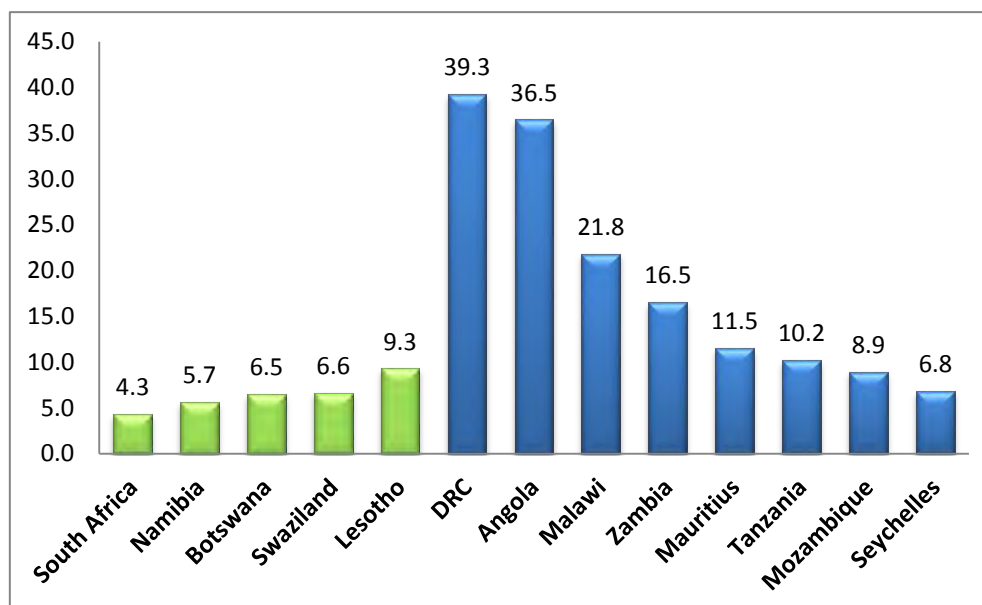
⁴ For the SACU countries, a green and blue legend represent real interest rates and lending rates, respectively.

Namibia with 91 percent. Other SADC member states also show some degree of financial integration which is highest between Seychelles and the DRC with 89 percent followed by Zambia and Angola with 79 percent, Zambia and Malawi with 76 percent, Zambia and Mozambique with 71 percent as well as Zambia and Tanzania with 65 percent. Interestingly, Tanzania seems to be financially integrated with a number of other countries such as Angola with 77 percent, Seychelles with 70 percent, Namibia with 73 percent and Swaziland with 67. The rest of the member countries show evidence of weak financial integration and widespread financial fragmentation (see Appendix 2A). This differences in levels of financial integration is an early warning signal for SADC to proceed cautiously along the monetary integration path and learn from the experience of the Eurozone during the 2009 euro crisis (see Appendix 2C).

2.5 FINANCIAL INTERMEDIATION

Financial intermediation is a process of linking sectors of the economy with surplus funds with the sectors that are in deficit even though they have opportunities for investment. The spread between deposit and lending rates can serve as an indicator of the effectiveness with which financial intermediation takes place in an economy. Randall (1998) argues that a persistent wide financial intermediation spread can symbolise lack of competition, perceived market risk, bank unsoundness, scale diseconomies, distortionary regulatory constraints, and the underdevelopment of the financial sector. The interest rate spread, defined as the disparity between deposit and lending rates, may be an indicator of the health of the financial sector.

Figure 2.3 shows that SADC is polarised. The five SACU countries have smaller financial intermediation spread compared to other SADC countries with the smallest spread recorded in South Africa. Seychelles and Mozambique are the only countries that come closest to the SACU inner circle while DRC and Angola are outliers. The small spread in SACU may be a consequence of deeper financial integration in SACU, relative to the rest of SADC, given that four members of SACU are also members of the common monetary area (CMA). As indicated earlier, the CMA arrangement makes the South African economy dominant in the monetary policy-making landscape in the union while the rest of other countries implement monetary policy purely to defend the parity between the rand (a South African currency) and local currencies. This has facilitated significant convergence in interest rates between lending and deposit rates in SACU.

Figure 2.3: Interest rate spread in SADC (2000-2010 average)⁵

Source: World Bank Global Financial Development Database

2.6 FINANCIAL DEVELOPMENT

2.6.1 Financial Deepening

The credit-deposit ratio is used to measure the degree of financial deepening in SADC. Table 2.1 shows that the ratio is highest in South Africa, Namibia, Mauritius and Swaziland. Namibia, Mauritius and Swaziland recorded average growth rates of 2.7, 7.8 and 28.8 percent, respectively between the 2000-2005 and 2006-2010 periods. During the same period the highest average growth rates were recorded in Seychelles which grew at 103.6 percent, while Angola saw the growth rate of 95.0 and Tanzania recorded a 67.2 percent growth rate. It is important to note that most of these economies that registered remarkable growth rates were growing from a very low base. Nevertheless, some economies recorded some declines in the credit-deposit ratio. For example, Botswana registered a decline of 28.4 percent, Lesotho recorded a decrease of 16.9 percent and Zimbabwe saw a 15.2 percent decline between the 2000-2005 and 2006-2010 periods.

⁵ Data for Zimbabwe is not available while the average for DRC is just for 2008-2010 due to lack of data for earlier years for the interest rate spread.

Table 2.1: Financial deepening in SADC

	<i>Bank credit to bank deposits (%)</i>		<i>Bank private credit to GDP (%)</i>	
	2000-2005	2006-2010	2000-2005	2006-2010
Angola	30.64	59.74	2.98	11.70
Botswana	67.77	48.52	16.11	20.18
DRC	35.40	54.89	0.96	3.33
Lesotho	40.92	34.00	10.77	10.22
Malawi	37.45	61.19	4.21	9.32
Mauritius	78.72	84.89	61.78	76.53
Mozambique	53.88	52.36	11.74	16.43
Namibia	124.22	127.59	43.11	45.63
Seychelles	24.67	50.23	21.32	23.20
South Africa	125.37	124.99	63.85	74.15
Swaziland	78.43	100.99	13.62	21.93
Tanzania	39.00	65.20	5.93	13.19
Zambia	40.59	66.72	6.41	10.62
Zimbabwe	68.27	57.87	16.28	N/A

Source: Global Financial Development Database: N/A indicates that data are not available for the period.

Bank lending to the private sector is deemed more efficient than credit to government due to the fact that governments are usually motivated by short-term spending intended to deepen political popularity often to the detriment of long-term economic development. The ratio of credit granted to the private sector to GDP is used to measure the contribution of the banking sector to private sector-led economic growth. It can be seen from Table 2.1 that this ratio is highest in South Africa, Mauritius, Namibia, Swaziland and Botswana. In addition, this ratio follows an upward trend between 2000-2005 and 2006-2010 periods in the same countries. Swaziland recorded an average growth rate of 60.9 percent, Botswana grew at an average of 25.2 percent, Mauritius recorded 23.9 percent average growth rate, South Africa saw an average growth rate of 16.1 percent while a 5.8 percent average rate of growth was observed in Namibia. During the same period Angola, DRC, Malawi and Tanzania registered the highest average growth rates in SADC at 292.2, 246.2, 121.2, and 122.5 percent, respectively. Lesotho is the only economy in SADC that recorded a decline in the ratio of credit to the private sector to GDP during the sample period.

2.6.2 Liquidity Management

One of the fundamental functions of commercial banks is provision of liquidity to facilitate daily trade transactions in the economy. If a bank fails to honour its customer's

demand for cash, that may serve as an early warning signal for lurking insolvency. This may actually even spark a bank-run and cause systemic crisis. It is very important therefore for a bank to strike a good investment-liquidity mix to ensure optimal lending and liquidity positions. The liquid assets to deposits and short-term funding ratio attempts to measure how well the bank strikes this mix. In the context of SADC, Table 2.2 indicates that the ratio is highest in Lesotho and lowest in South Africa. Lesotho's high ratio is consistent with the low credit-deposit ratio. It is, however, notable that the ratio fell by 15.6 percent in Lesotho between the 2000-2005 and 2006-2010 periods while it increased by 27.2 percent in South Africa. Other member states that recorded average declines in this ratio are Angola (45.6 percent), Mozambique (35.1 percent), Namibia (30.1 percent) and Botswana (20.6 percent).

Table 2.2: Bank liquidity management in SADC

	<i>Liquid assets to deposits and short term funding (%)</i>	
	2000-2005	2006-2010
Angola	72.97	39.66
Botswana	30.07	23.87
DRC	N/A	56.59
Lesotho	93.20	78.65
Malawi	70.37	45.70
Mauritius	35.93	42.39
Mozambique	65.41	42.44
Namibia	20.02	13.99
Seychelles	66.07	58.69
South Africa	13.80	17.55
Swaziland	30.49	34.83
Tanzania	57.62	46.98
Zambia	55.27	46.78
Zimbabwe	N/A	N/A

Source: Global Financial Development Database: N/A indicates that data are not available for the period.

2.6.3 Stock market development

Banks are not the only source of finance in many countries in SADC as Table 2.3 shows. Unlike countries such as Lesotho that have no stock markets, countries such as South Africa present firms with alternative avenues for raising funds to finance investment. The stock market turnover and stock market capitalisation to GDP ratios are used to measure the development of stock markets in SADC⁶. Existence of a stock market is a necessary but not

⁶ Turnover ratio is the total value of shares traded during the period divided by the average market capitalization for the period. Average market capitalization is calculated as the average of the end-of-period values for the

sufficient condition for financial development, there is need for such markets to be developed in order to meet the intended needs. Table 2.3 shows that South Africa boasts the most developed stock market with a stock market capitalisation ratio of 162.3 percent followed by Mauritius and Botswana with 30.7 and 22.2 percent, respectively. Stock markets in other member countries remain shallow. However, a positive development is that all countries follow an upward trend in both measures of stock market development. Malawi is the only country recording a decline in the stock market turnover ratio. Financial liberalisation policies can help deepen stock market development. For example, Botswana permitted residents to maintain on-and-offshore foreign currency deposits accounts in 1998. This paved the way for a full capital account convertibility in 1999 which according to Kayawe and Amusa (2003) –allowed for dual listings between the Botswana Stock Exchange (BSE) and foreign stock markets. This has resulted in the broadening and deepening of the local share market as well as an increase in the liquidity of domestic firms.”

Table 2.3: Stock Market Development in SADC

	<i>Stock market capitalisation to GDP (%)</i>		<i>Stock market turnover ratio (%)</i>	
	2000-2005	2006-2010	2000-2005	2006-2010
Botswana	22.19	32.50	3.00	3.71
Malawi	5.55	23.92	4.49	2.80
Mauritius	30.74	52.02	5.35	8.97
Namibia	6.06	7.48	2.87	3.72
South Africa	162.31	238.74	38.13	64.98
Swaziland	8.34	N/A	1.44	N/A
Tanzania	4.14	N/A	4.70	N/A
Zambia	8.56	N/A	2.95	N/A
Zimbabwe	143.37	N/A	1.93	N/A

Source: Global Financial Development Database: Member countries that do not have Stock Markets such as Lesotho and those for which data are not available have been excluded from the analysis. N/A indicates that data are not available for the period.

current period and the previous period. In addition, market capitalization (also known as market value) is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. Listed companies do not include investment companies, mutual funds, or other collective investment vehicles.

2.7 FINANCIAL INCLUSION

Financial inclusion is highest in SADC countries that are also members of SACU. Nevertheless, even in these countries, cash-based transactions are still significant as a consequence of a large proportion of an unbanked population. For example, Porteus (2003) indicates that the unbanked were estimated at 17.6 million people without basic bank accounts in 2001 in SA. However, Schoombie (2009) observes an improvement in South Africa between 2004 and 2008 where the poor were captured by the banking net due to the “government incentivised Mzansi entry-level bank account.” Consequently, South Africa shows the highest level of financial inclusion with over 800 bank accounts per 1000 adults and 8 bank branches per 100, 000 adults (Table 2.4). Namibia follows with over 700 bank accounts per 1000 adults and 7 bank branches per 100, 000 adults. Botswana has over 400 bank accounts per 1000 adults and 8 bank branches per 100, 000 adults. Swaziland follows with over 400 bank accounts per 1000 adults and 5 bank branches. Seychelles is the only country outside SACU that displays a high degree of financial inclusion. In fact, Seychelles’ population is more banked than Namibia, Botswana and Swaziland.

Table 2.4: Financial inclusion in SADC

	<i>Bank accounts per 1000 adults</i>	<i>Bank branches per 100, 000 adults</i>
Angola	105.64	1.14
Botswana	430.64	8.17
Lesotho	261.16	2.42
Mozambique	N/A	2.61
Namibia	635.32	7.44
Seychelles	781.66	32.56
South Africa	810.61	8.18
Swaziland	410.74	5.70
Tanzania	113.60	1.57

Source: Global Financial Development Database: Member countries for which data are unavailable have been excluded. N/A indicates that data are not available for the period.

The rest of the SADC member states show a high degree of financial exclusion. The CGAP and World Bank (2010) show that the common barriers to financial inclusion in most of these countries are low or lack of regular income, low population density, insufficient physical infrastructure, poor legal environment, poor financial literacy and inadequate branch penetration. Figure 2.1 has shown that the level of concentration is very high in the SADC banking industry. As a result, banking fees are prohibitively high for the poor to operate bank

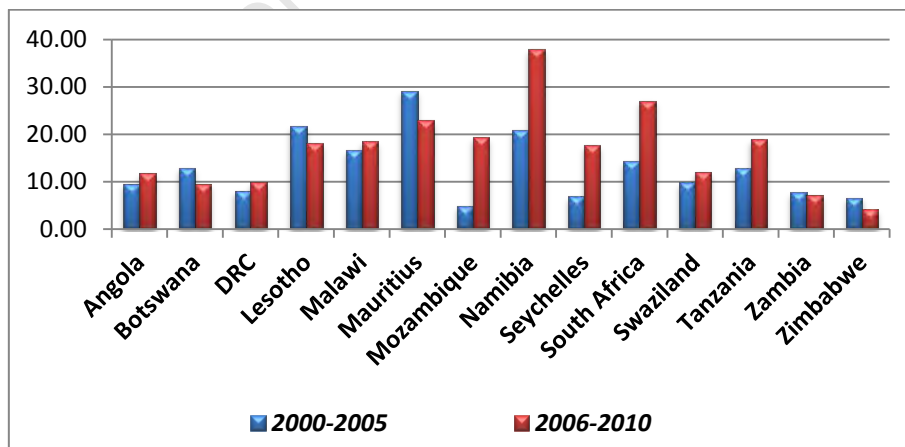
accounts, the minimum amount required to open an account is too high and the bank access point is also too far. If financial literacy is reduced, innovations such as cellphone-banking which has proved effective in countries such as Kenya, can help increase the level of financial inclusion in SADC.

2.8 FINANCIAL STABILITY

2.8.1 Probability of default

Financial stability is crucial for efficient functioning of the financial system. Since the banking sector constitutes the largest part of the financial system in most SADC countries, the z-score⁷ is used to measure the stability of the financial system. Figure 2.4 indicates that for the period 2000-2005 the z-score was lowest in Mozambique at 4.83 percent and highest in Mauritius at 29.05 percent. During the period 2006-2010, the z-score was lowest in Zimbabwe and Zambia at 4.05 and 7.04 percent, respectively. The highest distance to default was recorded in Namibia and South Africa at 37.79 and 26.98 percent, respectively. Zimbabwe, Botswana and Mauritius experienced some deterioration in financial stability between the 200-2005 and 2006-2010 periods as reflected in the decline of the z-score at 38.3, 25.7 and 21.5 percent, respectively. Financial stability improved significantly in Mozambique and Seychelles as the z-score grew by 299.9 and 157.1 percent, respectively.

Figure 2.4: Probability of default (z-score)



Source: World Bank Global Financial Development Database

⁷ Z-score captures the probability of default of a country's banking system, calculated as a weighted average of the z-scores of a country's individual banks (the weights are based on the individual banks' total assets). Z-score compares a bank's buffers (capitalization and returns) with the volatility of those returns. This is a measure of distance to default.

2.8.2 Bank Profitability

Bank profitability is closely associated with the soundness and stability of the financial system. The profits made by banks provide a cushion against negative shocks which may threaten financial stability (Micco and Panizza, 2005). Table 2.5 shows that in SADC, the highest level of profitability is recorded in Malawi and Mozambique during the period 2000 to 2010. This is reflected by an average return on assets of 5.14 and 3.13 percent, respectively. Botswana realised the highest average return on equity amounting to 49.23 percent during the 2000-2010 period followed by Seychelles at 33.87 percent. During the same period, Malawi and Mozambique remain profitable recording an average return on equity of 31.72 and 31.44 percent, respectively. All SADC countries were profitable during the 2000-2010 decade because none of them record negative return on assets and equity.

Table 2.5: Bank profitability in SADC (2000-2010)

	<i>Return on assets (%)</i>	<i>Return on equity (%)</i>
Angola	2.82	29.08
Botswana	2.75	49.23
DRC	1.36	12.91
Lesotho	2.38	28.45
Malawi	5.14	31.72
Mauritius	1.90	14.29
Mozambique	3.13	31.44
Namibia	2.25	15.67
Seychelles	2.45	33.87
South Africa	1.13	18.82
Swaziland	2.27	15.48
Tanzania	2.29	22.21
Zambia	1.43	13.62
Zimbabwe	0.54	6.39

Source: Global Financial Development Database: Member countries for which data are unavailable have been excluded. N/A indicates that data are not available for the period.

2.9 CONCLUSION

As discussed in the foregoing, despite evidence of some degree of financial integration and the implementation of financial reforms over the years in various countries, financial market continue to have high levels of concentration. Consequently, financial exclusion remains high in the SADC banking industry. Boone et al. (2005) argued that high levels of

concentration do not necessarily imply lack of competition in the market. In the next chapter, this study measures the degree of competition in the banking industry in SADC.

University of Cape Town

REFERENCES

- Bank of Namibia (2011), Financial Stability Report, Windhoek, Namibia
- Boone, J. Griffith, R. and R. Harrison (2005), –Measuring competition,” Working paper No. 022, Advanced institute of Management Research
- Brownbridge, M. and C. Harvey. (1998) *Banking in Africa: The Impact of Financial Sector Reform since Independence*. London: James Currey.
- CGAP and World Bank (2010), *Financial Access*, Washington DC, CGAP and World Bank
- Eichengreen, B. (2012), –Throwing out the baby with the bathwater? Implications of the euro crisis for Asian monetary integration,” *Journal of Economic Integration*, 27(2): 291-311
- Harvey, C. (1991) –On the Perverse Effects of Financial Sector Reform in Anglophone Africa.” *South African Journal of Economics*, 59(3).
- Government of Botswana, Competition Act No.17, 2009
- Government of Malawi, Competition and Fair Trading Act, 1998
- Government of Mauritius, Competition Act, 2007
- Government of Mozambique, Competition Act No. 10, 2013
- Government of Namibia, Competition Act No.10, 2013
- Government of Seychelles, Fair Trading Commission Act, 2009
- Government of South Africa, Competition Act No.89, 1998
- Government of Swaziland, Competition Act, 2007
- Government of Tanzania, Fair Competition Act No.8, 2003
- Government of Zambia, Competition and Fair Trading Act No.18, 1994
- Government of Zimbabwe, Competition Act No.7, 1996
- Kayawe, T and A. Amusa (2003), –Concentration in Botswana’s banking sector,” *SAJEMS*, 6(4): 823-832.
- Genesis (2004), –A survey of the SADC region: South African financial institutions, regional policies and issues of access,” Final Report – June 2004.
- Micco, A. and U. Panizza (2005), –Bank Concentration and Credit Volatility”. Central Bank of Chile Working Paper No. 342, Chile
- Motelle, S.I and R. Masenyetse (2012), –McKinnon-Shaw complementarity hypothesis: Evidence from Lesotho,” *African Finance Journal*, 4(1): 103-115
- Mowatt, R. (2001), –Prospects for financial sector reform in the context of regional integration in SADC,” Trade and Industrial Policy Secretariat (TIPS), South Africa
- Mundell, R. (1961), –A Theory of Optimum Currency Areas,” *American Economic Review*, 51: 657-665.
- Porteous, D. (2003), –The landscape of access to financial services in South Africa,” in South African Reserve Bank. *Labour Markets and Social Frontiers*, 3:1-6
- Sala-i-Martin, X. and J. Sachs (1993), –Fiscal Federalism and Optimum Currency Areas: Evidence for Europe,” in Matthew Canzoneri, Vittorio Grilli and Paul Masson (eds), *Establishing a Central Bank: Issues in Europe and Lessons from the US*, Cambridge: Cambridge University Press.
- Schoombie, A (2009), –Access to formal financial services for South Africa’s poor: Developments since 1990,” *South African Journal of Economic History*, 24(2): 131-156
- South African Reserve Bank (2010), Bank Supervision Department Annual Report, Pretoria, South Africa
- Soyibo, Adedoyin. (1997) –Financial Liberalisation and Bank Restructuring in Sub-Saharan Africa: Some Lessons for Sequencing and Policy Design.” *Journal of African*

Economies. 6(1): 100-150

Randall, R. (1998), "Interest rate spreads in the Eastern Caribbean." IMF working paper No. WP/98/59, Washington DC.

Zoellick, R. (2012), "A Blueprint for Germany to Save the Eurozone," Financial Times (24 January) www.ft.com.

University of Cape Town

LIST OF APPENDICES

Appendix 2A: Correlation between lending rates in SADC

	South Africa	Lesotho	Namibia	Swaziland	Botswana	Angola	DRC	Malawi	Mauritius	Mozambique	Seychelles	Tanzania	Zambia	Zimbabwe
South Africa	1.00													
Lesotho	0.93* (0.00)	1.00												
Namibia	0.98* (0.00)	0.91* (0.00)	1.00											
Swaziland	0.99* (0.00)	0.92* (0.00)	0.98* (0.00)	1.00										
Botswana	-0.14 (0.60)	0.01 (0.98)	-0.17 (0.53)	-0.11 (0.68)	1.00									
Angola	0.41 (0.11)	0.36 (0.17)	0.47*** (0.07)	0.42 (0.10)	0.02 (0.94)	1.00								
DRC	-0.57 (0.31)	-0.52 (0.36)	-0.65 (0.23)	-0.62 (0.26)	-0.74 (0.15)	0.22 (0.72)	1.00							
Malawi	0.34 (0.19)	0.55** (0.03)	0.41 (0.12)	0.33 (0.20)	0.29 (0.28)	0.67* (0.00)	-0.45 (0.45)	1.00						
Mauritius	0.32 (0.22)	0.35 (0.18)	0.38 (0.14)	0.34 (0.20)	0.54** (0.03)	0.47*** (0.07)	-0.61 (0.28)	0.63** (0.01)	1.00					
Mozambique	0.55*** (0.05)	0.53*** (0.06)	0.48*** (0.09)	0.55*** (0.05)	0.39 (0.19)	0.65** (0.02)	-0.89** (0.04)	0.61** (0.03)	0.63** (0.02)	1.00				
Seychelles	0.57** (0.02)	0.34 (0.20)	0.56** (0.02)	0.56** (0.02)	-0.64** (0.01)	0.35 (0.19)	0.89** (0.04)	-0.18 (0.51)	-0.32 (0.23)	-0.30 (0.33)	1.00			
Tanzania	0.66** (0.01)	0.51** (0.05)	0.73* (0.00)	0.67* (0.00)	-0.27 (0.32)	0.77* (0.00)	-0.49 (0.41)	0.35 (0.18)	0.29 (0.27)	0.23 (0.45)	0.70* (0.00)	1.00		
Zambia	0.63** (0.01)	0.64** (0.01)	0.68* (0.00)	0.65** (0.01)	0.01 (0.98)	0.79* (0.00)	0.42 (0.48)	0.76* (0.00)	0.54** (0.03)	0.71** (0.01)	0.29 (0.27)	0.65** (0.01)	1.00	
Zimbabwe	-0.66** (0.01)	-0.74* (0.00)	-0.67** (0.01)	-0.65** (0.02)	0.57** (0.04)	-0.56*** (0.05)	1.00* (0.00)	-0.65** (0.02)	0.48 (0.10)	-0.55 (0.10)	-0.48 (0.10)	-0.49*** (0.09)	-0.87* (0.00)	1.00

(*), (**) and (***) denote significant at 1, 5 and 10 percent level of statistical significance, respectively.

Appendix 2B: Enactment and enforcement of competition laws in SADC

	<i>Competition Authority</i>	<i>Relevant law</i>	<i>Enactment year</i>	<i>Commencement of operations#</i>
Angola	No	None	N/A	N/A
Botswana	Yes	Competition Act 17, 2009	2009	2010
DRC	No	None	N/A	N/A
Lesotho	No	None	N/A	N/A
Malawi	Yes	Competition and fair trading Act, 1998	1998	2005
Mauritius	Yes	Competition Act, 2007	2007	2009
Mozambique	No	Competition Act No.10, 2013	2013	No
Namibia	Yes	Competition Act No. 2, 2003	2003	2009
Seychelles	Yes	Fair Trading Commission Act, 2009	2009	2009
South Africa	Yes	Competition Act No. 89, 1998	1998	1999
Swaziland	Yes	Competition Act, 2007	2007	2010
Tanzania	Yes	Fair competition Act No.8, 2003	2003	2007
Zambia	Yes	Competition and fair trading Act No.18, 1994*	1994	1997
Zimbabwe	Yes	Competition Act No.7, 1996	1996	1998

Source: compiled by author from competition legislations of respective countries. This legislation later gave birth to the Competition and consumer protection Act No.24, 2010; N/A means not applicable. # This is the year in which the Competition Authority started its operations.*

Appendix 2C: International experience with economic unions: Lessons from the Eurozone crisis

Monetary integration in the Eurozone has been viewed as a model for developing regions to follow in order to deepen their own integration. Eichengreen (2012) indicates that the European model became a benchmark especially due to its success following the introduction of the euro as a single currency in 1999 which eliminated transaction costs from conversion of national currencies and risk from foreign currency volatility. Moreover, the European Central Bank (ECB) was very effective in implementing common monetary policy and maintaining price stability. All these developments made the European model a beacon of integration and SADC has also looked at the Eurozone example to map its integration path. The recent Euro-crisis has also provided important lessons for regional integration initiatives in SADC. Much of the processes underpinning the Eurozone integration were premised on the criteria of the optimum currency area (OCA). However, the 2009 euro-crisis has ignited new thinking on this matter indicating that, as Eichengreen (2012:292) paraphrases Saint Augustine, “a single currency would be [SADC’s] monetary salvation, just not yet.” What can SADC learn from the Eurozone experience?

The story of the euro crisis revealed a number of challenging realities with the following featuring prominently. *First*, a straight jacket monetary policy implementation failed to accommodate disparities in national economic developments and culminated in polarization between the core and the periphery. For example, ECB monetary policy created real estate bubbles in Ireland and Spain. *Second*, elimination of currency risk attracted significant and yet unsustainable capital inflows which eventually experienced a sudden stop and dampened prospects for economic growth beginning in 2008. This was accompanied by accumulation of fiscal deficits and unsustainable debts. *Third*, banks also took advantage of a supervision and regulation void at the regional level to expand their operations beyond national boundaries. As a result, banks became giants that were too big, in some cases, for their national governments to rescue them during bad times. *Fourth*, the fixed exchange rate made it impossible for countries to respond to adverse shocks resulting in protracted sluggish growth, and recessions in some cases. A strong message from this experience is that the process of monetary integration is not as straight forward, as initially thought,

especially in the light of widespread heterogeneity between constituencies of the union; a real prominent feature of SADC!

A key lesson is that SADC must ensure that certain preconditions are met before proceeding along the path spelled out by the European model, otherwise a more serious crisis may be inevitable. SADC faces challenges identical to those that confronted the euro area albeit to a more pronounced degree. For example, the Mundellian framework that emphasized symmetry or asymmetry of aggregate supply and demand shocks that affect countries that intend to forge monetary solidarity (Mundell, 1961). The surrender of monetary policy to the ECB constrained the ability of the peripheral economies to respond to unique negative shocks which plunged them into a crisis. This challenge is real for SADC which is also highly heterogeneous and exposed to different external shocks which require different monetary policies at the national level. In addition, the euro area faced a challenge of lack of labour mobility from depressed peripheral economies especially during crisis periods. In fact, in Spain skilled labour was more mobile than unskilled resulting in high unemployment rates (Zoellick, 2012). This problem is more serious for SADC where restrictions to labour movement are even more stringent. Such labour immobility and sticky wages coupled with forfeiture of monetary policy autonomy can amplify the repercussions of adverse shocks. Furthermore, the absence of a fiscal union which facilitates transfers to crisis areas further reduces the ability to respond successfully to negative asymmetric shocks. Sala-i-Martin and Sachs (1993) indicated that such inter-state transfers in the USA mitigated between 30 and 40 percent of adverse shocks to culprit states. A fiscal union in SADC remains far-fetched due to the great weight attached to sovereign policy-making and the likely fiscal costs in terms of forgone seignorage revenue which will emerge during issuance of a single currency at the regional level which have both caused reluctance for deeper political integration.

SADC must proceed rather cautiously along the regional integration path. The following issues associated with institutional arrangements should be addressed prior to formation of a monetary union. *First*, all integrating countries must deepen political integration. Obstfeld (1997: 317) states that the union must overcome ~~the~~ existing political stasis to force fundamental fiscal and labour market reform in its member states.” Strong political will and solidarity is essential for currency integration to be

successful and sustainable. *Second*, reforms aimed at improving labour market flexibility as well as dealing with country specific structural disparities must be implemented prior to adopting a single currency in order to create an adjustment mechanism to absorb the effect of external shocks. *Third*, fiscal discipline is also crucial and can be successfully met in a fiscal union. This discipline must emerge from each member of the union through fiscal arrangements that will cause fiscal stability. For example, this may require each country to reduce the high levels of debt through close cooperation with the external donor. Then countries can create a pool of resources that can be used to distribute emergency funding to depressed states. *Fourth*, a financial union in the form of a supranational regional central bank is critical to enforce unified financial supervision and regulation as well as apply a regional rescue package from a common resource pool. This is particularly important when banks operate beyond the border of their domicile states. In addition, the responsibility to rescue a transnational bank in crisis should be at the regional level. This will ensure that banks which would have become too-large for sole rescue by their national governments can also get help.

CHAPTER THREE

BANKING SECTOR COMPETITIVENESS IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY: DOES FINANCIAL INTEGRATION MATTER?

3.1 INTRODUCTION

The banking system in SADC is characterised by high levels of concentration as discussed in chapter two (Figure 2.1). This situation prevails despite the fact that Aziakpono et al. (2007) finds some evidence of financial integration in the SADC banking system. Although a high level of financial integration is observed mainly among the members of the common monetary area (CMA), there is also evidence of a convergence club in the sense that other member countries such as Botswana and Seychelles tend to be more integrated with the CMA. Moreover, throughout the 1990s, governments in the SADC countries implemented financial liberalisation policies in order to improve competition in the domestic financial sector by attracting new entrants into the local markets as well as take advantage of the benefits that stem from international capital flows.

The reform process has involved amongst other things: the liberalisation of interest rates and credit allocation, and the liberalisation of the capital account. However, Pasricha (2009) highlights that countries may fail to reap full benefits from financial integration if there is lack of competition in the domestic financial systems because lack of competition prevents price equalisation. In this chapter, this study contributes to existing stock of knowledge by achieving two objectives. The first objective is to measure the degree of banking competitiveness in SADC and the second one is to assess the impact of financial integration on banking competitiveness in the region. First, this study attempts to test the hypothesis that the banking industry in SADC is a pure monopoly. Second, the study proceeds to test the hypothesis that financial integration increases the level of competitiveness in the banking industry.

3.2 LITERATURE REVIEW

3.2.1 Competitiveness of the banking industry

The theoretical definition of competition tends to emphasise rivalry between firms. Park (1998:347) defines competition as “a dynamic process of rivalry among firms in which only the fittest survive and thrive.” Each firm endeavours to secure a bigger share of the market which will enable it to increase profitability. The prices are assumed to adjust flexibly to the interplay between forces of demand and supply. The firms are assumed to independently compete over prices and products. Consequently, under such circumstances, competition ensures allocative, productive and dynamic efficiency in the economy (Motta, 2004).

Competition in the banking industry provides a number of gains. Since banks are intermediaries that provide the credit needed for productive investment, lack of competition in the banking sector leads to undersupply of credit (Claessens and Laeven, 2005). In addition, Van Lenvensteijn et al. (2008) argued that lack of competition in the banking sector tempers with effective monetary policy implementation because it reduces the responsiveness of banks to monetary policy stimuli. Moreover, according to Bikker (2010) competition improves financial innovation and access to affordable financing by small and medium sized enterprises. Schaeck et al. (2009) believe that competition improves welfare in the economy by promoting financial stability.

Maudos and de Guavara (2007) indicate that the degree of competition in the banking industry is linked to productive efficiency. Production efficiency obtains when production of output is achieved at lowest cost. Schure and Wagenvoort (1999) get evidence that banks in Italy attained productive efficiency after 1993, a period during which Angelini and Cetorelli (2000) describe the Italian banking industry as competitive. Evenoff and Ors (2002) associate competition in the US banking industry with higher productive efficiency.

Despite its benefits, there are a number of barriers to competition. The barriers exist on both the demand and supply sides of the market. Bikker and Spierdijk (2009) show that on the supply side, high entry barriers undermine competition in the market. Furthermore, the heterogeneity of products makes it easy for banks to set prices independently and hard for customers to switch between banks. In addition, structural linkages between banks manifested by cross-ownership soften competition because it

gives one bank a share in others' performance. On the demand side, Bikker and Spierdijk (2009) point out that competition is weakened by the nature of financial services, due to the rarity of substitutes. Furthermore, it is very difficult for customers to switch between banks due to the contractual nature of banking services such as mortgage loans which, in a way, lock them in. Moreover, poor disclosure of information makes banking non-transparent and reduces consumer power. Such lack of transparency, coupled with lack of financial literacy, results in lack of competition in the market.

There are two strands of the literature on the measurement of banking sector competition, namely: static and dynamic techniques. Static techniques embody the structure-conduct-performance (SCP) paradigm, the efficiency hypothesis (EH) and several methods rooted in the industrial organisation theory (IO) for example, the Panzar and Rosse and the Conjectural Variation (CV) techniques. The SCP approach seeks to determine whether a highly concentrated market results in collusion among larger banks culminating into superior market performance. It combines two concepts, namely; competition and market structure. The basis for the SCP is that the performance of firms is determined by the influence of market structure on their conduct. It assumes a market with a long-run equilibrium which depends on forces of demand and cost structure.

Empirically, the SCP hypothesis is tested by regressing profits on a bank concentration ratio or a Herfindahl-Herschman index and the resulting estimated coefficient is used as a measure of concentration. SCP also predicts that lack of competition in a market leads to higher prices and abnormal returns. The SCP approach has some limitations. One is that it is static in nature and does not capture the dynamic nature of competition. Another one is that it is based on the reduced-form approach and fails to provide facts on the underpinnings of the pricing conduct of banks (Bikker, 2004). In addition, it relates competition to the number of players in the market where fewer players are linked to lack of competition. This is a major problem in recent years where consolidation among banks has gained momentum via mergers and acquisitions and reduced the number of players in the market (Shaffer, 2004).

The EH investigates whether efficiency of larger banks actually enhances their performance (Bikker and Haaf, 2002). The basis for this is that efficiency variations

from bank to bank drive the differences in profit levels. Banks with better management and production technologies may be relatively more cost effective. As a result, they may enlarge their share of the market and realise higher profits. Thus cost advantage becomes a source of market concentration (Demsetz, 1973). Kadiyali et al. (2001) indicate that the differences in products and services drive market concentration. Banks may also be differentiated on the basis of product quality. This may give some a comparative advantage which may enable them to improve product quality with a small increase in price or even no price increase at all. The result may be expansion of their share of the market.

The limitations of the SCP model lead to the rise of non-structural models grouped under the new empirical industrial organisation (NEIO) models. The three predominant methods in this generation of models are the Panzar and Rosse, the Conjectural Variation (CV) and mark-up test. The Panzar Rosse model estimates a reduced-form revenue equation using bank level data. Then the H-statistic is calculated by taking the sum of gross-revenue input-price elasticities. Panzar and Rosse (1987) use the H-statistic to indicate the type of market structure. $H \leq 0$ implies a neoclassical monopolist, $H = 1$ denotes a competitive price-taking bank in long-run equilibrium and $0 < H < 1$ suggests that a bank is operating under monopolistic competition. This approach has two advantages. First, it does not require huge data to implement. Second, it yields results that are robust regardless of any market definition (Shaffer, 2004). However, it also does not go without criticism because just like the SCP, it is based on the reduced-form revenues and assumes that they are autonomous to shifts in the demand curve as the input supply curve of the industry turns horizontal. In addition, the approach imposes a requirement of long-run equilibrium in its determination of market structure. Moreover, although the sign of the H-statistic is very informative, Shaffer (2004) argues that its value, for H not equal to one, has an ambiguous interpretation in theory. The Panzar and Rosse approach has been used by many researchers, for example Bucks and Mathiesen (2005) and more recently Biekpe (2011) on Ghana, Prasad and Ghosh (2005) on India and Hauner and Peiris (2005) on Uganda.

Unlike the SCP and the Panzar and Rosse models which are based on reduced-form functions, the CV model is a short-run structural approach. It is founded on the premise that profit-maximising banks in short-run equilibrium choose prices or

quantities to ensure that their marginal cost equals the perceived marginal revenue. It requires three specifications, one for demand, one for costs and another for the interrelations among players in the market. The approach is based on conjectural variants on quantities, and the value of the conjectural variation parameter (θ) is used to measure the degree of competition in the market where $\theta > 0$ and $\theta \rightarrow -\infty$ denote perfect competition and perfect collusion, respectively⁸. This approach has an advantage that it is not based on the assumption of exogenous input prices which may not hold at times. Nevertheless, it has a limitation that the estimated conjectural variations are highly sensitive to the definition of the market (Shaffer, 2004).

The mark-up test pioneered by Bresnahan (1982) and Lau (1982) uses two distinct demand and supply functions to estimate a structural model. This approach is based on the foundation of profit-maximisation in equilibrium. Perfect competition coincides with the demand price while perfect collusion coincides with the marginal revenue of the industry. The banks' perceived marginal revenue function is given by $P + \lambda h(\cdot)$, where P is the industry price, λ is the index for the degree of market power by an average bank in the industry and $h(\cdot)$ is the semi-elasticity of market demand. According to the mark-up test, $\lambda = 0$ indicates high competition and $\lambda = 1$ represents perfect collusion. The mark-up test has a merit of yielding an easy to interpret statistic and it is also not sensitive to the definition of a market. It was employed, among others, by Shaffer (2001), and Gruben and McComb (2003) to banking markets.

The second strand - dynamic techniques - addresses inter-temporal aspects that arise due to pertinent issues of entry, growth and exit of banks in an industry. There are three models in this class, namely; the persistence of profitability (POP) model, the dynamic Panzar and Rosse model, and the dynamic CV model. The POP model distils competitive dynamics that arise from market share and strategic behaviour by studying the persistence of a corporate rate of return. The argument is that given free entry and exit, abnormal profits cannot persist over time. Abnormal profits will attract new entrants into the market and force profits to decline towards zero. Persistence of abnormal profits may imply presence of barriers to entry which gives banks that are already in the market an edge to exercise monopoly power. Glen et al (2001) employ this methodology on a sample of developing countries.

⁸ $\theta = 1$ and $\theta = 0$ denote cartel pricing and independent pricing in the market, respectively.

The dynamic Panzar and Rosse model was developed by Shaffer (2004) who fitted a revenue equation to lagged input prices and managed to extract the adjustment process of market participants from the deviation from long-run equilibrium. Although this method improves the accuracy of the H-statistic, it still relies on the assumption that monopolistic and perfect competition can only be identified under the condition of long-run market equilibrium. The dynamic CV aims to capture short-run dynamics by applying an error correction model to the static conjectural variations (Steen and Salvanes, 1999).

Other methods of assessing competition in the banking sector seek to measure market power in a direct manner. The basis for such approaches is the fact that increased market power may indicate low competition. A common approach is the Lerner index. This index is defined as the ability to charge a price over marginal costs. It is measured as the ratio of the difference between output prices and marginal costs to output price. Demirguc-Kunt and Peria (2010) indicate that unlike the H-statistic which is based on long-run equilibrium, the Lerner index can be computed at each point in time. This approach is used by several authors on some country case studies such as Angelini and Cetorelli (2000) for Italy, and Shaffer (1993) for Canada. Fernandez de Guevara et al. (2002) applied the Lerner index on a cross-section of countries in the European Union. It is important to highlight some weaknesses of the Lerner index. First, the index focuses on orthodox financial intermediation activity; however, in recent years banks increasingly derive income from non-interest sources such as fees and commission. Second, the technique ignores the cost of risk and thus exaggerates the profit margin and market power. Third, for empirical purposes, it is difficult to separate financial income associated with loans as well as financial costs related to deposits.

The empirical literature on banking competitiveness is replete with the application of the Panzar-Rosse approach. For example, Hondroyiannis et al. (1999) used the method to study the degree of competition in Greece for the period 1993 to 1995 and found evidence of monopolistic competition. In Colombia, Barajas et al. (2000) studied banking competitiveness for the period 1985 to 1998 and discovered the presence of monopolistic competition. They attributed this to financial liberalisation which facilitated entry of foreign banks. In addition, Hempell (2002) conducted a study in Germany and found that the banking sector is monopolistically competitive.

Coccorese (2004) applied the Panzar-Rosse technique to the Italian banking sector and found support for monopolistic competition and a similar finding is obtained by Gunalp and Celik (2006) in Turkey. Evidence of near-perfect competition is found in China by Yuan (2006) using the Panzar-Rosse method.

There are also a number of cross-countries studies which include Weill (2004) for 12 countries in the European Union (EU) who conclude that the EU-banking sector is characterised by monopolistic competition. Bikker and Groeneveld (2000) expand the sample to 15 countries in the European Union and confirm the same finding. In addition, Bikker and Haaf (2002) studied 23 countries and observed that competition is weak in small markets and strong in international markets. Furthermore, Gelos and Roldos (2002) study 8 European and Latin American countries and find that they are characterised by monopolistic competition. Delis et al. (2008) also confirm the finding of monopolistic competition in a case study of Greece, Latvia and Spain.

Another commonly applied technique is the CV which is used by Gruben and McComb (2003) who find evidence of perfect competition in Mexico in the 1987 to 1993 period. Angelini and Cetorelli (2000) also used CV approach to assess the competitiveness of the Italian banking sector for the period 1984 to 1997. They found that in Italy, competition does not necessarily rise with concentration levels. In a study of the Netherlands, Toolsema (2002) found that the consumer credit market is characterised by perfect competition. The CV technique has also been applied to a group of countries. Some examples include Shaffer (2001) for a mixture of 15 industrialised North American, European and Asian countries, Bikker and Haaf (2002) who study the deposit and loan markets for 9 European countries and Delis et al. (2008) for Greece, Latvia and Spain.

A number of studies have been carried out on African countries as well. For example, Biekpe (2011) investigated the state of competition in Ghana and found evidence for monopolistic competition. He notes that structure acts as an indirect barrier to entry which ensures larger profits in the industry. In Tanzania, Simpasa (2011) employed Panzar-Rosse to assess competition from 2004 to 2008 and discovered the presence of oligopolistic conduct in the industry. Poshakwale and Qian (2011) studied the impact of reforms such as removal of ceilings on bank loans and liberalisation of deposit and lending rates and privatisation of four large state-owned

banks in Egypt. The results of their study indicate that the reforms impacted positively on competition.

A number of studies have attempted to measure competition in the context of SADC. For example, Mlambo and Ncube (2011) applied the Panzar-Rosse approach to investigate the degree of competition in South Africa and find that the banking industry is monopolistically competitive. On the contrary, South Africa banking sector is found to be highly competitive by Claesens and Laeven (2003) who include South Africa among fifty countries in their study which focused on the 1994 to 2001 period. For other SADC member countries, there is little work that has been done on the subject. Kayewe and Amusa (2003) applied SCP approach to study the degree of competition in the banking industry in Botswana and found that financial liberalisation policies contributed positively by improving the level of competitiveness in Botswana. Namibian Economic Policy Research Unit (2005) used the Herfindahl-Hirschman index to measure concentration in the Namibian banking industry. The study found that the structure of the market is oligopolistic. It further attributes the wide interest rate spreads and bank charges in Namibia relative to South Africa to lack of competition in the market. In Tanzania, Simpasa (2011) employed Panzar-Rosse to assess competition from 2004 to 2008 and discovered the presence of oligopolistic conduct in the industry.

3.2.2 Competitiveness of the banking industry and financial integration

Integration of financial markets has increased significantly in recent years across the globe –due to increased globalisation of investment seeking higher rates of return and the opportunity to diversify risk internationally” (Jain and Bhanumurthy, 2005:15). According to Reddy (2002) financial integration can have regional and global dimensions. Regional financial integration results from ties between a given region and the major financial centre serving the region. In this case, regional interest rates revolve around a basic benchmark rate such as price of a short-term low-risk financial instrument in a competitive and liquid market whose changes may capture the stance of monetary policy of the centre. For example, in the CMA the South African repo rate serves as a benchmark rate. This form of integration is seen to have a potential for developing local financial markets in order to upgrade them to cope with the flow of funds within the region. Global financial integration occurs when

domestic markets and institutions are opened to the free flow of capital across borders by eliminating capital controls (Moreno and Andersen, 2006). Therefore, one way of deepening financial integration is to remove restrictions on capital flows between countries.

Edison *et al.* (2002:750) defines financial integration as “the degree to which an economy does not restrict cross-border financial transactions”. In his definition, Schmukler (2004) also draws attention to the crucial role played by the removal of restrictions on interest rates and capital which enables countries to receive inflows of capital and allow their residents access to foreign markets. This form of integration is called *de jure* financial integration. Kose *et al.* (2006) indicates that rule-based indicators are used to measure this form of financial integration. For example, Chinn and Ito (2007) developed an index that measures the extent to which countries are open to cross-border financial transactions (See Appendix 3A for other examples).

Another definition of financial integration is offered by Held *et al.* (1999:189) who tend to focus on the “extent to which the prices of, and returns to, assets are equalised between different national financial markets”. In a similar vein, Adam *et al.* (2002:4) postulate that “financial markets are integrated when the law of one price holds”. This price-based definition of *de facto* financial integration underscores the importance of the equality of returns to identical financial assets regardless of the residence of issuer and holder of the asset. Hence, financial integration is defined as a process of unifying markets thereby allowing risk-adjusted returns to converge on the assets of same maturity across the markets.⁹ Kose *et al.* (2006) indicates that *de facto* financial integration can be measured using price-based measures such as interest rate differentials defined by the uncovered or real interest rate parity condition and the international arbitrage pricing model¹⁰. However, price-based measures are limited by

⁹ Prasad *et al.* (2003:7) distinguishes *de jure* from *de facto* financial integration. On the one hand, *de jure* financial integration refers to adoption of capital account liberalisation policies, while *de facto* financial integration focuses on actual capital flows, on the other. The later cannot be easily regulated by governments because this form of integration may still be high despite strict capital control measures on paper. Hence, if the controls are not effectively enforced they may be easily evaded.

¹⁰ The price-based measures are based on the principle of the interest rate parity. It states that given a free movement of capital in the absence of transaction costs, the law of one price would hold. This implies that homogeneous assets would attract similar return irrespective of the country of origin and their currency denomination. Generally, the tendency for interest rates to be similar may be a result of the presence of arbitrage opportunities as capital seeks the highest return as well as the use of interest rates as a monetary policy tool which leads to policy convergence (Barassi *et al.*, 2000).

the fact that they are affected by macroeconomic conditions even in the absence of any regulatory changes on capital account transactions.

The second type of measures of *de facto* financial integration is based on the actual volume or quantity of capital flows between countries. One example is the home-bias indicator (Adam *et al.*, 2002). This indicator focuses on the asset and liability composition of a bank. In situations in which the bulk of the assets and liabilities are domestic, that indicates low integration. The common indicators are: ratio of foreign assets to total assets of the national banking sector, ratio of the foreign liabilities to total liabilities of the national banking sector, ratio of the sum of foreign assets and liabilities to the sum of total assets and liabilities of the banking sector, and the sum of the foreign assets and liabilities as a share of GDP. The second example of quantity-based indicators is the international portfolio penetration. This is measured using indicators that are based on the flow of capital between countries as foreigners invest locally and residents invest abroad. The following ratios are commonly used: the ratio of the flow (or stock) of foreign assets to GDP, the ratio of the flow (or stock) of foreign liabilities to GDP, the ratio of the sum of foreign assets and liabilities to GDP (or as a ratio of total foreign trade i.e. import plus export) and types of capital flows (stock) such as foreign direct investment (FDI) and portfolio inflows and outflows to GDP (Edison *et al.*, 2002). Appendix 3B summarises some commonly used measures of financial integration.

Shaffer (2004: 289) argues that “the fundamental policy concern over market power is the associated elevation of prices above marginal cost, with attendant reduction in output quantity below the fully competitive level.” To this end, financial integration helps consumers by introducing a wider spectrum of assets and services as well as by lowering prices through increased competition (Heinemann and Joop (2002). Integration of banking is defined by Saab and Vacher (2007:11) as “a process of convergence into a single market for banking products and services, where all buyers and sellers within the union have opportunities to transact on the most favourable terms.” This process can be hindered by a number of barriers such as home bias¹¹, institutions in country of origin or recipient country as well as type of regulations.

¹¹ This refers to reluctance by agents to function in other countries in the region other than their domicile country.

Complete financial integration hinges on the hypothesis that identical assets and financial services will bear equal prices across different markets. This predicts “one price” for homogenous products across the different markets. This prediction forms the basis for a price-based measure of financial integration founded on convergence of prices of similar products in the different markets. According to Kleimeier and Sander (2002) the law of one price may not be attainable if there is lack of competition, different risks and/or cultural practices from country to country or even in the same country. Another measure of financial integration is based on quantities of capital flows between countries. This is built on the assumption that financial integration leads to expansion of markets which opens up opportunities for efficient banks. Saab and Vacher (2007:12) note that “cross-border flows of deposits may be observed in response to the new competitive conditions.” Nevertheless, varying levels of competition are expected in different market segments.

The link between domestic financial market structure and financial integration hinges on a number of issues. First, information asymmetry between domestic and foreign markets results in segmented equilibrium which makes it difficult for cross-border interbank activity to flourish. According to Freixas and Holthausen (2005), this segmentation occurs even in the absence of capital controls. They further show that even when an integrated equilibrium occurs, interbank rates may not end up identical or equal. Pasricha (2009) argues that the local-foreign interest rate differentials worsen under imperfect competition. Second, market power in the interbank market would directly result in wider bid-ask spreads (Pasricha, 2008b) and would have an indirect effect on liquidity levels. While capital account liberalisation may play a vital role in deepening financial integration, the full price-effect of the integration process can be felt only if the integrating financial markets become more competitive (Pasricha, 2009).

Fernandez de Guevara et al. (2007) indicated that by increasing competition, financial integration broadens the range of products for consumers and reduces prices. In addition, Vives (2010) discovered that market integration in Europe has led to increased competition in banking. Financial integration affects the domestic economy in two ways, namely through a) entry of foreign banks and b) access to foreign financial products by locals. This access is possible at two levels, that is, the level of

households and firms which may by-pass the local bank-network and utilise foreign banking services as well as the level of local banks that may begin to invest abroad.

There are several studies that focus on the question of whether entry of foreign banks causes domestic banks to be more competitive. For example, Clarke *et al.* (2000) investigated the effect of foreign bank penetration in Argentina. Their findings reveal that foreign banks competed aggressively with domestic banks. However, they note that this occurred only in selected segments of the markets. They cite the example of fierce competition introduced by foreign banks in the segment of the credit market that served the manufacturing sector. The competitive pressure exerted by foreign banks drove profits of domestic banks down. In addition, Liuhto *et al.* (2006) find that entry of foreign banks increased competition in the Central and Eastern European countries in the short run. Hence, foreign banks affect competition in the banking industry positively and reduce tendency for abnormal bank profits.

Gelos and Roldos (2002) find that foreign banks did not reduce the degree of competition in Argentina and Mexico. Moreover, Goldberg *et al.* (2000) argue that foreign banks also contribute positively to financial stability. Their study focused on lending behaviour of foreign and domestic banks in Argentina and Mexico in the period 1994 to 1998. They found that foreign banks increased their lending activities without necessarily increasing credit volatility relative to all domestic banks. In this way, foreign banks contributed positively to stability in credit. However, they emphasised that bank soundness and not necessarily ownership is the main driver of credit growth and volatility. This means that well capitalized banks are better able to sustain their credit activities especially after crises periods.

3.2.3 Other determinants of bank competitiveness

The theoretical assertions on the determinants of bank competition emanate from two rival theories, namely the contestability theory and the efficiency hypothesis. On the one hand, the efficiency hypothesis suggests that if mergers and acquisitions are driven by bank efficiency in the sense that efficient banks takeover the inefficient ones, the remnant may continue to price competitively even after the consolidation (Demsetz, 1974). On the other hand, the contestability theory postulates that competition in the banking industry may still thrive even in concentrated markets so long as there is free-entry into the market (Baumol, 1982). Maudos and de Guavara

(2007) indicate that the degree of competition in the banking industry is linked to productive efficiency. Productive efficiency obtains when production of output is achieved at lowest cost. Schure and Wagenvoort (1999) get evidence that banks in Italy attained productive efficiency after 1993, a period during which Angelini and Cetorelli (2000) describes the Italian banking industry as competitive. Evenoff and Ors (2002) associate competition in the US banking industry with higher productive efficiency.

There is also literature on other factors that have a bearing on the relationship between competition and the price-setting behaviour of banks. The structure conduct performance (SCP) posits a positive relationship between banking industry concentration and profits (Weiss, 1989). In addition, there is evidence that rising concentration increases profits and encourages wider spreads between lending and deposit rates (Clarke et al., 2003). Bikker et al. (2007:7) interprets this to imply that “concentration impairs competition”. However, Yeyati and Micco (2007) argue that more concentrated banking markets are not necessarily less competitive because often mergers reduce duplication of activities and increase efficiency.

Bank competition is also influenced by bank ownership (Micco et al., 2007; Demirguc-Kunt et al., 2004). Claessens et al. (2001) provide evidence of the indirect positive impact of foreign bank participation in concentrated domestic banks in 80 countries. Foreign bank entry into local banking markets exert pressure on domestic bank profitability and stimulate competitive behaviour. Moreover, competition in the banking industry depends on availability of substitute-financial products and services (Corvoisier and Gropp, 2002), bank regulation (Souza-Sobrinho, 2010), diversification (Winton, 1997) and bank size (Bikker et al., 2006). Bikker et al., (2006) show that large banks tend to control a larger share of the market than small banks. This means that markets that have large banks are characterised by high concentration levels. In fact, according to the relative market power proposition small banks only serve as a “competitive fringe” (Perera et al., 2012:67). Competition in the banking sector is also associated with macroeconomic factors such as economic growth and inflation (Claessens and Laeven, 2005). The determinants of bank competition can be summarised into market structure, contestability, financial substitution, quality of institutions and macroeconomic variables.

3.3 METHODOLOGY

3.3.1 Measuring competitiveness in the banking industry

3.3.1.1 Model specification

This study employs the Panzar-Rosse model to measure the degree of competition in the SADC banking industry. This model is able to measure competitive behaviour even in settings where concentration levels may be high in the market. As Boone et al. (2005) argues that stiff competition may throttle performance of less efficient banks and increase the level of concentration in the market. Therefore, competition may be evident even in concentrated markets. The Panzar-Rosse model is based on the assumption of long-run equilibrium in the market. However, Goddard and Wilson (2009) show that sometimes deviations from this long-run equilibrium occur and adjustment back to the equilibrium state may be slow. As a result, this study uses a dynamic form of the Panzar-Rosse model to study the phenomenon in the SADC banking industry.

The model is adopted from Bikker and Haaf (2002) who modify the standard Panzar-Rosse reduced form revenue equation by first adding the lagged dependent variable and then taking first differences to obtain the following dynamic model (see Appendix 3C for derivations):

$$\begin{aligned} \Delta \ln Rev_{it} = & \\ \alpha \Delta \ln Rev_{i,t-1} + \sum_{j=1}^J \mu_j \Delta \ln W_{j,i,t} + \sum_{m=1}^M \omega_m \Delta \ln X_{m,i,t} + \sum_{q=1}^Q \eta_q \Delta \ln Z_{q,t} + \Delta v_{i,t} \end{aligned} \quad (1)$$

Following Molyneux et al. (1996) the assumption of long-run equilibrium is tested using the natural logarithm of the return on assets (ROA) in equation 2 instead of $\ln Rev_{it}$ to yield the following dynamic equation:

$$\begin{aligned} \Delta \ln Roa_{it} = & \\ \alpha \Delta \ln Roa_{i,t-1} + \sum_{j=1}^J \mu_j \Delta \ln W_{j,i,t} + \sum_{m=1}^M \omega_m \Delta \ln X_{m,i,t} + \sum_{q=1}^Q \eta_q \Delta \ln Z_{q,t} + \Delta v_{i,t} \end{aligned} \quad (2)$$

The dynamic H-statistic is derived as:

$$H = \frac{\sum_{j=1}^3 \mu_j}{1-\alpha} \quad (3)$$

The dynamic E-statistic is derived as:

$$E = \sum_{j=1}^3 \mu_j \quad (4)$$

The null hypothesis for long-run equilibrium is given by: $H_0: E = 0$. The value of the H-statistic has the following implications for bank competition. $H \leq 0$ implies a neoclassical monopolist, $H = 1$ denotes a competitive price-taking bank in long-run equilibrium and $0 < H < 1$ suggests that a bank is operating under monopolistic competition. These conditions are tested using the Wald Chi-square test and the results are reported in Tables 1 and 2.

3.3.1.2 *Estimation techniques*

This study uses the generalised method of moments (GMM) to estimate the relationship between banking competitiveness and financial integration in SADC. The advantage of GMM is that it is capable of circumventing dynamic panel and endogeneity biases (Roodman, 2009). Arellano and Bond (1991) show that dynamic panel bias can be eliminated by expressing equations 1 and 2 in first differences. This transformation ensures that the country-specific characteristics, which are called fixed effects, become weakly correlated with explanatory variables. However, even after this difference-GMM transformation, equations 1 and 2 suffer from another problem called endogeneity bias because the lagged dependent variables are correlated with the differenced residuals. The endogeneity bias is mitigated by using past values of endogenous variables. In addition, higher lags of the dependent variable are used to eliminate autocorrelation (Holtz-Eakin et al. 1988; Arellano and Bond, 1991). For additional efficiency gains, Blundell and Bond (1998) combine the differenced and level equations to obtain a system of equations and instrument the variables in levels with their corresponding first differenced lagged variables. By so doing, they developed what came to be known as system-GMM. This study uses this system-GMM approach to estimate equations 1 and 2. Roodman (2006) argues that the GMM framework was designed for applications in situations where the cross-sectional dimension of the panel N is larger than the time-series dimension T i.e. $N > T$. This requirement is met by the structure of the dataset utilised by this study.

3.3.1.3 Diagnostic tests

In order for the results based on system-GMM to be credible, the model must satisfy certain requirements. First, Roodman (2006:40) recommends that the number of instruments should be less than the number of cross-sectional units. This ensures that the chosen instruments do not “overfit endogenous variables” and manage to “expunge their endogenous components.” Second, the presence of first order serial correlation in levels should be ruled out. This is the case if the Arellano-Bond second order autocorrelation test fails to reject second order autocorrelation. Third, a Hansen test is performed to test whether the over-identification restrictions are valid. The model passes this test if the value of the Hansen p-values exceeds 0.1. Fourth, the standard errors are corrected for small sample-bias using a two-step procedure of Windmeijer (2005).

3.3.2 The relationship between banking competitiveness and financial integration

This study uses two methods of analysis to estimate the relationship between banking competitiveness and financial integration in SADC. First, Prais-Winsten regression with panel corrected standard errors (PW-PCSE) is used to estimate equation 5. The advantage of this technique lies in its ability to account for heteroscedasticity, as well as cross and serial correlation of the residuals (Beck and Katz, 1995). Second, in order to check for robustness, fixed effects estimator that is robust to cross-sectional heteroscedasticity and within-panel serial correlation is also used. This estimator is able to remove time-invariant individual effects and yields consistent estimates in the presence of “unobserved heteroscedasticity” (Schmitz and Von Hagen, 2011).

3.3.2.1 Prais-Winsten regression with panel corrected standard errors (PW-PCSE)

This technique is capable of estimating linear models that utilise data characterised by both cross-sectional and time-series dimensions when the error term is not independently and identically distributed. The dynamic model is specified as:

$$COM_{it} = \alpha + \rho COM_{it-1} + x_{it}\beta + \mu_{it} \quad (5)$$

Where *COM* denotes the level of competition in the market measured by the Boone indicator. As shown in chapter one, this indicator has several advantages. For example, it does not require huge datasets to compute, and thus can be calculated over a period of time thereby providing the evolution of competition in the market. However, there is no absolute benchmark for the level of the indicator except that more negative it gets, the higher the level of competition in the market. In addition, *i* and *t* represent the given country and year, respectively. In this case, μ_{it} may be serially correlated over time or characterised by contemporaneous correlation across countries. Beck and Katz (1995) provide simulation evidence that PW-PCSE is suitable for estimating models based on data characterised by 10-20 cross-sectional units and 10-40 time periods per units, especially when the number of cross-sectional dimension (*N*) exceeds the time dimension (*T*), i.e. $N > T$. Beck (2001:274) also demonstrates that this method cannot be applied specifically for cases where $T < 10$ and does not necessarily require a large *N*.¹²

3.3.2.2 Fixed effects estimator (FE)

This estimator assumes constant slope coefficients across the countries in the panel. In addition, although the intercept is allowed to vary across the countries, it is assumed to be time-invariant. The model is similar to equation 5. In this case x_{it} accounts for heterogeneous effect of variables that are not observed and is a vector of endogenous variables. For this model, the error term comprises unobserved individual effects μ_i , unobserved time effects γ_t and the stochastic component ε_{it} i.e. $\mu_i = \gamma_t + \varepsilon_{it}$. It is assumed to be identically independently normally distributed, that is:

$$\mu_{it} \sim N(0, \sigma_{\mu}^2) \quad (6)$$

3.3.2.3 Unit root testing

The unit root properties of the data are studied before applying both PW-PCSE and FE estimators to equation 5. In order to achieve this, the study uses three panel unit root tests, namely; the Levin and Lin (1992) and Levin, Lin and Chu (2002), Maddala and Wu (1999), and Im et al. (2003) tests (Appendix 3D). The decision on

¹² Beck (2001) argues that using this technique on 14 OECD countries ($N = 14$) neither violates any assumption for the model nor undermines the results.

the degree of integration of each series is reached on the basis of a simple majority rule for cases where one test may yield contradictory results.

3.4 DATA ANALYSIS

3.4.1 Data and variable description

The study uses annual data collected from Bankscope database to measure the degree of competition in the banking industry. Balance sheets and income statements of various banking institutions are used to compute values for the variables that are used to estimate equations 1 and 2 above. Detailed descriptions of the variables used in both equations are contained in Appendix 3E. The time span covers 2005 to 2012. Hence, the number of banks (N) exceeds the number of time periods (T) i.e. $N > T$. In order to estimate the relationship between banking competitiveness and financial integration i.e. equation 5, the study uses unbalanced annual panel data collected from World Bank's New database on Financial Development and Structure for the fourteen countries of SADC. The data covered a period running from 2000 to 2010. The regulatory quality index and the financial liberalisation index were obtained from the World Bank's Worldwide Governance Indicators database and Chinn-Ito database¹³, respectively. The list of variables used in estimating equation 5, as well as their respective definitions, is contained in Appendix 3F.

3.4.2 Discussion of results

3.4.2.1 *The competitiveness of the banking industry in SADC*

The number of instruments is less than the number of banks in all the specifications. As a result, the Hansen test reliably indicates that the over-identification restrictions are valid because even though its p-value is greater than 0.1, it is also less than 1. In addition, the Arellano-Bond autocorrelation test does not reject presence of second order autocorrelation. Furthermore, the Panzar-Rosse model requires that the banks are observed in long-run equilibrium. As a result, a Wald test is conducted to determine whether the E-statistic is statistically significant from zero. The findings reported in Tables 3.1 and 3.2 indicate that this requirement is satisfied.

¹³ Downloadable from: http://web.pdx.edu/~ito/Chinn-Ito_website.htm

The Wald test is also used to decide on the level of competition in the market. This test rejects the possibility of both pure monopoly and perfect competition in all specifications.¹⁴ Financial intermediation has been a traditional function of banks in SADC. In order to test competition in this aspect of the market, the natural logarithm of interest revenue is used as a dependent variable. In this case, Table 3.1 reports that the market is characterised by monopolistic competition.¹⁵ This result lends support to Fosu (2013) who finds that the banking market in SADC is monopolistically competitive. The H-statistic for all SADC countries is 0.520 and rises to 0.532 when SACU countries are excluded from the sample. This increase in competitive conduct may reflect the fact that SACU countries are less competitive on the market segment for interest-bearing products compared to the rest of SADC.

The market for non-interest bearing products has also grown in importance in recent years, where banks compete over products that attract fees or commission-based charges. In order to capture a total picture of competition in the banking industry, a different specification in which total revenue is used as a dependent variable, is estimated. As shown in Table 3.2, the result of monopolistic competition is robust. However, in this case, it is important to note that the value of the H-statistic declines from 0.515 to 0.428 as SACU is excluded from the sample.

¹⁴ Aziakpono et al. (2007) find that financial integration in SADC is highest among countries that are members of SACU and yet financial integration is shallow in the rest of SADC. The computation of the H-statistic is done on the basis of two samples; one is called SADC which includes all SADC countries (excluding the DRC due to lack of data) and the other one is called SADC-I which excludes SACU. By comparing the results from the two samples, the study indirectly infers the effect of financial integration on the degree of competition in the market.

¹⁵ It is important to note that Shaffer (2004) makes a point that the interpretation of the H-statistic for values less than unity is ambiguous. Given this observation, it may be more appropriate to describe the SADC regional banking industry as characterized by “imperfect competition” rather than specifically monopolistic competition. The literature review has also shown that national banking markets are characterized by oligopolistic competition due to small number of players in some countries and dominance of few players in others. Moreover, potential competition in SADC is undermined by barriers to entry. Baumol (1982) argues that barriers to entry and exit undermine contestability in the market. Therefore, the strict licensing of banks with stringent minimum capital requirements and high exit costs erode the incentive for entry. In addition, the values of the H-statistics reported in this study are not that close to unity.

Table 3.1: Degree of competition in SADC using *lnIR*

	<i>Dependent variable: lnIR</i>		<i>Dependent variable: lnROA</i>	
	<i>SADC</i>	<i>SADC-I</i>	<i>SADC</i>	<i>SADC-I</i>
<i>lag lnIR</i>	0.357* (0.000)	0.242* (0.001)		
<i>lag lnROA</i>			0.286*** (0.087)	0.287* (0.006)
<i>lnUPF</i>	0.016 (0.815)	0.156 (0.271)	0.509** (0.028)	0.449** (0.042)
<i>lnUPL</i>	0.128 (0.256)	0.310** (0.032)	0.013 (0.973)	-0.256 (0.459)
<i>lnUPK</i>	0.068 (0.321)	-0.063 (0.425)	-0.213 (0.460)	-0.153 (0.395)
<i>lnTA</i>	0.636* (0.000)	0.783* (0.000)	-0.085 (0.258)	-0.069 (0.247)
<i>lnEQTA</i>	0.046 (0.738)	0.034 (0.854)	0.992** (0.025)	0.913 (0.009)
<i>lnLEV</i>	0.035 (0.888)	-0.156 (0.457)	-0.265 (0.383)	-0.697*** (0.058)
<i>lnRISK</i>	-0.006 (0.717)	0.005 (0.739)	-0.130* (0.006)	-0.157** (0.024)
<i>lnOITA</i>	-0.003 (0.938)	0.002 (0.971)	0.086 (0.247)	-0.020 (0.845)
<i>lnGDPG</i>	0.140* (0.000)	0.131** (0.037)	0.221** (0.025)	0.186*** (0.082)
<i>lnINF</i>	0.102** (0.033)	-0.024 (0.714)	-0.192 (0.134)	-0.171 (0.243)
<i>Constant</i>	-1.615** (0.020)	-0.999 (0.364)	1.567 (0.581)	-0.808 (0.700)
<i>Hansen test</i>	64.93 (0.278)	65.51 (0.494)	59.40 (0.461)	63.27 (0.572)
<i>AB – AR (1) test</i>	-1.87 (0.062)	-1.67 (0.095)	-2.06 (0.040)	-2.17 (0.030)
<i>AB – AR (2) test</i>	0.83 (0.405)	0.98 (0.327)	0.31 (0.758)	0.52 (0.601)
<i>Instrument count</i>	71	78	71	78
<i>Market structure</i>	<i>MC</i>	<i>MC</i>		
<i>H – stat./E – stat.</i>	0.520	0.532	0.297	0.565
<i>Wald test: H = 0/E = 0</i>	2.76*** (0.099)	4.07** (0.047)	0.69 ^{lc} (0.406)	0.01 ^{lc} (0.904)
<i>Wald test: H = 1</i>	11.17* (0.001)	4.45** (0.038)		
<i>Sample size</i>	628	375	559	311

(*), (**) and (***) denote the level of statistical significance at 1, 5, and 10 percent, respectively. Superscript (lc) denotes long run equilibrium cannot be rejected. MC indicates monopolistic competition cannot be rejected. SADC-I excludes SACU.

Table 3.2: Degree of competition in SADC using $\ln TR$

	<i>Dependent variable: $\ln TR$</i>		<i>Dependent variable: $\ln ROA$</i>	
	<i>SADC</i>	<i>SADC-I</i>	<i>SADC</i>	<i>SADC-I</i>
<i>lag $\ln TR$</i>	0.204 (0.165)	0.290** (0.011)		
<i>lag $\ln ROA$</i>			0.306** (0.030)	0.554* (0.001)
<i>lnUPF</i>	-0.027 (0.682)	-0.050 (0.633)	0.019 (0.920)	0.055 (0.794)
<i>lnUPL</i>	0.250 (0.185)	0.293** (0.024)	-0.671** (0.026)	-0.187 (0.370)
<i>lnUPK</i>	0.187*** (0.078)	0.061 (0.503)	-0.023 (0.912)	-0.087 (0.507)
<i>lnTA</i>	0.808* (0.000)	0.975* (0.000)	0.006 (0.933)	0.055 (0.473)
<i>lnEQTA</i>	0.298*** (0.063)	0.0003 (0.998)	0.819** (0.039)	0.791** (0.022)
<i>lnLEV</i>	-0.335*** (0.051)	-0.029 (0.845)	-0.543 (0.181)	-0.856** (0.032)
<i>lnRISK</i>	0.006 (0.739)	0.030 (0.362)	-0.140** (0.029)	-0.106 (0.203)
<i>lnGDPG</i>	0.024 (0.629)	0.093 (0.167)	0.044 (0.695)	0.227*** (0.080)
<i>lnINF</i>	0.082** (0.038)	0.089 (0.171)	0.051 (0.685)	-0.121 (0.366)
<i>Constant</i>	-1.105*** (0.084)	-0.690 (0.533)	-4.811* (0.006)	-2.626 (0.0204)
<i>Hansen test</i>	55.81 (0.629)	65.84 (0.517)	84.11 (0.355)	73.29 (0.468)
<i>AB – AR (1) test</i>	-1.89 (0.059)	-2.19 (0.028)	-2.47 (0.014)	-2.26 (0.024)
<i>AB – AR (2) test</i>	1.01 (0.312)	1.04 (0.299)	0.26 (0.794)	1.12 (0.263)
<i>Instrument count</i>	71	78	91	84
<i>Market structure</i>	<i>MC</i>	<i>MC</i>		
<i>H – stat./E – stat.</i>	0.515	0.428	-0.675	-0.219
<i>Wald test: $H = 0/E = 0$</i>	3.96** (0.049)	5.35** (0.023)	2.64 ^{le} (0.107)	0.46 ^{le} (0.499)
<i>Wald test: $H = 1$</i>	5.08** (0.026)	3.95*** (0.050)		
<i>Sample size</i>	646	393	585	337

(*), (**) and (***) denote the level of statistical significance at 1, 5, and 10 percent, respectively. Superscript (le) denotes long run equilibrium cannot be rejected. SADC-I excludes all banks in SACU. MC indicates monopolistic competition cannot be rejected.

A scaled specification, which involves dividing total revenue with total assets, is also estimated for robustness checks.¹⁶ The results, for this specification are reported in Appendix 3I. The finding of monopolistic competition is confirmed by this specification as well even though the value of the H-statistic is lower. Moreover, the H-statistic declines from 0.468 to 0.413 when SACU countries are excluded from the sample. This decline in competitive conduct may imply that unlike the market segment for interest-bearing products, banks in SACU tend to be more competitive than the rest of SADC on non-interest-bearing products. This indicates that financial fragmentation undermines competitive conduct in SADC. The implication is that the financial reforms that were embraced by SADC which culminated into deeper financial integration in SADC are somehow associated with the degree of competition in the region. Overall, the results show that the unit price of labour is the biggest contributor to the value of the H-statistic in SADC.

The coefficients of the unit prices of funds and labour are positive in all specifications. However, the unit price of capital is positive only for the interest revenue specification. The unit price of funds is insignificant in all specifications, while the unit price of capital is significant in both specifications involving total revenue, even though this is true only for the sample including all SADC countries. This finding may provide some evidence that interest rate liberalisation policies have had some effect. Moreover, the unit price of labour is the largest contributor to the value of the H-statistic in SADC even though it tends to be significant in all specifications estimated using the sample that excludes SACU countries. This result suggests that even though banks have embraced technology in their operations, labour still plays a major role in their operations and has a bearing on competitive conduct in the market. Therefore, both labour policies and the skill endowment of labour play a role in this regard.

The coefficient of bank size, measured by total assets, bears a positive sign and it is generally significant in both the interest and total revenue specifications. This indicates presence of economies of scale enjoyed by large banks in the region. The leverage ratio is insignificant in the interest revenue specification. However, this variable is significant in both total revenue specifications, albeit with an unexpected

¹⁶ Bikker et al. (2009) highlight that certain biases arise from misspecification errors associated with the decision to either scale revenue by total assets or not. To address this, this study uses both specifications.

sign. This suggests that conversion of more assets into loans, in an environment characterised by high default risk, may erode revenue. As a response to high risk, banks may be reluctant to lend, or in cases where they do so, they may be prompted to levy a higher premium on lending rates. This response is reflected by a positive coefficient of the natural logarithm of risk, even though this is insignificant. Moreover, the ratio of other operating income to total assets is negative for the SADC sample even though it is insignificant. The negative sign is harmony with the findings of Bikker and Haaf (2002) who indicate that the introduction of non-interest bearing products provides an incentive to shift from traditional financial intermediation activities. Consequently, member states should invest in institutions such as the credit bureaus in order to ease the screening of borrowers and reduce the burden of credit risk.

The effect of the macroeconomic environment is captured by GDP growth and inflation rate. The coefficient of the natural logarithm of GDP growth is generally positive but significant only in the interest income specification. This shows that high and stable growth, which has characterised many SADC countries over the last decade, has a positive impact on bank revenue. Therefore, policymakers must continue to formulate and implement sound macroeconomic policies to ensure high and sustained rate of growth of the economy. In addition, inflation bears a positive coefficient which is insignificant in the sample that excludes members of SACU. This finding is consistent with Mamatzakis et al. (2005) and Fosu (2013).

3.4.2.2 *Determinants of banking competitiveness in SADC: Any role for financial integration?*

The unit root test results show that the Boone indicator¹⁷, return on assets, return on equity, regulatory quality index, growth rate, inflation rate, ratio of offshore bank deposits to total deposits and foreign direct investment are stationary i.e. I(0) stationary. Moreover, all non-stationary series such as concentration ratio, liquidity ratio, financial liberalisation index and financial intermediation spread become stationary in first differences i.e. I (1) stationary (Appendix 3G). Hence, all I(1) stationary variables are used in their first differences in the estimation of equation 5.

¹⁷ See Appendix 3H for the derivation of this indicator.

Table 3.3 presents the results for the estimation of equation 5. The results on the impact of financial integration on bank competition are mixed. It turns out that the *rule-based measure* of financial integration, the financial liberalisation index, provides evidence of a positive relationship between financial integration and bank competition¹⁸. This indicates that, an increase in *de jure* financial integration reflected by relaxation of restrictions on financial markets would be accompanied by stiff competition. However, this result is not significant for the PW-PCSE estimation. This shows that removal of entry restrictions may attract new entrants into the market and reduce market power of domestic banks. This result lends support to Claessens et al. (2001) who provide evidence of a positive impact of foreign bank participation in concentrated domestic banks in a sample of 80 countries. Similarly, Salas and Saurina (2003) found evidence that financial liberalisation and deregulation is accompanied by high competition in the banking industry in Spain.

The *quantity-based measures* of financial integration, namely the ratio of FDI to GDP and the ratio of offshore bank deposits to total deposits, reveal a negative relationship between financial integration and bank competition (Appendix 3J). Furthermore, when a measure of financial instability is included in the model, the inverse relationship is confirmed between bank competition and the ratio of FDI to GDP (Table 3.3). The two measures capture *de facto* level of financial integration in the region. This suggests that an increase in the FDI to GDP ratio, an indication of deepening financial integration, dampens competition in the local banking industry. This result suggests that FDI flows tend to favour large banks which already control a large share of the market. The concentration index bears a positive sign which indicates that intense concentration in the banking industry depletes competition. This outcome occurs when inefficient banks gain market power (Yeyati and Micco, 2007). According to Table 3.3, the results on the effect of the ratio of offshore bank deposits to total deposits are inconclusive. The PW-PCSE estimator seems to provide more evidence of a negative relationship between competition and financial integration while the fixed-effect estimator tends to suggest otherwise.

Other determinants of competition in the banking industry that are statistically significant in Table 3.3 are bank profitability, liquidity ratio, regulatory quality index and economic growth. There is a statistically significant positive relationship between

¹⁸ There is an inverse relationship between the Boone indicator and competition.

the return on assets and bank competition. This indicates that as banks become more profitable, new entrants may be attracted into the market thereby increasing the level of competition. Even though new entry is not limited to foreign banks, foreign entry is common in SADC. Claessens et al. (2001) provides evidence that foreign entry stimulates competition in local markets. Moreover, there is evidence of a negative relationship between the liquidity ratio and bank competition. High liquidity levels reduce the competitive behaviour of banks because such levels provide no incentive for banks to offer a high return on deposits. This reduces competition in the deposit market. Furthermore, a high liquidity ratio indicates that banks are biased towards holdings of liquid assets such as treasury bills, and other short-term placements at the cost of credit extension which is riskier. This practice reduces competition in the credit market.

Table 3.3: Determinants of competition in SADC

Model	Dependent Variable: Boone Indicator											
	PW – PCSE	FE	PW – PCSE	FE	PW – PCSE	FE	PW – PCSE	FE	PW – PCSE	FE	PW – PCSE	FE
bi_{t-1}	0.357* (0.000)	-0.090 (0.309)	0.293* (0.002)	-0.114 (0.228)	0.272* (0.002)	-0.127 (0.161)	0.236* (0.006)	-0.148 (0.122)	0.280* (0.004)	-0.151** (0.039)	0.243** (0.017)	-0.183** (0.022)
Δci	0.001** (0.042)	0.001 (0.210)	0.001 (0.196)	0.001 (0.297)	0.001*** (0.092)	0.001 (0.177)	0.001 (0.229)	0.001 (0.224)	0.002* (0.001)	0.0002 (0.709)	0.001** (0.014)	0.0002 (0.630)
roa	-0.003 (0.395)	-0.005** (0.035)				-0.0004 (0.896)	-0.004*** (0.095)		-0.004 (0.134)	-0.005** (0.067)		
roe			0.001 (0.225)	-0.0001 (0.849)			0.001** (0.033)	-0.0001 (0.916)			0.0003 (0.418)	0.0001 (0.742)
Δliq	0.001 (0.103)	0.001** (0.011)	0.001** (0.029)	0.001* (0.002)	0.001*** (0.089)	0.001** (0.025)	0.001** (0.023)	0.001** (0.010)	0.001*** (0.088)	0.002* (0.002)	0.001** (0.031)	0.002* (0.001)
nim	0.001 (0.665)	0.003 (0.230)	0.003 (0.362)	0.002 (0.222)	0.003 (0.105)	0.005 (0.120)	0.003** (0.049)	0.005 (0.108)	0.004** (0.036)	0.007 (0.123)	0.005* (0.008)	0.006 (0.113)
zs	0.003* (0.002)	0.001*** (0.059)	0.003* (0.004)	0.001*** (0.095)	0.003* (0.001)	0.001 (0.204)	0.003* (0.005)	0.001 (0.286)	0.004* (0.000)	0.001 (0.169)	0.003* (0.002)	0.001 (0.313)
$regi$	0.031* (0.002)	-0.039 (0.358)	0.034* (0.003)	-0.045 (0.287)	0.016 (0.163)	-0.042 (0.333)	0.022*** (0.078)	-0.049 (0.261)	0.029** (0.017)	0.014 (0.748)	0.034** (0.020)	0.007 (0.867)
g	0.003* (0.001)	0.001 (0.475)	0.003* (0.001)	0.001 (0.409)	0.003* (0.000)	0.0003 (0.562)	0.003* (0.000)	0.0004 (0.522)	0.003* (0.001)	0.0001 (0.802)	0.003* (0.000)	0.0002 (0.760)
inf	0.001* (0.004)	0.001** (0.021)	0.001* (0.001)	0.001** (0.042)	1.92e-06 (0.994)	-0.0004 (0.170)	-0.0001 (0.868)	-0.001 (0.150)	0.001* (0.002)	0.001* (0.004)	0.001* (0.001)	0.001* (0.005)
$\Delta finlib$	-0.001 (0.927)	-0.010** (0.037)	0.0004 (0.971)	-0.010** (0.045)								
fdi					0.003* (0.001)	0.003* (0.009)	0.003* (0.000)	0.003* (0.009)				
obd									0.0001* (0.002)	-0.0002** (0.052)	0.0001** (0.011)	-0.0002** (0.050)
Constant	-0.117* (0.000)	-0.120* (0.000)	-0.140* (0.000)	-0.128* (0.000)	-0.153* (0.000)	-0.143* (0.000)	-0.162* (0.000)	-0.151* (0.000)	-0.149* (0.000)	-0.128* (0.001)	-0.162* (0.000)	-0.141* (0.000)
R^2	0.73		0.74		0.79		0.81		0.76		0.76	
χ^2 value	155.66 (0.000)	778.45 (0.000)	176.31 (0.000)	1573.71 (0.000)	121.07 (0.000)	189.44 (0.000)	159.08 (0.000)	26.25 (0.000)	197.36 (0.000)	90.08 (0.000)	122.92 (0.000)	67.27 (0.000)

(*), (**), and (***) denote 1, 5, and 10 percent statistical level of significance and p-values are in parenthesis.

The regulatory quality index is inversely related to bank competition. Strict regulations stifle bank competition because they make it harder in terms of compliance costs especially for small banks. In this way small banks which have the potential to introduce competition into the market suffer *regulatory-suffocate* and remain what Perera et al. (2012:67) calls a “competitive fringe.” There is also a negative relationship between economic growth and bank competition. This result shows that an increase in economic growth would reduce competition in the banking industry. High growth rate of the economy opens opportunities for banks to make higher profits because the demand for financial services tends to rise with income. As the demand for financial services increases, particularly in an environment of excess liquidity in the banking industry, it reduces the incentive for banks to offer competitive deposits and lending rates to their clients.

The net interest margin appears to have a negative effect on bank competition even though the effect is insignificant. However, Appendix 3J shows that when financial instability is excluded from the model, the effect of the net interest margin on competition remains negative but becomes insignificant. The negative sign implies that as the gap between interest paid and received becomes wider, competition in the banking industry declines. This means that high spreads are indicative of inefficiencies which are associated with low competition in the banking industry. There is also evidence of a negative relationship between financial instability and bank competition. This implies that as the probability of default increases, banks lose their competitive appetite. Financial instability may compel banks that are suffering high defaults to surrender their market-share to surviving banks through mergers and acquisitions. Such consolidation would increase the level of concentration in the market and likely erode competition. This may also explain the negative relationship between the inflation rate and bank competition because high and volatile inflation creates macroeconomic instability which in turn reduces competition.

3.5 CONCLUSION

The study has attempted to measure the degree of competition in the SADC banking industry distinguishing competitive conduct in SADC as a whole and SADC without members of SACU. In doing so, the study tested the hypothesis that the banking industry in the SADC region is a pure monopoly. Several findings emerge

from this investigation. *First*, the hypothesis of a pure monopoly is rejected. The results reveal that the banking industry in SADC, both with and without SACU, is characterised by monopolistic competition. Overall, the results show that the unit price of labour is the biggest contributor to the value of the H-statistic in SADC. This underscores the role of labour in the banking industry even during an era of technology-driven banking. Therefore, labour policies as well as the skill endowment have a bearing on competitive conduct in the banking industry. *Second*, the level of risk in the banking industry may explain the shift from traditional financial intermediation activities where interest-bearing assets play a crucial role to non-interest bearing activities where fee and commission-based income has gained importance. This is supported by the negative sign of the coefficient of the ratio of loans to total assets, the positive sign of the coefficient of the ratio of loan loss provisions to total assets as well as the negative sign of the ratio of other operating income to total assets. *Third*, the macroeconomic environment plays a vital role in the sense that GDP growth bears a significant positive sign. This reflects the important role played by a stable macroeconomic environment towards improving the degree of competition in the market. Therefore, as attempts are made to deepen the level of financial integration in SADC, member states must also move towards a harmonised formulation and implementation of macroeconomic policies. Such common macroeconomic policies will ensure a meaningful process of financial integration in the region which will give impetus to competition policies.

The study continued to test the second hypothesis that financial integration leads to high competition in the banking industry in SADC. This hypothesis is confirmed when financial integration is measured by a *rule-based measure* - financial liberalisation index. As *de jure* financial integration increases, competition in the local banking industry also stiffens. This shows that removal of entry restrictions may attract new entrants into the market and reduce market power of domestic banks. Conversely, there is also some evidence of a negative direct effect of financial integration on bank competition when *quantity-based measures*, namely; bank offshore deposits to total deposits ratio and FDI to GDP ratio, are used to measure financial integration. This implies that *de facto* financial integration in SADC dampens competition in the market. There is also evidence that bank regulation is inversely related to competition indicating that strict regulations make it harder and

costly for smaller banks to comply. This situation gives bigger and more established banks a competitive edge. The results show that competition policies cannot function on their own, they should be coupled with effective supervisory and regulatory policies to ensure that they complement each other in creating a competitive banking industry. Moreover, regulatory and supervisory authorities should adopt a tier-system to ensure fair-play in the market and at the same time avoid *regulatory-suffocate* for smaller banks.

This chapter has provided evidence that the banking industry in SADC is characterised by monopolistic competition. It is important to investigate the effect of competition on financial stability in SADC. The next chapter is dedicated to this issue.

University of Cape Town

REFERENCES

- Adam, K., Jappelli, T., Menichini, A., Padula, M., and Pagano, M., (2002), –Analyse, Compare, and Apply Alternative Indicators and Monitoring Methodologies to Measure the Evolution of Capital Market Integration in the European Union,” Centre for Studies in Economics and Finance Working Paper, University of Salerno, Italy
- Angelini, P. and N. Cetorelli, (2000), –Bank Competition and Regulatory Reform: The Case of the Italian Banking Industry.” Bank of Italy Temi di discussione, No. 380.
- Arellano, M. and S. Bond (1991), –Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations,” *The Review of Economic Studies*, 58 (April): 277 – 297
- Aziakpono, M., S. Kleimeier, and H. Sander (2007), –Banking market integration in the SADC countries: Evidence from interest rate analysis,” Paper No. RM/07/047, Maastricht Research School of Economics of Technology and Organisations, University Maastricht
- Barajas, A., Steiner, R., and N. Salazar (2000), –The impact of liberalization and foreign investment in Colombia’s financial sector,” *Journal of Development Economics*, 63(1): 157-196.
- Barassi, M. R., Caporale, G. M., and S. G. Hall (2000), –Interest Rates Linkages: Identifying Structural Relations,” Discussion Paper No. 2000.02, Centre for International Macroeconomics, Oxford University, UK
- Baumol, W. (1982), –Contestable Markets: An Uprising in the Theory of Industry Structure,” *American Economic Review*, 72: 1-15.
- Bayoumi, T. and R. MacDonald (1995), –Consumption, Income, and International Capital Market Integration,” *IMF Staff Papers*, 42 (3): 552-76.
- Biekpe, N. (2011), –The competitiveness of commercial banks in Ghana,” *African Development Review*, 23(1): 75-87
- Bikker, J. A., and J. M. Groeneveld (2000), –Competition and concentration in the EU banking industry,” *Kredit und Kapital*, 33(1): 62–98.
- Bikker, J. A. and K. Haaf (2002), –Competition, concentration and their relationships: An empirical analysis of the banking industry,” *Journal of Banking and Finance*, 26, 2191–2214.
- Bikker, J. (2004), **Competition and efficiency in a unified European banking market**, Cheltenham: Edward Elgar.
- Bikker, J.A., Spierdijk, L. and P. Finnie (2006), –The Impact of Bank Size on Market Power,” DNB Working Paper No.120, De Nederlandsche Bank, Amsterdam.
- Bikker, J. Finnie, P. and L. Spierdijk (2007), –Misspecification of the Panzar-Rosse Model: Assessing Competition in the Banking Industry,” DNB Working Paper No. 114
- Bikker, J. A., and L. Spierdijk (2009), –Measuring and explaining competition in the Financial sector,” Discussion paper series Tjalling C. Koopmans Research Institute, Vol. 09-01
- Bikker, J. A., Shaffer, S. and L. Spierdijk (2009), –Assessing competition with the Panzar-Rosse Model: The role of scale, costs, and equilibrium,” Working Papers No. 09-27, Utrecht School of Economics.
- Bikker, J. (2010), –Measuring performance of banks: An assessment”, *Journal of*

- Applied Business and Economics*, 11(4): 141–159.
- Beck, N. and J. N. Katz (1995), –What to do (and not to do) with time series cross-section data,” *American Political Science Review*, 89(3): 634-647
- Beck, N. (2001), –Time-series-cross-section data: What have we learned in the past few years?” *Annual Review of Political Science*, 4: 271-293
- Blundell, R. and S. Bond (1998), –Initial conditions and moment restrictions in dynamic panel data models,” *Journal of Econometrics*, 87(1): 115–143.
- Boone, J. Griffith, R. and R. Harrison (2005), –Measuring competition,” Working paper No. 022, Advanced institute of Management Research
- Bresnahan, T. F. (1982), –The oligopoly solution concept is identified,” *Economics Letters*, 10 (1982): 87–92.
- Bresnahan, T. F. (1989), –Empirical studies of industries with market power,” In R. Schmalensee, & R. D. Willig (Eds.), **Handbook of industrial organization**, Vol. II, Chapter 17, pp. 1011–1057, New York: North-Holland
- Bucks T. and J. Mathisen (2005), –Competition and Efficiency in Banking: Behavioral Evidence from Ghana,” IMF Working Paper No. 05/17.
- Cheung, Y.W., Chinn, M.D. and E. Fujii (2003), –China, Hong Kong, and Taiwan: A Quantitative Assessment of Real and Financial Integration,” *China Economic Review*, 14:281– 303.
- Chinn, M. D. and Ito. H. (2007), –Capital account liberalisation, institutions and financial development: Cross country evidence,” NBER working paper No. 8967, Cambridge Massachusetts
- Claessens S., Demirguc-Kunt, A., and H. Huizinga (2000), –The Role of Foreign Banks in Domestic Banking Systems,” In Claessens, S., and Jansen, M., (eds), **The Internationalisation of Financial Services**, The Hague: Kluwer Books.
- Claessens, S. Demirgüc-Kunt, A and H. Huizinga (2001): –How does foreign entry affect domestic banking markets?” *Journal of Banking and Finance*, 25(5): 891-911.
- Claessens, S. and L. Laeven (2003), –Financial Development, Property Rights and Growth,” *Journal of Finance*, 58(6): 24-36.
- Claessens, S. and L. Laeven (2005), –Financial dependence, banking sector competition and economic growth,” World Bank Research Working paper No. 3481, Washington DC.
- Clarke, G. Cull, R. D’Amato, L., and A. Molinari (2000), –On the kindness of strangers? The impact of foreign entry on domestic banks in Argentina,” in S. Claessens and M. Jansen, Eds, **The internationalisation of financial services**, Kluwer Law International: The Hague, Netherlands.
- Coccorese, P. (2004), –Banking competition and macroeconomic conditions: A disaggregate analysis,” *Journal of Financial Markets, Institutions and Money*, 14(3): 203-219.
- Corvoisier, S. and R. Gropp (2002), –Bank concentration and retail interest rates”, *Journal of Banking and Finance*, 26 (11): 2155-89
- Delis, M. D., Staikouras, K. C. and P. T. Varlagas (2008), –On the Measurement of Market Power in the Banking Industry,” *Journal of Business Finance and Accounting* 35 (7-8): 1023-1047.
- Demirgüç-Kunt, A. Laeven, L. and R. Levine (2004), –Regulations, Market Structure, Institutions, and the Cost of Financial Intermediation,” *Journal of Money, Credit, and Banking*, 36(3): 593-622.
- Demirguc-Kunt, A. and M. S. M. Peria (2010), –A framework for analysing

- competition in the banking sector: An application to the case of Jordan,” Policy Research Working Paper No. 5499, The World Bank, Washington DC.
- Demsetz, H. (1973), “Industry structure, market rivalry and public policy,” *Journal of Law and Economics*, 16: 1–9.
- Demsetz, H. (1974), “Two Systems of Belief about Monopoly”, in Goldschmid H.J., Mann H.M. and J.F. Weston (eds), **Industrial Concentration: The New Learning**, pp. 164-184, Boston: Little Brown.
- Evanoff, D. and E. Ors (2002), “Local Market Consolidation and Bank Productive Efficiency.” Federal Reserve Bank of Chicago Working Paper No. 2002-25.
- Feldstein, M. and C. Horioka (1980), “Domestic Saving and International Capital Flows,” *Economic Journal*, 90: 314-329.
- Fernández de Guevara, J., Maudos, J. and F. Pérez (2002), “Market power in European banking sectors,” Working paper No. WP-EC-2002-05, Instituto Valenciano de Investigaciones Económicas.
- Fernandez de Guevara, J. Maudos, J. and F. Perez (2007), “Integration and competition in the European financial markets,” *Journal of International Money and Finance*, 26 (2007): 26-45
- Fosu, S. (2013), “Banking competition in Africa: Sub-regional comparative studies,” *Emerging Markets Review*, 15(2013): 233-254
- Freixas, X. and C. Holthausen (2005), “Interbank market integration under asymmetric information,” *The Review of Financial Studies*, 18(2):459–490
- Goddard, J. and J. O. Wilson (2009), “Competition in banking: a disequilibrium approach,” *Journal of banking and Finance*, 33: 2282-2292
- Gelos, G. and J. Roldos (2002), “Consolidation and market structure in emerging market banking systems.” IMF May 2002, Washington D.C., United States
- Glen, J., Lee, K. and A. Singh (2001) Persistence of profitability and competition in emerging markets, *Economics Letters*, 72: 247–53.
- Goldberg, L. B. G. Dages, and D. Kinney (2000), “Foreign and Domestic Bank Participation in Emerging Markets: Lessons from Argentina and Mexico,” National Bureau of Economic Research working paper No. 7714, Cambridge, MA
- Gropp, R., C. K. Sorensen and J.D. Lichtenberger (2007), “The dynamics of bank spreads and financial structure,” European Central Bank working paper Number 7/4, Germany
- Gruben, W. C. and R. P. McComb (2003), “Privatization, competition, and supercompetition in the Mexican commercial banking system,” *Journal of Banking and Finance*, 27(2), 229–249.
- Gunalp, B. and T. Celik (2006), “Competition in the Turkish Banking Industry”, *Applied Economics*, 38(11): 1335-1342.
- Hasan, I., and K. Marton (2000), “Development and efficiency of the banking sector in a transitional economy: Hungarian experience, BOFIT Discussion Papers No. 7.
- Hauer, D. and S.J. Peiris (2005), “Bank Efficiency and Competition and Low-Income Countries: The Case of Uganda,” IMF Working Paper No. 05/240
- Heinemann, F. and M. Jopp (2002), “The benefits of a working European retail market for EU financial service,” Institut für Europäische Politik, Berlin
- Held, D. McGrew, A. Goldblatt, D. and J. Perraton (1999), **Global Transformations: Politics, Economics, Culture**, UK: Polity Press. 301
- Hempell, H. (2002), “Testing for competition among German banks,” Economic Research Centre of the Deutsche Bundesbank, Discussion paper No. 04/02.

- Holtz-Eakin, D, Newey, W. and H. S. Rosen (1989), "The revenues-expenditures nexus: Evidence from local government data." *International Economic Review*, 30: 415-429
- Hondroyannis, G., Lolos, S., and E. Papapetrou (1999), "Assessing competitive conditions in the Greek banking system," *Journal of International Financial Markets Institutions and Money*, 9(4): 377-391.
- Im, K. S, M. H. Pesaran and Y. Shin (2003), "Testing for unit roots in heterogeneous panels," DAE, Cambridge University Working paper No. 9526, UK
- Jain, S. and Bhanumurthy, N. R. (2005), "Financial markets integration in India," *Asian Pacific Development Journal*, 12(2): 15-32
- Kadiyali, V., K. Sudhir, and V.R. Rao (2001), "Structural Analysis of Competitive Behavior: New Empirical Industrial Organization Methods in Marketing," *International Journal of Research in Marketing*, 18:161-186
- Kayawe, T and A. Amusa (2003), "Concentration in Botswana's banking sector," *SAJEMS*, 6(4): 823-832.
- Kleimeier, S. and H. Sander (2002), "European Financial Market Integration: Evidence on the Emergence of a Single Eurozone Retail Banking Market", European Credit Research Institute Research Report No.2.
- Kose, M. A., E. Prasad, K. Rogoff, and S. J. Wei (2006), "Financial Globalization: A Reappraisal," IMF Working Paper No. WP/06/189.
- Lau, L. (1982), "On Identifying the Degree of Competitiveness from Industry Price and Output Data." *Economics Letters* 10(1-2): 93-99.
- Levin A. and C. F. Lin (1992), "Unit root test in panel data: Asymptotic and sample properties," University of California at San Diego, Discussion paper No. 93, USA
- Levin, A. Lin, C. F. and C. S. Chu (2002), "Unit root test in panel data: Asymptotic and finite sample properties," *Journal of Econometrics*, 108(1): 1-24
- Liuhto, K., Sorg, M. and J. Uiboupin, (2006), "Foreign banks entry and bank performance in the CEE countries," *Banks and Bank systems*, 1(3): 41-63
- Maddala, G. S and S. Wu (1999), "A comparative study of unit root tests with panel data and new simple test," *Oxford Bulletin of Economics and Statistics*, Special Issue: 631-65
- Mamatzakis, E., Staikouras, C. and N. Koutsomanoli-Fillipaki (2005), "Competition and concentration in the banking sector of the South Eastern European region," *Emerging Markets Review*, 6(2): 192-209
- Maudos, J. and J. F. de Guevara (2007), "The cost of market power in banking: Social Welfare loss vs. cost inefficiency," *Journal of Banking and Finance*, 31(7): 2103-2135
- Micco, A., Panizza, U. and M. Yañez (2007), "Bank ownership and performance. Does politics matter?" *Journal of Banking and Finance*, 31(1): 219-241.
- Mlambo, K. and M. Ncube (2011), "Competition and efficiency in the banking sector in South Africa," *African Development Review*, 23(1): 4-5.
- Molyneux, P., Thornton, J., and D. M Lloyd-Williams (1996), "Competition and market contestability in Japanese commercial banking," *Journal of Economics and Business*, 48(1): 33-45.
- Montiel, P. (1996), "Managing Economic Policy in the face of Large Capital Inflows: What have we Learned?" In Calvo, G., and M. Hochreiter, (eds). **Private Capital Flows to Emerging Markets after the Mexican Crisis**. Washington DC: Institute for International Economics.
- Montiel, P. and C. Reinhart (1999), "Do Capital Controls and Macroeconomic

- Policies Influence the Volume and Composition of Capital Flows? Evidence from the 1990s," *Journal of International Money and Finance*, 18 (4): 619-35.
- Motta, M. (2004), **Competition Policy: Theory and Practice**, Cambridge University Press.
- Moreno, R. and P. Andersen (2006), "Financial Integration: An overview," BIS papers, No. 23
- Namibian Economic Policy Research Unit (2005), "Competition in Namibia's banking industry," NEPRU Policy Brief, Windhoek, Namibia
- Panzar, J. and J. Rosse (1987), "Testing for monopoly equilibrium," *Journal of Industrial Economics*, 35(4): 443-456
- Park, D (1998), "The meaning of competition: A graphical exposition," *Journal of Economic Education*, 29(4): 347-357
- Pasricha, G. K. (2008), "Imperfect Competition in Financial Markets and Capital Controls: A Model and a Test," MPRA Paper No. 12125, University Library of Munich, Germany
- Pasricha, G. K. (2009), "Bank Competition and International financial Integration: Evidence Using a New Index," Hong Kong Institute for Monetary Research Working Paper No. 24/2009
- Perera, S., Skully, M. and M. Nguyen (2012), "Market concentration and pricing behaviour of Sri Lankan banks," *South Asian Journal of Global Business Research*, 1(1): 63 - 78
- Prasad, E., Rogoff, K., Wei, S. J. and M. A. Kose (2003), "Effects of Financial Globalization on Developing Countries: Some Empirical Evidence," Washington D.C.: International Monetary Fund.
- Prasad, A. and S. Ghosh (2005), "Competition in Indian Banking," IMF Working Paper, No. WP/05/141
- Poshakwale, S.S. and B. Qian (2011), "Competitiveness and Efficiency of the Banking Sector and Economic Growth in Egypt," *African Development Review*, 23 (1): 99-120.
- Reddy, Y.V.(2002), "Monetary and financial sector reforms in India: A practitioner's perspective," presented at the India Economy Conference, Program on Comparative Economic Development (PCED) at Cornell University, USA, April 19-20, 2002
- Roodman, D. (2006), "How To Do xtabond2: An Introduction to "Difference" and "System" GMM in Stata," Center for Global Development Working Paper No. 103
- Roodman, D. (2009) "How to Do xtabond2: An Introduction to Difference and System GMM in Stata," *Stata Journal*, 9(1): 86-136
- Saab, Y. S. and J. Vacher (2007), "Banking sector integration and competition in CEMAC," IMF working paper No. WP/07/3
- Sanya, S. and M. Guertner (2012), "Assessing bank competition within the East African community," IMF working paper No. WP/12/32, Washington DC
- Schaeck, K., M. Cihák and S. Wolfe (2009), "Are competitive banking systems more stable?," *Journal of Money, Credit and Banking*, 41(4): 711-734.
- Schmitz, B. and J. von Hagen (2011), "Current account imbalances and financial integration in the euro area," *Journal of International Money and Finance*, 30(8): 1676-1695
- Schmukler, S. L (2004), "Financial Globalization: Gain and pain for Developing Countries," *Second Quarter Economic Review*, Federal Reserve Bank of Atlanta

- Schure, P. and R. Wagenvoort (1999), "Economies of Scale and Efficiency in European Banking: New Evidence." European Investment Bank Economic and Financial Reports No. 99/01.
- Shaffer, S. (1993), "A test of competition in Canadian banking," *Journal of Money, Credit, and Banking*, 25(1): 49–61.
- Shaffer, S. (2001), "Banking conduct before the European single banking license: A cross-country comparison," *North American Journal of Economics and Finance*, 12(1): 79–104.
- Shaffer, S. (2004), "Patterns of competition in banking," *Journal of Economics and Business*, 56(2004): 287-313
- Simpasa, A. M. (2011), "Competitive conditions in the Tanzanian commercial banking industry," *African Development Review*, 23(1): 88-98
- Souza-Sobrinho, N. F. (2010), "The Macroeconomics of Bank Interest Spreads: Evidence from Brazil," *Annals of Finance*, 6(1): 1–32.
- Steen, F. and K. G. Salvanes (1999), "Testing for Market Power using a Dynamic Oligopoly Model," *International Journal of Industrial Organization*, 17(1999): 147-177.
- Toolsema, L. A. (2002), "Competition in the Dutch Consumer Credit Market," *Journal of Banking and Finance*, 26(11): 2215-2229.
- Van Leuvensteijn, M., C. Kok Sørensen, Bikker J.A, and A.A.R.J.M. Van Rixtel (2008), "Impact of bank competition on the interest rate pass-through in the euro area," Tjalling C. Koopmans Research Institute Discussion Paper Series No. 08-08, Universiteit Utrecht
- Vives, X. (2010), "Competition and stability in banking," CESifo Working Paper No. 3050.
- Von Furstenberg, G. M. (1998), "From Worldwide Capital Mobility to International Financial Integration: A Review Essay," *Open Economies Review*, 9 (1): 53-84.
- Weill L. (2004), "On the Relationship between Competition and Efficiency in the EU Banking Sector," *Kredit und Kapital*, 37(3): 329-352.
- Weiss, L. W. (1989), "A review of concentration–price studies in banking. In L. W. Weiss (Ed.), **Concentration and price**, pp. 219–254, Cambridge, MA: MIT Press.
- Windmeijer, F. (2005), "A finite sample correction for the variance of linear efficient two-step GMM estimators," *Journal of Econometrics*, 126(1): 25–5
- Winton, A. (1997), "Competition Among Financial Intermediaries When Diversification Matters." *Journal of Financial Intermediation*, 6(4): 307-346.
- Yeyati, E.L. and A. Micco (2007), "Concentration and foreign penetration in Latin American banking sectors: Impact on competition and risk," *Journal of Banking and Finance*, 31(2007): 1633-1647
- Yuan, Y. (2006), "The state of competition of the Chinese banking industry," *Journal of Asian Economics*, 17(3), 519–534.

LIST OF APPENDICES

Appendix 3A: Some common measures of *de jure* financial integration

<i>Measure</i>	<i>Source</i>	<i>Description</i>
IMF-restriction measure	Edison <i>et al.</i> (2002)	The <i>IMF-restriction measure</i> is a zero-one dummy variable which classifies countries on an annual basis by the presence or absence of restrictions. The dummy assumes a value of one in years when there are restrictions on capital account transactions and zero in years when there are no restrictions on transactions. A derivative of the IMF-restriction measure is the <i>Share</i> which calculates the proportion of years that a country had no capital accounts restrictions over the sample period.
Montiel-Reinhart intensity measure	Montiel (1996); Montiel and Reinhart (1999)	Unlike the IMF-restrictions measure, the <i>Montiel-Reinhart intensity measure</i> measures the various degrees of capital restrictions thereby combining the IMF and country-specific information, to construct an index that takes three values, 0, 1 or 2, to indicate a closed, semi-closed (or partially open) and an open capital account.
OECD Code of liberalisation of capital movements	Edison <i>et al.</i> (2003),	<i>Code of Liberalisation of Capital Movements</i> has been based on data from the OECD member countries. The data on 11 different types of international transactions inter alia, transactions in direct investment, collective investment securities, real estate, financial credits and loans and personal capital movements. The code indicates whether there are restrictions on these transactions or not, as well as whether such restrictions apply to commercial banks only or include other financial institutions.

Appendix 3B: Common measures of *de facto* financial integration

<i>Measure</i>	<i>Source</i>	<i>Description</i>
Interest rate parity	(Barassi <i>et al.</i> , (2000), von Furstenberg (1998)	<i>Interest rate parity</i> measure states that given a free movement of capital in the absence of transaction costs, the law of one price would hold. This implies that homogeneous assets would attract similar return irrespective of the country of origin and their currency denomination. Generally, the tendency for interest rates to be similar may be a result of the presence of arbitrage opportunities as capital seeks the highest return as well as the use of interest rates as a monetary policy tool which leads to policy convergence. The different interest rate parity conditions include closed interest parity (CLIP), covered interest parity (CIP), uncovered interest parity (UIP) and real interest parity (RIP).
Consumption correlation	Adam <i>et al.</i> (2002), Von Furstenburg (1998), Bayoumi and MacDonald (1995)	This indicator implies that financially integrated economies are characterised by convergence in per capita consumption growth, because this implies similar real interest rates. The main assumption here is that consumers fully exploit all risk-sharing opportunities and have homogenous relative degree of risk-aversion and time preference rates across the countries.
Investment-savings correlation	Feldstein and Horioka (1980), Von Furstenburg (1998), Adam <i>et al.</i> (2002)	This measure predicts independence of domestic investment on domestic savings because financial integration allows for access to foreign savings. Hence a high dependence on domestic savings to finance investment suggest segmentation of concerned markets. This assumes complete arbitrage in perfect world capital markets which ensures equality of domestic and world interest rates.
Market penetration of foreign banks	Adam <i>et al.</i> (2002), Claessens <i>et al.</i> (2000)	Market penetration is measured by the share of foreign banks in the total number of banks operating in a country, the share of foreign bank assets, and the ratio of foreign bank assets to total assets of the banking system.
International portfolio penetration	Edison <i>et al.</i> (2002)	These indicators are based on the flow of capital between countries as foreigners invest locally and residents abroad. The following ratios are commonly used: the ratio of the flow (or stock) of foreign assets to GDP, the ratio of the flow (or stock) of foreign liabilities to GDP, and the ratio of the sum of foreign assets and liabilities to GDP (or as a ratio of total foreign trade i.e. import plus export). Components of capital flows (stock) such as FDI and portfolio inflows and outflows to GDP
Financial services prices	Adam <i>et al.</i> , (2002)	Access to foreign markets forces domestic banks to impose competitive charges on their services. Thus the difference between foreign and domestic bank-charges should approach zero.

Appendix 3C: Derivation of the reduced form equations

Bikker and Haaf (2002) formulate the Panzar-Rosse model by specifying the following marginal cost (MC) and marginal revenue (MR) equations:

$$MC_{it} = \alpha_0 + \alpha_1 \ln Out_{it} + \sum_{k=1}^L \beta_k \ln fi_{k,i,t} + \sum_{k=1}^p \gamma_k \ln Xc_{k,i,t} \quad (7)$$

$$MR_{it} = \lambda_0 + \lambda_1 \ln Out_{it} + \sum_{n=1}^p \delta_n \ln Xr_{n,i,t} \quad (8)$$

Where $\ln fi_{k,i,t}$ represents the natural logarithm of factor input k or n of bank i at time t . $\ln Out_{it}$ is the natural logarithms of output. $\ln Xc_{k,i,t}$ and $\ln Xr_{n,i,t}$ are the natural logarithms of exogenous variables k and n . Profit optimisation is realised at the point where MR equals MC. This condition is transposed in $\ln Out_{it}$ and transformed to define the following reduced form revenue function:

$$\ln Rev_{it} = \alpha + \sum_{j=1}^J \mu_j \ln W_{j,i,t} + \sum_{m=1}^M \omega_m \ln X_{m,i,t} + \sum_{q=1}^Q \eta_q \ln Z_{q,t} + \varepsilon_{i,t} \quad (9)$$

$$\varepsilon_{i,t} = \xi_i + \nu_{i,t} \quad (10)$$

Where $\ln Rev_{it}$ the natural logarithm of total revenue or the ratio of total revenue to total assets of bank i at time t . W_j is a vector of prices of inputs such as deposits, labour and capital. $\ln X_{m,i,t}$ and $\ln Z_{q,t}$ represent bank specific control variables and macroeconomic variables, respectively. Equation 10 defines a composite error term composed of bank fixed effects ξ_i and residuals $\nu_{i,t}$. The error term is assumed to be independently identically distributed with a mean of zero and variance σ_v^2 .

The H-statistic is given by the sum of the coefficients of factor prices in equation 3 as follows:

$$H = \sum_{j=1}^3 \mu_j \quad (11)$$

Molyneux et al. (1996) tests for the assumption of long-run equilibrium by using the natural logarithm of the return on assets (ROA) in equation 9 instead of $\ln Rev_{it}$ to yield:

$$\ln ROA_{it} = \alpha + \sum_{j=1}^J \mu_j \ln W_{j,i,t} + \sum_{m=1}^M \omega_m \ln X_{m,i,t} + \sum_{q=1}^Q \eta_q \ln Z_{q,t} + \varepsilon_{i,t} \quad (12)$$

The E-statistic is computed as the sum of the elasticity of returns with respect to input prices as follows:

$$E = \sum_{j=1}^3 \mu_j \quad (13)$$

In order to account for dynamics, a lagged dependent variable is introduced to both equations 9 and 12, as follows:

$$\ln Rev_{it} = \alpha \ln Rev_{i,t-1} + \sum_{j=1}^J \mu_j \ln W_{j,i,t} + \sum_{m=1}^M \omega_m \ln X_{m,i,t} + \sum_{q=1}^Q \eta_q \ln Z_{q,t} + \varepsilon_{i,t} \quad (14)$$

Equation 14 can be differenced to eliminate bank-specific effects to get:

$$\Delta \ln Rev_{it} = \alpha \Delta \ln Rev_{i,t-1} + \sum_{j=1}^J \mu_j \Delta \ln W_{j,i,t} + \sum_{m=1}^M \omega_m \Delta \ln X_{m,i,t} + \sum_{q=1}^Q \eta_q \Delta \ln Z_{q,t} + \Delta v_{i,t} \quad (15)$$

Similarly, equation 12 can be differenced to obtain:

$$\Delta \ln Roa_{it} = \alpha \Delta \ln Roa_{i,t-1} + \sum_{j=1}^J \mu_j \Delta \ln W_{j,i,t} + \sum_{m=1}^M \omega_m \Delta \ln X_{m,i,t} + \sum_{q=1}^Q \eta_q \Delta \ln Z_{q,t} + \Delta v_{i,t} \quad (16)$$

The E-statistic is still computed according to equation 13 above. However, the dynamic H statistic is derived as:

$$H = \frac{\sum_{j=1}^3 \mu_j}{1-\alpha} \quad (17)$$

The value of the H statistic can be linked to the degree of competition in the market as follows: $H \leq 0$ implies a neoclassical monopolist, $H = 1$ denotes a competitive price-taking bank in long-run equilibrium and $0 < H < 1$ suggests that a bank is operating under monopolistic competition.

Appendix 3D: Panel unit root tests

This study uses three panel unit root tests, namely; the Levin and Lin (1992) and later developed by Levin, Lin and Chu (2002), Maddala and Wu (1999), and Im et al. (2003) tests. These tests are based on the assumption of no cross-sectional dependence among the units and are based on the following augmented Dickey-Fuller (ADF) regression:

$$\Delta y_{it} = \alpha_i + \beta_i t + \gamma_i y_{it-1} + \varepsilon_{it} \quad (18)$$

Where the error term ε_{it} is identically independently distributed and α_i and β_i allow for fixed time trends for specific units for each i . The null hypothesis of a unit root is:

$$H_0: \gamma_i = 0, \text{ for all } i \quad (19)$$

The alternative hypothesis varies with each test. For the *Levin and Lin* (1992), the alternative hypothesis assumes a homogenous autoregressive coefficient across countries and the test supposes that the fixed effects capture the inter-individual heterogeneity:

$$H_1: \gamma_i < 0, \text{ for all } i \quad (20)$$

Im et al (2003) go beyond the Levin and Lin (1992) test by allowing the value of the autoregressive coefficient to be heterogeneous. Using the same null hypothesis defined in equation 19, the alternative hypothesis in their case is given as:

$$H_1: \gamma_i < 0, \text{ for } i = 1, \dots, N_1 \text{ and } \gamma_i = 0, i = N_1 + 1, \dots, N \quad (21)$$

For this test, there are individuals $i = 1, \dots, N_1$, where y_{it} is stationary and individual $i = N_1 + 1, \dots, N$, where y_{it} is not stationary. The decision rule is based on the t-statistic calculated as:

$$\bar{t} = \frac{1}{N} \sum_{i=1}^N t_i \quad (22)$$

t_i in equation 22 is the individual ADF t-statistics for the unit root test.

Maddala and Wu (1999) combine the p -values of the test statistic for a unit root for every individual cross-sectional unit. Their resulting test statistic is defined as:

$$\psi = -2 \sum_{i=1}^N \ln(p_i) \quad (23)$$

p_i represents the p -value of the test statistic of the ADF test statistic in each cross-sectional unit.

Appendix 3E: Description of variables

	<i>Name</i>	<i>Description</i>
Dependent variable	<i>lnTR</i>	Natural logarithm of total revenue
	<i>lnTRTA</i>	Natural logarithm of the ratio of total revenue to total assets
Determinants	<i>lnROA</i>	Natural logarithm of the return on assets
	<i>lnUPF</i>	Natural logarithm of the unit price of funds; computed as the ratio of total interest expense to total deposits
	<i>lnUPL</i>	Natural logarithm of the unit price of labour; computed as the ratio of personnel expenses to total assets
	<i>lnUPK</i>	Natural logarithm unit price of capital; computed as the ratio of other operating expenses to fixed assets
	<i>lnTA</i>	Natural logarithm of total assets
	<i>lnEQTA</i>	Natural logarithm of the ratio of equity capital to total assets
	<i>lnLEV</i>	Natural log of bank leverage; computed as the ratio of loans to total assets
	<i>lnRISK</i>	Natural logarithm of credit risk; computed as the ratio of loan loss provisions to total loans
	<i>lnOITA</i>	Natural logarithm of the ratio other operating income to total assets
	<i>lnGDPG</i>	Natural logarithm of GDP growth
<i>lnINF</i>	Natural logarithm of inflation rate	

N.B: This Table contains descriptions of variables used when estimating equations 1 and 2

Appendix 3F: Description of variables

	<i>Variable</i>	<i>Description</i>
Bank Competition	<i>ci</i>	Concentration ratio
	<i>bi</i>	Boone indicator is a measure of degree of competition based on profit-efficiency in the banking market. It is calculated as the elasticity of profits to marginal costs. An increase in the Boone indicator implies a deterioration of the competitive conduct of financial intermediaries.
Determinants	<i>roa</i>	Return on assets
	<i>roe</i>	Return on equity
	<i>liq</i>	Ratio of liquid assets to GDP
	<i>fis</i>	Interest rate spread captured by the difference between lending and deposit rates.
	<i>nim</i>	Net interest margin
	<i>regi</i>	Regulatory quality index
	<i>g</i>	GDP growth rate
	<i>inf</i>	Inflation rate
	<i>fi</i>	Financial integration measured using the following proxies:
		<i>finlib</i> Chinn-Ito financial liberalization index
	<i>odb</i> Offshore bank deposits to total deposits	
	<i>fdi</i> Flows of foreign direct investment to GDP	

N.B: Data on **regi** were obtained from the World Bank's Governance Indicators database, and data on **finlib** were obtained from Chinn-Ito database on the new financial liberalization measure. The Table contains descriptions of variables used to estimate the relationship between banking competitiveness and financial integration according to equation 5.

Appendix 3G: Unit root test results

	Level			First Difference			Decision
	LLC	IPS	ADF-F	LLC	IPS	ADF-F	
<i>ci</i>	-2.465* (0.007)	0.979 (0.836)	16.009 (0.936)	-15.815* (0.000)	-1.933** (0.027)	54.869* (0.001)	I(1)
<i>bi</i>	-11.497* (0.000)	-2.898* (0.002)	71.438* (0.000)				I(0)
<i>roa</i>	-6.868* (0.000)	-0.444 (0.328)	38.945*** (0.082)				I(0)
<i>roe</i>	-11.976* (0.000)	-1.824** (0.034)	44.744* (0.006)				I(0)
<i>zs</i>	-9.194* (0.000)	-2.030** (0.021)	59.228* (0.001)				I(0)
<i>liq</i>	1.820 (0.966)	2.845 (0.998)	13.541 (0.990)	-8.682* (0.000)	-1.209** (0.113)	47.747* (0.006)	I(1)
<i>fis</i>	-4.095* (0.000)	-0.255 (0.399)	25.671 (0.370)	-7.221* (0.000)	-1.352*** (0.088)	43.106** (0.010)	I(1)
<i>nim</i>	-18.170* (0.000)	-3.072* (0.001)	60.145* (0.000)				I(0)
<i>regi</i>	-6.868* (0.000)	-0.444 (0.328)	38.945*** (0.082)				I(0)
<i>g</i>	-8.825* (0.000)	-3.081* (0.001)	61.697* (0.000)				I(0)
<i>inf</i>	-8.009* (0.000)	-1.495*** (0.068)	51.681* (0.004)				I(0)
<i>finlib</i>	-0.264 (0.396)	1.903 (0.971)	4.916 (0.961)	-7.222* (0.000)	-1.170 (0.121)	22.512** (0.032)	I(1)
<i>obd</i>	-6.821* (0.000)	-0.777 (0.219)	45.742** (0.019)				I(0)
<i>fdi</i>	-9.879* (0.000)	-3.274* (0.000)	70.574* (0.000)				I(0)

(*), (**), and (***) denote 1, 5, and 10 percent level of statistical significance, respectively. *p*-values are in parenthesis. The decision on the order of integration is based on all three unit root tests, but where all three are not conclusive, the decision is based on a simple majority-rule, i.e. two tests that are in agreement.

Appendix 3H: Derivation of the Boone Indicator

Boone, Griffith and Harrison (2005) specify the following demand curve for a banking industry in which each bank i produces output q_i :

$$p_i(q_i, q_j) = a - bq_i - d \sum_{j \neq i} q_j \quad (24)$$

Each bank is assumed to face constant marginal cost c_i . The sensitivity of bank i 's price to changes in its competitors output is assumed to be non-negative and less than the response to own output changes i.e. $0 < d \leq b$. In addition, the non-output related the price component exceeds the constant marginal costs i.e. $a > c_i$. The profit of each bank is defined as:

$$\pi_i = (p_i - c_i)q_i \quad (25)$$

Substitute equation 1 into 2 to get:

$$\pi_i = (a - bq_i - d \sum_{j \neq i} q_j - c_i)q_i \quad (26)$$

Each bank chooses output in order to maximize profits and the first order condition is given by:

$$a - 2bq_i - d \sum_{j \neq i} q_j - c_i = 0 \quad (27)$$

Equation 26 suggests a quadratic relationship between profits and marginal costs. If entry costs matter, each bank would only enter the market when the entry costs e are not prohibitive i.e. $\pi_i \geq e$.

In this set-up, competition would rise if bank products become quasi-homogenous i.e. d increases. In addition, competition would become stiffer if entry costs fall. According to Boone, Griffith and Harrison (2005) the market-share s_i of efficient banks would increase if either bank products become substitutable or entry costs decline. Such market share is modeled as follows:

$$s_i = \frac{p_i q_i}{\sum_j p_j q_j} \quad (28)$$

$$\ln(s_i) = a + \beta \ln\left(\frac{c_i}{\sum_j c_j}\right) \quad (29)$$

The β is the Boone indicator. Market-share would increase in favour of more efficient banks, that is, banks with lower marginal costs i.e. $\beta < 0$. Van Leuvensteijn et al. (2007) indicates that the log-log specification in equation 29 allows for interpretation of the relationship in terms of elasticity of market-share to changes in β . For example, $\beta = -3$, implies that a bank whose marginal cost are higher by one percent relative to another which is more efficient, would have a market-share that is 3 percent lower than its more efficient rival.

Appendix 3I: Degree of competition in SADC – scaled specification

	<i>Dependent variable: lnTRTA</i>		<i>Dependent variable: lnROA</i>	
	<i>SADC</i>	<i>SADC-I</i>	<i>SADC</i>	<i>SADC-I</i>
<i>lag lnTRTA</i>	0.389* (0.000)	0.363** (0.026)		
<i>lag lnROA</i>			0.300*** (0.053)	0.538* (0.000)
<i>lnUPF</i>	-0.063 (0.412)	-0.117 (0.306)	0.018 (0.923)	-0.077 (0.654)
<i>lnUPL</i>	0.153 (0.114)	0.333** (0.046)	-0.683*** (0.051)	-0.073 (0.659)
<i>lnUPK</i>	0.196*** (0.099)	0.047 (0.721)	-0.033 (0.874)	-0.138 (0.542)
<i>lnEQTA</i>	0.216*** (0.098)	0.140 (0.320)	0.804** (0.046)	0.708* (0.006)
<i>lnLEV</i>	-0.336** (0.032)	-0.089 (0.645)	-0.548 (0.164)	-0.755*** (0.020)
<i>lnRISK</i>	0.011 (0.574)	0.041 (0.151)	-0.143** (0.023)	-0.104*** (0.070)
<i>lnGDPG</i>	-0.004 (0.934)	0.032 (0.628)	0.047 (0.671)	0.226** (0.040)
<i>lnINF</i>	0.078*** (0.050)	0.070 (0.347)	0.056 (0.681)	-0.118 (0.338)
<i>Constant</i>	-1.123*** (0.068)	-0.606 (0.566)	-4.878* (0.007)	-2.144 (0.134)
<i>Hansen test</i>	52.81 (0.763)	66.53 (0.293)	84.30 (0.379)	67.51 (0.494)
<i>AB – AR (1) test</i>	-3.14 (0.002)	-2.22 (0.026)	-2.37 (0.018)	-2.21 (0.027)
<i>AB – AR (2) test</i>	0.72 (0.472)	1.15 (0.250)	0.20 (0.838)	1.08 (0.279)
<i>Instrument count</i>	71	71	91	78
<i>Market structure</i>	<i>MC</i>	<i>MC</i>		
<i>H – stat./E – stat.</i>	0.468	0.413	-0.698	-0.288
<i>Wald test: H = 0/E = 0</i>	4.32** (0.040)	2.94*** (0.090)	2.15 ^{le} (0.145)	1.33 ^{le} (0.252)
<i>Wald test: H = 1</i>	4.96** (0.028)	3.22*** (0.076)		
<i>Sample size</i>	646	393	585	337

(*), (**) and (***) denote the level of statistical significance at 1, 5, and 10 percent, respectively. The specification involving scaled total revenue excludes the natural logarithm of total assets (Mamatzakis et al., 2005). The estimation was done using the Arellano-Bond twostep system-GMM with robust standard errors. SADC-I excludes all banks in SACU. Superscript (le) denotes long run equilibrium cannot be rejected. MC indicates monopolistic competition cannot be rejected.

Appendix 3J: Determinants of bank competitiveness in the SADC

<i>Model</i>	<i>Dependent Variable: Boone Indicator</i>					
	<i>I^a</i>	<i>I^b</i>	<i>II^a</i>	<i>II^b</i>	<i>III^a</i>	<i>III^b</i>
<i>bi_{t-1}</i>	0.453* (0.000)	0.385* (0.000)	0.341* (0.000)	0.308* (0.001)	0.306* (0.007)	0.276** (0.017)
Δci	0.001*** (0.093)	0.001 (0.271)	0.001 (0.176)	0.001 (0.284)	0.001** (0.060)	0.001 (0.142)
<i>roa</i>	-0.002 (0.469)		0.001 (0.722)		-0.002 (0.383)	
<i>roe</i>		0.001 (0.164)		0.001** (0.016)		0.0004 (0.179)
Δliq	0.001** (0.011)	0.002* (0.003)	0.001** (0.010)	0.001* (0.004)	0.001** (0.010)	0.001* (0.003)
<i>nim</i>	-0.001 (0.845)	0.001 (0.763)	0.001 (0.501)	0.002 (0.318)	0.002 (0.292)	0.003 (0.145)
<i>regi</i>	0.038* (0.000)	0.038* (0.000)	0.031* (0.000)	0.030** (0.002)	0.042* (0.000)	0.040* (0.001)
<i>g</i>	0.002** (0.032)	0.002** (0.039)	0.002* (0.000)	0.002* (0.001)	0.002* (0.005)	0.002** (0.014)
<i>inf</i>	0.0004 (0.135)	0.0004*** (0.086)	-0.0003 (0.276)	-0.0003 (0.249)	0.001** (0.029)	0.001** (0.030)
$\Delta finlib$	-0.001 (0.908)	-0.0001 (0.990)				
<i>fdi</i>			0.003* (0.000)	0.004* (0.000)		
<i>obd</i>					0.0001* (0.002)	0.0001** (0.015)
<i>Constant</i>	-0.043 (0.118)	-0.072* (0.008)	-0.082* (0.000)	-0.102* (0.000)	-0.076* (0.000)	-0.096* (0.000)
<i>R²</i>	0.58	0.59	0.71	0.74	0.63	0.63
χ^2 value	83.81 (0.000)	80.11 (0.000)	82.96 (0.000)	105.07 (0.000)	67.41 (0.000)	87.78 (0.000)
<i>rhos</i>	0.02	0.10	-0.37	-0.34	-0.06	0.04

(*), (**), and (***) denote 1, 5, and 10 percent statistical level of significance and *p*-values are in parenthesis; *a* and *b* denote a model that include *roa* and *roe*, respectively.

Appendix 3K: Correlation between variables used in the models

	<i>bi</i>	<i>ci</i>	<i>roa</i>	<i>roe</i>	<i>liq</i>	<i>nim</i>	<i>fis</i>	<i>regi</i>	<i>zs</i>	<i>g</i>	<i>inf</i>	<i>finlib</i>	<i>fdi</i>	<i>obd</i>
<i>bi</i>	1.00													
<i>ci</i>	0.32*	1.00												
<i>roa</i>	0.24*	0.09	1.00											
<i>roe</i>	0.08	0.12	0.41*	1.00										
<i>liq</i>	0.06	0.01	-0.01	0.14	1.00									
<i>nim</i>	0.19	-0.09	-0.05	-0.13	-0.38*	1.00								
<i>fis</i>	-0.12	-0.15	-0.09	-0.16	-0.33*	0.03	1.00							
<i>regi</i>	0.28*	-0.01	0.11	0.41*	0.41*	0.06	-0.55*	1.00						
<i>zs</i>	0.34*	0.05	0.09	0.21**	0.40*	0.07	-0.26*	0.48*	1.00					
<i>g</i>	0.18**	-0.23*	-0.04	0.08	-0.21**	0.12	0.20**	0.18**	0.07	1.00				
<i>inf</i>	-0.20**	0.24*	-0.14	-0.18**	-0.13	-0.13	0.66*	-0.47*	-0.25*	-0.41*	1.00			
<i>finlib</i>	-0.06	-0.31*	0.05	0.32*	0.38*	-0.02	-0.08	0.41*	-0.05	0.01	-0.18**	1.00		
<i>fdi</i>	0.15***	0.05	-0.07	-0.10	-0.05	0.01	0.45*	-0.10	-0.07	0.11	0.02	0.15***	1.00	
<i>obd</i>	0.01	0.12	-0.10	-0.19	-0.03	0.15	0.04	0.29*	-0.14	-0.13	0.06	0.18**	0.13	1.00

(*), (**), and (***) denote 1, 5, and 10 percent level of statistical significance, respectively.

CHAPTER FOUR

COMPETITIVENESS AND STABILITY OF THE BANKING INDUSTRY IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY

4.1 INTRODUCTION

The competitive behaviour of commercial banks is closely related to the stability of the financial system. There are two theoretical predictions on the relationship between competition of the banking industry and financial stability, namely the competition-fragility hypothesis and the competition-stability hypothesis. The former predicts that increased competition in the banking system erodes financial stability. This is because profits, which are generally larger in less competitive markets, act as a buffer against fragility and provide incentives against risk-taking. Allen and Gale (2004) show that a high degree of heterogeneity of borrowers may result in riskier portfolios in a market characterised by fierce competition and high competition may result in weak screening of borrowers. Bolt and Tieman (2004) add that high competition in the banking industry encourages banks to behave in a riskier manner. Perfect competition may make it harder for banks to provide liquidity to a peer bank that suffers a transient liquidity shortage. As a result, such a bank may go under and unnecessarily cause systemic crisis (Allen and Gale, 2000).

The competition-stability hypothesis predicts a positive relationship between competition and stability, that is, higher competition improves bank efficiency and enhances financial stability. Boyd and De Nicolo (2005) show that market power in banking enables banks to charge higher interest rates on loans. As a result, high interest rates make it costly for firms to repay loans and raise the size of non-performing loans to the detriment of financial stability. In addition, they argue that a high degree of market power breed “too big to fail” banks which have a huge incentive to take on greater risks because they are insulated against collapse. This situation creates wrong incentives and increases chances of instability in the banking system (Mishkin, 1999).

In this chapter, this study tests the hypothesis that there is a causal relationship between competition in the banking industry and financial instability in SADC. It contributes to knowledge in two ways. First, although a number of studies focus on

the relationship between competition and financial stability, to the best of my knowledge no study has examined the causality between the two especially in a developing country context. Second, this study adds a new dimension to the study of the competition-stability hypothesis by incorporating the role of bank profitability and financial integration on this matter. Hence, the study would attain the following objectives. The first one is to determine the impact of competition in the banking industry on financial stability, in the context of financial integration in the region, taking bank profitability into account; and the second one is to ascertain the direction of causality between competition in the banking industry and financial stability in SADC.

4.2 THE RELATIONSHIP BETWEEN COMPETITIVENESS AND FINANCIAL STABILITY: LITERATURE REVIEW

Mishkin (1999:6) argues that the term financial instability is used to describe a situation that ensues “when shocks to the financial system interfere with information flows so that the financial system can no longer do its job of channelling funds to those with productive investment opportunities.” At the micro level, financial instability is usually measured using the ratio of bank non-performing loans to total loans and the z-score which captures the probability of default of a bank by comparing the returns with the volatility of the same returns.

The relationship between competition and stability in the banking industry is explained by two theories, namely the competition-fragility and competition-stability hypotheses. The competition-fragility hypothesis is supported by the “charter-value” theory of banking. According to this theory, a bank is modelled around the choice it makes on the risk of a portfolio of assets (Marcus, 1984; Keeley, 1990). This model predicts that in an environment of high competition, banks are under pressure to make profits and have incentives to take on more risks. Consequently, this increases the degree of fragility. Moreover, stiff competition makes it hard for banks to monopolise on borrower-information and deters them from earning significant gains from possessing such unique information on borrowers. This dampens the incentive to undertake accurate borrower screening thereby increasing the risk of instability (Allen and Gale, 2004). The policy prescription emerging from these models is that elimination of barriers to entry and competition augurs well for financial stability.

Another argument that is put forward in support of competition-fragility hypothesis is that market power enhances profitability through quasi-monopoly pricing. This argument perceives profits that are generated in concentrated markets as a source of franchise value.¹⁹ Monopoly pricing leads to high profits which improve the market value of the bank as well as franchise value. The profits made by banks provide a cushion against negative shocks which may threaten financial stability (Micco and Panizza, 2005). Since profit margins are thin in competitive markets, market power is able to foster financial stability through a buffer of profits that can be helpful during a downswing. This means that banks may plough back profits during bad times in order to cushion themselves.

The relationship between competition and fragility also depends on the interbank market and the payment system. A perfectly competitive banking market suffers from cooperation-failure in the sense that if all banks are price-takers in the market, none of them desires to help a bank plagued by liquidity shortages (Allen and Gale, 2000). Such a troubled bank may eventually fail. As a result, its failure may, depending on its size and financial linkages with other banks, cause systemic failure of the entire market. In contrast, under limited competition, banks are willing to assist another bank that faces transient illiquidity (Saez and Shi, 2004). Furthermore, the number of players in the banking industry is crucial for financial stability. A smaller number of banks in the market may lower oversight demands (supervisory and regulatory burden) and improve financial stability (Beck, 2008).

Hellman et al. (2000) use a dynamic model that takes into account the problem of moral hazard and find that high competition encourages gambling or risk-loving behaviour in the banking industry. They conclude that for regulation to be effective to avert a decline in prudence in the banking industry, capital requirements should be coupled with controls on deposit rates. In addition, Repullo (2004) underscores that markets which are competitive and devoid of risk-based regulation that is effective to curb incentives that shift risk, are more prone to risk.

The size of the bank plays an important role in strengthening the competition-fragility relationship. The theoretical underpinning here is that concentrated markets tend to have larger banks with diversified portfolios and enjoy economies of scale in

¹⁹ Franchise value is the opportunity cost of bankruptcy. It can be computed as the present value of future profits that the banks expect to realise (Northcott, 2004).

offering financial intermediation services (Diamond, 1984; Allen, 1990). Conversely, highly competitive markets have smaller banks with narrower portfolios and no scale economies. Therefore, the “large-bank” theory predicts that competitive markets are more fragile compared to their less competitive counterparts.

According to Smith (1984) a reduction in competition in the banking industry improves the stability of the industry, while higher competition threatens financial stability. The thrust of this assertion is that high competition worsens liability risk through its negative effect on the duration of banking relationships. Banking relationships, i.e. the relationship between a bank and its clients, last longer in less competitive markets than in competitive ones. Since banks are few in less competitive markets, their clients stick with them for longer than they would otherwise do under competitive markets. Therefore, competitive markets are plagued by uncertainty and fragility due to the short-term nature of banking relationships in such markets. Furthermore, Besanko and Thakor (1993) observe that banks which operate in competitive markets tend to take on more risk because they do not enjoy rents generated from borrower-information that their counterparts in less competitive banks are able to get through relationship banking.

The competition-stability hypothesis, on the contrary, predicts a positive relationship between competition in the banking system and financial stability. Competitive markets are characterised by low interest rates on loans. The low cost of borrowing attracts borrowers with safer projects and improves financial stability. Competition in credit markets exerts downward pressure on lending rates and encourages higher investments with no threat to solvency of banks (Koskela and Stenbacka, 2000). The opposite result obtains in markets where competition is low because interest rates tend to be high in such markets. In an environment of high interest rates, borrowing is expensive. This situation gives rise to bad incentives associated with moral hazard (Stiglitz and Weiss, 1981) in the sense that borrowers with riskier projects patronise the banks. Consequently, this increases idiosyncratic and default risks. Berger et al. (2008) indicate that high interest rates exacerbate non-performing loans and put banks at risk.

Boyd and De Nicolo (2005) also demonstrate with the aid of a theoretical model that high interest rates increase chances of non-performing loans and threaten financial stability. Thus an increase in competition would lead to lower interest rates

and reduce banks' risk appetite as well as default risk. In this sense, competition would be good for financial stability. They argue that studies that are based on franchise value theory mistakenly conclude that competition is bad for stability because they omit some important issues. First, such studies manifest a bias towards competition-fragility hypothesis by allowing deposit markets to be competitive while suppressing competition in the loan market. Second, they neglect other forms of bank assets other than loans. As a result, they focus only on the portfolio problem and ignore the optimal contracting problem associated with lending. Third, franchise value theory ignores the influence of competition on the behaviour of borrowers. To this end, Boyd and de Nicolo (2005) propose that the risk-shifting theory provides a better framework for analysing the relationship between competition and stability in banking industries.

The risk-shifting theory divides the effect of competition into two channels, namely; the deposit and lending channels. The deposit channel predicts low deposits rates in less competitive deposit markets accompanied by high bank profits and low bank risk. Nevertheless, when competition is low, interest rates on loans are high making loan defaults more likely. The net effect of the two channels influences bank risk. In the context of asymmetric information problems, moral hazard and adverse selection on the borrower's side, the lending channel is stronger. The effect in this case is that competition reduces bank risk through lower funding costs and enhances financial stability (Boyd and de Nicolo, 2005).

According to Martinez-Miera and Repullo (2010), the risk-shifting theory does not take into account the fact that the revenue that the bank makes from performing loans declines as lending rates fall. They describe what they call the margin-effect theory which assumes that as competition stiffens, it exerts downward pressure on lending rates. Low interest rates make it much easier for firms that would otherwise still be willing to repay the loans at higher interest rates, to continue to service their loans. In a way, the effective profits generated by the banks are lower than they would otherwise be at high interest rates. This increases the tendency for banks to take on more risk. Hence, over and above the *risk-shifting effect*, there is an opposite *margin effect*. Consequently, the relationship between competition and the stability of the banking industry is not monotonic; rather it is U-shaped. This underscores the fact that the probability of bank failure declines at the initial stages as competition rises

and begins to increase beyond a certain point. Therefore, the net effect of competition on stability depends on which effect dominates between the risk-shifting or margin effects.

Concentrated markets tend to be breeding platforms for large banks. Some banks may grow to levels where they may be deemed “too-large to fail/fail.” The “too large to fail” status creates bad incentives. Mishkin (1999) argues that such banks may begin to take on greater risks knowing that they will be bailed out in case borrowers begin to default to the point where the bank may go insolvent. In contrast, fierce competition keeps the size of banks in check and ensures that no bank grows to levels where it becomes “too big to fail.” In this sense, market concentration is bad for financial stability. Moreover, having large banks that have close financial linkages with other smaller banks in the industry intensifies systemic risk. In this context, systemic risk may culminate into contagion as an ailing large bank may push small and financially healthy banks into insolvency only to precipitate a financial crisis.

Beck (2008) points out that large is also complex. He indicates that there is a positive correlation between bank size and complexity of the business model of the bank. If concentration is a result of consolidation through mergers and acquisitions, the resulting bank conglomerates may end up offering a complex array of financial products which were previously offered by specialised institutions. In this way, large bank monitoring is difficult and increases regulatory and supervisory burden. If the regulatory and supervisory apparatus fails to keep pace with such developments, then concentration may lead to financial fragility.

There is no doubt that financial instability is very costly. Hoggarth and Saporta (2001) estimate the fiscal cost of banking crises for the period 1977-2000 at 4.5 per cent of GDP. Boyd et al. (2003) show that there is a higher likelihood of a costly banking crisis under competitive markets than under less competitive ones. This underscores the value of understanding the relationship between competition and financial stability. Allen and Gale (2004) argue that the relationship between competition and financial stability is more complex than a simple trade-off purported by the competition fragility hypothesis.

Empirical evidence on the relationship between banking industry competitiveness and financial stability is mixed. For example, in the case of the US economy, Keeley (1990) finds that following liberalisation and deregulation in the US during the 1980s

competition increased and led to higher fragility of the banking system. This finding is confirmed by Dick (2006) who observes an increase in loan loss provisions following deregulation. Moreover, Salas and Saurina (2003) discover that the three decade long liberalisation process in Spain improved competition and exposed banks with lower equity-asset ratios to higher credit risk. On the contrary, Jayaratne and Strahan (1998) argue that an acute decline in loan losses was realised in the US in the period after deregulation of branches. This implies that competition that was stimulated by deregulation enhanced financial stability in the US. Additional support of this stance is given by Jimenez et al. (2007) in the case of Spain. They point out that in Spain the quality of loans improves with more market power because non-performing loans tend to decline as market power increases.

The large-bank effect has also been studied by Benston et al. (1995) who find that mergers and acquisitions in the US improved diversification and resulted in financial stability. This result is backed up by Craig and Santos (1997). However, Hughes and Mester (1998) refute this finding with the assertion that consolidation, which leads to greater concentration, has a tendency to raise the risk associated with bank portfolios. In addition, De Nicolo (2000) supports the fact that, in the case of banks in America, Japan and Europe, expansion in bank size due to consolidation leads to increased probability of failure. Moreover, De Nicolo and Kwast (2002) argue that consolidation raised systemic risk in the US between 1988 and 1999 through interbank linkages.

The evidence from single-country studies is mixed. Beck (2008) indicates that the ambiguity in the single-country studies highlights two issues. The first issue is that the relationship between market structure and financial stability is not the same as the relationship between competitiveness and financial stability. The second one is that a complex web of interactions exists between 1) the regulatory and supervisory framework, 2) market structure and competitiveness as well as the individual or combined impact of these factors on 3) financial stability. Furthermore, cross-country studies tend to mainly provide empirical proof for the competition-stability hypothesis while evidence on the concentration-stability hypothesis remains ambiguous.

In a cross-country study, Beck et al. (2006) find evidence of a positive relationship between competition and financial stability. Schaeck et al. (2006) find evidence of an inverse relationship between competition and financial stability. They

used the H-statistic to measure competition in 38 countries over the period 1980-2003. Their finding is that competitive markets are financially safer than less competitive ones. In addition, Schaeck and Cihak (2007) use 2,600 banks in Europe to demonstrate that capital ratios are higher for banks that operate in competitive markets. They conclude that competition improves financial stability through bank capitalisation.

Entry barriers and other restrictions on banks are identified as a threat to financial stability because they hinder competition (Barth et al., 2004). Such restrictions create room for more market power. Berger et al. (2009) study 23 developed countries and find out that market power tends to increase loan portfolio risk. Further support for this argument is given by Boyd et al. (2009) who use bank-level data from 23 developed countries to compute z-scores and estimate bank fragility in a study of the relationship between market power and fragility. They find that countries characterised by high concentration have a higher probability of bank failure. On the contrary, Beck et al. (2006) investigated the relationship between market power and financial stability on a sample of 69 countries during the period 1980-1997. Their findings indicate that systemic crises are less possible in concentrated banking systems.

Internationalisation of banks also plays a pivotal role in the relationship between competition and financial stability. As transnational banks penetrate domestic markets, they enjoy diversification gains and may raise the range of financial products locally and put pressure on profit margins. Consequently, since foreign banks are generally well-capitalised they contribute positively to the stability of banking system of the recipient country (Barth et al., 2004).

Evidence from cross-country studies indicates that some aspects of financial system liberalisation thwart systemic risk if supervision is effective (Shehzad and de Haan, 2009). This means that there are several other factors that impact on the competition-stability relationship which may either result in an inverse or positive relationship between the two. For example, regulation through risk-based capital requirements tends to lower the competition-effect on financial stability. Allen (2012) indicates that banks that have high capitalisation are perceived to have a higher incentive to monitor firm performance. As a result, bank charter value improves as bank risk declines. Moreover, appropriately priced deposit insurance may curb the

risk of bank runs (Demirgüç-Kunt and Huizinga, 2004). Brown and Dinc (2011) warn that when supervisors choose to bail out ailing banks simply because they are too big or too many that their collapse may cause systemic crisis, they create an implicit too big/many to fail dilemma. This practice provides an incentive for banks to take risk together. Such herding behaviour may increase chances of mob failure.

Another factor is availability of alternative financial products. Berger et al (2009) argue that availability of financial services offered by stock markets provides an alternative for firms to switch between bank loans and other forms of funding. Since stock listings impose high requirements on transparency and information disclosure, such requirements ensure that firms that make intentional/calculated defaults incur reputational costs. Even in a competitive environment, this would deter firms from such behaviour and create stability.

The quality of institutions has a direct effect on moral hazard and adverse selection. One example is the sharing of credit information. Institutions such as a credit registry or bureau create databanks on the credit history of borrowers. Since such information can be shared with banks, it can reduce moral hazard and adverse selection because borrowers will have good incentives to choose safer investments and avoid defaulting on loans (Kallberg and Udell, 2003). Houston et al. (2010) utilise a sample of 2,400 banks in 69 different countries and find that information sharing improves bank profits and reduces bank risk. Depending on how these factors interact, the outcome may be either a trade-off between competition and stability or a positive relationship between the two. This may be the reason why some studies also find no evidence of any relationship between competition and financial stability (Matutes and Vives, 1996).

4.3 METHODOLOGY

4.3.1 Panel unit root tests

The simple time-series unit-root tests have low power, often due to sample size problems. Panel data unit-root and cointegration tests gain power by exploiting both the time-series and cross-sectional dimensions of the data set. This study employs three panel unit-root tests, namely; the Levin and Lin (1992), and the Levin, Lin and Chu (2002), Maddala and Wu (1999), and Im et al. (2003) tests. In case where the three tests contradict, the decision rule is a simple majority rule. If the two series are

stationary, then causality is tested using a simple vector autoregressive (VAR) based Granger causality test, however, presence of non-stationarity necessitates testing for cointegration. Canning and Pedroni (2008) show that in the presence of cointegration, the VAR model used to test for panel causality should incorporate an error correction term.

4.3.2 Panel Causality Test

The study proceeds to ascertain the direction of causality between the financial instability and competition in the banking industry in SADC. The procedure follows Holtz-Eakin et al. (1989) who specify a VAR model that accounts for individual effects as follows:

$$FS_{it} = \beta_0 + \sum_{k=1}^L \beta_j FS_{i,t-k} + \sum_{k=1}^L \delta_k COM_{i,t-k} + \gamma_{FIS,i} + \zeta_{it} \quad (30)$$

$$COM_{it} = \varpi_0 + \sum_{k=1}^L \varpi_k COM_{i,t-k} + \sum_{k=1}^L \tau_k FS_{i,t-k} + \gamma_{COM,i} + \varepsilon_{it}$$

Where FS_{it} and COM_{it} represent financial stability and competition in the banking industry for country i ($i = 1, \dots, N$) at time t ($t = L + 1, \dots, T$), respectively. L and k ($k = 1, \dots, L$) denote the maximum lag and the lag length chosen using the Akaike and Schwarz information criteria, respectively. ζ_{it} and ε_{it} are error terms. $\gamma_{FIS,i}$ and $\gamma_{COM,i}$ are the fixed effects for financial intermediation spread and competition in the banking industry. Unlike a simple VAR which assumes that the underlying structure is identical for each country and fails to allow for individual effects, the equation 31 includes $\gamma_{FIS,i}$ and $\gamma_{COM,i}$ to avoid inconsistent estimates caused by the correlation between the right-hand side variables and the individual effect. Nevertheless, even this system suffers from correlation between the lagged dependent variables and the error terms with the fixed effect term. Such a problem can be circumvented by eliminating the fixed effects by differencing the data as follows:

$$\Delta FS_{it} = \beta_0 + \sum_{k=1}^L \beta_k \Delta FS_{i,t-k} + \sum_{k=1}^L \delta_k \Delta COM_{i,t-k} + v_{it} \quad (31)$$

$$\Delta COM_{it} = \varpi_0 + \sum_{k=1}^L \varpi_k \Delta COM_{i,t-k} + \sum_{k=1}^L \tau_k \Delta FS_{i,t-k} + \varphi_{it}$$

Where Δ is the difference operator and $v_{it} = \Delta \zeta_{it}$ and $\varphi_{it} = \Delta \varepsilon_{it}$ are the error terms. Holtz-Eakin et al. (1989) indicate that equation 31 suffers from the simultaneity problem due to the correlation between the difference error terms and the lagged dependent variables. Moreover, heterogeneity may emerge from heterogeneous errors across the different countries. They propose the use of instrumental variables to overcome these problems. The procedure tests for the null hypothesis of no causality given by:

$$H_0: \delta_k = \tau_k = 0 \quad (32)$$

The outcome of the cointegration test determines the choice of the VAR specification. If FS_{it} and COM_{it} are not cointegrated, then the specification according to equation 31 is used. It can be estimated using the generalised method of moments (GMM) procedure of Arellano and Bond (1991). However, if cointegration is present between FS_{it} and COM_{it} , then Canning and Pedroni (2008) shows that an appropriate specification should include an error correction term as follows:

$$\Delta FIS_{it} = \beta_0 + \kappa_i \hat{e}_{it-1} + \sum_{k=1}^L \beta_k \Delta FS_{i,t-k} + \sum_{k=1}^L \delta_k \Delta COM_{i,t-k} + v_{it} \quad (33)$$

$$\Delta COM_{it} = \varpi_0 + \pi_i \hat{e}_{it-1} + \sum_{k=1}^L \varpi_k \Delta COM_{i,t-k} + \sum_{k=1}^L \tau_k \Delta FS_{i,t-k} + \varphi_{it}$$

The error correction term \hat{e}_{it} is constructed on the basis of the cointegrating relationship and measures the size of the deviation from long-run equilibrium which can be defined as:

$$\hat{e}_{it} = FS_{it} - \hat{\alpha}_i - b_i - \hat{\lambda}_i COM_{it-k} \quad (34)$$

The adjustment back to the long-run equilibrium relationship between FS_{it} and COM_{it} , is possible if at least κ_i or π_i are not equal to zero. Equation 31 is augmented in three ways. First, a time dummy variable namely: *year2007* which takes the value of 1 for the year 2007 and after, and zero otherwise, is added to the model. This addition is intended to capture the impact of the global financial crisis that emanated from the sub-prime crisis in the United States of America and spread to other

countries around the world. Second, in order to investigate the impact of financial integration on the relationship between financial stability and banking competitiveness, the study also adds $FI_{i,t-1}$ to equation 31. This variable represents two measures of financial integration, namely financial liberalisation index and the ratio of offshore bank deposits to total bank deposits. Third, two measures of bank profitability namely; the return on assets and equity are also introduced in the equations in turns. They are represented by $Pro_{i,t-1}$, in equation 35 below. Finally, the impact of institutions such as the credit bureau, denoted as $bureau_{i,t-1}$, is investigated by including the following interactive terms in equation 35, $\Delta COM_{i,t-k} * bureau_{i,t-1}$ and $\Delta COM_{i,t-k} * bureau_{i,t-1}$. This modification enables the study to capture the conditional relationship between financial stability and banking competitiveness if and only if there is a credit bureau in the country (Brambor et al., 2006). Therefore, the study estimated variants of the following augmented VAR:

$$\Delta FS_{it} = \beta_0 + \sum_{k=1}^L \beta_k \Delta FS_{i,t-k} + \sum_{k=1}^L \delta_k \Delta COM_{i,t-k} + \gamma_1 \Delta COM_{i,t-k} * bureau_{i,t-1} + \theta_1 Pro_{i,t-1} + \theta_2 FI_{i,t-k} + \theta_3 year2007 + \Delta v_{it} \quad (35)$$

$$\Delta COM_{it} = \varpi_0 + \sum_{k=1}^L \varpi_k \Delta COM_{i,t-k} + \sum_{k=1}^L \tau_k \Delta FS_{i,t-k} + \gamma_1 \Delta FS_{i,t-k} * bureau_{i,t-1} + \phi_1 Pro_{i,t-1} + \phi_2 FI_{i,t-k} + \phi_3 year2007 + \Delta \varphi_{it}$$

The study applies the Arellano and Bond (1991) system GMM procedure to estimate equation 35. Roodman (2006:1) indicates that this technique is “designed for situations with 1) ‘small T , large N ’ panels.” In fact, Bruno (2005) concurs that GMM estimators retain their properties when N is large but once N becomes small, they become biased and imprecise. In addition, Judson and Owen (1999) perform Monte Carlo simulations and find that GMM estimators produce efficient estimates for unbalanced panels with $T \leq 10$. This description characterises the dataset used in this study as explained in section 4.4.1 below.

Granger causality test is very sensitive to the lag length selected. Therefore, prior to applying system GMM to estimate equation 35 above, an optimal lag length should be determined so that causality can be tested at an appropriate lag length k . There is no emerging consensus on how to select an appropriate lag length for panel data.²⁰

²⁰ For example, Liu et al. (2001) choose the longest possible lag and then estimate the system VAR 1 eliminating one lag at the time until they get to the shorted lag. In their case the longest lag was set at $k = 4$, and the elimination process reduced the lag length to $k = 1$. Then the analysis is conducted

This study adopts the approach followed by Hartwig (2010) and Hartwig (2012) who estimate equation 30 using ordinary least square and use the Schwarz information criterion (SIC) to ascertain an appropriate lag length. Schwarz (1978) shows that the SIC is computationally simple and performs effectively in many modelling frameworks especially in small samples.

4.4 DATA ANALYSIS

4.4.1 Data and variable description

The study uses annual data for a ten-year period spanning 2000 to 2010 collected from World Bank's New Database on Financial Development and Structure for the fourteen countries in SADC. Furthermore, data on the financial liberalisation index were obtained from the Chinn-Ito database²¹. The data provide measurements for bank competitiveness and financial instability for panels with $N = 14$ and $T = 10$. Appendix 4A provides description of the variables.

4.4.2 Presentation and discussion of results

4.4.2.1 Unit root test results

The unit root tests unanimously reveal that all variables are stationary, i.e. integrated of order zero – $I(0)$ - with the exception of the concentration ratio and the financial liberalisation index which are non-stationary (Appendix 4B). Both the concentration ratio and the financial liberalisation index are integrated of one i.e. $I(1)$. This means that their first differences are stationary. Since the measure of financial stability – z-score- is stationary, there is no combination of financial stability and competition measure that warrants any need for testing for cointegration. Panel Granger causality test can be conducted using a standard equation 35 above as augmented.

4.4.2.2 Causality between competition and financial instability in SADC

using the Wald test based on all lag structures. None of the information criteria is used in this case to decide on the optimal lag length. Other studies such as Hsiao and Hsiao (2006:1099) just use the principle that the number of coefficients should not exceed the number of cross-section units.

²¹ Downloadable from: http://web.pdx.edu/~ito/Chinn-Ito_website.htm

The relevant diagnostic tests are reported with the results in Tables 4.1 to 4.3. First, the instrument count is reported in line with the recommendation of Roodman (2006). Roodman (2006:40) reasons that “too many instruments can overfit endogenous variables and fail to expunge their endogenous components.” The results of this study generally comply with the rule of thumb that the number of instruments must be less than the number of countries studied. Second, the Hansen test supports the validity of instruments that have been used in the estimations. Third, the second order Arellano-Bond autocorrelation test shows evidence of low serial correlation between the residuals. Therefore, the results of the estimation of equation 35 using system-GMM are reliable.

Table 4.1: Causality between banking competitiveness and financial instability in SADC

<i>Predictor</i>	<i>Causality between</i>		<i>Impact of the financial crisis</i>	
	<i>zs</i>	<i>bi</i>	<i>zs</i>	<i>bi</i>
<i>1st lag zs</i>	0.804* (0.000)	0.008 (0.173)	0.684** (0.011)	0.008 (0.221)
<i>2nd lag zs</i>	0.315*** (0.098)	-0.006 (0.191)	0.206 (0.347)	-0.007 (0.228)
<i>1st lag bi</i>	-114.793* (0.006)	0.553* (0.000)	-84.025** (0.079)	0.517*** (0.099)
<i>2nd lag bi</i>	99.056* (0.000)	0.597** (0.026)	92.560** (0.019)	0.619 (0.166)
<i>Year2007</i>			5.221** (0.060)	0.013 (0.795)
<i>Direction of causality</i>	<i>bi → zs</i>		<i>bi → zs</i>	
<i>Wald test</i>	19.72* (0.001)	1.98 (0.181)	5.42** (0.038)	1.65 (0.220)
<i>Hansen test</i>	1.70 (0.945)	3.46 (0.903)	3.03 (0.696)	4.22 (0.754)
<i>AB – AR(1)</i>	-1.76 (0.078)	-1.96 (0.051)	-1.68 (0.092)	-2.23 (0.026)
<i>AB – AR(2)</i>	-0.06 (0.952)	-1.29 (0.196)	-0.70 (0.485)	-1.44 (0.150)
<i>Intrument count</i>	12	12	10	12
<i>Lag length</i>	2	2	2	2

(*), (**) and (***) indicate 1, 5 and 10 percent level of significance, respectively. The tests include both individual effects and linear trends and p-values are in parenthesis. Two-step system GMM procedure with robust standard errors was used in order to adjust for heteroscedasticity. AB-AR (1) and AB-AR (2) refer to the Arellano-Bond first and second order serial correlation test, respectively.

Table 4.1 presents results for the estimation of the equation 35 and its augmented version which incorporates a time dummy variable for the year 2007. Competition is

measured by the Boone indicator; a higher Boone indicator implies lower competition. Financial instability is measured by the z-score, which simply captures the probability of default in the banking industry. The selected lag length is 2. Competitiveness in the banking industry Granger causes financial instability for SADC countries. The results show opposite signs for the coefficient of the Boone indicator at different lags. This implies that increased competitiveness in the banking industry is accompanied by higher financial instability in the first year. This is evidence for the *competition-fragility* effect. However, in the second year, the effect switches to a *competition-stability* effect. This finding remains robust when a time dummy variable for the year 2007 is added to the model. The sign for this dummy variable is positive even though its impact is only significant on financial instability. This means that the occurrence of the global financial crisis in 2007 resulted in a higher probability of default in the SADC banking industry.

The causal relationship between bank competitiveness and financial instability was also investigated by separately adding profitability and financial integration measures to equation 35 as control variables. In this case the selected lag length is 1. The results for these estimations are presented in Table 4.2. When bank profitability is measured using the return on equity, Granger causality is observed from financial instability to bank competitiveness. The positive sign for the Boone indicator implies that an increase in financial instability in SADC dampens the competitive appetite of commercial banks in the region. This result remains robust even when controlling for financial integration in the region using the financial liberalisation index. Nevertheless, when bank profitability is controlled for using return on assets, there is no evidence of causality between bank competition and financial instability. Even though causality tends to run from competition to financial instability when financial integration is controlled for using the ratio of offshore bank deposits to total bank deposits (see Appendix 4C). Table 4.3 also shows that the dummy variable for the global financial crisis has a positive effect on the z-score which suggests that the probability of default increased during the global financial crisis period. This implies that financial liberalisation exposes the banking industry to financial instability through contagion.

Table 4.2: Causality between banking competitiveness and financial instability in SADC when controlling for profitability and financial integration

<i>Predictor</i>	<i>Causality between</i>		<i>Causality between</i>	
	<i>zs</i>	<i>bi</i>	<i>zs</i>	<i>bi</i>
<i>1st lag zs</i>	0.866* (0.000)	0.003** (0.016)	0.973* (0.000)	0.002* (0.009)
<i>1st lag bi</i>	4.150 (0.353)	0.714** (0.012)	0.235 (0.971)	1.132* (0.002)
<i>1st lag finlib</i>	0.664 (0.130)	0.006 (0.472)		
<i>1st lag roe</i>			0.074 (0.150)	0.001 (0.315)
<i>Year2007</i>	4.611*** (0.069)	-0.081** (0.061)	-0.227 (0.846)	-0.039** (0.035)
<i>Direction of causality</i>	<i>zs → bi</i>		<i>zs → bi</i>	
<i>Wald test</i>	0.93 (0.353)	7.66** (0.016)	0.00 (0.971)	9.86* (0.009)
<i>Hansen test</i>	9.07 (0.336)	5.60 (0.587)	3.46 (0.903)	4.91 (0.767)
<i>AB – AR(1)</i>	-1.92 (0.055)	-1.76 (0.078)	-1.82 (0.069)	-1.81 (0.070)
<i>AB – AR(2)</i>	-0.09 (0.931)	0.44 (0.663)	0.00 (0.996)	0.40 (0.691)
<i>Instrument count</i>	12	11	12	12
<i>Lag length</i>	1	1	1	1

(*), (**) and (***) indicate 1, 5 and 10 percent level of significance, respectively. The tests include both individual effects and linear trends and *p*-values are in parenthesis. Two-step system GMM procedure with robust standard errors was used. AB-AR(1) and AB-AR(2) refer to the Arellano-Bond first and second order serial correlation test, respectively.

4.4.2.3 Dealing with information asymmetries

Table 4.3 presents results for causality test between competition in the banking industry in SADC and financial instability when accounting for the presence of the credit bureau. There is evidence of Granger causality from bank competition to financial instability. An interesting observation in this case relates to the effect of competition on financial instability. This effect, for a given year, is given by the sum of the coefficient of competition and the appropriate interaction term. The results show that, in the first year, competition has a negative average effect of 33.6 percent on the Boone indicator, that is, an increase in bank competition will lead to a rise in financial instability. This is the *competition-fragility* effect. However, in the second year, the effect becomes positive with a value of 27.5 percent implying a *competition-stability* effect. Hence, the effect of the degree of competition on financial instability

is smaller in the presence of a credit bureau indicating that such institutions reduce information asymmetries.

Table 4.3: Causality between competition and financial instability in SADC when controlling for presence of credit bureau

<i>Predictor</i>	<i>Causality between</i>		<i>Causality between</i>	
	<i>bi</i>	<i>zs</i>	<i>bi</i>	<i>zs</i>
<i>1st lag bi</i>	0.722* (0.002)	79.170* (0.006)	0.589** (0.016)	102.339* (0.008)
<i>2nd lag bi</i>	0.171 (0.469)	-75.755* (0.007)	0.371*** (0.066)	-81.831* (0.004)
<i>1st lag zs</i>	0.009 (0.655)	0.730* (0.000)	0.009 (0.282)	0.620* (0.001)
<i>2nd lag zs</i>	-0.010 (0.605)	0.365* (0.002)	-0.010 (0.260)	0.103 (0.455)
<i>1st lag bi * bureau</i>		-112.795** (0.028)		-127.243* (0.005)
<i>2nd lag bi * bureau</i>		103.295* (0.008)		135.679* (0.000)
<i>1st lag zs * bureau</i>	-0.002 (0.896)		-0.004 (0.644)	
<i>2nd lag zs * bureau</i>	0.003 (0.834)		0.005 (0.613)	
<i>Year2007</i>			0.004 (0.929)	7.233** (0.047)
<i>Direction of causality</i>	<i>bi → zs</i>		<i>bi → zs</i>	
<i>Wald test</i>	1.80 (0.201)	8.24** (0.014)	1.38 (0.284)	9.53* (0.002)
<i>Hansen test</i>	2.01 (0.919)	8.16 (0.226)	1.10 (0.954)	3.20 (0.670)
<i>AB – AR(1)</i>	-3.71 (0.000)	-2.00 (0.046)	-1.91 (0.056)	-1.90 (0.057)
<i>AB – AR(2)</i>	0.25 (0.801)	0.00 (0.997)	0.22 (0.823)	0.36 (0.718)
<i>Instrument count</i>	12	12	12	12
<i>Lag length</i>	2	2	1	1

(*), (**) and (***) indicate 1, 5 and 10 percent level of significance, respectively. The tests include both individual effects and linear trends and p-values are in parenthesis. Two-step system GMM procedure with robust standard errors was used. AB-AR(1) and AB-AR(2) refers to the Arellano-Bond first and second order serial correlation test, respectively.

The results in Table 4.3 reaffirm the findings obtained without controlling for the credit bureau as reported in Table 4.1 and provide evidence of causality running from bank competition to financial instability. Moreover, it shows that institutions such as the credit bureau which are designed to reduce information asymmetries can be

effective in ensuring that competition contributes to financial stability in the long-run. The message for competition authorities and regulatory and supervisory authorities is that formulation of sound competition, regulatory and supervisory policies requires a coordinated approach. None of such policies can be effective if drafted in isolation because their implementation clearly has a bearing on the nexus between competition and financial stability.

4.4.2.4 *Causality between market power and financial instability in SADC*

Table 4.4 presents results for causality test between market power in the banking industry in SADC and financial instability. Market power is measured using a simple concentration ratio. There is evidence of Granger causality from financial instability to market power. The sign of the coefficient of financial instability is positive which indicates that increased probability of default in the banking industry increases the level of concentration in the market. This may reflect the fact that financial instability may lead to mergers and acquisitions as efficient banks swallow troubled banks. A similar finding obtains when the two measures of financial integration are included in the model, even though no evidence of causality is found when the two measures of bank profitability are used (Appendix 4D). In addition, when the dummy variable for the year 2007 is added to the model, there is evidence of bidirectional causality between financial instability and market power. The positive effect of this dummy variable on financial instability reflects the fact that the global financial crisis could have increased the probability of default in the SADC banking industry. However, the negative effect on concentration indicates that such a crisis may not have increased concentration levels even though this effect is not statistically significant.

Table 4.4: Causality between banking market power and financial instability in SADC

<i>Predictor</i>	<i>Causality between</i>		<i>Impact of the financial crisis</i>		<i>Impact of credit bureau</i>			
	<i>zs</i>	<i>ci</i>	<i>zs</i>	<i>ci</i>	<i>zs</i>	<i>ci</i>	<i>zs</i>	<i>ci</i>
<i>1st lag zs</i>	0.981*	0.544*	0.916*	0.530***	0.263	0.842*	0.034*	0.844*
	(0.001)	(0.007)	(0.000)	(0.068)	(0.104)	(0.000)	(0.004)	(0.000)
<i>1st lag ci</i>	0.011	0.897*	0.024**	0.912*	0.649*	0.974***	0.832*	0.998
	(0.792)	(0.000)	(0.031)	(0.000)	(0.001)	(0.092)	(0.006)	(0.126)
<i>1st lag ci * bureau</i>					-0.328		-0.021	
					(0.315)		(0.501)	
<i>1st lag zs * bureau</i>						-0.398		-0.451
						(0.388)		(0.452)
<i>Year2007</i>			1.054	-3.742			3.243	0.009
			(0.452)	(0.476)			(0.525)	(0.999)
<i>Direction of causality</i>	<i>zs → ci</i>		<i>ci ↔ zs</i>		<i>zs → ci</i>		<i>ci → zs</i>	
<i>Wald test</i>	0.07	9.94*	5.74**	3.90***	1.62	9.17*	6.11	1.49
	(0.792)	(0.007)	(0.031)	(0.068)	(0.224)	(0.003)	(0.012)	(0.242)
<i>Hansen test</i>	9.84	8.99	11.28	10.26	2.40	7.44	9.99	7.00
	(0.277)	(0.438)	(0.336)	(0.418)	(0.934)	(0.490)	(0.351)	(0.428)
<i>AB – AR(1)</i>	-2.03	-2.32	-2.12	-1.89	-1.71	-2.17	-1.90	-2.22
	(0.042)	(0.021)	(0.034)	(0.058)	(0.088)	(0.030)	(0.057)	(0.027)
<i>AB – AR(2)</i>	-0.36	-1.34	0.06	-0.99	-0.27	-1.47	0.85	-1.26
	(0.719)	(0.182)	(0.949)	(0.321)	(0.784)	(0.142)	(0.394)	(0.208)
<i>Instrument count</i>	10	11	13	13	10	11	13	11
<i>Lag length</i>	1	1	1	1	1	1	1	1

(*), (**) and (***) indicate 1, 5 and 10 percent level of significance, respectively. The tests include both individual effects and linear trends and p-values are in parenthesis. Two-step system GMM procedure with robust standard errors was used. AB-AR (1) and AB-AR (2) refer to the Arellano-Bond first and second order serial correlation test, respectively.

4.5 CONCLUSION

The study attempted to test the hypothesis that there is a causal relationship between competition and financial instability. The findings validate this hypothesis and bring up several revelations. *First*, there is evidence of Granger causality from competition to financial instability in SADC. Nevertheless, the effect of competition tends to vary from a *competition-fragility effect* in the first year to a *competition-stability effect* in the second year. This result is robust even when the dummy variable for the global financial crisis is added to the model. However, when information asymmetries are minimised through establishment of a credit bureau, the size of the effect of competition on financial instability is reduced. *Second*, when financial integration and profitability are included in the model, the direction of causality switches. In this case, financial instability Granger causes competition in the banking industry, that is, a rise in the probability of default dampens the competitive appetite of commercial banks in SADC. This implies that competition policy should always be accompanied by policies that are aimed at achieving and maintaining financial stability. *Third*, there is also evidence of Granger causality from financial instability to market power. An increase in the probability of default results in consolidations and increases the level of concentration in the market. This finding reinforces the fact that formulation and implementation of effective competition policy to create a competitive environment in the banking industry should always take issues of financial stability into account. Otherwise, a rise in financial instability will erode competition in the market. More specifically, the findings have a strong implication for policy in the sense that competition policy should never be formulated and implemented in isolation. In fact, it should be accompanied by appropriate policies intended to enhance financial stability.

The evidence of a causal relationship between financial instability and bank competition has implications for financial intermediation in SADC through the pricing behaviour of commercial banks. It is therefore important to investigate the causal relationship between bank competition and the financial intermediation spread in SADC. The next chapter is devoted to this important issue.

REFERENCES

- Allen, F. (1990), –The market for information and the origin of financial intermediation,” *Journal of Financial Intermediation*, 1(1): 3-30
- Allen, F. (2012), –Financing firms in different countries,” in G. Wood and M. Demirbag (eds), **Handbook of institutional approaches to institutional business**, Edward Elgar publishing limited, Cheltenham, UK: 41-64
- Allen, F. and D. Gale (2000), –Financial contagion,” *Journal of political economy*, 108(1): 1-33
- Allen, F. and D. Gale (2004), –Competition and financial stability,” *Journal of Money, Credit, and Banking*, 36(3): 454-480
- Arellano, M and S. Bond, (1991), –Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations.” *Review of Economic Studies*, 58: 277-297
- Bank of Namibia (2011), Financial Stability Report, Windhoek, Namibia
- Barth, J.R., Caprio, Jr., G., and R. Levine (2004), –Bank supervision and Regulation: What Works Best?” *Journal of Financial Intermediation* 13(2): 205-48.
- Beck, T., Demirgüç-Kunt, A., and R. Levine (2006), –Bank concentration, competition, and crises: First results.” *Journal of Banking and Finance* 30(5): 1581-603.
- Beck, T. (2008), –Bank competition and financial stability: Friends or foes?” Policy research working paper No. WPS4656, World Bank, Washington DC
- Benston, G., Hunter, C. and L. Wall (1995), –Motivations for bank mergers and acquisitions: enhancing the deposit insurance put option versus earnings diversification,” *Journal of Money, Credit and Banking*, 27: 777-788
- Berger, A., R. DeYoung, M. Flannery, D. Lee, and O. Oztekin (2008), –How Do Large Banking Organizations Manage Their Capital Ratios?” *Journal of Financial Services Research*, 34 (2): 123–49
- Berger, A. N., L. Klapper and R. Turk-Ariss (2009), –Bank competition and financial stability,” *Journal of Financial Services Research*, 35(2): 99-118
- Besanko, D. and A. V. Thakor (1993), –Relationship banking, deposit insurance and bank portfolio,” in C. Mayer and X. Vives (eds), **Capital markets and Financial Intermediation**, Cambridge: Cambridge University Press, 262-285
- Bolt, W. and A. F. Tieman (2004), –Banking competition, risk and regulation,” IMF working paper No. WP04/11, Washington DC, USA
- Boyd, J. H., De Nicolo, G. and B. D. Smith (2003), –Crises in competitive versus monopolistic banking systems,” IMF Working paper No. WP/03/188, Washington DC
- Boyd, J. H. and G. De Nicolo (2005), –The theory of bank risk taking and competition revisited,” *Journal of Finance*, 60(3): 1329-1343
- Boyd, J. H., G. De Nicolo and A. Jalal (2009), –Bank competition, risk and asset allocations,” IMF working paper No. WP09/143, Washington DC
- Brambor, T. Clark, W. and M. Golder (2006), “Understanding Interaction Models: Improving Empirical Analyses” *Political Analysis*, 14: 63-82
- Brown, C. and S. Dinc (2011), –Too many to fail? Evidence of regulatory reluctance in bank failures when banking sector is weak,” *Review of Financial Studies*, 24(4): 1378-1405
- Bruno, G. S. (2005), –Estimation and inference in dynamic unbalanced panel-data models with small number of individuals,” *The Stata Journal*, 5(4): 473-500

- Canning, D. and P. Pedroni (2008), "Infrastructure, long-run economic growth and causality tests for cointegrated panels," *The Manchester School*, 76 (2008): 504-527
- Craig, B. and J. Santos (1997), "The risk effect of bank acquisitions." Federal Reserve Bank of Cleveland Economic Review, Quarter II (1997): 25-35.
- De Nicoló, G. (2000), "Size, charter value and risk in banking: An international perspective." International Finance Discussion Paper No. 689, Board of Governors of the Federal Reserve System
- De Nicoló, G. and Kwast, M. (2002) Financial risk and consolidation: Are they related?" *Journal of Banking and Finance*, 26(5): 861-80
- Demirgüç-Kunt, A. and H. Huizinga (2004), "Market discipline and deposit insurance," *Journal of Monetary Economics* 51(2): 375-399
- Diamond, D. (1984), "Financial intermediation and delegated monitoring," *Review of Economic Studies*, 51(3): 393-414
- Dick, A. (2006), "Nationwide branching and its impact on market structure, quality and bank performance," *Journal of Business*, 79(2): 567-592
- Hartwig, J. (2010), "Is health capital formation good for long-term economic growth? –Panel Granger-causality evidence for OECD countries," *Journal of Macroeconomics*, 32(2010): 314-325
- Hartwig, J. (2012), "Testing the growth effects of structural change," *Structural Change and Dynamics*, 23(2012): 11-24
- Hellman, T., Murdock, K. and J. E. Stiglitz, (2000), "Liberalisation, moral hazard in banking and prudential regulation: Are capital controls enough?" *American Economic Review*, 90(1): 147-165
- Hoggarth, G. and V. Saporta (2001), "Costs of banking system instability: Some empirical evidence," *Financial Stability Review*, (June 2001): 148-165
- Hughes, J.P., and L. Mester (1998), "Bank capitalization and cost: Evidence of scale economies in risk management and signaling." *Review of Economics and Statistics*, 80(2): 314-25.
- Holtz-Eakin, D, Newey, W. and H. S. Rosen, (1989), "The revenues-expenditures nexus: Evidence from local government data." *International Economic Review*, 30: 415-429
- Houston, J. F., Lin, C., Lin, P. and Y. Ma (2010), "Credit rights, information sharing and bank risk-taking," *Journal of Financial Economics*, 96(3): 485-512
- Im, K. S, M. H. Pesaran and Y. Shin (2003), "Testing for unit roots in heterogeneous panels," DAE, Cambridge University Working paper No. 9526, UK
- Jayaratne, J. and P. Strahan (1998), "Entry restrictions, industry evolution, and dynamic efficiency: Evidence from commercial banking," *Journal of Law and Economics*, 41(1): 239-279
- Jimenez, G., Lopez, J. and J. Saurina (2007), "How does competition impact bank risk-taking?" Federal Reserve Bank of San Francisco working paper No. 2007-23, USA
- Judson, R. A. and A. L. Owen (1999), "Estimating dynamic panel data models: a guide for macroeconomists," *Economics Letters*, 65(1999): 9-15
- Levine A. and C. F. Lin (1992), "Unit root test in panel data: Asymptotic and sample properties," University of California at San Diego, Discussion paper No. 93, USA
- Levine, A. Lin, C. F. and C. S. Chu (2002), "Unit root test in panel data: Asymptotic and finite sample properties," *Journal of Econometrics*, 108: 1-24
- Keeley, M. C. (1990), "Deposit insurance, risk and market power in banking,"

- American Economic Review*, 80(5): 1183-1200
- Kallberg, J.G. and G. F. Udell (2003), –The value of private sector business credit information sharing: The US case,” *Journal of Banking and Finance*, 27(3): 449-469
- Koskela, E. and R. Stenbacka (2000), –Is there a trade-off between bank competition and financial fragility?” *Journal of Banking and Finance*, 24(12): 1853-1873
- Maddala, G. S. and S. Wu (1999), –A comparative study of unit root tests with panel data and new simple test,” *Oxford Bulletin of Economics and Statistics*, Special Issue: 631-65
- Marcus, A. J. (1984), –Deregulation and bank financial policy,” *Journal of Banking and Finance*, 8(4): 557-565
- Martinez-Miera, D. and R. Repullo (2010), –Does competition reduce the risk of bank failure?” *Review of Financial Studies*, 23 (10):3638-3664
- Matutes, C. and X. Vives (1996), –Competition for deposits, fragility and insurance,” *Journal of Financial Intermediation*, 5(2): 184-216
- Micco, A. and U. Panizza (2005), –Bank Concentration and Credit Volatility”. Central Bank of Chile Working Paper No. 342, Chile
- Mishkin, F. S. (1999), –Financial consolidation: Dangers and opportunities,” *Journal of Banking and Finance*, 23(February): 675-691
- Mowatt, R. (2001), –Prospects for financial sector reform in the context of regional integration in SADC,” Trade and Industrial Policy Secretariat (TIPS), South Africa
- Northcott, C.A. (2004), –Competition in banking: A review of the literature,” Bank of Canada, Working Paper No. 2004-24, Canada
- Repullo, R. (2004), –Capital requirements, market power and risk-taking in banking,” *Journal of Financial Intermediation*, 13(2): 156-182
- Roodman, D. (2006), –How to do xtabond2: An introduction to “difference” and “system” GMM in Stata,” Working Paper No. 103, Center for Global Development.
- Schaeck, K., Cihak, M., and S. Wolfe (2006), –Are more competitive banking systems more stable?” IMF Working Paper No. 06/143, Washington DC, USA
- Schaeck, K. and M. Cihak (2007), –Banking competition and capital ratios.” IMF Working Paper No. 07/216, Washington DC, USA
- Saez, L. and Shi, X. (2004), –Liquidity pools, risk sharing and financial contagion,” *Journal of Financial Services Research*, 25(1): 5-23
- Salas, V. and J. Saurina (2003), –Deregulation, market power and risk behaviour in Spanish banks,” *European Economic Review*, 47(6): 1061-1075
- Schwarz, G. (1978), –Estimating the dimension of a model,” *The Annals of Statistics*, 6: 461-464
- Shehzad, C. T. and J. De Haan (2009), –Financial reform and banking crises,” CESifo working paper, No. 2870
- Smith, B. D. (1984), –Private information, deposit interest rates, and the ‘stability’ of the banking system,” *Journal of Monetary Economics*, 14(3): 293-317
- South African Reserve Bank (2010), Bank Supervision Department Annual Report, Pretoria, South Africa
- Stiglitz, J. and A. Weiss (1981): Credit Rationing in Markets with Imperfect Information, *American Economic Review* 71,393-410

LIST OF APPENDICES

Appendix 4A: Description of variables

<i>Variable</i>		<i>Description</i>
Bank Competitiveness	<i>ci</i>	Concentration index
	<i>bi</i>	Boone indicator is a measure of degree of competition based on profit-efficiency in the banking market. It is calculated as the elasticity of profits to marginal costs. An increase in the Boone indicator implies a deterioration of the competitive conduct of financial intermediaries.
Financial instability	<i>zs</i>	z-score captures the probability of default of a country's banking system, calculated as a weighted average of the z-scores of a country's individual banks (the weights are based on the individual banks' total assets). Z-score compares a bank's buffers (capitalization and returns) with the volatility of those returns.
Bank profitability	<i>roe</i>	Commercial banks' net income to yearly averaged equity.
	<i>roa</i>	Commercial banks' net income to yearly averaged total assets.
Financial integration	<i>finlib</i>	The Chinn-Ito financial liberalisation index

Appendix 4B: Panel unit root test results

	<i>Level</i>			<i>First difference</i>			<i>Decision</i>
	<i>LLC</i>	<i>IPS</i>	<i>F-ADF</i>	<i>LLC</i>	<i>IPS</i>	<i>F-ADF</i>	
<i>ci</i>	-2.465* (0.007)	0.979 (0.836)	16.009 (0.936)	-15.815* (0.000)	-1.933** (0.027)	54.869* (0.001)	I(1)
<i>bi</i>	-11.497* (0.000)	-2.898* (0.002)	71.438* (0.000)				I(0)
<i>roe</i>	-11.976* (0.000)	-1.824** (0.034)	44.744* (0.006)				I(0)
<i>roa</i>	-9.698* (0.000)	-2.022** (0.022)	48.364* (0.002)				I(0)
<i>finlib</i>	-0.264 (0.396)	1.903 (0.971)	4.916 (0.961)	-7.222* (0.000)	-1.170 (0.121)	22.512** (0.032)	I(1)
<i>obd</i>	-6.821* (0.000)	-0.777 (0.219)	45.742** (0.019)				I(0)
<i>zs</i>	-9.194* (0.000)	-2.030** (0.021)	59.228* (0.001)				I(0)

(*), (**) and (***) indicate 1, 5 and 10 percent level of significance, respectively. The tests include both individual effects and linear trends. The null hypothesis is that there is a panel unit root. The decision is based on a simple majority rule of the three tests in a case where they yield contradictory results. The optimal lag was selected using the SIC.

Appendix 4C: Causality between banking competitiveness and financial instability in SADC

<i>Predictor</i>	<i>Causality between</i>		<i>Causality between</i>	
	<i>zs</i>	<i>bi</i>	<i>zs</i>	<i>bi</i>
<i>1st lag zs</i>	1.024* (0.000)	-0.007 (0.138)	0.831* (0.000)	-0.0003 (0.831)
<i>2nd lag zs</i>	0.058 (0.629)	0.008 (0.220)	0.064 (0.665)	-0.001 (0.843)
<i>1st lag bi</i>	-9.188 (0.632)	-0.283 (0.410)	-23.244*** (0.082)	0.487** (0.042)
<i>2nd lag bi</i>	17.728 (0.384)	0.685 (0.213)	36.527*** (0.068)	0.301 (0.112)
<i>1st lag roa</i>	0.269 (0.847)	-0.011 (0.393)		
<i>2nd lag roa</i>	0.934 (0.643)	0.004 (0.620)		
<i>1st lag obd</i>			-0.006 (0.774)	0.0003 (0.652)
<i>2nd lag obd</i>			0.018 (0.481)	-0.0004 (0.487)
<i>Year2007</i>	-4.221 (0.620)	-0.036 (0.560)	3.772*** (0.069)	-0.001 (0.969)
<i>Direction of causality</i>	<i>None</i>		<i>bi → zs</i>	
<i>Wald test</i>	0.50 (0.494)	2.08 (0.175)	4.46*** (0.053)	0.00 (0.960)
<i>Hansen test</i>	3.61 (0.989)	3.52 (0.620)	6.58 (0.999)	7.32 (0.992)
<i>AB – AR(1)</i>	-2.06 (0.040)	-1.83 (0.068)	-1.72 (0.086)	-1.87 (0.061)
<i>AB – AR(2)</i>	-0.60 (0.547)	-0.32 (0.751)	-0.62 (0.538)	0.53 (0.593)
<i>Intrument count</i>	19	12	29	26
<i>Lag length</i>	2	2	2	2

(*), (**) and (***) indicate 1, 5 and 10 percent level of significance, respectively. The tests include both individual effects and linear trends and p-values are in parenthesis. Two-step system GMM procedure with robust standard errors was used. AB-AR(1) and AB-AR(2) refers to the Arellano-Bond first and second order serial correlation test, respectively.

Appendix 4D: Causality between market power and financial instability in SADC when controlling for profitability and financial integration

Predictor	Causality between		Causality between		Causality between		Causality between	
	zs	ci	zs	ci	zs	ci	zs	ci
1st lag zs	0.898*	0.684*	0.824*	0.517***	0.937*	0.412	1.135*	0.233
	(0.000)	(0.009)	(0.000)	(0.079)	(0.000)	(0.362)	(0.002)	(0.607)
1st lag ci	0.009	0.886*	0.029	0.937*	0.010	0.887*	0.007	0.884*
	(0.818)	(0.000)	(0.245)	(0.000)	(0.841)	(0.000)	(0.900)	(0.000)
1st lag obd	-0.010	0.034						
	(0.760)	(0.766)						
1st lag finlib			0.886	1.133				
			(0.344)	(0.589)				
1st lag roe					0.008	0.213**		
					(0.954)	(0.021)		
1st lag roa							-2.089	3.361**
							(0.242)	(0.016)
Year2007	3.591	-6.823	3.142	-6.242	1.328	-6.899***	3.823	-6.863***
	(0.261)	(0.123)	(0.202)	(0.156)	(0.521)	(0.066)	(0.253)	(0.049)
Direction of causality	zs → ci		zs → ci		None		None	
Wald test	0.05	9.28*	1.47	3.58***	0.04	0.90	0.02	0.28
	(0.819)	(0.009)	(0.245)	(0.079)	(0.842)	(0.362)	(0.900)	(0.607)
Hansen test	12.47	7.19	8.12	10.76	2.28	4.93	8.96	5.30
	(0.188)	(0.618)	(0.522)	(0.293)	(0.810)	(0.425)	(0.441)	(0.808)
AB – AR(1)	-1.86	-1.75	-2.17	-2.07	-2.00	-2.31	-1.75	-1.69
	(0.063)	(0.080)	(0.030)	(0.039)	(0.046)	(0.021)	(0.080)	(0.091)
AB – AR(2)	0.58	-1.13	-0.03	-1.55	0.73	-1.09	-1.09	-0.89
	(0.564)	(0.256)	(0.974)	(0.120)	(0.467)	(0.274)	(0.274)	(0.374)
Intrument count	13	13	13	13	9	9	13	13
Lag length	1	1	1	1	1	1	1	1

(*), (**) and (***) indicate 1, 5 and 10 percent level of significance, respectively. The tests include both individual effects and linear trends and p-values are in parenthesis. Two-step system GMM procedure with robust standard errors was used. AB-AR (1) and AB-AR (2) refers to the Arellano-Bond first and second order serial correlation test, respectively.

CHAPTER FIVE

COMPETITIVENESS OF THE BANKING INDUSTRY AND FINANCIAL INTERMEDIATION SPREAD IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY

5.1 INTRODUCTION

The micro-economic determinants of the financial intermediation spread include the competitiveness of the banking industry. Economic theory links more competitive markets with efficient banks and small financial intermediation spreads (Beck and Hesse, 2009). The literature on this subject commonly uses two rival structural theories to explain the link between competition and the pricing behaviour of banks. On the one hand, the structure-conduct-performance hypothesis indicates that banks with a large share of the market and distinct products or services tend to gain market power in both the loans and deposits markets. In order to reap huge profits, such banks charge high on loans and offer little on deposits (Berger, 1995). Consequently, the gap between lending and deposit rates becomes wide. On the other hand, the efficiency hypothesis states that concentration can be a result of consolidation as more efficient banks grow faster than their inefficient counterparts even to the point of taking them over. In this case, the surviving banks may set lending and deposit rates efficiently even if concentration in the market increases as a result of the mergers and acquisitions (Gropp et al., 2007). This theory predicts a narrow financial intermediation spread even in concentrated markets. Moreover, a third theory called the new empirical industrial organisation (NIEO) theory is sometimes used to study the causal relationship between bank competition and financial intermediation spread. It argues for a co-existence of concentration and competitive pricing in the market. This means that high concentration in markets does not necessarily imply low competition (Claessens and Leaven, 2004).

In SADC foreign bank penetration is high. For example, South African banks have penetrated markets of several other member states and in some instances even taking over some local banks. Of course, there is also presence of foreign banks from outside SADC. There is empirical evidence that such foreign bank entry enhances competition in domestic markets (Barajas et al., 2000; Demirguc-Kunt et al., 2004). However, it is vital to assess the impact of competition on the pricing behaviour of

banks. In order to do so, this chapter tests the hypothesis that higher competition leads to narrow financial intermediation spread. The chapter would achieve two objectives. The first one is to test the causal relationship between financial intermediation spread and competition while the second one is to examine the role of financial integration in this causal relationship. In doing so, the study would thus contribute to the stock of knowledge in two ways. First, owing to the importance of the spread to effective financial development, a study of the causal relationship between competition and the financial intermediation spread is crucial. Second, Aziakpono et al. (2007) found evidence of financial integration in the SADC region especially among countries that are part of SACU. Hence, SADC provides a natural experiment for assessing the interaction between competition and the size of the spread in the context of financial integration. To the best of my knowledge, no study of this nature has been conducted especially in the context of SADC.

5.2 LITERATURE REVEIW

The size of the financial intermediation spread, that is the difference between lending and deposit rates, is important in the process of financial intermediation²². Bernanke (1983) perceives the spread as the cost of financial intermediation. Brock and Rojas-Suarez (2000) argue that wide spreads reflect higher lending rates and low rates of deposits. As a result, wide interest rate spreads impede investment through high costs of borrowing and, at the same time, suffocate domestic resource mobilisation via low returns on deposits. Several studies have investigated the determinants of interest rate spreads and find that both micro and macro-economic factors play a pivotal role (Demirguc-Kunt and Huizinga, 1999; Demirguc-Kunt et al., 2003). Lack of competition is also found to be a very important micro-economic determinant of the interest rate spread.

The link between the financial intermediation spread and the competitive level of the banking industry depends largely on the effect of market structure on the pricing behaviour of banks. Two rival theories have been traditionally used to explain this link, namely the structure-conduct-performance (SCP) and efficient-structure hypotheses. The literature on this subject considers Hicks (1935) as the pioneer of the

²² The financial intermediation spread is used interchangeably with interest rate spread

SCP hypothesis. He referred to it as the *quiet life hypothesis* in the sense that managers that exercise monopoly power in the market enjoy monopoly rents and exert minimal effort towards attaining efficiency due to the absence of competition. In this way, concentration increases inefficiencies. Competition is thus seen as a way of eliminating such inefficiencies in the market because it creates an environment of rival behaviour between market participants and provides incentives for managers to exert more effort to keep their firm solvent (Leibenstein, 1966)²³. Corvoisier and Gropp (2002) assert that under the SCP hypothesis concentrated markets are characterised by collusive behaviour of banks and unfavourable pricing. In this case, banks that command a large market share tend to be price-setters in the markets and are likely to use this power to ask for high rates of interest on loans and pay low rates of interest on deposits in order to reap abnormal profits.

Berger and Hannan (1998) argue that market structure affects efficiency as a result of several factors. For example, greater market power enables banks, not only to reap supernormal profits but also their managers to enjoy a quiet life because they do not need to worry about high costs in an uncompetitive environment. In addition, such managers may perpetuate their inefficiency by using their market power to charge high prices. In this way, managerial incompetence or slack management which characterises markets with high concentration creates inefficiencies in the market through high costs. Evidence in support of the SCP hypothesis is provided by the Goddard et al. (2001) in the case of European banks.

Another structural theory - the efficient-structure hypothesis - reaches a different conclusion²⁴. According to this hypothesis, more efficient banks experience more rapid growth than their less efficient counterparts. Such banks may be able to cut production costs through x-efficiency, by eliminating waste and attaining maximum output using a given quota of inputs. Sometimes, more efficient banks may even buy-over the less efficient banks and begin to enjoy scale efficiency. It is argued that this situation increases the level of concentration in the market without compromising the competitive pricing behaviour of the efficient banks (Gropp et al., 2007). In this way, market concentration is a consequence of better performance by banks that are efficient. Molyneux and Forbes (1995) argue that the underpinning of the efficient

²³ Other early proponents of the SCP hypothesis include Mason (1939) and Bain (1951).

²⁴ This theory is attributed to the pioneering work of Demsetz (1973) by Perera et al. (2012)

structure hypothesis is that profit maximising firms that enjoy cost efficiency would gain a larger market share by beating the price of rival firms. Several studies, such as Berger (1995) on US banking markets, Lang (1996) on Western German banks, Weill (2004) on Western European banks, and Pruteanu-Podpiera et al. (2007) on the Czech banking sector, find support for the efficiency hypothesis.

A third theory that links competition with the price-setting behaviour of banks is the NEIO theory (Bresnahan, 1982; Panzar and Rosse, 1987). Unlike the two structural theories discussed above, this is a non-structural theory which argues that concentrated markets may also manifest competitive pricing. The position of this theory is that factors such as barriers to entry and exit as well as the degree of contestability in the market have a bearing on the level of competition in the market. If there is free entry into the market or minimal restrictions to entry, banks manifest competitive pricing even in concentrated markets. This assertion is backed-up by Hauner and Peiris (2005) in their study of the Ugandan banking sector. They find that competitiveness increased at the same time when concentration increased in the markets. Mahathanaseth and Tauer (2012) undertake a study on the Thai banking industry using the NEIO approach. In this study, they examine the impact of market concentration on interest rate margins and find that collusion and market power increased during the 2005 to 2011 period with adverse effects on the interest rate margins. The proliferation of internet-usage, which empowers consumers to compare interest rates for a large spectrum of banks, could increase contestability in the market (Corvoisier and Gropp, 2002). This of course, underscores the critical role of high literacy levels, presence and proper enforcement of effective information disclosure requirements as well as access to reliable internet services.

Competition in banking markets has important implications for access to credit by small and medium-sized enterprises. Unlike studies by Petersen and Rajan (1995) and Fischer (2000) which link more concentration with more availability of credit in their studies on the US and German economies, respectively, more recent studies provide evidence of benefits of competition to credit-seeking firms. For example, Agostino and Trivieri (2010) use panel data on Italian firms for the period 1995 to 2003 to demonstrate the importance of competition for easy access to credit by small and medium-sized firms. They find that competition improves credit conditions for the benefit of such enterprises. In addition, Claessens and Laeven (2005) in their cross

country study of 16 countries for a period spanning 1980 to 1990 provide further evidence of a positive relationship between competitive banking markets and firm growth. Additional support for the finding that access to credit by small and medium-sized firms improves with competition is offered by Carbo-Valverde et al. (2009) in the case of Spain. In a recent study, Chong et al. (2012) find that, in China, constraints to access to credit by small and medium-sized enterprises tend to increase with concentration levels. Moreover, Love and Peria (2012) find evidence that lack of competition is bad for credit extension. Their study uses a cross country sample comprising 53 countries.

A number of studies have been carried out with a focus on the determinants of the interest rate spread. In the case of the EU, Carbo-Valverde and Rodriguez-Fernandez (2007) investigate this issue for the period 1994 to 2001 and find no evidence of a relationship between market concentration and interest rate spread. Nevertheless, the study finds that the spread is related to various forms of bank risk such as interest rate, credit and liquidity risks. However, Claeys and Vennet (2008) examine the determinants of interest rate spreads in Central and Eastern European Countries (CEEC) in comparison to Western European countries during the period 1994 to 2001. They find that competition, inferred from market structure, exerts downward pressure on the magnitude of the interest rate spread.

In Latin America, Brock and Rojas-Suarez (2000) study the phenomenon of the determinants of interest rate spread in Argentina, Colombia, Bolivia, Chile and Peru for the 1991 to 1996 period. They find that micro-economic factors influence the spread in Bolivia, while in Chile and Colombia, both micro and macro-economic factors matter. Still in Latin America, Peria et al. (2004) investigate the impact of foreign entry and market concentration in Argentina, Chile, Peru, Colombia and Mexico for the 1995 to 2001 period. They make two observations from their results. First, market concentration is an important determinant of the interest rate spread especially for local banks. Second, foreign banks are able to enjoy cost efficiency and thus exert competitive pressure in the market. A study of the same subject in Mexico by Maudos and Solis (2009) reveal that high interest rate spreads are related to the market power of banks. More recently, Chortareas et al. (2012) study the relationship between the interest rate spread and market power and competition using Generalised Method of Moments (GMM) for 9 countries in Latin America covering the period

1999 to 2006. They find that competitive markets have narrow spreads. However, there seems to be no effect of market power on the size of the interest rate spread.

There is also literature on other factors that have a bearing on the relationship between competition and the price-setting behaviour of banks. Some of the factors are bank ownership (Micco et al., 2007; Demirguc-Kunt et al., 2004), availability of substitute-financial products and services (Corvoisier and Gropp, 2002), regulation (Souza-Sobrinho, 2010) and bank size (Bikker et al., 2006). The size of the bank plays a significant role in helping a bank to gain market power. Bikker et al., (2006) show that large banks tend to control a larger share of the market than small banks. This means that markets that have large banks are characterised by high concentration levels. In fact, according to the relative market power proposition, small banks only serve as a “competitive fringe” (Perera et al., 2012:67).

The ownership of banks also plays a crucial role in influencing the pricing behaviour of banks. The literature distinguishes between the pricing behaviour of private versus state-owned banks and between foreign as opposed to domestic banks. For example, according to Micco et al. (2007) private banks tend to be more efficient than state-owned banks. In addition, there is a significant literature on the contribution of foreign ownership to the pricing behaviour of banks. In fact, several studies have specifically analysed the interaction between market structure, active presence of foreign banks and the financial intermediation spread (Barajas et al., 2000; Demirguc-Kunt et al., 2004). These studies find that foreign entry improves the efficiency of financial intermediation. Hence, if foreign banks help improve the competitiveness of banks in the market; they exert pressure that narrows the spread between lending and deposit rates.

The price-setting behaviour of banks also responds to the presence of other non-bank players in the financial market which offer substitute products to banking services. The Monti-Klein model suggests that availability of substitutes to bank products reduces the interest rate spread (Freixas and Rochet, 1997). Gropp et al. (2007:10) indicate that according to “the Ho and Saunders model, the banks spreads depend on the elasticity of the demand for loans and the supply of deposits.” A low elasticity for the demand for loans or supply of deposits implies a wider financial intermediation spread if competition is low in the market. This means that availability of substitute financial products and services would increase competition in the market

and reduce the interest rate spread. For example, on the market for loans, Corvoisier and Gropp (2002) show that when firms have an option to raise funds from the stock market, interest rates on loans are likely to be lower. On the deposit side, if alternative financial products such as securities investment and money market funds are accessible to households, they would influence banks to offer competitive deposits rates.

The majority of studies on the relationship between competition and the interest rate spread do not examine the causality between the two. There are, however, recent studies that investigate the causal relationship between competition and bank efficiency. For example, using a sample comprising of banks from both the European Union (EU) and the US, Schaeck and Cihak (2008) discover that the direction of causality runs from competition to profit efficiency. In addition, Pruteanu-Podpiera et al. (2007) lends support for the finding that competition Granger-causes bank efficiency in their study which focuses on the market for loans for a sample of Czech banks during the period 1994 to 2005. A year later, Casu and Girardone (2009) utilise a panel Granger-causality test to examine the competition-efficiency hypothesis using a sample of commercial banks drawn from France, Germany, Italy, Spain, and United Kingdom for a period 2000 to 2005. Their findings provide evidence of bi-directional causality between competition and bank efficiency. Ferreira (2012) use a sample of banks from 27 EU countries for the period 1996 to 2008 and find that competition Granger-causes cost-efficiency of banks.

5.3 METHODOLOGY

5.3.1 Unit root tests

Unlike simple time-series unit root tests which are plagued by problems of low power especially when the time span is short, unit root tests based on panel data gain more power by exploiting both time series and cross-sectional dimensions of the data. This study uses three panel unit root tests, namely; the Levin and Lin (1992), and Levin, Lin and Chu (2002), Maddala and Wu (1999), and Im et al. (2003) tests (Appendix 3D).

5.3.2 Panel Granger Causality Test

The study proceeds to ascertain the direction of causality between the financial intermediation spread and competition in the banking industry in SADC. The procedure is based on the following VAR model:

$$FIS_{it} = \mu_{FIS,i} + \sum_{k=1}^L \eta_{11ik} FIS_{i,t-k} + \sum_{k=1}^L \eta_{12ik} COM_{i,t-k} + \zeta_{it} \quad (36)$$

$$COM_{it} = \mu_{COM,i} + \sum_{k=1}^L \eta_{21ik} COM_{i,t-k} + \sum_{k=1}^L \eta_{22ik} FIS_{i,t-k} + \varepsilon_{it}$$

Where FIS_{it} and COM_{it} represent financial intermediation spread and competition in the banking industry for country i ($i = 1, \dots, N$) at time t ($t = L + 1, \dots, T$), respectively. k ($k = 1, \dots, L$) and L denote the lag length and the maximum lag chosen using the Schwarz information criteria (SIC), respectively. ζ_{it} and ε_{it} are error terms. The VAR-36 assumes that the underlying structure is identical for each country and fails to allow for individual effects. This omission leads to inconsistent estimates because the right hand side variables tend to correlate with the individual effects. Holtz-Eakin et al. (1989) account for individual effects as follows:

$$FIS_{it} = \beta_0 + \sum_{k=1}^L \beta_k FIS_{i,t-k} + \sum_{k=1}^L \delta_k COM_{i,t-k} + \gamma_{FIS,i} + v_{it} \quad (37)$$

$$COM_{it} = \varpi_0 + \sum_{k=1}^L \varpi_k COM_{i,t-k} + \sum_{k=1}^L \tau_k FIS_{i,t-k} + \gamma_{COM,i} + \varphi_{it}$$

Where $\gamma_{FIS,i}$ and $\gamma_{COM,i}$ are the fixed effects for financial intermediation spread and competition in the banking industry, respectively. v_{it} and φ_{it} are the error terms. VAR-37 also faces a problem due to the correlation between the lagged dependent variables and the error terms with the fixed effect term. This problem is circumvented by eliminating the fixed effects by differencing the data as follows:

$$\Delta FIS_{it} = \beta_0 + \sum_{k=1}^L \beta_k \Delta FIS_{i,t-k} + \sum_{k=1}^L \delta_k \Delta COM_{i,t-k} + \Delta v_{it} \quad (38)$$

$$\Delta COM_{it} = \varpi_0 + \sum_{k=1}^L \varpi_k \Delta COM_{i,t-k} + \sum_{k=1}^L \tau_k \Delta FIS_{i,t-k} + \Delta \varphi_{it}$$

Where Δ is the difference operator. Holtz-Eakin et al. (1989) indicate that VAR-38 suffers from the simultaneity problem due to the correlation between the difference error terms and the lagged dependent variables. Moreover, heterogeneity may emerge from heterogeneous errors across the different countries. They propose the use of

instrumental variables to overcome these problems. The procedure tests for the null hypothesis of no causality given by:

$$H_0: \delta_k = \tau_k = 0 \quad (39)$$

The VAR-38 is estimated using the generalised method of moments (GMM) procedure of Arellano and Bond (1991). The GMM is able to correct the endogeneity problem that is inherent in dynamic panels by differencing the data to eliminate individual effects. Furthermore, use of instrumental variables removes the correlation between the lagged dependent variable and the error term (Roodman, 2006). If cointegration is present between FIS_{it} and COM_{it} , then Canning and Pedroni (2008) show that an appropriate specification should include an error correction term as follows:

$$\Delta FIS_{it} = \beta_0 + \kappa_i \hat{e}_{it-1} + \sum_{k=1}^L \beta_j \Delta FIS_{i,t-k} + \sum_{k=1}^L \delta_k \Delta COM_{i,t-k} + \Delta v_{it} \quad (40)$$

$$\Delta COM_{it} = \varpi_0 + \pi_i \hat{e}_{it-1} + \sum_{k=1}^L \varpi_k \Delta COM_{i,t-k} + \sum_{k=1}^L \tau_k \Delta FIS_{i,t-k} + \Delta \varphi_{it}$$

As indicated in the previous chapter, \hat{e}_{it} is constructed on the basis of the cointegrating relationship and measures the size of the deviation from long-run equilibrium.

The VAR-38 is augmented by including two dummy variables namely: $CA_{i,t-1}$ and $year2007$. $CA_{i,t-1}$ takes the value of 1 for a country that has established a competition authority that is at least five years old and zero otherwise. The inclusion of this variable is motivated by the fact that in an effort to intensify competition and promote fair trading in the economy, individual members of SADC enacted competition laws and established competition authorities to implement such laws (See appendix 2B). It is important to investigate the impact of competition policies on the causal relationship between financial intermediation spread and banking competitiveness. For this purpose, the product of $CA_{i,t-1}$ and the appropriate predictor is introduced in the model as indicated in VAR-41 below²⁵. In addition, a time dummy variable for the year 2007 is included in the model. Limiting time dummies

²⁵ In order to account for dummy variables in a system GMM framework, an interactive term is used; otherwise the effect of the dummy variable dissipates during the differencing process.

only to the year 2007 minimises the loss of degrees of freedom and makes it possible to capture the effect of the global financial crisis that emanated from the sub-prime crisis in the United States of America and spread to other countries around the world. Furthermore, two measures of financial integration, namely; the financial liberalisation index (*finlib*) and the ratio of offshore bank deposits to total deposits (*obd*) are separately added to the system of equations to account for the impact of financial integration on the competition-financial intermediation spread nexus. They are represented by $FI_{i,t-1}$, in VAR-41 below. Therefore, the study estimated the following augmented VAR:

$$\Delta FIS_{it} = \beta_0 + \sum_{k=1}^L \beta_k \Delta FIS_{i,t-k} + \sum_{k=1}^L \delta_k \Delta COM_{i,t-k} + \phi_1 FI_{i,t-1} + \theta_1 \Delta COM_{i,t-k} * CA_{i,t-1} + \omega_1 year2007 + \Delta v_{it} \quad (41)$$

$$\Delta COM_{it} = \varpi_0 + \sum_{k=1}^L \varpi_k \Delta COM_{i,t-k} + \sum_{k=1}^L \tau_k \Delta FIS_{i,t-k} + \phi_2 FI_{i,t-1} + \theta_2 \Delta FIS_{i,t-k} * CA_{i,t-1} + \omega_2 year2007 + \Delta \varphi_{it}$$

Granger causality test is very sensitive to the optimal lag length selected. It is important that the test is applied at the appropriate lag length k to avoid misleading results. For this purpose, this study adopts the approach followed by Hartwig (2010) and Hartwig (2012) who estimate VAR-36 using ordinary least square (OLS) and employ the SIC to ascertain an appropriate lag length. The optimal lag is chosen where the value of the SIC is minimum. The selected lag length for each specification is reported with other results in Tables 5.1 and 5.2.

5.4 DATA ANALYSIS

5.4.1 Data and variable description

The study uses annual data collected from World Bank's New database on Financial Development and Structure for the fourteen countries of SADC. The data covered a period running from 2000 to 2010. As mentioned in the previous chapter, the data on the financial liberalisation index were obtained from the Chinn-Ito database. Various ratios were calculated and used in the estimation of VAR-41. The definitions of the variables that are used in the model are contained in Appendix 5A.

5.4.2 Discussion of results

5.4.2.1 Results for unit root tests

The panel unit root test results are provided in Appendix 5B. The results show that the Boone indicator and the ratio of offshore bank deposits to total deposits are integrated of order zero i.e. $I(0)$ stationary, while the rest of the variables are $I(1)$ stationary. Thus VAR-41 can be estimated using a combination of an $I(0)$ stationary variable, the Boone indicator and an $I(1)$ stationary variable, the financial intermediation spread. This combination does not necessitate any testing for panel cointegration because the causality tests can be conducted without the inclusion of the error correction term in the VAR.

5.4.2.2 Causality between banking competitiveness and the financial intermediation spread

The diagnostic tests for the suitability of applying dynamic system-GMM estimation to VAR-41 are reported in Tables 5.1 and 5.2. First, the Hansen test confirms that the over-identification restrictions are valid in all specifications as reflected by the fact that *p-values* of the test exceed 0.1 significantly. Second, the Arellano-Bond autocorrelation test consistently cannot reject absence of second order serial correlation. Third, the instrument count is lower than the number of countries which increases the credibility of the results. The results for the estimation of causality between causality between bank competition, measured by the Boone indicator which is inversely related to bank competition, and the financial intermediation spread are reported in Tables 5.1 and 5.2.

The results reported in Table 5.1 provide evidence of Granger causality from bank competition to the financial intermediation spread. The coefficient of the Boone indicator is significant at 10 percent level of statistical significance and bears a positive sign which conveys a negative relationship between bank competition and the spread. As the banking industry becomes more competitive, the spread between lending and deposit rates becomes smaller. This implies that competitive pressures in the market compel banks to offer relatively higher returns on deposits to attract customers and ask for low lending rates on loans to attract borrowers. This finding shows that any policy that encourages competitive behaviour in the banking industry

augurs well for a narrow financial intermediation spread which is good for financial development.

The time dummy for the 2007 global financial crisis has a significant positive impact on the financial intermediation spread. This implies that the size of the financial intermediation spread increased during the global financial crisis that emanated from the sub-prime crisis in the United States of America. This finding supports the hypothesis that banks tend to levy a premium on the lending rate to compensate for likely losses that may be caused by financial instability. At the same time, deposit rates are usually reduced or left unchanged. Consequently, the gap between deposit and lending rates becomes larger. This finding shows that if policies that are aimed at achieving and maintaining financial stability such as sound and robust regulatory and supervisory framework are successful, they will also have other positive spill-over effects in the form of smaller financial intermediation spreads.

Table 5.1: Causality between competition and financial instability in SADC when controlling for financial integration

<i>Predictor</i>	<i>Effect of the global financial crisis</i>		<i>Effect of financial integration</i>			
	<i>Causality between</i>		<i>Causality between</i>		<i>Causality between</i>	
	<i>bi</i>	<i>fis</i>	<i>bi</i>	<i>fis</i>	<i>bi</i>	<i>fis</i>
<i>1st lag bi</i>	0.774* (0.007)	103.029*** (0.088)	0.769** (0.013)	161.225* (0.000)	0.979* (0.001)	118.188 (0.184)
<i>1st lag fis</i>	0.004 (0.161)	0.221** (0.027)	0.001 (0.927)	0.145** (0.041)	0.001 (0.586)	0.241 (0.277)
<i>1st lag finlib</i>			0.163*** (0.057)	8.460* (0.009)		
<i>1st lag obd</i>					0.0004 (0.174)	-0.029 (0.513)
<i>Year2007</i>	-0.028 (0.326)	12.032*** (0.090)	-0.035 (0.340)	17.992* (0.001)	-0.012 (0.634)	14.488 (0.238)
<i>Direction of causality</i>	<i>bi → fis</i>		<i>bi → fis</i>		<i>None</i>	
<i>Wald test</i>	2.21 (0.161)	3.40*** (0.088)	0.01 (0.927)	41.32* (0.000)	0.31 (0.586)	1.97 (0.184)
<i>Hansen test</i>	10.72 (0.296)	7.46 (0.589)	10.70 (0.219)	4.12 (0.846)	7.28 (0.507)	4.87 (0.771)
<i>AR(1) test</i>	-1.69 (0.090)	-1.85 (0.065)	-2.11 (0.035)	-2.42 (0.015)	-1.87 (0.061)	-1.83 (0.067)
<i>AR(2) test</i>	-0.12 (0.906)	1.01 (0.311)	-0.59 (0.554)	0.83 (0.408)	-0.48 (0.628)	1.00 (0.317)
<i>Instrument count</i>	12	12	12	12	12	12
<i>Lag length</i>	1	1	1	1	1	1

(*), (**) and (***) indicate 1, 5 and 10 percent level of significance, respectively. The estimations are based on Arellano-Bond twostep system GMM with robust standard errors.

Table 5.1 also shows that, on the one hand, there is evidence of causal relationship between bank competition and financial intermediation spread when financial integration is added to the model using the financial liberalisation index. This finding reinforces the fact that an increase in bank competition reduces the spread between deposits and lending rates. The coefficient of the financial liberalisation index is significant and positive in both specifications. This indicates that relaxation of restrictions that prohibit free entry into the market undermines competition in the market which in turn widens the wedge between lending and deposit rates. This finding may seem counter-intuitive because financial liberalisation is expected to facilitate foreign bank entry into the local market which in turn would intensify competitive pressures in the domestic banking industry. However, if foreign entry into the local market results in mergers and acquisitions it is possible for financial liberalisation to enlarge the spread. For example, in the case of Lesotho, such consolidation did not reduce concentration levels, but only shifted market power from domestic banks to foreign banks. This finding shows that policymakers should always ensure that countries that relax restrictions to foreign bank entry should also put policies that effectively enhance a competitive environment in the market in place. Failure to do so will only lead to high concentration in the market accompanied by high financial intermediation spread, especially if foreign entry leads to inefficient consolidations which only shift market power from local banks to foreign banks. However, no causality is evident when financial integration is captured using the ratio of offshore deposits to total deposits. Furthermore, even though the sign of this variable tends to suggest that deeper financial integration captured by an increase in the ratio of offshore deposits to total deposits, would reduce the magnitude of the financial intermediation spread, such an effect is statistically insignificant.

The study proceeds to add a dummy variable to account for the presence of competition authorities. Table 5.2 shows that this addition does not affect the direction of causality between bank competition and the financial intermediation spread. Thus the finding of the direction of Granger causality from bank competition to the financial intermediation spread remains robust. Moreover, the effect of the global financial crisis on the magnitude of the financial intermediation spread remains positive reinforcing the fact that banks add a premium to the lending rate to cushion themselves against possible losses that may be caused by the financial crisis.

However, it turns out that the effect of competition authorities is not significant. Similarly, when implementation of competition policies is accounted for in the estimation, the coefficient for the financial liberalisation index maintains its positive sign, but becomes insignificant. The policy implication is that countries that embrace financial integration must ensure that they formulate and effectively implement sound competition policies to intensify competition in the banking system and at the same time strengthen the regulatory and supervisory apparatus to bolster financial stability in order to reduce the size of the financial intermediation spread.

Table 5.2: Causality between competition and financial instability in SADC when controlling for competition policies

<i>Predictor</i>	<i>Effect of the global financial crisis</i>		<i>Effect of financial integration</i>	
	<i>Causality between</i>		<i>Causality between</i>	
	<i>bi</i>	<i>fis</i>	<i>bi</i>	<i>fis</i>
<i>1st lag bi</i>	0.581** (0.018)	89.154*** (0.078)	0.772** (0.024)	173.653* (0.008)
<i>1st lag fis</i>	0.004 (0.200)	0.175 (0.101)	0.0001 (0.985)	0.156 (0.119)
<i>1st lag finlib</i>			0.166 (0.115)	7.296 (0.179)
<i>1st lag bi * ca</i>		-6.508 (0.766)		0.800 (0.986)
<i>1st lag fis * ca</i>	0.001 (0.646)		-0.0004 (0.831)	
<i>Year2007</i>	-0.045 (0.115)	9.544*** (0.053)	-0.032 (0.487)	18.631** (0.011)
<i>Direction of causality</i>	<i>bi → fis</i>		<i>bi → fis</i>	
<i>Wald test</i>	0.92 (0.423)	3.89** (0.048)	0.01 (0.931)	4.47*** (0.056)
<i>Hansen test</i>	10.63 (0.224)	6.44 (0.599)	10.55 (0.159)	3.12 (0.874)
<i>AR(1) test</i>	-1.85 (0.065)	-1.75 (0.081)	-1.91 (0.056)	-2.32 (0.020)
<i>AR(2) test</i>	-0.24 (0.810)	0.98 (0.327)	-0.54 (0.586)	0.70 (0.482)
<i>Instrument count</i>	12	12	12	12
<i>Lag length</i>	1	1	1	1

(*), (**) and (***) indicate 1, 5 and 10 percent level of significance, respectively. The estimations are based on Arellano-Bond two-step system GMM with robust standard errors

5.5 CONCLUSION

This paper set out to test the hypothesis that higher competition leads to narrow financial intermediation spread in SADC. The findings reveal several facts. *First*, this hypothesis cannot be rejected. There is evidence of Granger causality from banking competitiveness to financial intermediation spread in SADC. The positive sign of the coefficient of the Boone indicator implies that as the level of competitiveness intensifies in the banking industry, the financial intermediation spread becomes smaller. *Second*, financial integration captured by the financial liberalisation index tends to reduce the level of competition in the market while at the same time enlarging the gap between deposit and lending rates. This implies that relaxation of entry restrictions allows inefficient consolidations as foreign banks take over local ones resulting in a mere shift in market power rather an increase in competition in the market. *Third*, the global financial crisis increased the magnitude of the financial intermediation spread in SADC. This indicates that while deposit rates tend to be sticky upwards, lending rates are rapidly increased as banks add a risk premium to the lending rate during times of instability to curb possible risks. The lesson for policymakers is that countries that seek to reduce the gap between lending and deposit rates must not hope that they can achieve that through financial liberalisation alone. In fact, a combination of financial liberalisation, competition and financial stability policies is necessary to achieve such a goal.

The findings of this chapter provide evidence of the role played by financial integration in strengthening the inverse relationship between competition and the financial intermediation spread in the SADC banking industry. It is, therefore, important to investigate the relationship between financial integration and the financial intermediation spread in a model that takes other determinants of the financial intermediation spread into account. The next chapter is devoted to the investigation of this important issue in the context of SADC countries.

REFERENCES

- Agostino, M. and Trivieri, F. (2010), –Is banking competition beneficial to SMEs? An empirical study based on Italian data,” *Small Business Economics*, 35(3): 335-355
- Arellano, M and S. Bond, (1991), –Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations.” *Review of Economic Studies*, 58: 277-297
- Aziakpono, M., S. Kleimeier, and H. Sander (2007), –Banking market integration in the SADC countries: Evidence from interest rate analysis,” Paper No. RM/07/047, Maastricht Research School of Economics of Technology and Organisations, University Maastricht
- Bain, J. S. (August 1951). –Relation of profit rate to industry concentration.” *Quarterly Journal of Economics*, 65: 293–324.
- Barajas, A., R. Steiner, and N. Salazar (2000), –The Impact of liberalisation and foreign investment in Colombia’s financial sector,” *Journal of Development economics*, 63(1): 157-196
- Beck, T. and H. Hesse (2009), –Why are interest spreads so high in Uganda?” *Journal of Development Economics*, 88(2009): 192-204
- Berger, A. N. (1995). –The profit–structure relationship in banking—Tests of market-power and efficient-structure hypotheses.” *Journal of Money, Credit, and Banking*, 27(2): 404–431.
- Berger, A.N. and Hannan, T. (1998), –The efficiency cost of market power in the banking industry: a test of the ‘quiet life’ and related hypotheses”, *Review of Economics and Statistics*, 80 (2): 454-65.
- Bernanke, B. S. (1983), –Non-monetary Effects of the Financial Crisis in the Propagation of the Great Depression.” *American Economic Review*, 73(3): 257-276.
- Bikker, J., L. Spierdijk and P. Finnie (2006), –The impact of bank size on market power.” De Nederlandsche Bank, Working Paper No. 120/2006, The Netherlands
- Bresnahan, T. F. (1982). –The oligopoly solution concept is identified.” *Economics Letters*, 10: 87–92.
- Brock, P. L. and L. Rojas-Suarez (2000) –Understanding the Behaviour of Bank Spreads in Latin America,” *Journal of Development Economics*, 63(1), 113–34.
- Canning, D. and P. Pedroni (2008), –Infrastructure, long-run economic growth and causality tests for cointegrated panels,” *The Manchester School*, 76 (2008): 504-527
- Casu, B. and C. Girardone (2009), –Does Competition Lead to Efficiency? The Case of EU Commercial Banks,” Cass Business School, Working Paper No. WP01/09
- Carbó-Valverde, S., Rodriguez-Fernandez, F., and G. Udell (2009), –Bank market power and SME financing constraints.” *Review of Finance* 13: 309-340.
- Carbo-Valverde, S. and F. Rodriguez-Fernandez (2007), –The Determinants of Bank Margins in European Banking.” *Journal of Banking and Finance*, 31(7): 2043-2063.
- Chong, T.T.L., L. Lu, and S. Ongena (2012), –Does Banking Competition Alleviate

- or Worsen Credit Constraints Faced by Small and Medium Enterprises? Evidence from China,” Discussion Paper No. 2012-013, Tilburg University, Center for Economic Research
- Chortareas, E. G., J. G. Garza-Garcia and C. Girardone (2012), “Competition, efficiency and interest rate margins in Latin American banking,” *International Review of Financial Analysis*, 24(2012): 93-103
- Claessens, S. A. and L. Laeven (2004), “What drives bank competition? Some international evidence,” *Journal of Money, Credit and Banking*, 36(3): 563-583
- Claessens, S. and L. Laeven (2005), “Financial dependence, banking sector competition and economic growth,” World Bank Research Working paper No. 3481, Washington DC.
- Claeys, S. and R. V. Vennet (2008), “Determinants of Bank Interest Margins in Central and Eastern Europe. Convergence to the West?” *Economic Systems*, 32(2): 197-216
- Corvoisier, S. and R. Gropp (2002), “Bank concentration and retail interest rates,” *Journal of Banking and Finance*, 26 (11): 2155-89
- Demirgüç-Kunt, A. and H. Huizinga (1999) “Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence,” *World Bank Economic Review*, 13(2), 379–408.
- Demirguc-Kunt, Asli L. Laeven and R. Levine (2003) “The Impact of Bank Regulations, Concentration, and Institutions on Bank Margins.” Policy Research Working Paper No. 3030, World Bank.
- Demirgüç-Kunt, A., L. Laeven and R. Levine (2004) “Regulations, Market Structure, Institutions, and the Cost of Financial Intermediation,” *Journal of Money, Credit, and Banking*, 36(3), 593-622
- Demsetz, H. (April 1973). “Industry structure, market rivalry, and public policy.” *Journal of Law and Economics*, 16: 1–10.
- Ferreira, C. (2012), “Bank market concentration and efficiency in the European Union: a panel Granger causality approach,” Technical University of Lisbon Working Paper No. 03/2012/DE/UECE
- Fischer, K. H. (2000) “Acquisition of information in loan markets and bank market power An empirical investigation.” Working Paper, Goethe University, Frankfurt.
- Freixas, X. and J. C. Rochet, (1997), *Microeconomics of Banking*, The MIT Press, Cambridge, Massachusetts.
- Goddard, J. A., Molyneux, P. M. and J. O. S. Wilson (2001), “European Banking: Efficiency, Technology and Growth,” Chichester, Wiley
- Gropp, R., C. K. Sorensen and J.D. Lichtenberger (2007), “The dynamics of bank spreads and financial structure,” European Central Bank working paper Number 7/4, Germany
- Hartwig, J. (2010), “Is health capital formation good for long-term economic growth? –Panel Granger-causality evidence for OECD countries, *Journal of Macroeconomics*, 32(2010): 314-325
- Hartwig, J. (2012), “Testing the growth effects of structural change,” *Structural Change and Dynamics*, 23(2012): 11-24
- Hauer, D. and S. J. Peiris (2005), “Bank efficiency and competition and low-income countries: the case of Uganda,” IMF Working Paper Number 05/240, Washington DC
- Hicks, J. (1935), “Annual survey of economic theory: monopoly,” *Econometrica*, 3:

1-20

- Holtz-Eakin, D, Newey, W. and H. S. Rosen, (1989), "The revenues-expenditures nexus: Evidence from local government data." *International Economic Review*, 30: 415-429
- Im, K. S, M. H. Pesaran and Y. Shin (2003), "Testing for unit roots in heterogeneous panels," DAE, Cambridge University Working paper No. 9526, UK
- Lang, G. (1996): "Efficiency, Profitability and Competition." *IFO Studien*, 42(4): 537-561
- Leibenstein, H. (1966): "Allocative Efficiency versus X-Efficiency." *American Economic Review* 56: 392-415
- Levine A. and C. F. Lin (1992), "Unit root test in panel data: Asymptotic and sample properties," University of California at San Diego, Discussion paper No. 93, USA
- Levine, A. Lin, C. F. and C. S. Chu (2002), "Unit root test in panel data: Asymptotic and finite sample properties," *Journal of Econometrics*, 108: 1-24
- Love, I. and M. S. M. Peria (2012), "How bank competition affects firm's access to finance," Policy Research Working Paper No. 6163, The World Bank, Washington DC
- Maddala, G. S. and S. Wu (1999), "A comparative study of unit root tests with panel data and new simple test," *Oxford Bulletin of Economics and Statistics*, Special Issue: 631-65
- Mahathanaseth, I. and L. W. Tauer (2012), Market-power versus cost-efficiency in Thailand's banking sector in the post-crisis period (1998-2011)," *Journal of Asian Economics*, 23(2012): 499-506
- Mason, E. S. (1939). "Price and production policies of large-scale enterprise." *American Economic Review*, 29 (1): 61-74.
- Maudos, J. and L. Solis (2009) "The Determinants of Net Interest Income in the Mexican Banking System: An Integrated Model." *Journal of Banking and Finance*, 33(10), 1920-1931
- Micco, A., Panizza, U., and M. Yañez (2007), "Bank ownership and performance. Does politics matter?" *Journal of Banking & Finance*, 31(1): 219-241.
- Molyneux, P. and W. Forbes, (1995), "Market structure and performance in European banking", *Applied Economics*, 27 (2): 155-9.
- Panzar, J.C. and J. N. Rosse (1987), "Testing for monopoly equilibrium," *Journal of Industrial Economics*, 35(4): 443-456.
- Petersen, M. A., and R. G. Rajan, (May 1995). "The effect of credit market competition on lending relationships". *Quarterly Journal of Economics*, 110(2): 407-443
- Perera, S., Skully, M. and M. Nguyen (2012), "Market concentration and pricing behaviour of Sri Lankan banks," *South Asian Journal of Global Business Research*, 11ss(2012): 63-78
- Peria, M., Soledad, M. and A. Mody (2004), "How foreign participation and market concentration impact bank spreads: Evidence from Latin America," *Journal of Money, Credit, and Banking*, 36(3): 511-537
- Pruteanu-Podpiera, A., L. Weill, and F. Schobert (2007), "Market power and efficiency in the Czech banking sector," Working Paper No. 6, Czech National Bank,
- Roodman, D. (2006), "How to do xtabond2: An introduction to "difference" and "system" GMM in Stata," Working Paper No. 103, Center for Global Development.

- Schaeck, and M, Cihak (2008), –How does competition affect efficiency and soundness in banking? New empirical evidence,” ECB Working Paper No. 932.
- Souza-Sobrinho, N. F. (2010), –The Macroeconomics of Bank Interest Spreads: Evidence from Brazil,” *Annals of Finance*, 6(1): 1–32.
- Weill L .(2004), –On the Relationship between Competition and Efficiency in the EU Banking Sector”, *Kredit und Kapital*, **37**: 29-352.

University of Cape Town

LIST OF APPENDICES

Appendix 5A: Description of variables

<i>Measure for</i>	<i>Variable</i>	<i>Description</i>
Financial Intermediation Spread	<i>fis</i>	Deferential between lending and deposit rates
Banking competitiveness	<i>bi</i>	Boone indicator measures the degree of competition based on profit-efficiency in the banking market. It is calculated as the elasticity of profits to marginal costs. An increase in the Boone indicator implies a deterioration of the competitive conduct of financial intermediaries.
Financial integration	<i>finlib</i> <i>obd</i>	Chinn-Ito financial liberalization index Offshore bank deposits to total deposits ratio

Appendix 5B: Panel unit root test results

	<i>Level</i>			<i>First difference</i>			<i>Decision</i>
	<i>LLC</i>	<i>IPS</i>	<i>F-ADF</i>	<i>LLC</i>	<i>IPS</i>	<i>F-ADF</i>	
<i>bi</i>	-11.497* (0.000)	-2.898* (0.002)	71.438* (0.000)				I(0)
<i>fis</i>	-4.095* (0.000)	-0.255 (0.399)	25.671 (0.370)	-7.221* (0.000)	-1.352*** (0.088)	43.106** (0.010)	I(1)
<i>obd</i>	-6.821* (0.000)	-0.777 (0.219)	45.742** (0.019)				I(0)
<i>finlib</i>	-0.264 (0.396)	1.903 (0.971)	4.916 (0.961)	-7.222* (0.000)	-1.170 (0.121)	22.512** (0.032)	I(1)

(*), (**) and (***) indicate 1, 5 and 10 percent level of significance, respectively. The tests include both individual effects and linear trends. The null hypothesis is that there is a panel unit root. The decision is based on a simple majority rule of the three tests in a case where they yield contradictory results. The optimal lag was selected using the SIC.

CHAPTER SIX
FINANCIAL INTEGRATION AND BANKING
INTERMEDIATION SPREAD IN THE SOUTHERN AFRICAN
DEVELOPMENT COMMUNITY

6.1 INTRODUCTION

Financial integration is seen as a catalyst for deeper financial development. The complementarity role of financial integration to financial development is manifested through increased competition and diversification in the domestic financial system (Gourinchas, 2004). Financial integration facilitates technology and skills transfer as well as better techniques to manage risks through foreign entry. Consequently, the quality and efficiency of local intermediaries improves. In order to reap these benefits, many developing countries embraced financial sector reforms, in particular capital account liberalisation. The 1990s saw similar attempts being made by SADC countries. As discussed in chapter one, the reform process has involved amongst other things: the liberalisation of interest rates and credit allocation, introduction of new indirect monetary policy tools, the strengthening of prudential supervision and regulation through the enactment of Central Bank statutes, the restructuring and privatisation of banks, and the liberalisation of the capital account.

In this chapter, this study attempts to test the hypothesis that financial integration enhances financial intermediation by narrowing the financial intermediation spread. In testing this hypothesis, the study attains the following objectives: First, it determines the impact of financial integration among SADC countries as a group on the magnitude of their financial intermediation spread especially in countries that are members of the CMA where financial integration is deepest. Second, it separates the impact of financial integration on the financial intermediation spread for each member of SADC.

6.2 LITERATURE REVIEW

The rationale for economies to deepen their integration with international financial markets rests on the fact that this process grants several advantages to integrating economies. For instance, Reddy (2002) states that integrated markets facilitate

transmission of price signals by the authorities, while Obstfeld (1994) argues that they allow borrowing to smooth consumption during adverse shocks. Mohan (2005) indicates that integrated markets are important for strengthening the finance-growth nexus and promote the adoption of modern technology and payment systems which lower the costs of financial intermediation. Moreover, Trichet (2005) reasons that enhanced competition and efficiency of financial intermediaries in their allocation of resources can lead to financial stability. According to Pasricha (2009), price equalisation is at the heart of a meaningful financial integration process. Lack of competition in the financial sector hinders price equalisation and undermines the full benefits of financial integration such as improvement of financial intermediation.

The process of financial intermediation involves two arms, namely mobilisation of savings from surplus sectors of the economy and allocation of the resources to deficit sectors of the economy. The intermediaries charge a fee for the function of linking lenders and borrowers. The size of the spread should thus reflect this fee as far as possible. The financial intermediation spread is defined as the difference between what the bank earns on its assets and what it pays out on its liabilities (Khawaja and Ud Din, 2007). There are two ways of measuring this concept, namely the ex-post and ex-ante measures. Demirguc-Kunt and Huizinga (1998) use the ex-post spread calculated for each bank using the net interest rate margin (NIM). However, Tennant and Felawewo (2009) use ex-ante measure calculated as the difference between loan and deposit interest rates.

The literature shows that there is a negative relationship between the size of the financial intermediation spread and financial development. Quaden (2004:2) articulated that an effective banking system fuels growth by facilitating “higher expected returns for savers with a financial surplus, and lower borrowing costs for investing in new projects that need external finance.” To this end, Ndung’u and Ngugi (2000:iii) postulate that large interest spread discourages potential savers through low returns on deposits and exaggerates borrowing costs thereby handicapping investment financing. Samuel and Valderrama (2006) concur with this position and provide evidence of the negative effect of wide financial intermediation spread on private investment and economic growth in Barbados. Thus the financial intermediation spread can be used as an indicator of the efficiency of the banking sector. The financial intermediation spread is narrower under perfect competition as it reflects

transaction costs only. However, the spread tends to be wider under imperfect markets manifesting inefficiencies in the markets (Ngugi, 2001).

Beck and Hesse (2009:192) indicate that in a perfect world without market frictions and transaction costs, the deposit and lending rates are equal. They, however, highlight that in the real world, there are ~~inter~~mediation costs and information asymmetries resulting in agency costs.” This creates the wedge between deposit and lending rates to the detriment of financial intermediation. According to Randall (1998) the persistence of wide spread can be a symptom of a series of problems such as lack of competition, perceived market risk, bank unsoundness, scale diseconomies, distortionary regulatory constraints, and the underdevelopment of the financial markets. Randall (1998:7) further notes lucidly that ~~w~~ide spreads can be inimical to economic growth as they contribute to financial disintermediation and reduce private investment.”

There are two strands that emerge from the survey of the theoretical literature on the relationship between financial integration and development. The first strand highlights a positive relationship between the two variables, while the second one focuses on the negative relationship. Gourinchas (2004) refers to the first strand as the complementarity effect and the second as the substitutability effect of financial integration on financial development. There are several channels through which the two strands operate; however, this study focuses on the channels that have a bearing on the cost of intermediation.

Financial integration complements the domestic financial market development by introducing competition through foreign entry and access to foreign markets by local financial institutions. As local firms and individuals gain access to the global pool of savings and credit through foreign markets, local financial intermediaries will face international competitive pressure. Consequently, this will reduce the cost of intermediation domestically, and will improve the quality of financial products (Summers, 2000). Another benefit is that financial integration results in importation of international best-practice in accounting, financial regulation and supervision which augur well for financial stability. Moreover, foreign banks may also bring technology and advanced risk-management techniques that may improve domestic financial stability. Banks which operate in stable markets do not impose unnecessary premium in their pricing to cater for the risk of instability. As a result, the spread in

such markets is narrow. According to Agenor (2003) foreign entry brings along new financial innovations and reduces the cost of collecting and processing information that is useful for screening borrowers. This enhances the efficiency of the local financial system and reduces the cost of intermediation. Furthermore, Guiso et al. (2004) point out that foreign entry may reduce market power in the local financial market thereby lowering intermediation costs.

As a substitute, financial integration may cause redundancy of the local financial system as firms and individuals favour more efficient foreign markets which offer sophisticated financial products. Thus this may lead to financially repressed local markets (Guiso et al., 2004). In addition, foreign banks may just mobilise domestic resources only to channel them abroad with negative repercussions in terms of costly credit especially for small and medium sized firms to the detriment of domestic financial development (Giannetti et al., 2002).

Agenor (2003) further observes that in their efforts to extend credit, foreign banks tend to favour larger firms and corporate borrowers as opposed to small firms and households. This stifles credit extension to low income borrowers who may have had access credit from domestic banks. Another drawback of financial integration is that the penetration of the more sophisticated and lower cost foreign banks in the domestic markets may exert too much competitive pressure on domestic banks and drive them into financial difficulties. This may lead to mergers with and acquisition of struggling domestic banks and high banking concentration which could create monopoly power at the expense of efficiency (Agenor, 2003). Once efficiency deteriorates interest rate spreads would widen because loan rates will be higher and deposit rates lower than under a competitive environment.

The literature abounds with determinants of the financial intermediation spread, for example, Beck and Hesse (2009) divide the determinants of the financial intermediation spread into four empirically testable hypotheses. The first one is the risk-based hypothesis, which states that the spread is determined by systemic differences in various deficit sectors of the economy as well as imperfections associated with contracts and information. These factors increase lending risk, forcing lenders to impose a risk-premium on lending rates. The second one is the macroeconomic view which identifies exchange rate and interest rate policies as the major determinants. The third theory is the small financial system view which

hypothesises that small financial systems lack economies of scale and therefore face a fixed transaction cost in their provision of services which causes the spread between deposit and lending rates to widen. The last hypothesis is the market structure view. This one places emphasis on the degree of competitiveness in the banking system along with the impact of privatisation and the entry of foreign banks on the structure of the market.

Beck and Hesse (2009) show that the four hypotheses can be grouped into two focus areas. The first group which entails the small financial system view, risk-based view and market structure view, deals with the microeconomic determinants of the financial intermediation spread (see Ho and Saunders, (1981); Demirguc-Kunt and Huizinga (1998); Barajas et al, (2000), Robinson (2002) and Sologoub (2006)). The second group concentrates on the macroeconomic determinants (Cukierman and Hercowitz, (1990); Chirwa and Mlachila (2004) and Ngugi (2001)). This study focuses on the review of empirical literature related to the second group.

At the macro level, macroeconomic stability borne by sound monetary and fiscal policies create the environment that sets the tone for the determination of interest rates for financial intermediation. Central Banks across the globe have increasingly recognised achievement and maintenance of price stability as the main goal for monetary policy. In addition, low and stable inflation influences the interest rate spread (Cukierman and Hercowitz, 1990). To this end, central bank policies can distort the operations of financial markets if unanticipated. Hence, for monetary policy to be predictable, modern central banks have to be transparent. However, in 1979, the Fed advanced five reasons for its secrecy. First, secrecy of the central bank was perceived to prevent speculation. Second, the incorrect anticipation of the Fed's reaction to newly disseminated information could spark market overreaction. Third, disclosure of the policy and goals of the bank could hike the borrowing costs to government. Fourth, flexibility to handle events case-by-case was seen to be superior to taking a stance a priori. Fifth, disclosure could be disruptive and would complicate the smoothing of interest rates by the central bank (Tomljanovich, 2007:795). The camp of protagonists to central bank transparency asserts that full information disclosure of central bank policies may ameliorate financial markets efficiency (Blinder, 1998; Blinder et al 2001). They argue that clearer information on how the central bank makes its policy decisions reduces much speculation and enhances

predictability of future movements in financial assets. Chortareas et al (2002) carried out a cross-sectional study to look at transparency and macroeconomic variables and discovered that countries –with transparent central banks have lower inflation rates.” Inflation can feed into a wider spread if monetary shocks do not affect deposit and lending rates symmetrically.

According to Chirwa and Mlachila (2004:100) macroeconomic stability and the policy environment in general affect the pricing behaviour of commercial banks. They highlight that inflation, output growth and money market real interest rates have a notable influence on the determination of the interest rate spread. The business cycle impacts on the magnitude of the financial intermediation spread due its effect on the creditworthiness of borrowers (Kiyotaki and Moore, 1997). In Uganda, Beck and Hesse (2009) found that higher inflation, higher treasury-bill rates and exchange rate appreciation enlarge the financial intermediation spread. Furthermore, Hesse (2007) studies the determinants of the financial intermediation spread in Nigeria and observed that increased liquidity and capital resulted in narrower spread. Moreover, on the basis of a study on Kenya, Ngugi (2001) adds that interest rate uncertainty and exchange rate volatility influence the magnitude of the interest rate spread.²⁶

Randall (1998) studies the determinants of the interest rate spread in the Caribbean and finds that the share of commercial bank loans to the public sector are also important. Peria and Mody (2004) adds that the degree of development of capital markets is also an important determinant of the spread because the scarcity of alternative avenues of investment widens the wedge between the deposit and lending rates. Crowley (2007) shows that the growth of broad money and the fiscal balance also play an important role in the determination of the spread. Monzur (2010) in a case study of Bangladesh discovered that liberalisation of interest rates narrows the spread, while still others find the opposite result (Barajas et al., 1999; Chirwa and Mlachila, 2004).

In the context of SADC, Aziakpono et al. (2007) measured the depth of banking integration and found evidence of deeper banking integration within the CMA followed by members of SACU. He further observed a convergence-club as some countries such as Tanzania, Seychelles, and Zambia tend to move towards the CMA

²⁶ See also Brock and Franken (2003:17)

countries. Specifically focusing on members of the CMA and SACU, Aziakpono (2008) tested the validity of the dominance hypothesis. He found evidence of a strong level of dependence of the other financial markets in other members of SACU on the financial system of South Africa. The findings have two implications for financial integration in SADC, more especially for CMA-member states that are characterised by deeper financial integration. First, South Africa serves as a platform for linking the rest of the members of the union with international financial markets. Second, financial integration can also affect individual member countries through direct financial flows between each country and the rest of the world.

6.3 METHODOLOGY

6.3.1 Description of data and variables

The study uses unbalanced panel data obtained from the World Bank's world development indicators and IMF's international financial statistics (IFS) databases. The sample period spans 1980 to 2010. Panel data techniques make it possible to exploit both the time and cross-sectional dimensions of the data. This makes it easy to study both time-dynamics and the unobserved differences associated with each cross-sectional unit (Bruno, 2005a). The analysis of the relationship between financial integration and financial intermediation spread is implemented using two techniques. First, the feasible generalised least squares (FGLS) technique is used to investigate this relationship for all members of SADC as a group²⁷. Second, the seemingly unrelated regression (SUR) model is used to separate the relationship for individual members of SADC. The justification for the choice of each technique is provided in 6.3.2 below. A detailed description of the variables that are used in the estimations is contained in Appendix 6A.

6.3.2 Presentation of econometric techniques

6.3.2.1 Model I: Feasible generalised least square (FGLS)

The model estimated in this study is specified as follows:

$$fis_{it} = \omega_0 + \beta_{it}fi_{it} + \alpha_{it}X_{it} + \varepsilon_{it} \quad (42)$$

²⁷ Due to lack of sufficient data, Angola, DRC, Namibia and Zimbabwe were excluded from the analysis.

$$E(\varepsilon_{it}^2) = \sigma_{ii} \quad (43)$$

$$E(\varepsilon_{it}\varepsilon_{jt}) = \sigma_{ij} \quad (44)$$

$$\varepsilon_{it} = \rho_i\varepsilon_{it-1} + \mu_{it} \quad (45)$$

Where fis_{it} and fi_{it} are respectively measures of the financial intermediation spread and financial integration for country i at time t , and X_{it} in a vector of control variables. Aziakpono et al. (2007) find that financial integration in SADC is deepest amongst CMA countries which can be identified as the SADC core and the other countries as the SADC periphery. In order to investigate the relationship between the financial intermediation spread and financial integration with a distinction between the deep and shallow levels of financial integration within SADC, equation 42 is augmented. This is done by imposing a condition in equation 42 in the form of a dummy variable CMA which takes that value of 1 for a country that belongs to the monetary area, and zero otherwise. Furthermore, an interaction term between this dummy variable and a measure of financial integration is also added to the equation. In this way, the condition of being a member of the CMA will either affect the intercept ω_0 or the slope β_{it} coefficients in equation 42 or both. Hence, a variant of equation 42 is also estimated to investigate the conditional relationship between the financial intermediation spread and financial integration. The equation is:

$$fis_{it} = \omega_0 + \omega_1 CMA_{it} + \beta_{1it} fi_{it} + \beta_{2it} CMA_{it} * fi_{it} + \alpha_{it} X_{it} + \varepsilon_{it} \quad (42a)$$

Clearly, this is a conditional relationship because if a country does not belong to the CMA, then equation 42a reduces to equation 42. Moreover, the effect of belonging to the CMA may disappear if the coefficients ω_1 and β_{2it} are not statistically different from zero. The estimation results for equation 42a are reported in Table 6.1 and Appendix 6G. The estimation of equation 42a was achieved using FGLS approach. FGLS is an appropriate technique for modelling countries that are characterised by financial integration because it able to account for panel-specific serial correlation as well as the presence of hetroskedasticity (Wooldridge, 2002). Kmenta (1986) shows that this technique deals with the intricate nature of disturbances in cross-sectional time-series data by specifying a model for heteroskedasticity, contemporaneous correlation and serial correlation in the form of a first-order autoregressive model represented by equations 43, 44 and 45, respectively.

Unlike generalised least squares (GLS) technique which assumes the variance-covariance matrix of the residuals (Ω) to be known, FGLS computes consistent estimates of the elements of Ω , namely; ρ_i and σ^2 , the resulting matrix is $\hat{\Omega}$. Kmenta (1986) indicates that once $\hat{\Omega}$ has been calculated, then consistent estimates of the coefficients can be estimated (see Appendix 6B). This technique is appropriate where the time dimension exceeds the cross-sectional dimension, i.e. $T > N$.

6.3.2.2 *Model II: Seemingly unrelated regression (SUR) technique*

Equation 42 is estimated using SUR. The SUR approach pioneered by Zellner (1962) is based on the generalised least squares (GLS) estimation technique (Appendix 6C). The choice of this technique is justified by three reasons. First, unlike other approaches, SUR does not assume homogeneity in the country-specific parameters. This makes it easy to extract coefficients that apply to individual countries in the sample instead of giving equal weighting to all countries regardless of their differences. In this way, the differing degrees of economic and financial development across countries can easily be accounted for. Second, most panel data methods, especially non-stationary panel data methods, presume independence across equations. Baltagi (2001) indicates that this is a very restrictive assumption which holds only in extreme cases. The SUR approach is unique due to its assumption of contemporaneous correlation in the disturbances (Revankar, 1974). Zellner (1962) demonstrated that if contemporaneous correlation is present, then estimating the whole system jointly yields more efficient parameters than applying Ordinary Least Squares to each equation. Hence, SUR method allows for robust analysis of inter-linkages inherent in the macroeconomic and financial data for members of SADC. Furthermore, the estimates from the joint estimation approach are asymptotically more efficient. Third, Westerlund (2007) indicates that this approach is appropriate when the cross-sectional dimension N is of a smaller order than the time series dimension T , i.e. $N < T$. This condition ensures that the covariance matrix of the regression errors is not rank deficient. In the case of SADC, the time series dimension of the data is large while the cross-sectional dimension is small.

The study adopts a three-step procedure in the estimation of equation 42. First, the panel unit root properties of the data are studied. In this step three first generation panel unit root tests such as Levin and Lin (1992), Levin and Lin and Chu (2002), Im,

Pesaran and Shin (2003), and Maddala and Wu (1999) tests are used²⁸. In instances where the three tests yield contradictory results, a simple majority rule is used to formulate the decision for individual series. Second, the Breusch and Pagan (1980) Lagrange multiplier test is performed to test for contemporaneous correlation. This test shows that SUR can be appropriately applied to estimate equation 42 because of the evidence of contemporaneous correlation between the residuals (see Appendix 6D). Third, the FGLS and SUR are applied to estimate equation 36.

6.4 DATA ANALYSIS

6.4.1 Panel Unit root Tests

Table 2 shows that the financial intermediation spread, GDP growth rate, inflation rate, private sector credit to GDP ratio, real interest rate differential, offshore bank deposits to total deposits ratio and ratio of foreign direct investment to GDP are I(0) stationary. The ratio of M2 to GDP, real effective exchange rate, bank rate and financial liberalisation index are I(1) stationary. All I(1) stationary variables are used in their first differences to estimate equation 42 above (see Appendix 6E).

6.4.2 The impact of financial integration on the financial intermediation spread in SADC as a bloc

The two quantity-based measures of financial integration, namely the ratio of offshore bank deposits to total deposits and the ratio of foreign direct investment to GDP provide evidence of a positive and statistically significant conditional relationship between the financial intermediation spread and financial integration for the CMA countries (Table 6.1).²⁹ This implies that an increase in cross-border flows of funds in members of the CMA, either in the form of offshore deposits or foreign direct investment, leads to a higher gap between lending and deposit rates. Conversely, a negative relationship between financial integration and the financial intermediation spread is obtained on average for the entire SADC group.³⁰ In this

²⁸ Refer to Appendix 3D for technical notes

²⁹ The value of the coefficient is 0.016 percent for ratio offshore bank deposits to total, and 0.073 percent for the ratio of foreign direct investment to GDP.

³⁰ The value of the average SADC group coefficient is 0.002 and 0.036 percent for the ratio of offshore bank deposits to total deposits and ratio of foreign direct investment to GDP, respectively.

case, higher flows of funds across borders tend to be good for the financial intermediation spread.

As can be observed from Table 6.1, the real interest rate differential shows a statistically significant negative average relationship between financial integration and the financial intermediation spread for the SADC group. This means that financial integration, reflected by a narrow real interest rate differential, is associated with a wide spread on average for the SADC group. The financial liberalisation index confirms a positive, even though insignificant, average relationship between financial integration and the financial intermediation spread for the SADC group. This implies that an increase in the financial liberalisation index is expected to deepen financial integration and increase the financial intermediation spread. For members of the CMA, the intensity of financial liberalisation seems to reduce the size of the financial intermediation spread.

The results show that the growth rate of the economy is inversely related to the financial intermediation spread. Even though, economic growth is only significant for the model involving the real interest rate differential, its coefficient is consistently negative. This means that as the economy grows, the capacity of borrowers to repay their loans rises. As a result, the risk of default declines and banks also reduce the risk premium that is usually attached to the lending rate. Monetary policy decisions are captured by the bank rate. The bank rate is consistently significant with a negative sign which indicates that monetary policy decisions for SADC countries as a group tend to reduce the spread. This result can be explained by the fact that the deposit rates respond sluggishly to monetary policy changes but lending rates adjust rapidly to monetary policy stimuli. Thus an increase in the bank rate leads to a rise in the lending rate that is not accompanied by a rise in the deposit rate thereby widening the spread. Even if deposit rates increase, they usually do so at the slower rate than lending rates.

Table 6.1: Financial integration and the financial intermediation spread in SADC

<i>Model</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
<i>Constant</i>	9.276* (0.000)	7.893* (0.000)	9.947* (0.000)	7.044* (0.000)
<i>CMA</i>	2.510* (0.000)	4.875* (0.000)	1.627** (0.013)	6.463* (0.000)
<i>g</i>	-0.001 (0.920)	-0.007 (0.526)	-0.01 (0.227)	-0.032* (0.014)
<i>findep</i>	-0.033* (0.000)	-0.040* (0.000)	-0.036* (0.000)	-0.048* (0.000)
<i>Δstd</i>	-0.006 (0.536)	0.009 (0.342)	0.005 (0.545)	0.028* (0.002)
<i>Δbr</i>	-0.025** (0.049)	-0.027* (0.026)	-0.032* (0.006)	-0.035* (0.001)
<i>Δreer</i>	-0.039* (0.000)	-0.012*** (0.056)	-0.036* (0.000)	-0.037* (0.000)
<i>obd</i>	-0.002 (0.248)			
<i>obdCMA</i>	0.018* (0.000)			
<i>fdi</i>		-0.036 (0.118)		
<i>fdiCMA</i>		0.109* (0.000)		
<i>Δfinlib</i>			0.006 (0.938)	
<i>ΔfinlibCMA</i>			-0.972* (0.000)	
<i>idiff</i>				-0.064* (0.000)
<i>idiffCMA</i>				0.033 (0.170)
<i>n</i>	200	200	200	200
<i>Wald χ²</i>	175.83 (0.000)	350.78 (0.000)	114.22 (0.000)	386.72 (0.000)

(*), (**) and (***) denote 1, 5 and 10 percent level of statistical significance, respectively and *p*-values are in parenthesis.

Financial deepening carries a negative sign and is significant for all four specifications. This indicates that the more banks extend credit to the private sector, the smaller the size of the spread. The finding may suggest that as commercial banks lend out more to the private sector, they gain confidence in borrower's willingness and ability to repay and do not need to impose high risk premiums. This is how the relationship-banking model is used as a risk management strategy where borrowers with a good repayment history are likely to receive more credit at a lower risk premium. The real exchange rate consistently bears a negative sign for all specifications implying an inverse relationship between the spread and real exchange

rate oscillations. This implies that real exchange rate depreciation is associated with narrow spread. Another indicator of financial depth is the ratio of broad money liabilities (M2) to GDP which is negative, but insignificant, in all specifications. This indicates that an increase in the pool of loanable funds gives banks a leeway to reduce the premium that they may otherwise impose on the lending rates in the case of low liquidity. It turns out the sign of the ratio of M2 to GDP switches to positive and becomes significant in all specifications involving inflation rate (Appendix 6G).

Inflation consistently bears a negative sign in all specifications. This finding implies an inverse relationship between inflation and financial intermediation spread. On the one hand, high and volatile inflation would reduce policy predictability by the private sector and make it hard for planned financial obligations such as debt obligations to be met. Banks hedge against the risk of high and volatile inflation by imposing a premium on the lending rates. On the other hand, low and stable inflation augurs well for the size of the financial intermediation spread. Inflation in the SADC countries covered by the study is generally in single digit. This low inflation environment augurs well for a narrow wedge between lending and deposit rates (see Appendix 6G).

6.4.3 The impact of financial integration on the financial intermediation spread in individual members of SADC

The financial liberalisation appears to reduce the size of the financial intermediation spread in the CMA. Nevertheless, this relationship is only statistically significant in Lesotho (Appendix 6H). This contrast may imply that relaxation of restrictions to free flow of capital between countries may not necessarily have a uniform effect on the pricing behaviour of banks in each country perhaps due to disparities in market structure from country to country.

The growth rate of the economy is inversely related to the financial intermediation spread. This evidence is obtained from CMA member countries as well as Malawi and Tanzania (Appendix 6H-6I). For these countries, as the growth of the economy is accompanied by a rise in the capacity of borrowers to repay their loans. As a result, the risk of default declines and banks also reduce the risk premium that is usually attached to the lending rate. Furthermore, in the bank rate is consistently significant with a negative sign. This finding is generally true for Swaziland, Seychelles,

Tanzania and Zambia. Therefore, for these countries, monetary policy decisions for SADC countries as a group tend to reduce the spread. However, some evidence of a positive, but statistically insignificant, relationship is observed in South Africa, Lesotho, Mauritius and Mozambique (Appendix 6H-6I).

Financial deepening carries a negative sign and is significant for all four specifications. This indicates that the more banks extend credit to the private sector, the smaller the size of the spread. This finding is true for Lesotho, Malawi, Zambia and Mauritius even though contradictory results are obtained in South Africa, Swaziland, Mozambique and Tanzania (Appendix 6H-6I). The real exchange rate consistently bears a negative sign for all specifications implying an inverse relationship between the spread and real exchange rate oscillations. This implies that real exchange rate depreciation is associated with narrow spread. While this result is true only for Lesotho, Botswana and Tanzania, a positive relationship is obtained in South Africa, Swaziland, Malawi, Mauritius, Mozambique, Seychelles and Zambia. For the second indicator of financial depth, namely - the ratio of broad money liabilities (M2) to GDP, appears negatively related to the financial intermediation spread. This indicates that an increase in the pool of loanable funds gives banks a leeway to reduce the premium that they may otherwise impose on the lending rates in the case of low liquidity. This finding is observed in South Africa, Lesotho, Swaziland, Botswana, Malawi, Mauritius, Seychelles and Zambia, even though it tends to be significant in Swaziland, Malawi and Seychelles (Appendix 6H-6I).

6.5 CONCLUSION

The study set out to investigate the relationship between financial integration and the financial intermediation spread in the context of SADC countries. The results provide evidence of a relationship between financial integration and financial intermediation. However, the findings on the nature of the relationship are ambiguous revealing the following: First, *quantity-based measures of financial integration* provide mixed results. There is evidence of a positive and statistically significant relationship between the financial intermediation spread and financial integration for the CMA countries. Conversely, a negative relationship between financial integration and the financial intermediation spread is obtained on average for the entire SADC group. This means that while higher flows of funds across borders are associated with

a higher financial intermediation spread in the CMA, they are related to narrow spreads for an average SADC country. Second, *the price-based measure*, i.e. real interest rate differential, shows a statistically significant negative average relationship between financial integration and the financial intermediation spread for the SADC group. This means that financial integration, reflected by a narrow real interest rate differential, is associated with a wide spread on average for the SADC group. Third, *the rule-based measure*, i.e. the financial liberalisation index confirms a positive, even though insignificant, average relationship between financial integration and the financial intermediation spread for the SADC group. This shows that an increase in the financial liberalisation index is associated with deeper financial integration for CMA countries and not necessarily for an average SADC group.

The fact that the results are mixed indicate that SADC countries are have diverse characteristics such as different market structures, level of competition and institutions which all have a bearing on the relationship between financial integration and the financial intermediation spread. It is, therefore, vital to investigate whether financial integration does not hurt domestic financial development by exposing the economy to negative external shocks which may threaten financial stability. More specifically, is there any evidence of causality between financial integration and stability in SADC? This matter is addressed in the next chapter.

REFERENCES

- Aziakpono, M., S. Kleimeier, and H. Sander (2007), "Banking market integration in the SADC countries: Evidence from interest rate analysis," Paper No. RM/07/047, Maastricht Research School of Economics of Technology and Organisations, University Maastricht
- Aziakpono, M., J., (2008), "Financial and monetary autonomy and interdependence between South Africa and the other SACU countries," *South African Journal of Economics*, 76(2): 189-211
- Agenor, P. R., (2003), "Benefits and Costs of International Financial Integration: Theory and Facts," *The World Economy*, 26 (8): 1089-1118.
- Baltagi, B. H. (2001), **Econometric Analysis of Panel Data**, 2d ed. New York: John Wiley and Sons
- Barajas, A., R. Steiner, and N. Salazar (2000), "The Impact of liberalisation and foreign investment in Colombia's financial sector," *Journal of Development economics*, 63(1): 157-196
- Barajas, A., R. Steiner, and N. Salazar (1999), "Interest spreads in banking in Colombia 1974-96," IMF Staff Paper No.46, Washington DC
- Barassi, M. R., Caporale, G. M., and S. G. Hall (2000), "Interest Rates Linkages: Identifying Structural Relations," Discussion Paper No. 2000.02, Centre for International Macroeconomics, Oxford University, UK
- Beck, T. and H. Hesse (2009), "Why are interest spreads so high in Uganda," *Journal of Development Economics*, 88(2009): 192-204
- Blinder, A., Goodhart, C., Hildebrand, P., Lipton, D., and Wyplosz, C. (2001), "How do central banks talk?" *Geneva reports on the world economy 3*. Center for Economic Policy Research
- Breusch, T. and A. Pagan (1980), "The LM test and its application to model specification in econometrics," *Review of Economic Studies*, 47: 239-254.
- Brock, P. and H. Franken (2003): "Measuring the Determinants of Average and Marginal Bank Interest Rate Spreads in Chile: 1994-2001," University of Washington Economics Working Paper 25/2003.
- Bruno, G. S. F. (2005), "Estimation and inference in dynamic unbalanced panel-data models with a small number of individuals," *The STATA Journal*, 5(4): 473-500
- Chirwa, E. and M. Mlachila, (2004), "Financial Reforms and interest rate spreads in the commercial banking system in Malawi." IMF Staff papers, 51(1), 96-122
- Chortareas, G., Stasavage D., and Sterne, G., (2002), "Does it pay to be transparent? International evidence from central bank forecasts." *Federal Reserve Bank of St. Louis Review*, 84: 99-118
- Crowley, J. (2007), "Interest Rate Spreads in English-Speaking African Countries," IMF Working Paper No. WP/07/101, Washington DC
- Cukierman, A. and Hercowitz, Z., (1990), "Oligopolistic financial intermediation, inflation and the interest rate spread," The David Horowitz Institute for the Research of Developing Countries Working Paper No.2, Tel Aviv University.
- Demirguc-kunt, A. and Huizinga, H. (1998), "Determinants of commercial bank interest margins and profitability: Some international experience." World Bank Policy Research working paper No. WPS1900
- Giannetti, M. Guiso, L. Jappelli, T. Padula, M., and M. Pagano (2002), "Financial

- Market Integration, Corporate Financing and Economic Growth, European Commission Directorate-General for Economic and Financial Affairs, Economic Paper No 179.
- Gourinchas, P (2004), –Discussion of Guiso, L., Jappelli, T., Padula, M. and Pagano, M. Financial Market Integration and Economic Growth in the EU,” *Economic Policy* (October): 563-568.
- Guiso L. Jappelli, T. Padula, M. and M. Pagano (2004), –Financial Market Integration and Economic Growth in the EU,” *Economic Policy* (October): 523-577.
- Hesse, H. (2007), –Financial Intermediation in the Pre-Consolidated Banking Sector in Nigeria.” Policy research working paper No. 4267, The World Bank
- Ho, T.S.Y and Saunders, A. (1981). –The determinants of bank interest margin: Theory and empirical evidence.” *Journal of Financial and Quantitative Analysis*, XVI (4):581-599
- Im, K. S, M. H. Pesaran and Y. Shin (2003), –Testing for unit roots in heterogeneous panels,” DAE, Cambridge University Working paper No. 9526, UK
- Judson, R. A. and A. L. Owen (1999), –Estimating dynamic panel data models: A guide for macroeconomists,” *Economic Letters*, 65(1999): 9-15
- Khawaja, M. I. and M. Ud Din, (2007) –Determinants of Interest Spread in Pakistan,” *The Pakistan Development Review*, 46 (2): 129–143
- Kiyotaki, N. and J. Moore, (1997), Credit Chains, *Journal of political Economy*, 105: 211-248.
- Kmenta, J. (1986), **Elements of econometrics**, New York: Macmillan; London: Collier macmillan, 2nd Ed.
- Levin A. and C. F. Lin (1992), –Unit root test in panel data: Asymptotic and sample properties,” University of California at San Diego, Discussion paper No. 93, USA
- Maddala, G. S and S. Wu (1999), –A comparative study of unit root tests with panel data and new simple test,” *Oxford Bulletin of Economics and Statistics*, Special Issue: 631-65
- Mohan, R. (2005), –Globalisation, financial markets and the operation of monetary policy in India,” in –Globalisation and monetary policy in emerging markets,” BIS papers, No.23
- Monzur, H. (2010), –Financial Reforms and Persistently High Bank Interest Spreads in Bangladesh: Pitfalls in Institutional Development?” MPRA, Munich, Germany
- Ndung’u, N. and Ngugi, R. (2000), –Banking sector interest rate spread in Kenya.” Kenya Institute for Public Research and Analysis, Discussion paper No.5
- Ngugi. R. (2001), –An empirical analysis of interest rate spread in Kenya.” AERC Research paper No.106, Nairobi, Kenya
- Pasricha, G. K. (2009), –Bank Competition and International financial Integration: Evidence Using a New Index,” Hong Kong Institute for Monetary Research Working Paper No. 24/2009
- Peria M., and A. Mody (2004), –How foreign participation and market concentration impact bank spreads: Evidence from Latin America,” *Journal of Money, Credit and Banking*, 36(3): 511-537
- Quaden, G. (2004), –Efficiency and Stability in an Evolving Financial System, Working Paper, National Bank of Belgium.
- Randall. R. (1998), –Interest rate spreads in the Eastern Caribbean.” IMF working paper No. WP/98/59, Washington DC
- Reddy, Y.V.,(2002), –Monetary and financial sector reforms in India: A practitioner’s

- perspective,” presented at the India Economy Conference, Program on Comparative Economic Development (PCED) at Cornell University, USA, April 19-20, 2002
- Revankar, N.S (1974), –Some finite sample results in the context of two seemingly unrelated regression equations,” *Journal of American Statistical Association*, 69: 187-190
- Robinson, J.W. (2002), –Commercial bank interest rate spreads in Jamaica: Measurement, Trend, and Prospects.” www.boj.org.jm/uploads/pdf/papers
- Schmukler, S. and P. Zoido-Lobaton (2001), “Financial Globalization: Opportunities and Challenges for Developing Countries,” World Bank, Washington, D.C
- Sologoub, D. (2006), –The determinants of bank interest margins and profitability: case of Ukraine.” www.bof.fi/bofit/seminar/bofcef06/sologub.pdf
- Samuel, W., and L. Valderrama, (2006), –*The Monetary Policy Regime and Banking Spreads in Barbados*,” International Monetary Fund, Washington DC.
- Summers, L., (2000), –International financial crises: Causes, prevention and cures,” *American Economic Review*, 90(2): 1-16
- Tomljanovich, M. (2007), –Does central bank transparency impact financial markets? A cross-country econometric analysis.” *Southern Economic Journal*, 73(3): 791-813
- Tennant, D and A. Folawewo, (2009), –Macroeconomic and Market Determinants of Interest Rate Spreads in Low and Middle Income Countries,” *Applied Financial Economics*, 19(6): 489-507
- Trichet, J. (2005), –Asset price bubbles and monetary policy,” Mas Lecture, 8 June 2005, Singapore, Downloaded from: <http://www.ecb.int/press/key/date/2005/html/sp050608.en.html>
- Westerlund, J. (2007), –Testing for error correction in panel data,” *Oxford Bulletin of Economics and Statistics*, 69: 709–748.
- Wooldridge, J. M. (2002), **Econometric analysis of cross-section and panel data**, Cambridge, MA: MIT Press
- Zellner, A (1962), –An efficient method of estimating seemingly unrelated regression equations and tests for aggregation bias,” *Journal of American Statistical Association*, 57: 348-368

LIST OF APPENDICES

Appendix 6A: The Definition of variables

<i>Variable</i>	<i>Definition</i>
<i>fis</i>	Financial intermediation spread
<i>g</i>	GDP growth rate
<i>inf</i>	Inflation rate
<i>std</i>	M2 to GDP ratio
<i>reer</i>	Real effective exchange rate
<i>findep</i>	Ratio of private sector credit to GDP
<i>br</i>	Bank rate
<i>fin</i>	Measures of financial integration:
<i>fdi</i>	The ratio of foreign direct investment assets of country <i>i</i> to GDP (<i>Quantity-based measure</i>).
<i>obd</i>	Percentage of offshore bank deposits to total deposits (<i>Quantity-based measure</i>)
<i>finlib</i>	The financial liberalisation index of Chinn-Ito (<i>Rule-based measure</i>).

NB.: This table contains variables used to estimate equation 42

Appendix 6B: Feasible Generalised Least Squares (FGLS)

Consider a model of the financial intermediation spread specified as follows:

$$fis_{it} = \omega_0 + \beta_{it}fi_{it} + \alpha_{it}X_{it} + \varepsilon_{it} \quad (46)$$

Where fis_{it} and fi_{it} are respectively measures of the financial intermediation spread and financial integration for country i at time t , and X_{it} in a vector of control variables. Generalised least square (GLS) connects time series and cross-sectional data to derive consistent estimates of the desired coefficients of the model. This is based on the assumption that the variance-covariance matrix of the residuals (Ω) is known. Unlike GLS, FGLS does not make this assumption. Instead, FGLS computes consistent estimates of the elements of Ω , namely; ρ_i and σ^2 , and use them to calculate an estimate of Ω . Call the resulting matrix $\hat{\Omega}$. In order to do so, it is important to eliminate both serial correlation and contemporaneous correlation in the errors. This is done by performing the following steps:

- *Step I:* Estimate equation 46 using ordinary least squares and harvest the residuals from this equation;
- *Step II:* Use the residuals to estimate the cross-section specific serial correlation of the disturbances specified in:

$$\varepsilon_{it} = \rho_i \varepsilon_{it-1} + \mu_{it} \quad (47)$$

- *Step III:* Use the disturbance to eliminate serial correlation in the model to ensure that it is defined in terms of independent errors.
- *Step IV:* Use the residuals from the model with independent errors to estimate contemporaneous correlation of the errors given by:

$$E(\varepsilon_{it}\varepsilon_{jt}) = \sigma_{ij} \quad (48)$$

- *Step V:* Eliminate this contemporaneous correlation from the model.

At this stage the errors in the model are both independent over time and across units. Kmenta (1986) indicates that once $\hat{\Omega}$ has been calculated, then consistent estimates of the coefficients can be estimated. This technique is appropriate where the time dimension exceeds the cross-sectional dimension, i.e. $T > N$.

Appendix 6C: SUR Procedure

The seemingly unrelated regression (SUR) technique has the merit of accounting for the heterogeneity between the countries as well as contemporaneous correlation. The estimation procedure assumes that countries that belong to the same economic block can be subject to identical shocks; this may give rise to contemporaneous correlation. In addition, the structural disparities between the countries also exist which leads to heterogeneity across the SADC countries. In order to account for these two features, the SUR technique specifies the country specific equations and estimates them simultaneously. In the absence of contemporaneous correlation, the SUR technique and ordinary least squares (OLS) procedure give identical results. The procedure specifies the following system of equations:

$$Y_i = X_i\beta_i + \varepsilon_i \quad i = 1, 2, \dots, N \quad (49)$$

Where Y_i is a $T \times 1$ vector of observations on the financial intermediation spread (FIS) for country i , X_i is a $T \times k_i$ matrix of observations on k_i independent variables including the constant and β_i is a $k_i \times 1$ vector of coefficients to be estimated. The estimation procedure for the system of equations in 49 is two-fold. The first step is to test for the existence of contemporaneous correlation. This step assumes a non-zero covariance between the country specific errors terms. Given the various covariances θ_{ij} , the null hypothesis that is tested is:

$$H_0 = \theta_{ij} = 0 \quad (50)$$

This is test against the alternative hypothesis that at least one covariance is non-zero. The Lagrange multiplier test statistic that is based on the squared correlation r_{ij}^2 is used (Breusch and Pagan, 1980). The squared correlation is defined as:

$$r_{ij}^2 = \frac{\theta_{ij}^2}{\theta_{ii}\theta_{jj}} \quad (51)$$

The Breusch and Pagan Lagrange multiplier test statistic is defined as:

$$\lambda = T \sum_{i=2}^N \sum_{j=1}^{i-1} r_{ij}^2 \quad (52)$$

If the null hypothesis in equation 50 cannot be accepted, then there is evidence of contemporaneous correlation and the SUR technique can be applied.

Appendix 6D: BP test for independent errors

<i>Model</i>	$\chi^2(45)$	<i>p-value</i>	<i>Decision</i>
I	63.843**	0.034	Use SUR
II	60.147***	0.065	Use SUR
III	66.373**	0.021	Use SUR
IV	64.092**	0.032	Use SUR

(**) and (***) denote 5 and 10 percent level of statistical significance, respectively. The Null hypothesis of independent errors is rejected. This indicates presence of contemporaneous correlation between the error terms. Therefore, estimation of the equations independently for each country is inappropriate.

Appendix 6E: Unit root test results

	<i>Level</i>			<i>First Difference</i>			<i>Decision</i>
	<i>LLC</i>	<i>IPS</i>	<i>ADF-F</i>	<i>LLC</i>	<i>IPS</i>	<i>ADF-F</i>	
<i>fis</i>	-2.497* (0.006)	-1.010 (0.156)	30.506*** (0.062)				I(0)
<i>g</i>	- 19.635* (0.000)	-14.303* (0.000)	350.654* (0.000)				I(0)
<i>inf</i>	- 28.241* (0.000)	-11.611* (0.000)	72.429* (0.000)				I(0)
<i>std</i>	1.534 (0.938)	-0.303 (0.381)	21.889 (0.347)	0.688 (0.754)	-2.410* (0.008)	44.030* (0.002)	I(1)
<i>findep</i>	-3.046 (0.001)	-0.998 (0.159)	29.919 (0.071)				I(0)
<i>reer</i>	-0.542 (0.294)	-1.224 (0.111)	26.506 (0.150)	-5.502* (0.000)	-5.087* (0.000)	59.977* (0.000)	I(1)
<i>br</i>	-0.811 (0.209)	-1.112 (0.133)	25.869 (0.170)	-7.387* (0.000)	-8.800* (0.000)	98.219* (0.000)	I(1)
<i>finlib</i>	2.877 (0.998)	0.353 (0.638)	14.771 (0.678)	- 16.251* (0.000)	- 12.226* (0.000)	95.406* (0.000)	I(1)
<i>idiff</i>	-5.230* (0.000)	-6.427* (0.000)	70.929* (0.000)				I(0)
<i>obd</i>	-0.524 (0.300)	-1.670** (0.048)	30.479*** (0.063)				I(0)
<i>fdi</i>	-7.936* (0.000)	-8.087* (0.000)	89.122* (0.000)				I(0)

(*), (**), and (***) denote 1, 5, and 10 percent level of statistical significance, respectively. *p*-values are in parenthesis.

Appendix 6F: Correlation between the variables

	<i>fis</i>	<i>g</i>	<i>inf</i>	<i>findep</i>	<i>std</i>	<i>reer</i>	<i>br</i>	<i>fdi</i>	<i>finlib</i>	<i>idiff</i>	<i>obd</i>
<i>fis</i>	1.00										
<i>g</i>	-0.02 (0.73)	1.00									
<i>inf</i>	0.05 (0.48)	-0.13**	1.00								
<i>findep</i>	-0.06 (0.35)	-0.12***	-0.21*	1.00							
<i>std</i>	-0.08 (0.27)	-0.08 (0.24)	-0.34*	0.58*	1.00						
<i>reer</i>	-0.05 (0.44)	0.03 (0.62)	-0.27*	-0.14***	0.10 (0.16)	1.00					
<i>br</i>	0.08 (0.27)	-0.12***	0.58*	-0.17**	-0.28*	-0.09 (0.20)	1.00				
<i>fdi</i>	0.05 (0.48)	0.01 (0.90)	-0.07 (0.33)	-0.17*	0.07 (0.32)	0.03 (0.69)	-0.15** (0.03)	1.00			
<i>finlib</i>	0.12*** (0.08)	0.07 (0.30)	-0.18** (0.01)	-0.01 (0.92)	0.38* (0.00)	0.01 (0.92)	-0.14** (0.04)	0.15** (0.03)	1.00		
<i>idiff</i>	0.12*** (0.08)	0.09 (0.19)	-0.57* (0.00)	0.04 (0.55)	0.14** (0.04)	0.14*** (0.05)	-0.10 (0.16)	0.02 (0.80)	0.20* (0.00)	1.00	
<i>obd</i>	0.01 (0.90)	-0.04 (0.60)	0.03 (0.65)	-0.04 (0.59)	0.18** (0.01)	-0.10 (0.13)	-0.05 (0.43)	0.23* (0.00)	0.24* (0.00)	-0.08 (0.25)	1.00

(*), (**), and (***) denote 1, 5, and 10 percent level of statistical significance, respectively. *p*-values are in parenthesis.

Appendix 6G: Financial integration and the financial intermediation spread in SADC (using inflation rate)

<i>Model</i>	<i>I</i>	<i>II</i>	<i>III</i>
<i>constant</i>	6.376* (0.000)	7.172* (0.000)	5.751* (0.000)
<i>CMA</i>	1.590* (0.006)	5.189* (0.000)	2.178* (0.002)
<i>g</i>	-0.014 (0.168)	0.020 (0.026)	-0.002 (0.841)
<i>findep</i>	0.008** (0.033)	-0.022* (0.000)	-0.009* (0.003)
<i>Δstd</i>	0.002 (0.703)	0.013** (0.048)	0.018 (0.000)
<i>inf</i>	-0.039* (0.000)	-0.075* (0.000)	-0.059* (0.000)
<i>Δreer</i>	-0.008** (0.026)	-0.009** (0.022)	-0.013* (0.001)
<i>obd</i>	-0.002 (0.047)		
<i>obdCMA</i>	0.033* (0.000)		
<i>fdi</i>		0.004 (0.839)	
<i>fdiCMA</i>		0.101* (0.000)	
<i>Δfinlib</i>			0.050 (0.504)
<i>ΔfinlibCMA</i>			0.042 (0.729)
<i>n</i>	200	200	200
<i>Wald χ²</i>	153.02 (0.000)	935.89 (0.000)	114.22 (0.000)

(*), (**) and (***) denote 1, 5 and 10 percent level of statistical significance, respectively, and p-values are in parenthesis.

Appendix 6H: Financial integration and the financial intermediation spread in CMA member countries

<i>Model</i>	<i>South Africa</i>				<i>Lesotho</i>				<i>Swaziland</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
<i>constant</i>	-0.182 (0.887)	1.889** (0.077)	1.001 (0.323)	1.015 (0.324)	36.897* (0.000)	9.629* (0.000)	10.540* (0.000)	8.405* (0.000)	4.311* (0.000)	3.451* (0.009)	2.833** (0.020)	2.798** (0.035)
<i>g</i>	-0.151*** (0.070)	-0.147** (0.068)	-0.170** (0.027)	-0.149*** (0.057)	-0.702* (0.000)	-0.092 (0.539)	-0.526* (0.009)	-0.211 (0.315)	-0.358** (0.044)	-0.754* (0.003)	-0.574** (0.033)	-0.411 (0.164)
<i>findep</i>	0.04* (0.000)	0.027* (0.003)	0.035* (0.000)	0.034* (0.000)	-1.737* (0.000)	-0.197* (0.000)	-0.018 (0.776)	0.056 (0.453)	0.174** (0.001)	0.391* (0.000)	0.387* (0.000)	0.371* (0.000)
<i>Δstd</i>	0.009 (0.652)	-0.018 (0.379)	-0.002 (0.928)	-0.001 (0.957)	-0.981* (0.000)	-0.153 (0.187)	-0.027 (0.864)	0.040 (0.819)	-0.162*** (0.055)	-0.250** (0.028)	-0.265** (0.016)	-0.317* (0.009)
<i>Δbr</i>	0.123** (0.034)	0.092 (0.139)	0.085 (0.134)	0.092 (0.112)	0.259* (0.001)	-0.313* (0.008)	0.032 (0.827)	0.293 (0.185)	0.008 (0.904)	-0.077 (0.469)	-0.148 (0.163)	-0.127 (0.267)
<i>Δreer</i>	0.063* (0.002)	0.040*** (0.076)	0.045** (0.024)	0.052** (0.010)	0.015 (0.594)	-0.065* (0.005)	-0.006 (0.845)	-0.042 (0.202)	0.064** (0.036)	0.042 (0.418)	0.026 (0.625)	0.026 (0.637)
<i>obd</i>	0.047*** (0.089)				-0.023 (0.232)				0.047* (0.000)			
<i>fdi</i>		0.006 (0.948)				0.186* (0.000)				-0.054 (0.483)		
<i>Δfinlib</i>			0.359 (0.322)				-12.024** (0.011)				-0.124 (0.910)	
<i>idiff</i>								0.147 (0.353)				0.096 (0.185)
<i>n</i>	20	20	20	20	20	20	20	20	20	20	20	20
<i>Adj R²</i>	0.45	0.38	0.39	0.38	0.18	0.73	0.27	0.12	0.84	0.69	0.68	0.68

(*), (**) and (***) denote 1, 5 and 10 percent level of statistical significance and p-values are in parenthesis.

Appendix 6I: Financial integration and the financial intermediation spread in other SADC member countries

<i>Model</i>	<i>Botswana</i>				<i>Malawi</i>				<i>Mauritius</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
<i>constant</i>	10.574* (0.014)	3.062** (0.015)	2.817** (0.019)	1.053 (0.405)	36.897* (0.000)	33.390* (0.000)	33.874* (0.000)	36.036* (0.000)	24.264* (0.000)	26.823* (0.000)	26.523* (0.000)	26.693* (0.000)
<i>g</i>	-0.025 (0.563)	0.006 (0.875)	-0.005 (0.910)	0.012 (0.745)	-0.702* (0.000)	-0.632* (0.000)	-0.579* (0.000)	-0.645* (0.000)	-0.097 (0.726)	-0.433 (0.142)	-0.319 (0.183)	-0.414*** (0.095)
<i>findep</i>	-0.132 (0.442)	0.124 (0.123)	0.167** (0.015)	0.271* (0.000)	-1.737* (0.000)	-1.563* (0.000)	-1.561* (0.000)	-1.791* (0.000)	-0.297* (0.000)	-0.031* (0.000)	-0.293* (0.000)	-0.301* (0.000)
<i>Δstd</i>	-0.016 (0.706)	-0.012 (0.783)	-0.004 (0.917)	0.025 (0.577)	-0.981* (0.000)	-0.836* (0.000)	-0.923* (0.000)	-0.957* (0.000)	-0.043 (0.434)	0.025 (0.666)	-0.018 (0.720)	-0.055 (0.327)
<i>Δbr</i>	-0.238 (0.154)	-0.111 (0.502)	-0.110 (0.519)	-0.220 (0.158)	0.259* (0.001)	0.274* (0.001)	0.272* (0.001)	0.333* (0.000)	0.105 (0.556)	0.243 (0.155)	0.178 (0.292)	0.299*** (0.086)
<i>Δreer</i>	-0.111 (0.153)	-0.132*** (0.079)	-0.138** (0.061)	-0.100 (0.187)	0.015 (0.594)	0.035 (0.267)	-0.007 (0.784)	0.033 (0.267)	0.243* (0.014)	0.105 (0.318)	0.225** (0.019)	0.288* (0.005)
<i>obd</i>	-0.208*** (0.061)				-0.023 (0.232)				0.019 (0.147)			
<i>fdi</i>		0.147** (0.040)				0.526*** (0.099)				0.722** (0.073)		
<i>Δfinlib</i>			0.402 (0.270)				-1.953 (0.231)				-0.882 (0.248)	
<i>idiff</i>				-0.075*** (0.056)				0.095** (0.066)				0.100 (0.408)
<i>n</i>	20	20	20	20	20	20	20	20	20	20	20	20
<i>Adj R²</i>	0.42	0.49	0.42	0.45	0.86	0.85	0.85	0.87	0.74	0.73	0.72	0.71

(*), (**), and (***) denote 1, 5 and 10 percent level of statistical significance, respectively. *p*-values are in parenthesis.

Appendix 6I: Financial integration and the financial intermediation spread in other SADC member countries (ctd)

<i>Model</i>	<i>Mozambique</i>				<i>Seychelles</i>				<i>Tanzania</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
<i>constant</i>	11.591* (0.000)	9.083* (0.002)	9.937* (0.000)	9.847* (0.000)	5.730* (0.000)	6.563* (0.000)	6.248* (0.000)	6.233* (0.000)	6.248* (0.007)	8.642* (0.000)	9.594* (0.000)	9.037* (0.000)
<i>g</i>	-0.307*** (0.052)	0.033 (0.868)	-0.168 (0.259)	0.013 (0.934)	0.048 (0.159)	0.099* (0.007)	0.025 (0.593)	0.061 (0.263)	-0.879* (0.000)	-0.556* (0.001)	-0.995* (0.000)	-0.913* (0.000)
<i>findep</i>	-0.001 (0.995)	0.173 (0.346)	0.034 (0.800)	0.032 (0.799)	0.039 (0.272)	0.078** (0.013)	-0.025 (0.516)	-0.023 (0.547)	0.444* (0.000)	0.380* (0.000)	0.318* (0.000)	0.336* (0.000)
Δ <i>std</i>	-0.227 (0.353)	0.053 (0.837)	-0.109 (0.646)	0.110 (0.628)	-0.002 (0.947)	0.067** (0.034)	0.044 (0.313)	0.072 (0.146)	-0.369** (0.014)	-0.306** (0.027)	-0.380** (0.019)	-0.347** (0.044)
Δ <i>br</i>	0.055 (0.638)	0.044 (0.684)	0.057 (0.560)	0.221*** (0.078)	-0.047 (0.676)	-0.108 (0.353)	-0.316** (0.045)	-0.120 (0.415)	-0.036** (0.056)	-0.051* (0.002)	-0.029 (0.247)	-0.040** (0.031)
Δ <i>reer</i>	0.100 (0.109)	0.029 (0.701)	0.077 (0.250)	0.092 (0.151)	0.080* (0.004)	0.079* (0.002)	0.057*** (0.096)	0.069** (0.025)	-0.039 (0.233)	-0.017 (0.596)	-0.055 (0.125)	-0.042 (0.236)
<i>obd</i>	-0.00003 (0.999)				-0.004* (0.000)				0.046 (0.185)			
<i>fdi</i>		-0.551** (0.054)				-0.324* (0.000)				-0.597* (0.002)		
Δ <i>finlib</i>			4.664 (0.167)				-0.201 (0.554)				-0.733 (0.506)	
<i>idiff</i>				-0.319** (0.010)				-0.048 (0.178)				-0.029 (0.616)
<i>n</i>	20	20	20	20	20	20	20	20	20	20	20	20
<i>Adj R</i> ²	0.10	0.22	0.13	0.35	0.51	0.63	0.37	0.42	0.77	0.82	0.75	0.75

(*), (**) and (***) denote 1, 5 and 10 percent level of statistical significance, respectively and *p*-values are in parenthesis.

Appendix 6I: Financial integration and the financial intermediation spread in other SADC member countries (ctd)

<i>Model</i>	<i>Zambia</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
<i>constant</i>	115.11 (0.492)	515.56* (0.009)	357.167** (0.025)	273.07*** (0.060)
<i>g</i>	17.379** (0.048)	20.905 (0.143)	9.553 (0.372)	8.946 (0.410)
<i>findep</i>	-38.123** (0.025)	-76.297* (0.000)	-36.875** (0.042)	-26.224 (0.103)
<i>Δstd</i>	-26.983* (0.003)	-30.653** (0.020)	-26.517** (0.022)	-37.210* (0.001)
<i>Δbr</i>	-4.197* (0.004)	-6.527* (0.003)	-4.366** (0.018)	-2.548 (0.162)
<i>Δreer</i>	1.397 (0.523)	1.029 (0.777)	-0.290 (0.917)	0.019 (0.994)
<i>obd</i>	4.883* (0.006)			
<i>fdi</i>		24.054 (0.187)		
<i>Δfinlib</i>			-1.154 (0.984)	
<i>idiff</i>				7.003** (0.022)
<i>n</i>	20	20	20	20
<i>Adj R²</i>	0.16	0.04	0.08	0.19

(*),(**) and (***) denote 1, 5 and 10 percent level of statistical significance, respectively and p-values are in parenthesis.

CHAPTER SEVEN

FINANCIAL INTEGRATION - STABILITY NEXUS THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY

7.1 INTRODUCTION

Financial institutions mobilise and allocate domestic resources (savings), support trade and provide avenues for diversification and hedging to mitigate financial risk as well as allow easier access to opportunities for investment. Financial intermediaries collect and process information and reduce information asymmetries and transaction costs. This enables them to allocate resources to the most promising projects and mobilise savings thereby boosting capital accumulation and growth (Levine, 1997). Furthermore, financial integration is perceived to have the potential to give impetus to financial development. Forbes (2005:153) shows that even though capital account liberalisation initially increased capital inflows, investment booms, and high growth rates at in Mexico, Thailand, Korea, Russia and Argentina, these countries later suffered a series of acute financial crises. This outcome indicates that the manner in which integration of financial markets takes place is related to financial stability.

This chapter tests the hypothesis that deeper financial integration increases the risk of financial instability in the domestic financial system. In testing this hypothesis, the study contributes to existing body of knowledge in two ways: First, the concept of financial instability tends to be difficult to quantify in the literature, and therefore, the study proposes a dynamic measure of financial instability using a bilinear generalised autoregressive conditional heteroskedasticity (BGARCH) model by Biekpe(1996). Second, the study establishes the implications of estimating financial instability using a standard GARCH (1,1) versus a simple BGARCH (1,1,1) for Granger causality between financial integration and stability. Third, the study proceeds to investigate the causal relationship between financial integration and instability in the case of SADC countries. The specific objectives are: to capture financial instability using a dynamic measure, and to determine the causal relationship between financial integration and stability in the SADC region.

7.2 LITERATURE REVIEW

Baele et al. (2004) argues that the definition of financial integration that purely focuses on the law of one price, fails to capture the full meaning of the concept. They

argue that a market is financially integrated if all agents with identical characteristics not only face one set of rules when dealing with financial instruments and services, and have equal access to the same set of financial instruments and services, but also face similar treatment when they operate in the market. Hence, deeper financial integration does not require financial structures to be identical across regions. As long as frictions to financial intermediation are minimal (or eliminated), the efficient and optimal allocation of capital can still be achieved. There are many benefits of financial integration. Among them, as Babecky et al. (2010) point out, is that financial integration fosters financial stability³¹. Financial stability is defined as a situation in which the financial system is capable of directing capital where it earns a viable-risk-adjusted return and has the ability to absorb shocks without the consequence of a collapse of financial institutions, financial markets and payment systems (Paeur, 2005; Nelson and Perli, 2005). Sound financial institutions nurture financial stability in an economy. This definition embodies three important aspects. The first aspect relates to the fact a stable financial system must be able to perform its functions effectively even under the strain of disturbances. The second one underscores that a stable system has to be capable of taking manageable risks and allocate capital in an efficient way. The last one highlights the role of proper and accurate assessment and pricing of risks to avert financial crisis in the future.

The IMF (1998) characterises a sound financial system along five lines: First, there must be a clear restructuring policy of undercapitalised, weak and insolvent institutions. Second, an independent regulatory and supervisory framework with the resources to ensure financial stability through enforcement of regulatory requirement and onsite surveillance must exist. Third, there has to be a financial safety net that can create confidence in the system and can better deal successfully with moral hazard. Fourth, institutions must have enough capital, show market discipline and good corporate governance. Fifth, financial infrastructure that functions well with an effective payment system and an effective legal framework that ensures information disclosure is necessary for financial soundness. Financial instability is therefore perceived as an antonym of financial stability.

³¹ The measurement of financial stability is still a matter of serious debate. There are two strands of the literature on measurement of financial stability, namely; multi-variable-based and single-variable-based measures. See Appendix 7A for some commonly used multi-variable measures of financial stability.

The literature on financial economics is replete with attempts to measure financial stability. Nonetheless, the measurement of financial stability remains very intricate and convoluted partly due to the fact that there is no standard definition of this concept (Dattels et al., 2010). Gadanez and Jayaram (2009) argue that the complex interactions of many elements of the economic and financial system coupled with the dynamic nature of such interactions over time as well as the trans-border inter-linkages make it very difficult to define and in fact measure financial stability. Thus the multi-dimensionality of financial stability has given rise to two groups of measures of this concept, that is, single-variable-based measures and composite indicators. Examples of single-variable-based measures are GDP growth, inflation, foreign exchange reserves, capital flows, real interest rates and growth in private sector credit (see Table 7.1). Other single-variable-based measures of financial stability include, *inter alia*; ratio of total debt to equity, corporate defaults, ratio of net foreign exchange exposure to equity, household debt and consumption, growth in monetary aggregates, capital adequacy, liquidity ratios, house prices and volatility of stock prices.

Composite indicators are multi-dimensional in nature. Appendix 7A provides a summary of some commonly used composite indicators. A key feature of composite indicators is that, unlike single-variable-based measures, they represent a weighted average of various measures of risk. Gadanez and Jayaram (2009) indicate that composite indicators are useful if they are able to predict or provide signals on the conditions that may threaten the stability of the financial system in order to facilitate systematic monitoring of the stability of the system, anticipate potential sources of stress on the financial system and alert the public effectively on such factors and their possible impact. This is important especially for policymakers who may have to proactively come up with mitigating policies to avoid or minimise the adverse effects of a financial crisis. One type of these indicators is the early warning indicators which were developed specifically to predict currency, balance of payments and banking crises (Calvo et al., 1993; Eichengreen et al., 1996; and Borio and Drehmann, 2009).

Table 7.1: Measures of financial stability

<i>Measure</i>	<i>Sector</i>	<i>Description of indicator</i>
1. GDP growth	Real sector	This measure is indicative of the strength

			of the macroeconomy. A negative value suggests that an economy is shrinking; high variability may indicate unsustainable growth.
2. Ratio of Fiscal deficit to GDP	Fiscal sector		Ability of government to finance its activities. High ratios suggest high vulnerability.
3. Inflation	Real sector		Measures macroeconomic soundness and stability. High inflation suggests a weak economy and increased indebtedness, while low levels may indicate increased risk appetite in the financial markets.
4. Foreign Exchange Reserves	External sector		Measures the ability of the economy to respond resiliently to external shocks. Reserves that fall below three months of imports-cover can indicate financial problems as well as reserves below short-term foreign debt.
5. Capital flows or current account balance	External sector		Measures the financial trade position of the country because large trade deficits would require huge inflows of capital which expose the economy to financial instability associated with reversals in capital flows especially of a short-term nature.
6. Exchange rates	External sector		A crisis may be a consequence of overvaluation or undervaluation of currency due to massive capital outflows or deterioration in export competitiveness.
7. Interest rates	Financial sector		Measures the cost of credit, the ability to mobilise deposits and sustainability of debt. High interest rates render credit expensive and raise default risk, while low interest rates make it difficult to mobilise deposits.
8. Growth in private sector credit	Financial sector		Measures the riskiness of the banking sector and vulnerability of the economy to default risk.

Source: Gadanez and Jayaram (2009)

The link between financial integration and stability may be positive or negative depending on the type of channel. For example, financial integration may favour financial stability through improvements in the bank supervisory and legal framework. Financial integration allows for importation of international best-practice in financial regulation and supervision as well as market discipline (Schmukler,

2004). As a result, local regulatory and supervisory authorities in countries with underdeveloped financial systems improve their supervisory and regulatory systems in line with best practice in the spheres of securities markets legislation, accounting standards, and corporate governance (Guiso *et al.*, 2004). In addition, Yusuf (2001) indicates that if foreign banks are regulated on a consolidated basis by authorities in countries of origin, then their presence in local markets will improve regulatory oversight. In that way, the less developed countries will benefit from more sophisticated foreign regulation. Consequently, problems associated with imperfect markets such as agency problems, information asymmetries and adverse selection will be curtailed. The financial system of the host country will therefore derive gains in terms of financial stability.

Another channel that leads to a positive relationship between financial integration and stability works through the reduction of volatility of capital flows especially during crisis. Financial integration can counter the drainage of capital from a country during crisis periods. This happens as depositors transfer assets to local foreign financial institutions that are viewed sounder compared to their domestically owned counterparts instead of moving the funds abroad. This can avert capital flight and minimise the extent of financial crisis (Agenor, 2003). This is true from a developed country perspective whose markets are advanced and well developed.

Agenor (2003) points to a third channel through which financial integration enhances financial stability. According to him, foreign banks can improve the quality of lending in the country. Foreign banks are able to do so because their lending behaviour is not influenced by government. Unlike domestically owned banks which may suffer “dirty” loan-books due to directed credit in line with political myopia, foreign banks are insulated from government control when extending credit. Moreover, foreign banks have more sophisticated risk assessment models that enable them to grant credit to credit-worthy borrowers. As a result, foreign banks boast “cleaner” loan-books and this contributes positively to financial stability. Nevertheless, financial integration can also have negative effects on financial stability.

Financial integration may also come at the cost of financial stability. First, it can destabilise the financial system by creating financial institutions that are “too-big-to-fall”. This can arise when foreign banks swallow domestic banks through mergers and

acquisitions. This increases the concentration in the domestic financial markets. Agenor, (2003) posits that this problem emerges when the monetary authorities become afraid that should a bank that has grown into a financial leviathan fail, then, its failure could precipitate a financial crisis. As a result, the authorities find failure of such a bank too costly and are willing to bail it out in the event of an imminent fall. This behaviour by the authorities creates wrong incentives for the concerned institution which may be manifested in reckless risk management. This increases moral hazard on the part of banks and may gradually cause financial instability. To this end, it is imperative that prudential regulation and supervision pro-actively curb unwanted growth of foreign banks by preventing mergers and acquisitions which are likely to cause systemic risks.

Second, foreign banks can contribute to financial instability by causing abrupt capital haemorrhages. The transnational nature of foreign banks makes it easy for them to withdraw capital from countries that are undergoing economic recessions in favour of more stable countries. They may do so because economic recessions tend to increase default rates and non-performing loans. The abrupt withdrawals of capital from host countries exacerbate financial instability. This underscores the need for appropriate measures to be put in place in order to provide for free entry of foreign banks without jeopardising the stability of the domestic financial system over time.

The third way through which financial integration could impact negatively on financial stability is through reckless lending habits. Reckless lending habits are often a repercussion of sudden capital inflows. The World Bank (2007) indicates that sudden receipts of foreign capital are often accompanied by a decline in the quality of loan portfolios in banks. This situation may be more acute in countries where the regulatory apparatus is feeble. Banks that are poorly regulated tend to satiate their risk appetite by investing in profitable yet risky activities. This surge in bank-lending exposes the financial system to risk of financial instability which can even ignite a crisis. Babecky et al. (2010:104) argue that, given the benefits and costs of financial integration, “a fundamental challenge for the regulatory and supervisory authorities is to minimise the negative impacts of financial market integration on financial stability without reducing the benefits of the process.”

The fourth and more serious factor through which financial integration erodes financial stability is contagion. This phenomenon thrives in an environment in which

markets of different countries move together. According to Karolyi (2003:184) “if a country is integrated in global financial markets, then financial markets are mechanisms that make asset prices in those markets and other variables move together.” Although the co-movement is good when there is a boom, it has serious deleterious effects on financial stability when the reverse occurs. Many researchers have spent a lot of time studying contagion, its nature, causes and consequences (Flood and Garber (1984), Obsfeld (1996), Buiter et al. (1996)). Hence, there are several theoretical explanations of how contagion occurs.

Karolyi (2003) defines contagion as a phenomenon associated with the propagation of market downside shocks from one country to another. This is usually observed through co-variation in exchange rates, capital flows and stocks prices. Dornbusch et al. (2001) concur with this definition. Contagion can be caused by a myriad of factors which can basically be grouped into two major categories, namely; fundamentals-based contagion and irrational contagion. Fundamentals-based contagion can be caused by a common shock be it a common global or local economic shock. For example, Calvo and Reinhart (1996) associate the US interest rate policy changes with capital flows to Latin American countries. Furthermore, trade links between countries facilitate the transmission of shocks from one country to its trade partner. Eichengreen et al. (1996) highlights that a major trade partner of a country that is suffering a financial crisis may also begin to see its assets prices plunge and experience huge capital outflows.

Irrational contagion is a result of co-movements between asset prices in two or more countries that is associated with investor behaviour such as herd behaviour, loss of confidence or other sentiments. Karolyi (2003) argues that financial markets provide a conduit for the transmission of the shocks but they do not cause the shocks. The irrationality of herd behaviour is a controversial issue in the literature. For example, Bikhchandani et al. (1992) argue that this behaviour only reflects the fixed cost of gathering and processing information for an investor whose portfolio is spread across several markets. Hence, less informed investors may act based on the information derived from investors who have adjusted their portfolios earlier. Asongu (2011) identifies three channels of financial contagion, namely; trade links, financial links and herding behaviour. . Moreover, Bhagwati (1998) argues that financial liberalisation exacerbates market imperfections such as asymmetric information,

bounded rationality, herd behaviour, asset price bubbles ...” which are detrimental to financial stability

Allen and Gale (2000) provide some empirical evidence that due to financial integration, failure of one institution may lead to failure in others through interbank market commitments. If these commitments are strong between banks in one country, there will be systemic risk in the banking sector of that country. However, financial integration makes it possible for such commitments to exist between banks in different countries. Consequently, contagion arises as failure of a bank in one country to spread to other related banks in different countries.

Moreover, reversals in capital flows in countries with highly open capital accounts pose a significant risk to financial stability. According to Jain and Bhanumurthy (2005) the case of Mexican peso crisis of 1994, Russian crisis of August 1998, and Brazilian Real collapse of January 1999, serve as examples in this regard. Admittedly, some misalignment of some kind in the economic fundamentals could have played a part in these crises but as Jain and Bhanumurthy (2005:16) argue these crises point to ~~the~~ inherent instability of financial markets and the risks that cross-border financial transactions can pose for countries with relatively fragile financial systems and not so strong regulatory and supervisory structures.”

Financial instability can be a repercussion of a strongly integrated system which lacks resilience and flexibility to adjust to adverse shocks such as contagion or systemic risks. The risk of contagion is present in both cross-sectoral and cross-border integration as local banks penetrate foreign markets and vice-versa. The extent of the risk depends on the degree of financial integration which increases the possibility of the spillover of foreign financial crises into local markets (Pauer, 2005). The output costs of financial instability can be quite high.

Asongu (2011) argues that financial integration provides a channel through which political risks arising from conflict and political upheavals in one country can spread to other countries. Using the political crisis in North Africa and the Middle East, he found that transmission of shocks through financial markets can be triggered by political crisis as well. Financial institutions may invest internationally in response to shocks that hit adversely on their liquidity and asset quality in order to spread risk or rebalance their portfolios to take advantage of certain regulatory loopholes in other countries (Batra, 2002). As a result, losses related to a crisis in one country may

cascade to other regions as investors curtail their lending to other countries (Didier et al, 2008).

7.3 METHODOLOGY

In order to determine the causal relationship between financial integration and stability in the SADC region, the study follows a two-step methodological procedure. In the first step, the BGARCH (1,1,1) model is used to derive measures of financial instability. This step is followed by testing for panel causality between financial integration and instability using feasible generalised least squares (FGLS) technique.

7.3.1 Panel unit root tests

In order to proceed to estimate the BGARCH (1, 1, 1) model, it is necessary to study the time series properties of the data. The study used the augmented Dickey Fuller (ADF) test to achieve this goal. Furthermore, the feasible generalised least squares (FGLS) technique requires that panel data should be stationary. In this case, this study uses three panel unit-root tests, namely; the Levin and Lin (1992), Maddala and Wu (1999), and Im et al. (2003) tests to study the stationarity of the variables. If the three tests contradict each other, the decision is then based on a simple majority rule.³²

7.3.2 Estimation techniques

7.3.2.1 Model I: BGARCH

Some studies have attempted to measure the risk of financial instability; however, the majority of them use static measures such as coefficient of variation (CV) (Delechat et al., 2009) which fail to capture the dynamic nature of the phenomenon of financial risk. To address this shortcoming, other studies use a simple GARCH (1, 1) following Engle (1982) and Bollerslev (1986). Consider the regression model specified as:

³² Pesaran (2007) criticises these tests for their failure to take cross-sectional dependence of the contemporaneous errors into account. Moreover, if the two series are stationary, then causality is tested using a simple vector autoregressive (VAR) based Granger causality test, however, presence of non-stationarity for a pair of *FI* and *FS* necessitates testing for cointegration. Canning and Pedroni (2008) show that in the presence of cointegration, the VAR model should incorporate an error correction term.

$$Y_t = \gamma_0 + \gamma_1 Y_{t-1} + \varepsilon_t \quad (53)$$

The classical linear regression model (CLRM) assumes homoskedasticity, that is, $var(\varepsilon_t) = \delta^2$. This assumption is usually violated by financial data. In order to account for the variability of the conditional variance δ_t^2 , Bollerslev (1986) specified a simple GARCH (1,1) model as follows:

$$\delta_t^2 = \alpha_0 + \alpha \varepsilon_{t-1}^2 + \lambda \delta_{t-1}^2 \quad (54)$$

All the parameters are positive, $\lambda > \alpha$ and the sum of $\alpha + \lambda$ is less than, but close to unity. However, this approach does not pay attention to the structure of the covariance between lagged values of independent variables. According to Biekpe (1996) and Biekpe and Moore (2000:7) this is a serious omission especially in the study of financial market data where the covariance between independent variables may play a significant role in determining market volatility.” In order to overcome this limitation, this study uses the BGARCH (1, 1, 1) model to measure the risk of financial instability in the SADC region (see Appendix 7B). Biekpe (1996) and Biekpe and Moore (2007) specify a BGARCH (q, p, k) as follows:

$$\delta_t^2 = \sum_{i=1}^p \lambda_i \varepsilon_{t-i}^2 + \sum_{j=0}^q \alpha_j \delta_{t-j}^2 + \sum_{i=1}^q \sum_{j=1}^k \beta_{ij} \delta_{t-i} \varepsilon_{t-j} \quad (55)$$

Where, δ_{t-i} and ε_{t-j} are the past values of the standard deviation and residuals of Y_t , respectively. For $i \neq j$ the expectation of the product of δ_{t-i} and ε_{t-j} is equal to zero i.e. $E(\delta_{t-i} \varepsilon_{t-j})=0$. Diongue et al (2010) add a constant term to equation 55 and a simple BGARCH (1, 1, 1) model can be specified as follows:

$$\delta_t^2 = \alpha + \lambda \varepsilon_{t-1}^2 + \alpha \delta_{t-1}^2 + \beta \varepsilon_{t-1} \delta_{t-1} \quad (56)$$

This study tests for suitability of the BGARCH model in the measurement of financial instability. The null hypothesis for this test is defined by:

$$H_0: \beta = 0 \quad (57)$$

If this hypothesis is rejected, then the BGARCH (1,1,1) is suitable to estimate financial instability due to its ability to incorporate vital information from the covariance term.

7.3.2.2 Model II: Feasible generalised least squares (FGLS)

Once financial instability has been measured, the study proceeds to test for panel causality between financial integration and instability using the FGLS technique. The FGLS is used to test for causality between financial integration and financial instability. To this end, a VAR model is specified as:

$$\begin{aligned} FI_{it} &= \beta_0 + \sum_{r=1}^L \beta_r FI_{i,t-r} + \sum_{r=1}^L \delta_r FS_{i,t-r} + v_{it} \\ FS_{it} &= \varpi_0 + \sum_{r=1}^L \varpi_r FI_{i,t-r} + \sum_{r=1}^L \tau_r FS_{i,t-r} + \Delta\varphi_{it} \end{aligned} \quad (58)$$

$FI_{i,t}$ and $FS_{i,t}$ denote financial integration and financial instability, respectively, for country i at time t . r represents the lag-length. $FI_{i,t}$ and $FS_{i,t}$ are assumed to be stationary. The choice of FGLS to estimate VAR(r) specified in 58 is motivated by the fact that panel data for SADC is characterised by contemporaneous correlation due to intra-SADC trade as well as the penetration of South African banks in the region. In addition, the disparities in the size of the economies may give rise to heteroscedasticity. Moreover, the sample comprises $T = 30$ and $N = 10$ which means that $T > N$. As a result, there is evidence of contemporaneous correlation between the residuals (Appendix 7C). Kmenta (1986) shows that this technique is able to deal with the inherent problems of heteroskedasticity, contemporaneous correlation and serial correlation associated with this type of data. The procedure applies the Wald test on the null hypothesis of no causality given by:

$$H_0: \delta_k = \tau_k = 0 \quad (59)$$

The VAR (k) specified in 58 is augmented by separately including a dummy variable to capture the impact of the global financial crisis that emanated from the sub-prime crisis in the United States of America in 2007. Furthermore, the impact of South African monetary policy is captured through the inclusion of $samp_{i,t-1}$ in VAR-60 below. Therefore, the study estimated the following augmented VAR (k):

$$\begin{aligned} FI_{it} &= \beta_0 + \sum_{k=1}^L \beta_k FI_{i,t-k} + \sum_{k=1}^L \delta_k FS_{i,t-k} + \phi_1 samp_{i,t-1} + \omega_1 yearD + v_{it} \\ FS_{it} &= \varpi_0 + \sum_{k=1}^L \varpi_k FS_{i,t-k} + \sum_{k=1}^L \tau_k FI_{i,t-k} + \phi_2 samp_{i,t-1} + \omega_2 yearD + v_{it} \end{aligned} \quad (60)$$

Causality testing can be highly sensitive to the choice lag-length. In order to estimate VAR-60 at the right lag-length, the study follows Hsiao and Hsiao (2006) who show that the number of coefficients in the model must be less than the number of cross-sectional units. Using this principle in combination with Akaike information criterion, the feasible lag length is $k = 2$.

7.3.2.3 Model III: Seemingly unrelated regression (SUR)

The study employs SUR approach pioneered by Zellner (1962) to estimate the causality between financial integration and stability for individual SADC countries. This approach is able to extract coefficients that apply to individual countries in the sample instead of giving equal weighting to all countries regardless of their differences. This capability makes it possible to account for differences in levels of economic and financial development across the member states as well as contemporaneous correlation between the disturbances (Revankar, 1974)³³.

7.4 DATA ANALYSIS

7.4.1 Description of data and variables

The study used annual panel data collected from World Bank's world development indicators (WDI) database and new database on Financial Development and Structure for 9 countries of SADC³⁴. The data covered a period spanning 1984 to 2010. However, the real exchange rate data only covered the period 1992 to 2010. The data on the financial liberalisation index were obtained from the Chinn-Ito database³⁵. The measures of volatility were generated from GDP growth rate, inflation rate, real interest rate, ratio of private sector credit to GDP and real exchange rates. Appendix 7D provides a description of the variables used in this study.

³³ Refer to Appendix 6A for details.

³⁴ Due to data limitations for some countries for the period covered by the study only the following countries were included: Botswana, Lesotho, Malawi, Mauritius, Seychelles, South Africa, Swaziland, Tanzania and Zambia.

³⁵ Downloadable from: http://web.pdx.edu/~ito/Chinn-Ito_website.htm

7.4.2 Unit root test results

The results of the augmented Dickey Fuller test show that most of the series are stationary, i.e. integrated of order zero or $I(0)$, while few are integrated of order one or $I(1)$ stationary, which means they become stationary only after being differenced once. The exception is the real effective exchange rate series for Swaziland which is integrated of order two and becomes stationary after the second difference (Appendix 7E). Furthermore, in order to test for panel causality between financial integration and stability, the FGLS technique was used to estimate VAR-60. This technique requires that panel data should be stationary. The evidence from panel unit root tests indicate that all the variables are $I(0)$ stationary (Appendix 7F).

7.4.3 Discussion of results

7.4.3.1 Financial instability in SADC

In order to ensure that the BGARCH (1,1,1) model is suitable for modelling financial instability in SADC; the study tested the hypothesis that β in equation 57 is statistically different from zero. The results in Appendix 7G show that this hypothesis is generally rejected at 1 percent level of statistical significance. This finding implies that omission of the co-variance between lagged values of the residuals and the standard error will result in loss of vital information about macroeconomic volatility. Thus the evidence shows that the BGARCH (1,1,1) model is suitable for measuring financial instability in SADC.

7.4.3.2 Causality between financial integration and stability: SADC Group

The study proceeds to compare implication of two types of volatility measures for causality between financial instability and integration in SADC. First, measures of financial instability are generated from a conventional GARCH (1,1) model and then panel causality is tested using FGLS. The results for this test are reported in Table 7.2. Second, BGARCH (1,1,1) is used to generate measures of financial instability and once again FGLS is applied to test for panel causality. The results for this second test are reported in Table 7.3. A comparison of the results on causality between financial instability and integration shows that the manner in which financial instability is measured has implications for causality. For instance, while no causality is obtained between volatility of growth generated from a simple GARCH (1,1) and financial

integration, there is evidence that financial integration Granger causes growth volatility generated from a BGARCH (1,1,1) model. As shown in sub-section 4.3.1, the BGARCH (1,1,1) model is suitable for measuring financial instability because of its advantage to account for the covariance between lagged residuals and standard error. Thus, the rest of the analysis uses measures of financial instability generated from this method to study panel Granger causality between financial instability and integration in SADC.

Table 7.3 presents results for the causal relationship between financial intermediation spread and various measures of financial instability. There is evidence of a causal relationship between financial integration and stability in SADC. Table 7.3 shows evidence of unidirectional causality from financial integration to growth volatility even though the relationship dissipates when the influence of South African monetary policy is controlled for (Table 7.4). The result that financial integration Granger causes growth volatility proves robust when financial integration is measured by the ratio of FDI to GDP (Appendix 7H). This result shows that even though in a fragmented global financial system, some shocks are asymmetric to individual economies, financial integration becomes a common denominator that creates a conduit for shocks to be transferred from one country to another. The magnetic field of shocks is larger under financial integration. This imposes a requirement to policy makers to put in place a policy-framework which will ensure that financial integration is embraced in a way that minimises its impact on domestic macroeconomic stability.

The direction of Granger causality runs from inflation volatility to financial integration. This provides evidence that inflation volatility in SADC tends to Granger cause financial integration. The relationship is negative and significant at the second lag which indicates that highly volatile inflation may lead to financial fragmentation in SADC (Tables 7.3 and 7.4). The lesson for policy makers is that relaxation of restrictions on capital flows should be accompanied by sound macroeconomic policy characterised by monetary policy that is able not only to achieve but to also maintain price stability; otherwise high inflation volatility may prevent deeper financial integration in the region. When financial intermediation is captured by the ratio of FDI to GDP, the direction of causality switches and runs from financial integration to inflation volatility (Appendix 7H). This implies that an influx of foreign capital in the

form of FDI flows may lead to transient price instability through real exchange rate appreciation.³⁶

Table 18 also shows that there is evidence from the monetary sector that confirms a unidirectional Granger causality from financial integration to both measures of financial instability. Financial integration in SADC tends to cause real interest rate volatility. This finding underscores the importance of sound and effective interest rate policy for a country that is adopting financial integration to mitigate the possible destabilising effects that may obtain. In addition, financial integration Granger causes credit volatility in SADC. This result indicates that regulatory authorities should never undermine the role of effective credit regulation in the context of financial integration. In fact, a common credit regulation apparatus at a SADC regional level can go a long way in curbing the destabilising effects that may come with financial integration.

³⁶ FDI inflows may exert pressure on the demand for domestic currency causing it to appreciate.

Table 7.2: Financial integration and the stability of the banking industry in SADC

Model	Real Sector				Monetary Sector				External Sector	
	Causality between		Causality between		Causality between		Causality between		Causality between	
	<i>finlib</i>	<i>g</i>	<i>finlib</i>	<i>inf</i>	<i>finlib</i>	<i>ri</i>	<i>finlib</i>	<i>credit</i>	<i>finlib</i>	<i>reer</i>
<i>finlib</i> _{<i>t</i>-1}	0.943*	0.114	0.960*	-0.135	0.932*	-0.158	0.933*	0.009***	0.571*	-0.030
	(0.000)	(0.282)	(0.000)	(0.191)	(0.000)	(0.121)	(0.000)	(0.099)	(0.000)	(0.728)
<i>finlib</i> _{<i>t</i>-2}	0.023	-0.067	0.013	0.211**	0.041**	0.149	0.037	-0.006	0.047***	0.083
	(0.388)	(0.547)	(0.624)	(0.040)	(0.055)	(0.151)	(0.105)	(0.207)	(0.072)	(0.353)
<i>g</i> _{<i>t</i>-1}	0.003	0.118***								
	(0.390)	(0.071)								
<i>g</i> _{<i>t</i>-2}	-0.003	-0.165**								
	(0.385)	(0.012)								
<i>inf</i> _{<i>t</i>-1}			-0.007***	0.150**						
			(0.059)	(0.017)						
<i>inf</i> _{<i>t</i>-2}			0.001	-0.246*						
			(0.716)	(0.000)						
<i>ri</i> _{<i>t</i>-1}					0.007**	0.086				
					(0.012)	(0.186)				
<i>ri</i> _{<i>t</i>-2}					-0.001	0.057				
					(0.786)	(0.385)				
<i>credit</i> _{<i>t</i>-1}							0.0001	-0.503*		
							(0.452)	(0.000)		
<i>credit</i> _{<i>t</i>-2}							0.0002***	-0.260*		
							(0.063)	(0.000)		
<i>reer</i> _{<i>t</i>-1}									-0.012*	0.298*
									(0.002)	(0.000)
<i>reer</i> _{<i>t</i>-2}									0.009**	-0.200*
									(0.023)	(0.008)
Year2007	-0.002	0.830*	0.003	0.154	-0.004	-0.015	0.012	0.015**	-0.038***	0.214***
	(0.944)	(0.000)	(0.905)	(0.374)	(0.848)	(0.908)	(0.585)	(0.026)	(0.095)	(0.052)
Constant	-0.048*	-0.082	-0.036	0.083	-0.050*	0.051	-0.057*	-0.006	-0.198*	0.002
	(0.003)	(0.307)	(0.026)	(0.237)	(0.002)	(0.308)	(0.000)	(0.818)	(0.000)	(0.968)
Direction of causality	None		<i>inf</i> ↔ <i>finlib</i>		<i>ri</i> → <i>finlib</i>		<i>finlib</i> → <i>credit</i>		<i>reer</i> → <i>finlib</i>	
Wald test	2.56	0.72	3.40	2.92*	5.75**	2.30	2.00	5.33	15.95	0.43
	(0.109)	(0.397)	(0.065)	(0.087)	(0.017)	(0.129)	(0.157)	(0.021)	(0.000)	(0.512)
Sample size	225	225	225	225	225	225	225	225	162	162

(*), (**) and (***) denote 1, 5 and 10 percent level of statistical significance, respectively and *p*-values are in parenthesis. Panel causality was tested using FGLS technique based on volatility measures generated from a simple GARCH (1,1) model

Table 7.3: Financial integration and the stability of the banking industry in SADC

Model	Real Sector				Monetary Sector				External Sector	
	Causality between		Causality between		Causality between		Causality between		Causality between	
	<i>finlib</i>	<i>g</i>	<i>finlib</i>	<i>inf</i>	<i>finlib</i>	<i>ri</i>	<i>finlib</i>	<i>credit</i>	<i>finlib</i>	<i>reer</i>
<i>finlib</i> _{<i>t</i>-1}	0.945*	0.245*	0.936*	-0.001	0.925*	-0.033*	0.933*	0.009***	1.375*	-0.051**
	(0.000)	(0.005)	(0.000)	(0.983)	(0.000)	(0.001)	(0.000)	(0.099)	(0.000)	(0.048)
<i>finlib</i> _{<i>t</i>-2}	0.028	-0.141**	0.046**	-0.058	0.052**	0.009	0.037	-0.006	-0.457*	-0.072*
	(0.247)	(0.033)	(0.035)	(0.236)	(0.021)	(0.410)	(0.105)	(0.207)	(0.000)	(0.006)
<i>g</i> _{<i>t</i>-1}	-0.0001	0.046								
	(0.592)	(0.476)								
<i>g</i> _{<i>t</i>-2}	0.0001	-0.002								
	(0.629)	(0.972)								
<i>inf</i> _{<i>t</i>-1}			0.0002	0.018						
			(0.698)	(0.775)						
<i>inf</i> _{<i>t</i>-2}			-0.001**	-0.036						
			(0.030)	(0.567)						
<i>ri</i> _{<i>t</i>-1}					0.001	-0.099				
					(0.132)	(0.132)				
<i>ri</i> _{<i>t</i>-2}					0.001**	-0.117***				
					(0.049)	(0.052)				
<i>credit</i> _{<i>t</i>-1}							0.0001	-0.503*		
							(0.452)	(0.000)		
<i>credit</i> _{<i>t</i>-2}							0.0002***	-0.260*		
							(0.063)	(0.000)		
<i>reer</i> _{<i>t</i>-1}									-0.00003*	-0.343*
									(0.009)	(0.000)
<i>reer</i> _{<i>t</i>-2}									-0.00002*	0.042
									(0.000)	(0.553)
Year2007	0.008	0.001	0.014	-0.258*	0.001	-0.017	0.012	0.015**	0.036**	0.056
	(0.740)	(0.988)	(0.542)	(0.000)	(0.944)	(0.501)	(0.585)	(0.026)	(0.023)	(0.192)
Constant	-0.049*	0.092	-0.044*	-0.035	-0.051*	0.036***	-0.057*	-0.006	-0.017**	-0.019
	(0.003)	(0.207)	(0.005)	(0.541)	(0.002)	(0.051)	(0.000)	(0.818)	(0.020)	(0.314)
Direction of causality	<i>finlib</i> → <i>g</i>		<i>inf</i> → <i>finlib</i>		<i>finlib</i> → <i>ri</i>		<i>finlib</i> → <i>credit</i>		<i>finlib</i> ↔ <i>reer</i>	
Wald test	0.72	7.75*	3.12***	0.41	0.06	5.25**	2.00	5.33**	135.86	6.02**
	(0.397)	(0.005)	(0.078)	(0.521)	(0.803)	(0.022)	(0.157)	(0.021)	(0.000)	(0.014)
Sample size	225	225	225	225	225	225	225	225	162	162

(*), (**) and (***) denote respectively 1, 5 and 10 percent level of statistical significance and *p*-values are in parenthesis. A simple BGARCH (1,1,1) model was used to generate measures of financial instability and Granger causality was tested using FGLS estimation.

Table 7.4: Financial integration and the stability of the banking industry in SADC controlling for South African monetary policy

Model	Real Sector				Monetary Sector				External Sector	
	Causality between		Causality between		Causality between		Causality between		Causality between	
	<i>finlib</i>	<i>g</i>	<i>finlib</i>	<i>inf</i>	<i>finlib</i>	<i>ri</i>	<i>finlib</i>	<i>credit</i>	<i>finlib</i>	<i>reer</i>
<i>finlib</i> _{<i>t</i>-1}	0.944*	0.094	0.925*	-0.007	0.915*	-0.013	0.932*	0.012**	1.351*	-0.120*
	(0.000)	(0.260)	(0.000)	(0.880)	(0.000)	(0.156)	(0.000)	(0.012)	(0.000)	(0.000)
<i>finlib</i> _{<i>t</i>-2}	0.039***	-0.014	0.067*	-0.056	0.072*	0.023**	0.048**	-0.003	-0.438*	0.114*
	(0.085)	(0.828)	(0.001)	(0.254)	(0.000)	(0.022)	(0.030)	(0.463)	(0.000)	(0.000)
<i>g</i> _{<i>t</i>-1}	-0.0002	0.030								
	(0.391)	(0.640)								
<i>g</i> _{<i>t</i>-2}	-0.00004	0.041								
	(0.844)	(0.496)								
<i>inf</i> _{<i>t</i>-1}			0.001	0.013						
			(0.224)	(0.838)						
<i>inf</i> _{<i>t</i>-2}			-0.002*	-0.043						
			(0.000)	(0.494)						
<i>ri</i> _{<i>t</i>-1}					0.001**	-0.030				
					(0.016)	(0.637)				
<i>ri</i> _{<i>t</i>-2}					0.001*	-0.120**				
					(0.003)	(0.049)				
<i>credit</i> _{<i>t</i>-1}							0.0001	-0.531*		
							(0.333)	(0.000)		
<i>credit</i> _{<i>t</i>-2}							0.0002***	-0.344*		
							(0.086)	(0.000)		
<i>reer</i> _{<i>t</i>-1}									-0.00004*	-0.283*
									(0.000)	(0.000)
<i>reer</i> _{<i>t</i>-2}									-0.0003*	-0.032
									(0.000)	(0.636)
<i>samp</i> _{<i>t</i>-1}	-0.004*	0.009**	-0.004*	0.011	-0.004*	-0.00004	-0.003***	-0.0003	0.002*	-0.010
	(0.008)	(0.021)	(0.005)	(0.803)	(0.000)	(0.979)	(0.053)	(0.486)	(0.001)	(0.286)
<i>samp</i> _{<i>t</i>-2}	0.0003	-0.010*	-0.0004	-0.005	-0.00001	0.003***	-0.0001	0.0003	-0.001	0.024**
	(0.807)	(0.008)	(0.782)	(0.912)	(0.990)	(0.097)	(0.966)	(0.339)	(0.109)	(0.010)
Year2007	0.008	-0.015	0.017	-0.251*	-0.001	-0.056*	0.010	0.016**	0.068*	0.125*
	(0.3732)	(0.728)	(0.471)	(0.000)	(0.933)	(0.000)	(0.641)	(0.010)	(0.000)	(0.006)
Constant	0.007	0.089	0.029	-0.050	0.018	-0.025	-0.008*	0.005	-0.052*	-0.196
	(0.803)	(0.400)	(0.244)	(0.424)	(0.507)	(0.263)	(0.769)	(0.816)	(0.000)	(0.191)
Direction of causality	None		<i>inf</i> → <i>finlib</i>		<i>finlib</i> → <i>ri</i>		<i>finlib</i> → <i>credit</i>		<i>finlib</i> ↔ <i>reer</i>	
Wald test	0.73	0.67	12.53*	0.30	0.06	3.62***	0.88	6.33*	353.11*	23.80*
	(0.393)	(0.412)	(0.000)	(0.585)	(0.809)	(0.057)	(0.347)	(0.012)	(0.000)	(0.000)
Sample size	225	225	225	225	225	225	225	225	162	162

(*), (**) and (***) denote 1, 5 and 10 percent level of statistical significance, respectively and *p*-values are in parenthesis.

For the external sector, the results show feedback Granger causality between financial integration and stability. The evidence from both Tables 7.3 and 7.4 shows that a rise in the volatility of the real exchange rate would lead to financial fragmentation in SADC. At the same time, deeper financial integration, reflected by an increase in the financial liberalisation index, would lead to a decline in exchange rate volatility in the first year. It turns out that when financial integration is measured by the ratio of FDI to GDP no evidence of causality between financial integration and real exchange rate volatility is obtained (Appendix 7H). The dummy variable for the 2007 global financial crisis is statistically insignificant in most specifications. However, for the external sector the effect is positive and statistically significant indicating that the global crisis is associated with both high credit and real exchange rate volatility in SADC.

7.4.3.3 Causality between financial integration and stability: Individual SADC member states

The findings for individual member countries reported in Table 7.5 show evidence of unidirectional causality from financial integration measured by the financial liberalisation index to growth volatility for Botswana, South Africa and Zambia. This indicates that for these countries relaxation of restrictions on capital flows tends to cause volatility of growth. Thus such relaxation of controls on capital must be accompanied by sound macroeconomic policies to ensure high and steady growth. For Malawi there is feedback causality between financial integration and growth volatility. There is no causality between financial integration and stability in Lesotho, Seychelles, Swaziland and Tanzania.

There is bidirectional causality between financial integration and stability in Botswana, Lesotho, and Tanzania. However, for Mauritius and Zambia, causality runs from financial integration to inflation volatility. This indicates that implementation of robust and effective monetary policy that achieves and maintains low and stable prices must be pursued by countries that embrace financial integration. In fact, in order to minimise the destabilising effects of poor policies by any member states, a common monetary policy apparatus for the region may be a better policy option.

Table 7.5: Causality between financial integration and stability in individual members of SADC controlling for the bank rate (Real Sector)

	Causality between		Direction	Causality between		Direction
	<i>finlib</i>	<i>g</i>		<i>finlib</i>	<i>inf</i>	
Botswana	1.52 (0.218)	15.13* (0.000)	<i>finlib</i> → <i>g</i>	15.66* (0.000)	3.14*** (0.076)	<i>finlib</i> ↔ <i>inf</i>
Lesotho	0.31 (0.577)	0.07 (0.799)	None	16.77* (0.000)	8.22* (0.004)	<i>finlib</i> ↔ <i>inf</i>
Malawi	3.23*** (0.072)	13.65* (0.000)	<i>finlib</i> ↔ <i>g</i>	2.13 (0.145)	0.85 (0.356)	None
Mauritius	6.56** (0.010)	0.42 (0.517)	<i>g</i> → <i>finlib</i>	1.11 (0.292)	3.19*** (0.074)	<i>finlib</i> → <i>inf</i>
Seychelles	1.80 (0.180)	0.82 (0.364)	None	0.64 (0.424)	0.01 (0.927)	None
South Africa	0.94 (0.331)	15.91* (0.000)	<i>finlib</i> → <i>g</i>	4.38** (0.036)	1.72 (0.190)	<i>inf</i> → <i>finlib</i>
Swaziland	0.18 (0.674)	0.33 (0.568)	None	0.63 (0.428)	2.22 (0.136)	None
Tanzania	0.00 (0.982)	0.38 (0.540)	None	5.97** (0.015)	8.65* (0.003)	<i>finlib</i> ↔ <i>inf</i>
Zambia	2.48 (0.116)	3.07** (0.080)	<i>finlib</i> → <i>g</i>	0.07 (0.789)	21.31* (0.000)	<i>finlib</i> → <i>inf</i>

N.B: Table reports Wald Chi-statistics with *p*-values in parenthesis. (*), (**) and (***) denote level of statistical significance at 1, 5, and 10 percent, respectively.

The monetary sector shows evidence of unidirectional causality from credit volatility to financial integration for South Africa, Swaziland and Zambia, while the direction switches around for Lesotho and Seychelles (Appendix 7I). This shows that credit risk management policies are necessary for integrating economies. Nonetheless, no evidence of causality is obtained in Botswana, Malawi, Mauritius and Zambia. There is generally no causality between financial integration and real interest rate volatility with the exception of Malawi and Zambia where causality is bidirectional and Botswana where the direction runs from financial integration to real interest rate volatility (Appendix 7I).

7.5 CONCLUSION

The study tested whether the BGARCH (1,1,1) model is suitable for measuring financial instability in SADC. The BGARCH (1,1,1) model was found suitable for this purpose and was employed to measure financial instability. In fact, omission of the covariance term has serious implications for Granger causality testing between financial integration and stability in SADC. The study proceeded to test for causality

between financial integration and stability. The findings reveal four facts: *First*, there is evidence of a causal relationship from financial integration to growth volatility. This result shows that financial integration creates a conduit through which asymmetric shocks to individual countries may be transferred from one country to another. This implies that policy makers must put in place a policy-framework which will ensure that financial integration is implemented in a manner that minimises its impact on domestic macroeconomic stability. *Second*, there is unidirectional Granger causality from inflation volatility to financial integration. The lesson for policy makers is that relaxation of restrictions on capital flows should be accompanied by sound macroeconomic policy characterised by monetary policy that is able not only to achieve but to also maintain price stability; otherwise high inflation volatility may prevent deeper financial integration in the region. *Third*, financial integration in SADC tends to cause real interest rate volatility which implies that sound and effective interest rate policy is important for a country that is adopting financial integration to mitigate the possible destabilising effects that may ensue. In addition, financial integration Granger causes credit volatility in SADC. This result indicates that regulatory authorities should never undermine the role of effective credit regulation in the context of financial integration. In fact, a common credit regulation apparatus at a SADC regional level may be instrumental in curbing the destabilising effects associated with financial integration. *Fourth*, there is feedback Granger causality between financial integration and stability pointing to a rise in the volatility of the real exchange rate would lead to financial fragmentation in SADC. At the same time, deeper financial integration, reflected by an increase in the financial liberalisation index, would lead to a decline in exchange rate volatility in the first year. It turns out that when financial integration is measured by the ratio of FDI to GDP no evidence of causality between financial integration and real exchange rate volatility is obtained.

REFERENCES

- Albulescu, T.C. (2008), "An Index of Financial Stress for Canada," Bank of Canada Working paper No. 03-14, Canada
- Allen, F. and D. Gale (2000), "Bubbles and crises," *Economic Journal*, 110: 236-255
- Agenor, P. R., (2003), "Benefits and Costs of International Financial Integration: Theory and Facts," *The World Economy*, 26 (8): 1089-1118.
- Asongu, A. S. (2011), "Political crises and risk of financial contagion in developing countries: Evidence from Africa," *Journal of Economics and International Finance*, 3(7):462-467
- Babecky, J., Komarek, L., and Z. Komarkova (2010), "Financial integration at times of financial (in)stability," Financial Stability Report 2009/2010, Czech National Bank.
- Baele, L., A., Ferrano, P. Hordahl, E. Krylova and C. Mannet (2004), "Measuring financial integration in the Euro Area," *Oxford Review of Economic Policy*, 20(4):509-530
- Batra, A. (2002), "Measures for financial stability: Domestic policy requirements for regeneration of international capital flows," ICRIER Occasional Policy paper (October, 2006), New Delhi, India
- Bhagwati, J. (1998), "The capital myth: the difference between trade in widgets and trade in dollars," *Foreign Affairs*, 77 (1998): 7-12
- Biekpe, N (1996), "Measuring currency volatility and returns", PhD Thesis, The Queen's University of Belfast, UK
- Biekpe, N. and M. J. Moore (2000), "Measuring volatility using bilinear GARCH models." *Investment Analysis Journal*, 52(2000): 7-10
- Bikhchandani, S., D. Hirshleifer and I. Welch (1992), "A theory of fads, fashion, custom and cultural changes as information cascades," *Journal of Political Economy*, 100: 992-1020.
- Bollerslev, T. (1986), "Generalised Autoregressive Conditional Heteroskedsticity," *Journal of econometrics*, 31(3): 307-327
- Buiter, W.H. & Corsetti, G.M. & Pesenti, P.A., (1996). Interpreting the ERM Crisis: Country Specific and Systemic Issues, CEP Discussion Paper DP0321
- Calvo, G. and C. Reinhart (1996), "Capital flows to Latin America: Is there evidence of contagion effects?," in G. Calvo, M Goldstein and E. Hochreiter (eds), *Private Capital Flows to Emerging Markets after the Mexican Crisis*, Washington DC: Institute for International Economics.
- Canning, D., & Pedroni, P. (2008). "Infrastructure, long-run economic growth and causality tests for cointegrated panels," *The Manchester School*, 76: 504-527.
- Dattels, P., McCaughrin, R., Miyajima, K. and J. Puig. 2010. "Can You Map Global Financial Stability?" IMF Working Paper No. WP/10/145, International Monetary Fund.
- Didier, T., Mauro, P. and Schmukler, S.L. (2008), "Vanishing financial contagion?" *Journal of Policy Modelling*, 30(2008):775-791
- Diongue, A. K., Guegan, D. and R. Walff (2010), "Exact maximum likelihood estimator for the BL-GARCH model under elliptical distributed innovations," *Journal of Statistical Computation and Simulation*, 80(7): 775-791
- Delechat, C., G. Ramirez, S. Wagh, and J. Wakeman-Linn, (2009), "Sub-Saharan Africa's integration in the global financial markets," IMF Working paper No. 09/114, International Monetary Fund.

- Edison, H., Levine, R., Ricci, L., and T. Slok (2002), "International Financial Integration and Economic Growth," *Journal of International Monetary and Finance*, 21 (6): 749-776.
- Eichengreen, B., A. Rose and C. Wyplosz (1996), "Contagious Currency Crises: First Tests," *Scandinavian Journal of Economics*, 98: 463-484.
- Engle, R. F. (1982), "Autoregressive Conditional Heteroskedasticity with estimates of the Variance of the United Kingdom," *Econometrica*, 50(4): 987-1007
- Flood, R.P. and P.M. Garber (1984), "Collapsing exchange-rate regimes: Some linear examples," *Journal of International Economics*, 17: 1-13.
- Forbes, J. K. (2005), "Capital controls: Mud in the wheels of market efficiency," *Cato Journal*, 25(1): 153-166
- Gadanez, B. and K. Jayaram (2009), "Measures of financial stability – Review," International Finance Corporation bulletin No. 31, Bank of International Settlements, Basel, Switzerland.
- Guiso L. Jappelli, T. Padula, M. and M. Pagano (2004), "Financial Market Integration and Economic Growth in the EU," *Economic Policy* (October): 523-577.
- Hsiao, F. S. T. and M. W. Hsiao (2006), "FDI, exports, and GDP in East and Southeast Asia – Panel data versus time-series causality analyses," *Journal of Asian Economies*, 17(2006): 1082-1106
- Im, K. S, M. H. Pesaran and Y. Shin (2003), "Testing for unit roots in heterogeneous panels," DAE, Cambridge University Working paper No. 9526, UK
- IMF and WB (2005), **Financial Sector Assessment: A Handbook**, International Monetary Fund and World Bank, Washington DC, USA
- IMF (2006), **Financial Soundness: Compilation Guide**, International Monetary Fund, Washington DC, USA
- Jain, S. and Bhanumurthy, N. R. (2005), "Financial markets integration in India," *Asian Pacific Development Journal*, 12(2): 15-32
- Karolyi, A., G (2003), "Does international financial contagion really exist?" *International Finance*, 6(2): 179-199.
- Kmenta, J. (1986), **Elements of Econometrics**, New York: Macmillan; London: Collier macmillan, 2nd Ed.
- Levin A. and C. F. Lin (1992), "Unit root test in panel data: Asymptotic and sample properties," University of California at San Diego, Discussion paper No. 93, USA
- Levine, R. (1997), "Financial development and economic growth: Views and agenda," *Journal of Economic Literature*, 35(2):688-726
- Maddala, G. S and S. Wu (1999), "A comparative study of unit root tests with panel data and new simple test," *Oxford Bulletin of Economics and Statistics*, Special Issue: 631-65
- Mörttinen, L., P. Poloni, P. Sandars and J. Vesala (2005), "Analysing banking sector conditions: How to use Macro-prudential indicators", ECB Occasional Paper No 26.
- Nelson, W R, Perli, R (2005): "Selected indicators of financial stability", 4th Joint Central Bank Research Conference on "Risk Measurement and Systemic Risk", ECB Frankfurt, November.
- Obstfeld, M. (1996), "Models of currency crises with self-fulfilling features," *European Economic Review*, 40(1996): 1037-1047
- Pauer, F. (2005), "Financial market integration and financial stability," *Monetary policy and the Economy*, Q2/05: 144-151

- Pesaran, M.H. (2007), –A Simple Panel Unit Root Test in the Presence of Cross Section Dependence,” *Journal of Applied Econometrics*, 22: 265-312
- Revankar, N.S (1974), –Some finite sample results in the context of two seemingly unrelated regression equations,” *Journal of American Statistical Association*, 69: 187-190
- Schmukler, S. L. (2004), –Financial globalisation: Gain and pain for developing countries,” *Federal Reserve of Bank of Atlanta Economic Review*, Quarter II: 39-66
- World Bank (2007), –Financial Flows to Developing Countries: Recent Trends and Prospects.” Global Development Finance, Washington DC, USA
- Yusuf, S (2001), –Globalisation and the challenge for developing countries,” World Bank policy research working paper No. 2618, Washington DC, USA
- Zellner, A (1962), –An efficient method of estimating seemingly unrelated regression equations and tests for aggregation bias,” *Journal of American Statistical Association*, 57: 348-368

LIST OF APPENDICES

Appendix 7A: Measures of financial instability

<i>Measure</i>	<i>Sources</i>	<i>Description of indicator</i>
1. Aggregate Financial Stability Index (AFSI)	Albulescu, T.C. (2008)	This index is a composite index of about three indices, namely the Financial Development Index (FDI), Financial Vulnerability Index (FVI) and the Financial Soundness Index (FSI). It comprises some of the following individual indicators: ratio of stock market capitalisation to GDP, ratio of total credit to GDP, interest rate spread, inflation rate, banking reform and financial liberalisation, budget deficit as percentage of GDP, current account deficit as a percentage of GDP, real exchange rate changes, loans as a percentage of total deposits, ratio of deposits to broad money, non-performing loans as a percentage of total loans, return on assets and liquidity ratio.
2. Financial Soundness Indicators (FSIs)	IMF Compilation Guide for Financial Soundness indicators (2006)	There are two major sets under FSIs, that is, <i>core set</i> and <i>encouraged set</i> . The core indicators include the following indicators. 1) Capital adequacy indicators measure the banking sector's ability to respond resiliently to sudden losses and 2) asset quality indicators are related to potential risks arising from the solvency position of banks. 3) Profitability indicators capture the capital free absorption capacity of a bank and 4) liquidity indicators gauge the resilience to adverse shocks to the cash-flow. 5) Foreign currency exposure indicator is used to measure the bank-risk emanating from fluctuations in assets prices. All the indicators under this set focus on deposit takers. The encouraged set goes beyond deposit takers to include indicators on the soundness of Other Financial Corporations (OFCs), Non-financial Corporations (NFCs), Households (HHs), Real Estate Markets as well as measure market liquidity.
3. Macro-prudential Indicators (MPIs)	Morttinen et al. (2005)	These have a broader spectrum of indicators grouped under three categories, namely; internal, external and contagion factors. <i>Internal factors</i> entail 38 profitability indicators, 18 balance-sheet-based indicators, 18 capital adequacy indicators, 7 demand and supply indicators which capture competitive conditions in the market, 57 risk concentration indicators that measure liquidity and credit risks, 8 market risk indicators that cover bank share prices, yield spread, bank rating and distance to default. <i>External factors</i> are composed of 15 financial fragility indicators, 5 asset price development indicators and 10 indicators of cyclical and monetary situation. The group, <i>contagion factors</i> are based on 3 interbank markets indicators.
4. CAMELS	IMF and WB (2005)	The measure comprises five core FSIs as well as management quality indicators which are qualitatively measured. In CAMELS the indicators are: Capital adequacy, Asset quality, Management soundness, earnings, Liquidity, sensitivity to market risk

Appendix 7B: BGARCH model

The following is a summary of the derivation of the BGARCH model taken from Biekpe (1996). Consider a bilinear GARCH (p, q, m, k) model of the form:

$$\delta_t^2 + \sum_{i=1}^p a_i \delta_{t-i}^2 = \sum_{j=0}^q \lambda_j \varepsilon_{t-j}^2 + \sum_{i=1}^m \sum_{j=1}^k b_{ij} \delta_{t-i}^2 \varepsilon_{t-j}^2 \quad (61)$$

If we set $q = 0$ and $k = 1$ and consider a BGARCH ($p, 0, m, 1$) model specified as:

$$\delta_t^2 + \sum_{i=1}^p a_i \delta_{t-i}^2 = \lambda \varepsilon_t^2 + \sum_{j=1}^m b_{j1} \delta_{t-i}^2 \varepsilon_{t-1}^2 \quad (62)$$

In its state form this model can be conveniently expressed as:

$$\delta_t^2 = \mathbf{A} \delta_{t-1}^2 + \lambda \lambda \varepsilon_t^2 + \mathbf{B} \delta_{t-1}^2 \varepsilon_{t-1}^2 \quad (63a)$$

$$\delta_t^2 = \mathbf{H} \delta_t^2 \quad (63b)$$

Where $\lambda = (1, 0, 0, \dots, 0)$, $\mathbf{H} = (1, 0, 0, \dots, 0)$, $\delta_t^2 = (\delta_t^2, \delta_{t-1}^2, \dots, \delta_{t-p+1}^2)$

The matrices \mathbf{A} and \mathbf{B} are defined as:

$$\mathbf{A} = \begin{pmatrix} -a_1 & -a_2 & \dots & -a_p \\ 1 & 0 & \dots & 0 \\ 0 & 0 & \dots & 1 \end{pmatrix} \text{ and } \mathbf{B} = \begin{pmatrix} b_{11} & b_{21} & b_{p1} \\ 0 & 0 & \dots & 0 \\ 0 & 0 & \dots & 0 \end{pmatrix} \quad (64)$$

Let matrix \mathbf{A} , vectors \mathbf{C} , \mathbf{H} and δ_t^2 be defined as in 63 and 64 above, then define \mathbf{B}_j as:

$$\mathbf{B}_j = \begin{pmatrix} b_{1j} & b_{2j} & b_{pj} \\ 0 & 0 & \dots & 0 \\ 0 & 0 & \dots & 0 \end{pmatrix} \text{ for } j = 1, 2, \dots, q \quad (65)$$

Using this definition of \mathbf{B}_j the BGARCH ($p, 0, 1, k$) model can be described by:

$$\delta_t^2 = \mathbf{A} \delta_{t-1}^2 + \lambda \lambda \varepsilon_t^2 + \sum_{j=1}^k \mathbf{B}_j \delta_{t-1}^2 \varepsilon_{t-j}^2 \quad (66a)$$

$$\delta_t^2 = \mathbf{H} \delta_t^2 \quad (66b)$$

If $\mathbf{B}_j = 0$, then the model specified in equation 66a reduces to a simple GARCH (p, q) in its state form. The general BGARCH (p, q, k) model in scalar form is given by:

$$\delta_t^2 = \delta_0^2 + \sum_{i=1}^p a_i \varepsilon_{t-i}^2 + \sum_{j=0}^q \lambda_j \delta_{t-j}^2 + \sum_{i=1}^p \sum_{j=1}^k \beta_{ij} \delta_{t-i} \varepsilon_{t-j} \quad (67)$$

$\varepsilon_t \sim N(0, \delta_t^2)$ conditional on the information set Ω_t . The ε_t are assumed to be independent. Biekpe (1996) provides proof for the asymptotic and second order stationarity of δ_t^2 . The procedure for testing the hypothesis is similar to what Bollerslev (1986) followed. The test sets:

$$\delta_t^2 = z_{ij}^T W \text{ for } i = 1, \dots, q; j = 1, \dots, p \quad (68)$$

Where W is a $q \times p$ matrix of coefficients and w_{ij} 's are elements of W . The Lagrange Multiplier (LM) statistic is used to test the hypothesis:

$$H_0: w_{ij} = 0 \quad (69)$$

If H_0 is true then the LM is asymptotically Chi-square distributed with $d = pq$ degrees of freedom, where d is the total number of elements in W for $i \neq j$. The BGARCH (p, q, m, k) model specified in equation 70 can be reduced to a BGARCH (1,1,1) model for $p = 1, q = 1$, and $k = 1$ as:

$$\delta_t^2 = \delta_0^2 + \alpha \varepsilon_{t-1}^2 + \lambda \delta_{t-1}^2 + \beta \varepsilon_{t-1} \delta_{t-1} \quad (70)$$

The estimation procedure for the parameters of the BGARCH (1, 1, 1) model specified in equation 64 follows maximum likelihood estimation method. This method minimises the following likelihood function:

$$L(\rho) = \sum_t \varepsilon_t^2 \quad (71)$$

Where $\rho = (\delta_0^2, \alpha_1, \dots, \alpha_p, \beta_1, \dots, \beta_p, w_{11}, \dots, w_{pq})^T$

Following Biekpe (1996) assume for convenience that:

$$\rho_0 = \delta_0^2, \rho_1 = \alpha_1, \dots, \rho_{p+1} = \lambda_1, \dots, \rho_{q+p} = \lambda_p, \dots, \rho_{q+p+1} = b_{11}, \dots, \rho_n = b_{qp} \quad (72)$$

Then set n as follows:

$$n = q + p + qp \quad (73)$$

The partial derivative of the likelihood function defined in 71 is given by:

$$\frac{\partial L(\rho)}{\partial \rho_i} = 2 \sum_{t=1}^N \varepsilon_t \frac{\partial \varepsilon_t}{\partial \rho_i} \quad \text{for } i = 1, 2, \dots, n \quad (74)$$

$$\frac{\partial^2 L(\rho)}{\partial \rho_i^2} = 2 \sum_{t=1}^N \frac{\partial \varepsilon_t}{\partial \rho_i} \frac{\partial \varepsilon_t}{\partial \rho_j} + 2 \sum_{t=1}^N \varepsilon_t \frac{\partial^2 \varepsilon_t}{\partial \rho_i \partial \rho_j} \quad (75)$$

$$\text{Assume that } \varepsilon_t = \frac{\partial \varepsilon_t}{\partial \rho_i} = \frac{\partial^2 \varepsilon_t}{\partial \rho_i \partial \rho_j} = 0 \quad \text{for all } t < 1 \quad (76)$$

$$\text{Let } G^T(\rho) = \left[\frac{\partial L}{\partial \rho_1}, \dots, \frac{\partial L}{\partial \rho_n} \right] \text{ and } J(\rho) = \left[\frac{\partial^2 L(\rho)}{\partial \rho_i \partial \rho_j} \right] \quad (77)$$

Where $J(\rho)$ is a matrix of second order derivative.

Define ρ_e as an estimate of ρ and expanding $G(\rho_e)$, near $\rho_e = \rho$ in a Taylor series will produce:

$$[G(\rho_e)]_{\rho_e=\rho=0} = G(\rho) + J(\rho)(\rho_e - \rho) \quad (78)$$

Rewriting equation 78 generates:

$$(\rho_e - \rho) = -J(\rho)G(\rho) \quad (79)$$

The Newton-Raphson equation can thus be obtained as:

$$\rho^{m+1} = \rho^m - J^{-1}(\rho^m)G(\rho^m) \quad (80)$$

Appendix 7C: Test for contemporaneous correlation

<i>Model</i>	<i>Chi Value</i>	<i>p-value</i>	<i>Decision</i>
1	108.802*	0.000	SUR
2	80.857*	0.000	SUR
3	95.860*	0.000	SUR
4	99.953*	0.000	SUR
5	54.418**	0.025	SUR
6	45.486	0.134	OLS
7	39.875	0.302	OLS
8	38.248	0.368	OLS

(*), (**) and (***) denote level of statistical significance at 1, 5, and 10 percent, respectively. Five specifications manifest presence of contemporaneous correlation while models 6-8 indicate that the residuals are independent. This means ordinary least square (OLS) estimation of individual equation for each country yield results similar to what obtains from SUR estimation. For purposes of this study SUR was applied to estimate all models.

Appendix 7D: Description of variables

	<i>Variable</i>	<i>Description</i>
<i>Monetary policy</i>	<i>samp</i>	Effect of South African monetary policy captured as the differential between the South African repo rate and the respective member of SADC.
<i>Financial instability</i>	<i>g</i> <i>inf</i> <i>cred</i> <i>ri</i> <i>reer</i>	Growth volatility Inflation volatility Credit volatility Real interest rate volatility Exchange rate volatility
<i>Financial integration</i>	<i>finlib</i> <i>fdi</i>	Chinn-Ito financial liberalisation index Ratio of FDI flows to GDP

Appendix 7E: Results for Unit root Tests

Country	<i>Credit</i>	<i>ri</i>	<i>g</i>	<i>inf</i>	<i>reer</i>
Botswana	I(1)	I(0)	I(0)	I(0)	I(1)
Lesotho	I(1)	I(0)	I(0)	I(0)	I(1)
Malawi	I(1)	I(0)	I(0)	I(1)	I(0)
Mauritius	I(1)	I(1)	I(0)	I(0)	I(1)
South Africa	I(0)	I(0)	I(0)	I(1)	I(1)
Seychelles	I(1)	I(0)	I(0)	I(0)	I(0)
Swaziland	I(1)	I(0)	I(0)	I(0)	I(2)
Tanzania	I(0)	I(0)	I(1)	I(1)	I(1)
Zambia	I(0)	I(1)	I(0)	I(1)	I(1)

N.B: The order to integration was decided using ADF-statistic

Appendix 7F: Panel unit root test results

	<i>Level</i>			<i>Decision</i>
	<i>LLC</i>	<i>IPS</i>	<i>ADF-F</i>	
<i>g</i>	-8.574 (0.000)	-8.316 (0.000)	97.472 (0.000)	I(0)
<i>inf</i>	-8.773* (0.000)	-9.811* (0.065)	109.933* (0.000)	I(0)
<i>ri</i>	-11.068* (0.000)	-10.018* (0.000)	111.453* (0.000)	I(0)
<i>credit</i>	-8.944* (0.000)	-9.084* (0.000)	106.108* (0.000)	I(0)
<i>reer</i>	-6.862* (0.000)	-6.001* (0.000)	65.104* (0.000)	I(0)
<i>finlib</i>	-3.309* (0.001)	-2.262** (0.012)	33.050** (0.017)	I(0)
<i>samp</i>	-0.005 (0.498)	-4.144* (0.000)	43.453* (0.000)	I(0)
<i>fdi</i>	-5.632* (0.000)	-7.563* (0.000)	85.934* (0.000)	I(0)

(*), (**), and (***) denote 1, 5, and 10 percent level of statistical significance, respectively. *p*-values are in parenthesis. The tests included both individual effects and individual linear trends. The lag-length selection was based on the SIC.

Appendix 7G: Results for BGARCH (1, 1, 1) model

<i>South Africa</i>	ε_t^2	δ_t^2	$\varepsilon_t \delta_t$	Adj. R^2	<i>Swaziland</i>	ε_t^2	δ_t^2	$\varepsilon_t \delta_t$	Adj. R^2
<i>g</i>	0.31 (0.02)	-0.30 (0.01)	0.38 (0.00)	0.70		1.44 (0.00)	0.11 (0.06)	0.09 (0.00)	0.94
<i>inf</i>	-1.41 (0.02)	-0.39 (0.07)	0.33 (0.00)	0.78		0.14 (0.05)	1.21 (0.00)	-0.07 (0.00)	0.99
<i>cred</i>	-0.86 (0.00)	-0.09 (0.21)	0.05 (0.00)	0.96		-1.88 (0.00)	-0.14 (0.05)	0.22 (0.00)	0.98
<i>ri</i>	0.34 (0.00)	0.35 (0.00)	0.11 (0.00)	0.95		0.16 (0.00)	0.35 (0.00)	0.05 (0.00)	0.99
<i>reer</i>	1.25 (0.34)	0.75 (0.00)	-0.06 (0.02)	0.79		-0.35 (0.00)	1.32 (0.00)	-0.01 (0.00)	0.99
<i>Lesotho</i>					<i>Botswana</i>				
<i>g</i>	0.03 (0.00)	0.77 (0.00)	0.03 (0.00)	0.99		-0.07 (0.00)	1.11 (0.00)	-0.03 (0.00)	0.99
<i>inf</i>	-0.17 (0.00)	1.03 (0.00)	-0.04 (0.00)	0.99		0.08 (0.44)	0.23 (0.00)	0.15 (0.00)	0.98
<i>cred</i>	-1.67 (0.00)	-0.35 (0.00)	0.28 (0.00)	0.89		-2.12 (0.00)	-0.60 (0.00)	0.43 (0.00)	0.95
<i>ri</i>	-0.24 (0.00)	1.03 (0.00)	-0.03 (0.00)	0.96		-0.22 (0.00)	0.98 (0.00)	-0.03 (0.00)	0.99
<i>reer</i>	0.55 (0.00)	-0.17 (0.00)	-0.01 (0.01)	0.99		0.24 (0.00)	0.35 (0.00)	0.05 (0.00)	0.99
<i>Malawi</i>					<i>Mauritius</i>				
<i>g</i>	0.49 (0.00)	0.28 (0.09)	-0.26 (0.02)	0.60		-0.23 (0.00)	1.13 (0.00)	-0.09 (0.00)	0.98
<i>inf</i>	1.93 (0.00)	0.08 (0.39)	0.02 (0.05)	0.94		0.21 (0.00)	0.94 (0.00)	-0.07 (0.00)	0.95
<i>cred</i>	-2.06 (0.00)	-0.26 (0.00)	0.36 (0.00)	0.89		-1.69 (0.17)	0.35 (0.43)	0.05 (0.12)	0.93
<i>ri</i>	-0.12 (0.00)	1.23 (0.00)	-0.02 (0.00)	0.99		-0.37 (0.09)	0.28 (0.00)	0.21 (0.00)	0.94
<i>reer</i>	-2.23 (0.01)	-0.34 (0.00)	0.03 (0.00)	0.94		-0.30 (0.00)	1.43 (0.00)	-0.01 (0.00)	0.99
<i>Seychelles</i>					<i>Tanzania</i>				
<i>g</i>	-0.32 (0.07)	0.72 (0.00)	4.29 (0.65)	0.56		-0.21 (0.00)	1.15 (0.00)	-0.03 (0.00)	0.99
<i>inf</i>	2.16 (0.00)	-0.17 (0.50)	-0.04 (0.03)	0.99		-1.31 (0.23)	-0.52 (0.21)	0.21 (0.00)	0.79
<i>cred</i>	-1.97 (0.26)	-0.40 (0.54)	0.25 (0.07)	0.76		-0.27 (0.42)	0.35 (0.01)	0.22 (0.00)	0.90
<i>ri</i>	0.13 (0.00)	0.54 (0.00)	0.03 (0.00)	0.99		-0.16 (0.33)	-0.81 (0.00)	0.35 (0.00)	0.80
<i>reer</i>	-1.57 (0.00)	-0.78 (0.00)	0.03 (0.00)	0.97		-0.25 (0.00)	1.33 (0.00)	0.004 (0.00)	0.99
<i>Zambia</i>									
<i>g</i>	0.87 (0.00)	0.23 (0.02)	0.23 (0.00)	0.80					
<i>inf</i>	2.51 (0.00)	0.13 (0.12)	-0.003 (0.36)	0.93					
<i>cred</i>	-2.12 (0.04)	-0.48 (0.12)	0.55 (0.00)	0.81					
<i>ri</i>	0.81 (0.00)	-0.24 (0.00)	-0.01 (0.00)	0.99					
<i>reer</i>	-0.42 (0.00)	1.68 (0.00)	-0.02 (0.00)	0.98					

(*), (**) and (***) denote 1, 5 and 10 per cent level of significance, respectively

Appendix 7H: Financial integration and the stability of the banking industry in SADC

Model	Real Sector				Monetary Sector				External Sector	
	Causality between		Causality between		Causality between		Causality between		Causality between	
	fdi	g	fdi	inf	fdi	ri	fdi	credit	fdi	reer
fdi_{t-1}	0.717* (0.000)	0.003** (0.039)	0.716* (0.000)	-0.014 (0.193)	0.715* (0.000)	-0.002 (0.560)	0.715* (0.000)	-0.001* (0.003)	0.633* (0.000)	-0.003 (0.590)
fdi_{t-2}	0.001 (0.982)	-0.002 (0.309)	0.022 (0.738)	-0.041* (0.001)	0.032 (0.630)	0.002 (0.520)	0.014 (0.838)	0.001 (0.124)	-0.033 (0.667)	-0.006 (0.337)
g_{t-1}	0.008 (0.401)	0.080 (0.204)								
g_{t-2}	0.023** (0.024)	0.055 (0.364)								
inf_{t-1}			-0.006 (0.463)	-0.048 (0.430)						
inf_{t-2}			0.004 (0.602)	-0.114*** (0.059)						
ri_{t-1}					-0.024*** (0.057)	0.007 (0.916)				
ri_{t-2}					0.014 (0.278)	-0.184* (0.003)				
$credit_{t-1}$							0.0003 (0.784)	-0.183* (0.006)		
$credit_{t-2}$							-0.002 (0.123)	0.051 (0.447)		
$reer_{t-1}$									-0.0001 (0.545)	-0.404* (0.000)
$reer_{t-2}$									0.0002 (0.207)	-0.134*** (0.083)
$samp_{t-1}$	-0.016 (0.190)	0.005*** (0.086)	-0.020*** (0.096)	0.007 (0.269)	-0.020*** (0.081)	0.003 (0.270)	-0.021*** (0.099)	0.0002 (0.512)	-0.027** (0.026)	-0.006 (0.550)
$samp_{t-2}$	0.023*** (0.059)	-0.004 (0.128)	0.023** (0.060)	-0.017* (0.003)	0.029** (0.014)	0.002 (0.472)	0.019 (0.120)	-0.0002 (0.562)	0.029** (0.016)	0.011 (0.301)
Year2007	0.718* (0.006)	-0.003 (0.929)	0.624** (0.016)	-0.236* (0.001)	0.655** (0.011)	-0.031** (0.045)	0.763* (0.005)	-0.009** (0.018)	0.874* (0.001)	0.109*** (0.096)
Constant	0.598* (0.003)	-0.025 (0.626)	0.619* (0.003)	-0.223** (0.034)	0.485** (0.013)	-0.045** (0.046)	0.730* (0.000)	0.005 (0.229)	1.178* (0.000)	-0.064 (0.712)
Direction of causality	fdi → g		fdi → inf		ri → fdi		fdi ↔ credit		None	
Wald test	1.01 (0.315)	2.75* (0.097)	0.66 (0.418)	3.50*** (0.061)	5.73** (0.017)	0.75 (0.386)	2.92*** (0.088)	7.27** (0.007)	2.31 (0.128)	0.09 (0.761)
Sample size	225	225	225	225	225	225	225	225	162	162

(*), (**) and (***) denote 1, 5 and 10 percent level of statistical significance, respectively and p-values are in parenthesis.

**Appendix 7I: Causality between financial integration and stability in individual
members of SADC controlling for the bank rate (Monetary Sector)**

	Causality between		Direction	Causality between		Direction
	<i>finlib</i>	<i>ri</i>		<i>finlib</i>	<i>credit</i>	
Botswana	0.02 (0.899)	4.27** (0.039)	<i>finlib</i> → <i>ri</i>	0.18 (0.670)	0.82 (0.365)	<i>None</i>
Lesotho	0.16 (0.687)	1.32 (0.251)	<i>None</i>	0.32 (0.573)	3.97** (0.046)	<i>finlib</i> → <i>credit</i>
Malawi	6.11** (0.014)	3.09*** (0.079)	<i>finlib</i> ↔ <i>ri</i>	0.03 (0.869)	2.42 (0.120)	<i>None</i>
Mauritius	0.03 (0.873)	2.51 (0.113)	<i>None</i>	0.06 (0.811)	2.05 (0.153)	<i>None</i>
Seychelles	1.36 (0.244)	1.43 (0.231)	<i>None</i>	0.02 (0.889)	25.62* (0.000)	<i>finlib</i> → <i>credit</i>
South Africa	0.19 (0.664)	1.50 (0.221)	<i>None</i>	5.57** (0.018)	2.02 (0.155)	<i>credit</i> → <i>finlib</i>
Swaziland	0.13 (0.718)	1.69 (0.193)	<i>None</i>	2.71*** (0.099)	0.04 (0.840)	<i>credit</i> → <i>finlib</i>
Tanzania	0.97 (0.325)	0.10 (0.749)	<i>None</i>	108.50* (0.000)	2.16 (0.141)	<i>credit</i> → <i>finlib</i>
Zambia	6.79* (0.009)	5.69** (0.017)	<i>finlib</i> ↔ <i>credit</i>	0.62 (0.431)	0.00 (0.992)	<i>None</i>

N.B: Table reports Wald Chi-statistic with *p*-values in parenthesis. (*), (**) and (***)

denote level of statistical significance at 1, 5, and 10 percent, respectively.

CHAPTER EIGHT

FINANCIAL INTERMEDIATION SPREAD AND STABILITY OF THE BANKING SYSTEM IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY

8.1 INTRODUCTION

Financial intermediation spread³⁷ discourages potential savers through low returns on deposits and suffocates investment through high borrowing costs (Ndung'u and Ngugi, 2000). A plethora of studies have devoted much attention on the factors that influence the financial intermediation spread and discovered that macroeconomic factors such as inflation and GDP growth (Demirguc-Kunt and Huizinga, 1999) and market structure (Brock and Franken, 2003) play a crucial role in this regard. In addition, Beck and Hesse (2009) tested the risk-based hypothesis in Uganda and identified financial market risk as an important determinant of the financial intermediation spread. According to their hypothesis, the spread is determined by systemic differences in various deficit sectors of the economy as well as imperfections associated with contracts and information. Incomplete information increases lending risk and forces banks to impose a risk-premium on lending rates.

Gorton and Winton (1998) observe that in underdeveloped financial markets, high financial intermediation spread acts as a shell around bank franchise value and helps avert financial instability. Beck et al (2003) concur with this argument and add that lack of competition in financial markets (which is common in less developed economies) reduces the probability of financial crises. The premise of this argument rests on the fact that oligopoly pricing, which results in wide interest rate spread, increases profitability and thus financial stability. It is important to specifically understand the causal relationship between the financial intermediation spread and financial instability. To the best of our knowledge, no attempt has been made to study this important issue. This chapter intends to fill this gap by testing the hypothesis that the spread causes financial instability. It builds on the work of the previous chapter by using measures of financial instability generated from both a standard GARCH (1,1)

³⁷ The financial intermediation spread is still defined as the difference between lending and deposit rates.

model and the BGARCH (1,1,1) model to investigate whether such measures have any significant implications for the nature of causality between financial instability and the financial intermediation spread in SADC using the feasible generalised least squares (FGLS) technique. The study proceeds to analyse causality between financial instability and the financial intermediation spread in SADC using measures of financial instability generated from BGARCH (1,1,1) model.

8.2 LITERATURE REVIEW

The literature on the finance-growth nexus can be divided into two strands. The first strand finds a positive empirical relationship between financial intermediation and economic growth (King and Levine, 1993; Levine and Zervos, 1998). The second strand finds a growth-decelerator effect arising from the fact that unbridled credit expansion usually precipitates a financial crisis (Loayza and Ranciere, 2005). Even though the two strands lead to different conclusions, they both highlight the critical role that commercial banks play in the economy. Traditional theories perceive financial intermediation as a process in which banks collect deposits and give out loans to support investment in the economy (Diamond and Dybvig, 1983; Gorton and Winton, 2003). Merton and Bodie (1995) argue that financial intermediaries are able to allocate scarce resources across space and time in an environment characterised by uncertainty. It is the uncertainty that gives rise to risk and underscores the need for appropriate risk management strategies. In the light of this, Levine (1997) indicates that risk pooling and diversification is among the important functions that banks perform to benefit the economy.

The main cause of uncertainty in banking markets is market frictions such as transaction costs, uncertainty about projects and information asymmetries. Beck (2006:2) states that “market frictions ... lead to a wedge between the interest rates that borrowers have to pay on their loans and interest rates that savers receive on their deposit ...” There are three main sources of market frictions, namely; intermediation costs, limited options for diversification of idiosyncratic risk and agency problems. First, intermediation costs associated with regulatory requirements, payment clearing and settlement systems drive the financial intermediation spread. Second, the limited alternatives to diversify idiosyncratic risk encourage risk-averse banks to include a

risk premium in lending rates. Third, information asymmetries give rise to agency problems. The banks find it difficult to determine the exact credit-worthiness of the borrower as well as accurately monitor the project after the loan has been disbursed. This complication gives rise to the principal-agent problem characterised by adverse selection and moral hazard.

Stiglitz and Weiss (1981) link adverse selection and moral hazard to the size of the financial intermediation spread. The thrust of this argument is that information limitations impair appropriate determination of the borrower's risk-profile and lead to a situation where interest rates are used as a screening instrument. Of course, any factor which widens the financial intermediation spread by hiking lending rates may lead to a higher probability of non-repayments and credit rationing. Adverse selection leads to credit rationing because a premium higher than the equilibrium interest rate tends to increase the riskiness of the pool of prospective borrowers. Moreover, high costs incurred when monitoring the project over the repayment period of the loans could create a moral hazard problem as loans may be used to finance riskier projects instead of the one for which the loan was given.

In order to manage the risks associated with the information asymmetry problem, Diamond (1984) demonstrates that financial intermediaries serve as "delegated monitors" in the economy. Consequently, banks have to incur the costs of monitoring of borrowers through collection of information which enables them to screen borrowers properly. The costs related to this effort are often passed on to borrowers in the form of higher lending rates. In line with this reasoning, Rashid (2011) presents a model that examines "cherry-picking" effect of foreign banks to explain the high financial intermediation spread in domestic markets. He points out that foreign banks attract borrowers with low risk and leave the risky ones to local banks. Consequently, this screening practice raises monitoring costs which are accounted for in the form of high lending rates. A fraction of borrowers who are otherwise credit-worthy, would fail to borrow at the high rates. As a result, risky borrowers who are unlikely to repay the loans would borrow thereby increasing the possibility of a financial instability.

Banks have a tendency to include a risk premium to the lending rate in an effort to manage risk. Banks remain exposed to credit risk after they have granted loans to borrowers until such a loan has been settled in full. During the life of the loan, there is a possibility of default or failure to repay it in full (Gropp et al., 2007). Another risk is

associated with the function of provision of liquidity. Diamond and Rajan (2006) impress the fact that both lenders and borrowers are concerned about liquidity. In order to effectively provide liquidity, banks need to strike a good liquidity-investment mix. Although the bulk of bank liabilities are of a short-term nature, loans usually take a longer time horizon. As a result, banks need to fund the loans in a manner that ensures that they will always be able to honour depositors' demand for cash balances on daily basis to avoid a bank run due to depositor-panic or self-fulfilling fears (Diamond and Dybvig, 1983)³⁸. Moreover, provision of liquidity exposes banks to interest rate risk. Gropp et al (2007) postulate that interest rate arises when a bank attempts to reinvest and refinance its positions in an environment of changing interest rates.

Blejer (2006) argues that financial instability may arise due to excessive bank-lending. Contagion makes it easy for a bank that is going under to sink with healthy banks that may hold sizeable assets on its balance-sheet. This systemic risk becomes sharper and intricate when domestic markets are integrated globally either through foreign ownership or purely on the basis of balance-sheet connections. Moreover, the pace of financial innovation which is often very complicated, risky and ahead of regulation may spark a financial crisis. Rapid financial innovation over the last two decades has considerably changed the banking landscape. For example, securitisation has made it possible to separate the origination of a loan from the holding of such a loan. This situation significantly changed the incentives involved in credit extension because those who originate the loans are not necessarily the ones that bear the risk should borrowers fail to repay. Consequently, modern theories of financial intermediation tend to emphasise the role of banks in the origination and distribution of securities (Shleifer and Vishny, 2010: 306).

The Shleifer and Vishny's (2010: 306) theory of financial intermediation identifies sentiment as a crucial influence in markets. The theory states that sentiment can be manifested in either ~~biased~~ expectations or institutional preferences and constraints such as the demand by foreigners or money market funds for AAA-rated securities." In this model, banks cannot only securitise loans, but can also pledge them

³⁸ Tchana (2008) argues that a bank run is a consequence of coordination failure on the part of depositors which causes a sudden unexpected rush of withdrawals of bank deposits.

as collateral when borrowing money. Since the loan can be mispriced, this theory predicts that the volatility of loan market prices would increase the volatility of both bank credit (a signal of financial instability) and real investment (a signal of cyclical fluctuations). This theory creates a link between bank balance-sheets and real investment. According to Shleifer and Vishny (2010:307) the bottom line is that –financial intermediation transmits security market fluctuations into the real economy; the volatility of sentiment turns into the volatility of real activity.” In line with this reasoning, Allen and Gale (2000) indicate that asset prices are determined by among other things the volatility of credit, such that credit expansion creates an asset price bubble.

The financial intermediation spread comprises two elements, the lending rate and the deposit rate. So far the discussion on the dynamics of the spread has largely concentrated on the factors that affect the lending rate. The reason is that deposit rates tend to be rigid and do not vary a lot. In fact, even in response to monetary policy impulses, lending and deposit rates respond asymmetrically. For example, Neumark and Sharpe (1992) find that in markets with low competition, banks are quicker to reduce deposit rates and are reluctant to increase them. Nevertheless, they increase lending rates quickly when there is tightening of monetary policy. Since the deposit rates are generally quite low, there is a limited scope for significant downward adjustment. Thus the rigidity in deposit rates renders the effect of factors that influence the lending rate more important in influencing the spread.

The monetary authorities have also recognised the influence that the price-setting behaviour of banks has on the efficacy of monetary policy-making. Thompson (2006) perceives lending rates as a mark-up over deposit rates and he finds asymmetries in the financial intermediation spread in the United States of America. Gropp et al. (2007:34) agree with this notion of asymmetry in the spread due to the rigidity of deposit rates relative to lending rates. They point out that in the euro area –banks tend to adjust loan rates quicker to changes in policy rates when rates are going up than when they are going down – and vice versa for deposit rates.” This finding implies that the dynamics of the spread are largely explained by fluctuations in lending rates.

The empirical literature on the determination of the financial intermediation spread relies heavily on the dealership model of Ho and Saunders (1981). The model views a bank as a dealer who sets interest rates on loans and deposits which arrive

asymmetrically to the bank. The model identifies market structure and risk premium as crucial determinants of the spread. Later, Wong (1997) applied a firm-theoretic model and discovers that credit and interest rate risks are pivotal factors that influence the financial intermediation spread. Maudos and Fernandez de Guevara (2004) note that the higher the credit and interest rate risks, the higher the likelihood of a wider spread. Although narrow financial intermediation spread may reflect financial intermediation efficiency, it may also be indicative of excessive risk-taking (Brock and Rojas-Suarez, 2000). This observation highlights the endogeneity problem that may be associated with a causal relationship between spread and financial stability.

Bonfilioli and Mendicino (2004) provide empirical evidence that financial liberalisation increases the incidence of financial fragility especially when implemented in developing countries whose banking industries are inefficient and underdeveloped. Financial intermediaries mobilise short-term resources and transform them into long-term assets. In a system with liberalised interest rates, interest rate risk tends to be high because interest rates are determined by the market and are flexible. Chari and Jagannathan (1989) argue that banks are more vulnerable when they operate under highly volatile interest rates. Furthermore, in the context of Uganda, Beck and Hesse (2009) tested the hypothesis that financial stability is related to the spread through the risk that lenders take, which are compensated for in a form of a premium embedded in the financial intermediation spread. They find evidence in support of this hypothesis in Uganda where the spread has a tendency to vary to a large extent with the portfolio of loans across different sectors of the economy.

Market frictions such as information asymmetries and transaction costs drive a wedge between deposit and lending rates in the case of Armenia (Dabla-Norris and Floerkemeier, 2007). Al-Jarrah (2010:8) observes that the spread in Jordan was high due to “a high degree of information asymmetry.” It is in this vein that Demirguc-Kunt et al. (2004) argue that institutions have a critical role to play in reducing market frictions. Legal institutions improve loan recovery and reduce default rates and thus enhance transparency in the market, contract enforceability, and collection of collateral. There is also empirical evidence from Uganda that lack of alternatives for creditors to diversify risk leads to higher lending rates (Beck and Hesse, 2009).

The risk appetite of a bank plays a significant part in the determination of the financial intermediation spread. In a study of the banking industry in Kenya, Collins

and Wanjau (2011) show that the financial intermediation spread is narrower for a risk-averse bank than for a risk-neutral one because risk aversion increases the bank's interest rates. Chand (2002) indicates that the high risk which increases intermediation costs in turn leads to a high spread in the case of the Pacific Islands. A high spread does not only discourage further borrowing, but also makes it difficult for existing debtors to repay their loans. In this way, a wide spread increases non-performing loans and may cause financial instability. Even though banks try to overcome this risk by making provisions to counter non-performing loans, using evidence from Kenya, Waweru and Kalani (2009) argue that such provisions may not be adequate to protect against default risk when non-performing loans are very high. This compels banks to embed a premium in lending rates to provide additional cushion.

The foregoing discussion has shown that financial risk represents one strong channel through which financial instability impacts on the size of the financial intermediation spread. Liquidity, interest rate, credit and sentiment risks all have a bearing on the magnitude of the spread through their effect on the pricing behaviour of banks. Due to the asymmetric effect that they have on deposit rates, the financial intermediation spread tends to largely reflect the setting of lending rates, and so financial instability tends to influence the spread through financial risk.

8.3 METHODOLOGY

8.3.1 Data and Description of variables

Annual panel data collected from World Bank's world development indicators (WDI) database and New database on Financial Development and Structure for nine countries of SADC are used in this study³⁹. The data covered a period spanning 1984 to 2010⁴⁰. Following the procedure outlined in detail in the previous chapter, the BGARCH (1,1,1) model (see Appendix 7G) was used to generate volatility measures of financial stability. The measures of volatility were then used as proxies for financial instability and the feasible generalised least squares (FGLS) technique was used to test the causality between the financial intermediation spread and financial

³⁹ Due to data constraints only the following countries were included in the study: Botswana, Lesotho, Malawi, Mauritius, Seychelles, South Africa, Swaziland, Tanzania and Zambia.

⁴⁰ Exchange rate data spans 1991 to 2010.

instability in the SADC region. Appendix 8A contains a description of variables used in the model.

8.3.2 Analytical Techniques

8.3.2.1 Unit root testing

In order to test for panel causality between financial integration and instability, the study employed the FGLS technique to estimate VAR-81. This technique requires that panel data should be stationary. Similar to the procedure followed in the previous chapter, this study uses three panel unit-root tests, namely; the Levin and Lin (1992), Maddala and Wu (1999), and Im et al. (2003) tests to study the unit root properties of the data. In case where the three tests contradict each other, the decision is based on a simple majority rule.

8.3.2.2 Panel causality testing

After using the BGARCH (1,1,1) model to generate measures of financial instability, the study proceeds to test for panel causality between the financial intermediation spread and financial instability. The FGLS is used to test for causality between financial intermediation spread and financial instability. To this end, a VAR model is specified as:

$$FIS_{it} = \beta_0 + \sum_{k=1}^L \beta_k FIS_{i,t-k} + \sum_{k=1}^L \delta_k FI_{i,t-k} + v_{it} \quad (82)$$

$$FI_{it} = \bar{\omega}_0 + \sum_{k=1}^L \bar{\omega}_k FI_{i,t-k} + \sum_{k=1}^L \tau_k FIS_{i,t-k} + \Delta\varphi_{it}$$

$FIS_{i,t}$ and $FI_{i,t}$ denote stationary series for financial intermediation spread and financial instability, respectively, for country i at time t . k represents the lag-length. The choice of FGLS to estimate VAR(k) specified in 81 is motivated by the fact that panel data for SADC is characterised by contemporaneous correlation due to intra-SADC trade as well as the penetration of South African banks in the region. In addition, the disparities in the size of the economies may give rise to heteroscedasticity. Moreover, the sample comprises $T = 30$ and $N = 10$ which means that $T > N$. Kmenta (1986) shows that this technique is able to deal with the inherent

must be less than the number of cross-sectional units. Using this principle and the Akaike information criterion, the feasible optimal lag length is $k = 2$.

8.4 DATA ANALYSIS

8.4.1 Unit root test results

The results show that all the variables are integrated of order zero, that is, $I(0)$ stationary, except the financial intermediation spread and the liquidity ratio which are integrated of order one i. e. $I(1)$ stationary (Appendix 8B). All $I(1)$ stationary variables are used in their first differences to estimate VAR-85.

8.4.2 Discussion of panel causality results

8.4.2.1 Causality between financial intermediation spread and financial stability

As established in the previous chapter, omission of the co-variance between σ_{ϵ}^2 when estimating financial instability is a serious shortcoming. This chapter proceeds to determine whether such an omission has significant implications for testing Granger causality between the financial intermediation spread and financial instability in SADC. This is done by generating financial instability measures using a standard GARCH () and BGARCH () models. The results for the Granger causality test are reported in Table 8.1 for measures of financial instability generated from a standard GARCH () model and Table 8.2 for financial instability measures obtained using BGARCH () model. The results for both cases are identical in three cases. No Granger causality is evident between the financial intermediation spread and volatility of the inflation rate and real interest rates. In addition, both cases reinforce feedback Granger causality between the spread and credit volatility. However, while unidirectional causality is obtained from the spread to volatility of growth generated using a standard GARCH () model, there appears to be feedback causality between the two when BGARCH () model is used to estimate growth volatility. Furthermore, the financial intermediation spread tends to Granger cause exchange rate volatility generated using a standard GARCH () model, even though when exchange rate volatility is measured using BGARCH () model evidence of feedback Granger causality is obtained. The results demonstrate that omission of the co-variance between σ_{ϵ}^2 when estimating financial instability is not a trivial

matter because it has far reaching consequences for Granger causality testing. The remainder of the analysis on Granger causality between the financial intermediation spread and financial instability based on the measures of financial instability obtained from BGARCH (1,1,1) model.

Table 8.2 presents results for the causal relationship between financial intermediation spread and various measures of financial instability. There is evidence of feedback causality between volatility of growth and financial intermediation spread. This finding lends support to Saunders and Schumacher (2000) who found that banks tend to charge higher lending rates in economies characterised by highly volatile growth rates. Business cycle fluctuations affect the ability of borrowers to repay their loans and prompt banks to levy a premium on lending rates to cushion themselves against the probability of default during a down-swing. Moreover, high lending rates make it expensive to borrow and deter investment growth, this in turn, destabilises economic growth. Even though this causal relationship is robust when the liquidity ratio is included in the model (Appendix 8C), causality tends to run in one direction from financial intermediation spread to growth volatility when monetary policy is accounted for (Table 8.3). The lesson for policy makers is that it is very important to conduct sound macroeconomic policies that ensure not only high, but also steady rate of growth in order to achieve and maintain a narrow wedge between deposit and lending rates which in turn will ensure stable investment through low borrowing costs. Furthermore, there is unidirectional causality from financial intermediation spread to inflation volatility in SADC (Appendix 8C). This indicates that a small financial intermediation spread also augurs well for price stability.

Tables 8.2 and 8.3 show that there is also evidence of feedback causality between financial instability measured by the volatility of credit and the financial intermediation spread. This result remains robust when both monetary policy (Table 8.3) and liquidity ratio (Appendix 8D) are controlled for in the model. This result suggests that banks in SADC include a premium on the lending rate to compensate for credit risk. Moreover, the premium that is added to the lending rates makes it harder for borrowers to repay their loans. This finding shows that credit regulators should seriously keep credit volatility in check. Unbridled credit volatility will result in higher lending rates and impose a burden on borrowers with a likelihood of precipitating a financial crisis.

The results provide evidence of bi-directional causality between financial intermediation spread and real exchange rate volatility. This result confirms the finding of Crowley (2007) who shows that exchange rate volatility can be a source of uncertainty which can culminate into wider financial intermediation spread. In addition, even though there is unidirectional causality between inflation volatility and financial intermediation spread when liquidity ratio is included in the model (Appendix 8C), such a relationship fades away in other specifications (Table 8.2 and 8.3). Moreover, both Tables 8.2 and 8.3 show no causality between the financial intermediation spread and real interest rate volatility.

Table 8.1 shows that the dummy variable for the global financial crisis has a positive effect on the magnitude of the financial intermediation spread. This implies that the size of the spread increased during the crisis years perhaps indicating that commercial banks increased their lending rates in response to the crisis. The coefficient of this dummy bears different signs for the measures of financial instability. The volatility of credit and real exchange rate increased during the crisis years while the volatility of real interest rates, inflation rate and growth rate declined during the same period. The dummy variable for the CMA generally bears a positive sign and has a statistically significant effect on the financial intermediation spread. This implies that the financial intermediation spread is higher for CMA countries than for an average SADC country.

Table 8.1: Financial stability and the financial intermediation spread in SADC

Model	Real Sector				Monetary Sector				External Sector	
	Causality between		Causality between		Causality between		Causality between		Causality between	
	<i>fis</i>	<i>g</i>	<i>fis</i>	<i>inf</i>	<i>fis</i>	<i>ri</i>	<i>fis</i>	<i>cred</i>	<i>fis</i>	<i>reer</i>
Δfis_{t-1}	0.072 (0.278)	0.047*** (0.076)	0.071 (0.287)	0.015 (0.577)	0.038 (0.568)	0.016 (0.474)	0.036 (0.589)	0.001 (0.215)	0.270* (0.000)	0.079* (0.000)
Δfis_{t-2}	-0.123*** (0.060)	-0.080* (0.002)	-0.115*** (0.080)	0.042 (0.121)	-0.118*** (0.070)	0.003 (0.878)	-0.112*** (0.085)	-0.002* (0.001)	-0.174* (0.005)	0.009 (0.663)
g_{t-1}	0.075 (0.205)	0.166* (0.007)								
g_{t-2}	-0.079 (0.198)	-0.189* (0.002)								
inf_{t-1}			0.001 (0.984)	0.159** (0.015)						
inf_{t-2}			0.028 (0.634)	-0.200* (0.002)						
ri_{t-1}					-0.054 (0.336)	0.074 (0.273)				
ri_{t-2}					-0.108*** (0.052)	0.103 (0.120)				
$cred_{t-1}$							-0.001** (0.020)	-0.395* (0.000)		
$cred_{t-2}$							0.0002 (0.739)	-0.106 (0.110)		
$reer_{t-1}$									0.008 (0.810)	0.227* (0.003)
$reer_{t-2}$									-0.056 (0.455)	-0.235* (0.001)
<i>CMA</i>	0.234* (0.008)	0.108 (0.341)	0.222** (0.015)	-0.266** (0.026)	0.241* (0.005)	-0.117 (0.272)	0.227** (0.018)	0.074 (0.719)	0.083 (0.474)	0.187 (0.171)
<i>Year2007</i>	0.328*** (0.052)	0.843* (0.000)	0.316*** (0.054)	0.186 (0.264)	0.263 (0.125)	-0.030 (0.819)	0.326** (0.046)	0.012 (0.172)	0.400** (0.030)	0.208** (0.037)
<i>Constant</i>	-0.145*** (0.072)	-0.142** (0.047)	-0.148*** (0.081)	0.079 (0.219)	-0.162*** (0.064)	0.081 (0.120)	-0.150*** (0.070)	0.028 (0.611)	-0.156 (0.196)	-0.109 (0.167)
<i>Direction of causality</i>	<i>fis</i> → <i>g</i>		None		None		<i>fis</i> ↔ <i>cred</i>		<i>fis</i> → <i>reer</i>	
<i>Wald test</i>	2.58 (0.108)	9.68* (0.002)	0.09 (0.769)	0.44 (0.507)	0.41 (0.521)	0.16 (0.692)	6.47* (0.011)	16.43* (0.000)	0.36 (0.547)	5.93 (0.015)
<i>Sample size</i>	216	216	216	216	216	216	216	216	153	153

(*), (**) and (***) denote 1, 5 and 10 percent level of statistical significance, respectively and *p*-values are in parenthesis. A standard GARCH (1,1) model was used to generated measures of financial instability and Granger causality was tested using FGLS estimation.

Table 8.2: Financial stability and the financial intermediation spread in SADC

Model	Real Sector				Monetary Sector				External Sector	
	Causality between		Causality between		Causality between		Causality between		Causality between	
	0.055 (0.407)	0.007*** (0.095)	0.044 (0.508)	-0.011 (0.669)	0.010 (0.882)	0.004*** (0.099)	0.036 (0.589)	0.001 (0.215)	0.302* (0.000)	0.019** (0.014)
	-0.130** (0.045)	-0.022* (0.000)	-0.106 (0.105)	-0.017 (0.504)	-0.110*** (0.087)	-0.001 (0.658)	-0.112*** (0.085)	-0.002* (0.001)	-0.075 (0.196)	-0.053* (0.000)
	-0.005 (0.255)	-0.003 (0.934)								
	0.007*** (0.074)	0.114* (0.001)								
			-0.005 (0.291)	0.119*** (0.066)						
			-0.006 (0.201)	-0.061 (0.326)						
					-0.021*** (0.070)	-0.019 (0.774)				
					-0.033* (0.003)	-0.059 (0.343)				
							-0.001** (0.020)	-0.395* (0.000)		
							0.0002 (0.739)	-0.106 (0.110)		
									0.001* (0.000)	-0.274* (0.000)
									0.0003** (0.039)	0.232* (0.000)
	0.203** (0.028)	0.059 (0.194)	0.257* (0.003)	-0.023 (0.912)	0.173** (0.031)	0.007 (0.962)	0.227** (0.018)	-0.074 (0.719)	0.134 (0.165)	0.102 (0.633)
	0.304*** (0.062)	-0.049** (0.034)	0.299*** (0.083)	-0.267* (0.000)	0.307*** (0.068)	-0.037* (0.000)	0.326** (0.046)	0.012 (0.172)	0.588* (0.001)	0.041 (0.394)
	-0.158*** (0.057)	-0.037** (0.017)	-0.179** (0.034)	0.064 (0.737)	-0.115 (0.169)	0.007** (0.049)	-0.150*** (0.074)	0.028 (0.611)	-0.192*** (0.088)	-0.028 (0.508)
	5.67** (0.017)	33.25* (0.000)	0.02 (0.883)	0.03 (0.859)	0.53 (0.467)	1.39 (0.238)	6.47** (0.011)	16.43* (0.000)	5.65** (0.017)	71.62* (0.000)
	216	216	216	216	216	216	216	216	153	153

(*), (**) and (***) denote 1, 5 and 10 percent level of statistical significance, respectively and p-values are in parenthesis. A standard GARCH (1,1) model was used to generate measures of financial instability and Granger causality was tested using FGLS estimation.

Table 8.3: Financial stability and the financial intermediation spread in SADC controlling for monetary policy

Model	Real Sector				Monetary Sector				External Sector	
	Causality between		Causality between		Causality between		Causality between		Causality between	
	<i>fis</i>	<i>g</i>	<i>fis</i>	<i>inf</i>	<i>fis</i>	<i>ri</i>	<i>fis</i>	<i>cred</i>	<i>fis</i>	<i>reer</i>
Δfis_{t-1}	0.126** (0.047)	0.007 (0.108)	0.132** (0.036)	-0.039 (0.211)	0.087 (0.174)	0.006* (0.004)	0.127** (0.043)	0.001 (0.258)	0.221* (0.000)	0.049* (0.000)
Δfis_{t-2}	-0.097 (0.134)	-0.023* (0.000)	-0.084 (0.197)	-0.63** (0.024)	-0.109*** (0.094)	0.002 (0.300)	-0.084 (0.191)	-0.002* (0.000)	-0.258* (0.000)	-0.066* (0.000)
g_{t-1}	-0.004 (0.360)	0.0002 (0.997)								
g_{t-2}	0.001 (0.792)	0.120* (0.001)								
inf_{t-1}			-0.003 (0.489)	0.026 (0.691)						
inf_{t-2}			-0.001 (0.882)	-0.090 (0.161)						
ri_{t-1}					-0.024** (0.040)	0.004 (0.954)				
ri_{t-2}					-0.034* (0.003)	-0.109*** (0.070)				
$cred_{t-1}$							-0.001** (0.040)	-0.503* (0.000)		
$cred_{t-2}$							0.001 (0.179)	-0.163** (0.017)		
$reer_{t-1}$									0.001* (0.000)	-0.510* (0.000)
$reer_{t-2}$									0.001* (0.000)	-0.009 (0.825)
br_{t-1}	0.026** (0.046)	0.001 (0.454)	0.029** (0.024)	-0.001 (0.841)	0.005 (0.675)	0.001 (0.634)	0.029** (0.020)	0.0003 (0.209)	0.010 (0.241)	-0.017* (0.000)
br_{t-2}	-0.050* (0.000)	0.0001 (0.889)	-0.054* (0.000)	-0.006 (0.417)	-0.033* (0.006)	0.005** (0.019)	-0.054* (0.000)	0.0002 (0.272)	-0.074* (0.000)	-0.018* (0.000)
Year2007	0.076 (0.674)	-0.049** (0.043)	0.027 (0.883)	-0.310* (0.000)	0.139 (0.433)	-0.034* (0.000)	0.052 (0.774)	0.010 (0.220)	-0.172 (0.169)	0.060** (0.078)
Constant	0.333** (0.053)	-0.036 (0.128)	0.342*** (0.051)	0.144 (0.162)	0.388** (0.017)	-0.060* (0.001)	0.351** (0.037)	-0.014 (0.497)	1.100* (0.000)	0.303* (0.000)
Direction of causality	<i>fis</i> → <i>g</i>		None		None		<i>fis</i> ↔ <i>credit</i>		<i>fis</i> → <i>reer</i>	
Wald test	0.93 (0.334)	32.92 (0.000)	0.11 (0.746)	0.50 (0.478)	0.32 (0.570)	1.20 (0.273)	8.52* (0.004)	18.41* (0.000)	0.53* (0.465)	340.71 (0.000)
Sample size	216	216	216	216	216	216	216	216	153	153

(*), (**) and (***) denote 1, 5 and 10 percent level of statistical significance, respectively and *p*-values are in parenthesis. A simple BGARCH (1,1,1) model was used to generated measures of financial instability and Granger causality was tested using FGLS estimation.

8.4.2.2 *Dealing with information asymmetries*

Appendix 8D shows results when a dummy variable for presence of a credit bureau is included in the model. The evidence shows no evidence of causality between financial intermediation spread and financial instability for economies that have a credit bureau. This shows that information-sharing helps financial intermediaries to effectively screen borrowers so as to be able to grant credit to those that are credit-worthy. This helps to curb the risk of financial instability with favourable effects on the spread. Hence, policy makers should strengthen the capacity of credit bureaus to increase both their coverage of the population and the depth and quality of credit information that they collect about borrowers. However, there is still evidence of unidirectional causality from the financial intermediation spread to real interest rate volatility. This result may indicate that there are other factors that are more prominent causal determinants of real interest rate volatility than the financial intermediation spread even under an information-sharing lending environment.

8.5 CONCLUSION

The study set-off to demonstrate the suitability of measuring macroeconomic volatility using the BGARCH (). The findings show that the BGARCH () model is an appropriate tool for measuring macroeconomic volatility. The second objective of the study was to test the hypothesis that there is a causal relationship between the financial intermediation spread and financial instability measured by five measures of macroeconomic volatility. The findings are three-fold. *First*, there is feedback causality between volatility of growth and financial intermediation spread. This finding shows that banks tend to charge higher lending rates when the volatility of growth is high in order to cushion themselves against the probability of default during a down-swing. Consequently, high lending rates discourage borrowers and reduce investment and destabilise economic growth. The lesson for policy makers is that it is very important to conduct sound macroeconomic policies that ensure not only high, but also steady rate of growth. This will ensure a narrow wedge between deposit and lending rates which will also contribute positively to the stability of growth. *Second*, there is also evidence of feedback causality between volatility of credit and the financial intermediation spread. This result suggests that banks in SADC include a premium on the lending rate to compensate for credit risk and the

added premium makes harder for borrowers to repay their loans. This finding shows that credit regulators can use credit volatility as an early warning signal for an impending financial crisis. *Third*, the results provide evidence of a bidirectional causal relationship between financial intermediation spread and real exchange rate volatility thus showing that exchange rate volatility can be a source of uncertainty which can culminate into wider financial intermediation spread. *Fourth*, institutions such as the credit bureau which facilitate information-sharing are crucial for curbing financial instability. This underscores the need to ensure that such institutions exist and have capacity to cover a sizeable amount of the population as well as good quality data on borrowers.

University of Cape Town

REFERENCES

- Al-Jarrah, I. M. (2010), –The cost of financial intermediation in the banking sector in Jordan,” *International Research Journal of Finance and Economics*, 56(2010): 7-16
- Allen, F. and D. Gale (2000), –Bubbles and crises,” *Economic Journal*, 110: 236-255
- Beck, T. (2006), –Efficiency in financial intermediation: Theory and empirical measurement,” World Bank, Washington DC.
- Beck, T., Demirgüç-Kunt, A. and R. Levine (2003) –Law, endowments, and Finance,” *Journal of Financial Economics*, 70: 137–181.
- Beck, T. and H. Hesse (2009), –Why are interest spreads so high in Uganda?” *Journal of Development Economics*, 88(2009): 192-204
- Blejer. M. (2006), –Economic Growth and the Stability and Efficiency of the Financial Sector,” *Journal of Banking and Finance* 30(2006): 3429-3432.
- Bonfilioli, A. and Mendicino, C. (2004), –Financial Liberalization, Bank Crises and Growth: Assessing the Links,” SSE WP-No.567
- Brock, P. and H. Franken (2003): –Measuring the Determinants of Average and Marginal Bank Interest Rate Spreads in Chile: 1994–2001,” University of Washington Economics Working Paper 25/2003.
- Brock, P. L. and L. Rojas-Suarez (2000) –Understanding the Behaviour of Bank Spreads in Latin America,” *Journal of Development Economics*, 63(1), 113–34.
- Collins, J. N. and K. Wanjau (2011), –The effects of interest rate spread on the level of non-performing assets: A case of commercial banks in Kenya,” *International Journal of Business and Public Management*, 1(1): 139-155
- Chand, S. (2002), –Financial sector development and economic growth in Pacific Island Countries,” *Pacific Economic Bulletin*, 17(1): 117-133
- Chari, V. V and Jagannathan, R. (1989), –Adverse Selection in a Model of Real Estate Lending,” *Journal of Finance*, 44(2): 499-508.
- Crowley, J. (2007), –Interest Rate Spreads in English-Speaking African Countries,” IMF Working Paper No. WP/07/101, Washington DC
- Dabla-Norris, E. and H. Floerkemeier (2007), –Bank efficiency and market structure: What determines banking spreads in Armenia?” IMF Working Paper No. WP/07/134, Washington DC.
- Demirgüç-Kunt, A. and H. Huizinga (1999) –Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence,” *World Bank Economic Review*, 13(2), 379–408.
- Demirgüç-Kunt, A., L. Laeven and R. Levine (2004) –Regulations, Market Structure, Institutions, and the Cost of Financial Intermediation,” *Journal of Money, Credit, and Banking*, 36(3), 593-622
- Diamond, D. W. (1984), –Financial intermediation and delegated monitoring,” *Review of Economic Studies*, 51 (3): 393-414.
- Diamond, D. and P. Dybvig (1983), –Bank runs, deposit insurance and liquidity,” *Journal of political economy*, 91: 401-419
- Diamond, D. and R. Rajan (2006), –Money in a theory of banking,” *American Economic Review*, 96(1): 30-53
- Gorton, G. and A. Winton (1998), –Banking in transition economies: does efficiency require instability? *Journal of Money, Credit, and Banking*, 30(3): 621-650.
- Gropp, R., C. K. Sorensen and J.D. Lichtenberger (2007), –The dynamics of bank

- spreads and financial structure,” European Central Bank working paper Number 7/4, Germany
- Ho, T.S.Y and Saunders, A. (1981). –The determinants of bank interest margin: Theory and empirical evidence.” *Journal of Financial and Quantitative Analysis*, XVI (4):581-599
- Hsiao, F. S. T. and M. W. Hsiao (2006), –FDI, exports, and GDP in East and Southeast Asia – Panel data versus time-series causality analyses,” *Journal of Asian Economies*, 17(2006): 1082-1106
- Im, K. S, M. H. Pesaran and Y. Shin (2003), –Testing for unit roots in heterogeneous panels,” DAE, Cambridge University Working paper No. 9526, UK
- King, R. and R. Levine (1993), –Finance and growth: Schumpeter might be right,” *Quarterly Journal of Economics*, 153(3): 717-38
- Kmenta, J. (1986), **Elements of Econometrics**, New York: Macmillan; London: Collier macmillan, 2nd Ed.
- Levin A. and C. F. Lin (1992), –Unit root test in panel data: Asymptotic and sample properties,” University of California at San Diego, Discussion paper No. 93, USA
- Levine R. (1997), –Financial development and economic growth: Views and agenda,” *Journal of Economic Literature*, 35: 688-726
- Levine, R and S. Zervos (1998), –Stock markets, banks and economic growth,” *American Economic Review*, 88(3): 537-558
- Loayza, N. and R. Ranciere (2005), –Financial development, financial fragility and growth,” IMF working paper No. 05/170, Washington DC
- Maddala, G. S and S. Wu (1999), –A comparative study of unit root tests with panel data and new simple test,” *Oxford Bulletin of Economics and Statistics*, Special Issue: 631-65
- Maudos, J. and J. Fernández de Guevara, (2004), –Factors explaining the interest margin in the banking sectors of the European Union”, *Journal of Banking and Finance*, 28 (9): 2259-2281.
- Merton, R. C., and Z. Bodie (1995) "A Conceptual Framework for Analyzing the Financial Environment." Chap. 1 in ***The Global Financial System: A Functional Perspective***, by D. B. Crane, K. A. Froot, Scott P. Mason, André Perold, R. C. Merton, Z. Bodie, E. R. Sirri, and P. Tufano, 3–31. Boston: Harvard Business School Press
- Ndung'u, N. and Ngugi, R. (2000), –Banking sector interest rate spread in Kenya.” Kenya Institute for Public Research and Analysis, Discussion paper No.5
- Neumark, D. and S. Sharpe, (1992), –Market structure and the nature of price rigidity: Evidence from the market for consumer deposits,” *Quarterly Journal of Economics*, 107 (2): 657-680
- Rashid, H. (2011), Credit to private sector, interest spread and volatility in credit-flows: Do bank ownership and deposits matter?” Department of Economic and social Affairs Working paper No. 105, United Nations Headquarters, New York
- Saunders, A. and Schumacher, L. (2000), –The determinants of bank interest rate margins: an international study”, *Journal of International Money and Finance*, 19 (6): 813-832.
- Shleifer, A. and R. Vishny (2010), –Unstable banking,” *Journal of financial economics*, 97 (2010): 306-318
- Stiglitz, J. and A. Weiss (1981): Credit Rationing in Markets with Imperfect

- Information, *American Economic Review* 71,393-410
- Tchana, T. F. (2008), "Regulation and banking stability: A survey of empirical studies," MPRA, Munich, Germany
- Thompson, M. A. (2006), "Asymmetric adjustment in the prime lending-deposit rate spread," *Review of Financial Economics*, 15(4): 323-329
- Waweru, N. M. and V. M. Kalani (2009), "Commercial banking crises in Kenya: Causes and remedies," *Global Journal of Finance and Banking Issues*, 3(3): 67-79
- Wong, K. P. (1997) "On the Determinants of Bank Interest Margins under Credit and Interest Rate Risks," *Journal of Banking and Finance*, 21 (2):251-271

University of Cape Town

LIST OF APPENDICES

Appendix 8A: Description of variables

<i>Sector</i>	<i>Variable</i>	<i>Description</i>
<i>Real Sector</i>	<i>fis</i>	Financial intermediation spread
	<i>g</i>	Growth volatility
	<i>inf</i>	Inflation volatility
<i>Monetary Sector</i>	<i>cred</i>	Credit volatility
	<i>ri</i>	Real interest rate volatility
<i>External Sector</i>	<i>reer</i>	Real effective exchange rate volatility

Appendix 8B: Unit root test results

	<i>Level</i>			<i>First Difference</i>			<i>Decision</i>
	<i>LLC</i>	<i>IPS</i>	<i>ADF-F</i>	<i>LLC</i>	<i>IPS</i>	<i>ADF-F</i>	
<i>g</i>	-8.574 (0.000)	-8.316 (0.000)	97.472 (0.000)				I(0)
<i>inf</i>	-8.773* (0.000)	-9.811* (0.065)	109.933* (0.000)				I(0)
<i>ri</i>	-11.068* (0.000)	-10.018* (0.000)	111.453* (0.000)				I(0)
<i>credit</i>	-8.944* (0.000)	-9.084* (0.000)	106.108* (0.000)				I(0)
<i>reer</i>	-6.862* (0.000)	-6.001* (0.000)	65.104* (0.000)				I(0)
<i>fis</i>	0.483 (0.685)	0.071 (0.529)	25.545 (0.111)	-13.653* (0.000)	-13.386* (0.000)	365.670 (0.000)	I(1)
<i>br</i>	-2.389* (0.009)	-1.913** (0.028)	30.150* (0.036)				I(0)
<i>liq</i>	1.583 (0.943)	-0.412 (0.340)	28.961 (0.049)	-4.877* (0.000)	-7.878* (0.000)	91.689* (0.000)	I(1)

(*), (**), and (***) denote 1, 5, and 10 percent level of statistical significance, respectively, and *p*-values are in parenthesis. The tests included both individual effects and individual linear trends. The lag-length selection was based on the SIC.

Appendix 8C: Financial stability and the financial intermediation spread in SADC controlling for liquidity levels

<i>Model</i>	<i>Real Sector</i>				<i>Monetary Sector</i>				<i>External Sector</i>	
	<i>Causality between</i>		<i>Causality between</i>		<i>Causality between</i>		<i>Causality between</i>		<i>Causality between</i>	
	0.079 (0.228)	0.011** (0.020)	0.076 (0.250)	0.042*** (0.052)	0.011 (0.870)	0.005** (0.014)	0.064 (0.330)	0.001 (0.173)	0.248* (0.000)	0.048* (0.000)
	-0.140** (0.030)	-0.018* (0.000)	-0.120*** (0.066)	0.092* (0.000)	-0.111*** (0.083)	0.003 (0.203)	-0.123*** (0.057)	-0.002* (0.000)	-0.035** (0.013)	-0.059* (0.000)
	-0.005 (0.301)	-0.016 (0.669)								
	0.007 (0.114)	0.114* (0.003)								
			-0.004 (0.423)	0.067 (0.249)						
			-0.001 (0.795)	-0.104*** (0.065)						
					-0.029** (0.011)	-0.060 (0.362)				
					-0.035* (0.002)	-0.053 (0.409)				
							-0.001** (0.068)	-0.138** (0.032)		
							0.0004 (0.434)	0.067 (0.288)		
									-0.0002* (0.000)	-0.240* (0.000)
									0.001* (0.000)	0.651* (0.000)
	0.027*** (0.066)	-0.001 (0.693)	0.025*** (0.087)	-0.014* (0.000)	0.016 (0.255)	0.0002 (0.744)	0.029** (0.045)	-0.0002 (0.558)	-0.116* (0.000)	-0.001** (0.014)
	-0.033*** (0.053)	-0.005** (0.042)	-0.037** (0.027)	0.043* (0.000)	-0.037** (0.023)	0.001 (0.139)	-0.032*** (0.051)	0.001* (0.001)	0.026* (0.000)	-0.001** (0.029)
	0.172 (0.309)	-0.024 (0.271)	0.170 (0.331)	-0.298* (0.000)	0.176 (0.321)	-0.036* (0.004)	0.200 (0.237)	-0.008*** (0.075)	1.473* (0.000)	-0.050* (0.000)
	-0.045 (0.508)	-0.025** (0.014)	-0.032 (0.656)	0.056* (0.000)	0.004 (0.953)	0.007 (0.212)	-0.025 (0.708)	0.001 (0.733)	-0.064* (0.001)	0.046* (0.000)
	4.93 (0.026)	26.61 (0.000)	0.10 (0.752)	3.49*** (0.062)	0.12 (0.733)	0.57 (0.450)	6.44** (0.011)	16.72* (0.000)	611.34* (0.000)	1308.96* (0.000)
	216	216	216	216	216	216	216	216	153	153

(*), (**), and (***) denote 1, 5 and 10 percent level of statistical significance, respectively and *p*-values are in parenthesis.

**Appendix 8D: Financial stability and the financial intermediation spread in SADC
(controlling for presence of a credit bureau)**

Model	Real Sector				Monetary Sector			
	Causality between		Causality between		Causality between		Causality between	
	0.064 (0.331)	0.005 (0.302)	0.043 (0.516)	0.176 (0.805)	0.023 (0.728)	-0.274* (0.000)	0.049 (0.460)	0.041 (0.258)
	-0.143** (0.030)	-0.020* (0.000)	-0.147** (0.023)	-0.046 (0.152)	-0.120*** (0.063)	-0.001 (0.808)	-0.135** (0.040)	-0.003* (0.002)
	-0.013 (0.519)	0.009 (0.826)						
	0.022 (0.287)	0.112* (0.004)						
			-0.004 (0.335)	0.018 (0.789)				
			-0.007 (0.111)	-0.160** (0.016)				
					-0.029 (0.228)	-0.128** (0.040)		
					-0.035 (0.169)	-0.032 (0.591)		
							-0.006 (0.825)	-0.329* (0.000)
							0.010 (0.708)	-0.009 (0.889)
	0.009 (0.662)							
	-0.017 (0.430)							
			-0.020 (0.282)					
			-0.028 (0.159)					
					0.024 (0.413)			
					-0.005 (0.868)			
							0.005 (0.857)	
							0.010 (0.700)	
		-0.011 (0.341)		-0.208 (0.771)		0.279* (0.000)		-0.040 (0.276)
		0.013 (0.223)		0.212 (0.768)		-0.275* (0.000)		0.041 (0.259)
	0.315* (0.004)	0.037 (0.607)	0.371* (0.000)	0.154 (0.916)	0.311* (0.006)	-0.017 (0.911)	0.326* (0.003)	-0.123** (0.036)
	-0.199** (0.038)	-0.042* (0.009)	-0.259* (0.005)	-0.166 (0.910)	-0.182*** (0.064)	-0.012 (0.936)	-0.196** (0.039)	0.104** (0.060)
bureau	without credit (0.335)	19.30 (0.000)	0.15 (0.697)	0.10 (0.755)	0.04 (0.849)	14.21* (0.000)	0.01 (0.931)	1.46 (0.227)
bureau	without credit (0.483)	0.49 (0.247)	0.07 (0.789)	0.09 (0.769)	0.47 (0.493)	14.65* (0.000)	0.01 (0.909)	1.23 (0.268)
	216	216	216	216	216	216	216	216

(*),(**) and (***) denote 1, 5 and 10 percent level of statistical significance, respectively and p-values are in parenthesis.

CHAPTER NINE

CONCLUSION

9.1 INTRODUCTION

Financial development is viewed as one of the important drivers of economic growth (King and Levine, 1993; Levine, 1997). Financial markets provide a conduit for financial resources to flow from surplus to deficit sectors of the economy and foster economic growth. The efficacy with which this financial intermediation process takes place is critical for giving impetus to the impact of financial resources on economic growth. Therefore, financial development is a necessary but not sufficient condition for economic growth. There are other important elements of the financial system that are important to enhance the impact of financial development on economic growth. This study has demonstrated on the basis of empirical evidence that financial integration, the degree of competition, and the stability of the financial system can either bolster or dampen the impact of financial development on economic growth. In the subsequent section, this chapter provides a summary of key findings of the study and offers some policy recommendations.

9.2 SUMMARY OF KEY FINDINGS AND POLICY RECOMMENDATIONS

9.2.1 Synthesis of key findings

The study started by measuring the degree of competition in the SADC banking industry using the H-statistic based on the Panzar-Rosse model. In doing so, the study distinguished between SADC as a whole bloc and SADC excluding SACU countries. The findings indicate that the banking industry in SADC, both with and without SACU, is characterised by monopolistic competition. The results provide several revelations. *First*, the unit price of labour is the biggest contributor to the value of the H-statistic in SADC. This underscores the role of labour in the banking industry despite the fact that banking activities have become technology-driven in recent years. Therefore, labour policies as well as the skill endowment have a bearing on competitive conduct in the banking industry. *Second*, the findings indicate that an environment of high risk in the banking industry has likely caused the shift from traditional financial intermediation activities where interest-bearing assets are the core business of banks to

non-interest-bearing activities which generate income from fees and commission. *Third*, the rate of growth of the economy improves banking revenue. The study continued to investigate the direct relationship between financial integration and competition in the banking industry and found that removal of restrictions on free flow of capital between countries enhances competition. Given this result, the study used the feasible generalised least square (FGLS) technique to test the hypothesis that financial integration enhances financial intermediation by narrowing the financial intermediation spread. The findings vary between members of the CMA and the rest of SADC perhaps due to disparities in the depth of financial integration between the two blocs. For example, on the one hand, deeper *de facto* financial integration captured by a rise in the ratio of FDI to GDP and offshore deposits to total deposits tend to widen the financial intermediation spread for CMA countries. On the other hand, the financial intermediation spread narrows as *de facto* financial integration deepens.

Competition-financial intermediation spread nexus: Economic theory predicts a trade-off between competition and the size of the financial intermediation spread. This study has tested the hypothesis that higher competition leads to narrow financial intermediation spread using panel causality test based on system-GMM. The findings suggest that competition results in narrower financial intermediation spread in the SADC region. This implies that formulation and effective implementation of sound competition policy can bolster efficiency in financial intermediation.

Competition-financial stability nexus: This study also investigated the causal relationship between competition and financial stability in the context of financial integration. This was achieved by testing the hypothesis that competition causes financial stability in the banking industry using system-GMM approach. The findings provide evidence of Granger causality from competition to financial instability in SADC. Nevertheless, the effect of competition tends to vary from a competition-fragility effect in the first year to a competition-stability effect in the second year. The impact of competition policies can gain impetus from a robust regulatory and supervisory apparatus.

Financial integration and stability nexus: One of the important benefits from financial integration is that it enhances financial stability. For instance, Schmukler (2004) argues that financial integration opens the economy to international competition and compels countries conform to international standards of reporting and financial regulation. Moreover, financial integration facilitates transfer of technology and know-how that improves efficiency and stability

in the domestic financial sector. However, financial integration can also undermine financial stability. The study attempted to measure financial instability by comparing GARCH () and BGARCH () models. The findings indicate that the BGARCH () model is more suitable for estimating financial instability because of its ability to incorporate additional information by accounting for the covariance between the residuals and past values of the standard deviation. Using this result, the study was able to generate measures of financial instability using the BGARCH () model and then proceeded to test the hypothesis that financial integration causes financial instability in SADC using FGLS technique. This study tests the hypothesis that there is a causal relationship between financial integration and financial instability. The findings validate the hypothesis even though the nature of causality varies with every measure of financial instability. For example, although financial integration tends to cause the volatility of both economic growth and real interest rates, there is evidence of feedback causality between financial integration and exchange rate volatility.

Financial stability and financial intermediation spread nexus: Asymmetric information complicates screening of borrowers to determine their creditworthiness and as a result impedes the efficiency of financial intermediation. This increases the risk of default and thwarts allocation of credit by compelling banks to incorporate a risk premium in the lending rate in order to cushion themselves against possible losses due to repayment failure. Consequently, the spread between lending and deposit rates gets large and increases the cost of information gathering and borrowing. Furthermore, high borrowing costs make it harder for borrowers to repay which increases the volume of non-performing loans. The study made use of measures of financial instability generated from the BGARCH () model to test the hypothesis that financial instability causes financial intermediation spread in SADC using FGLS technique. The findings provide evidence of feedback causality between the financial intermediation spread and several measures of financial instability. In addition, no causality is evident between financial stability and the spread when a dummy variable for the presence of a credit bureau is included in the model.

9.2.2 Policy implications and recommendations

The findings of this study have several policy implications. *First*, the unit cost of labour makes the largest contribution to the degree of competition in SADC. This implies that human

capital development through training coupled with appropriate labour laws and policies can go a long way towards improving competition in the banking industry. *Second*, there is evidence that non-interest bearing products have gained importance. This can be attributable to significant default risk which discourages loan-creation by banks. Moreover, financial integration makes it possible for banks to invest abroad. Since holding of offshore deposits attracts a lower level of risk compared to loans, banks prefer foreign asset-holdings to domestic loan-creation. This finding implies that factors that increase bank-risk must be addressed through creation of institutions such as commercial courts, credit bureaus, definition of properties among others.

Third, bank competition reduces the magnitude of the spread between lending and deposit rates. As a result, suitable competition policies can be formulated and implemented in order to increase the level of competition in the market and narrow the financial intermediation spread. This should be accompanied with specific policies aimed at eliminating barriers to entry and exit and intensify contestability in the market. *Fourth*, there is evidence of causality between competition and financial stability in SADC. In fact, the effect of competition on financial stability appears vary with the lag length. There is a switch from a competition-fragility effect in the first year to a competition-stability effect in the subsequent year. In addition, there is evidence of a causal relationship between financial integration and stability. The lesson for policy-makers is that, in order to avoid erosion of financial stability due to high levels of competition, competition policies must be combined with financial stability policies in the form of a robust and sound regulatory and supervisory framework. This is particularly important for countries that are undergoing financial integration.

The *fifth* finding is that there is causality between financial instability and the financial intermediation spread. In general, the results depict feedback causality between the financial intermediation spread and various measures of financial instability. Since no causality is evident when information-sharing institutions are included in the model, it is crucial that different members of SADC must establish credit bureaus to deal with asymmetric information problem.

Sixth, there is evidence that economic growth is important in various ways such as making it possible for banks to realise higher revenues, attain higher competition in the market and lower financial intermediation spread. This underscores the important role played by a stable macroeconomic environment. Therefore, as attempts are made to deepen the level of financial integration in SADC, member states must also move towards a harmonised formulation and

implementation of macroeconomic policies. Such common macroeconomic policies will ensure a meaningful financial integration in the region which will give impetus to competition policies with attendant benefits in terms of high competition, narrow financial intermediation spreads and stable banking markets.

9.3 PROPOSED AGENDA FOR FUTURE RESEARCH

The findings of this study have revealed that the SADC banking industry is characterised by monopolistic competition. In addition, competitiveness of the banking industry is found to be able to exert pressure on the size of the spread between lending and deposit rates. However, there are several areas of future research on this subject. For example, this study did not measure the efficiency of the banking industry in SADC. Future research should investigate this issue as well as assess the convergence of efficiency between members of SADC. Furthermore, as data become available, it is important to examine the effects of availability of stock market products which provide alternative sources of finance for firms.

Financial instability is a serious problem because it inhibits financial markets from serving as a conduit for funds to flow from surplus to deficit sectors of the economy. There are several attempts that have been made to measure financial instability. This study has contributed to this literature by testing the suitability of BGARCH () model as an alternative to measure financial instability. Nevertheless, it is still necessary to advance this work, especially on three aspects. *First*, this study has compared the ability of the BGARCH () model versus a standard GARCH () model. However, there have been a number of extensions to the standard GARCH which can provide opportunities for further research on the subject. More specifically, is it important to compare how the BGARCH model can perform when compared with extensions such as the Exponential GARCH and Threshold GARCH models. *Second*, even though financial instability is related to financial crisis, it is not clear at what point financial instability culminates into a crisis. It is important to incorporate characteristics of a Threshold GARCH model with the BGARCH model in order to come up with a model which can distinguish between financial instability and crisis. Such a model can help strengthen the early warning systems that are used to forecast periods of financial crisis. *Third*, in order to curb

financial instability, this study recommends establishment of institutions, such as the credit bureau, that are designed to facilitate information-sharing, especially between banks. However, bank regulation is another tool that can be used to attain this goal. Future research should determine its effectiveness in this regard.

Another area for future research is an investigation of the web of causal relationships between financial development and economic growth. Although this thesis made a simplifying assumption of a unidirectional causality from financial development to economic growth, there is also evidence of reverse causality from economic growth to financial development, bidirectional causality and no causality between the two variables⁴¹. For example, in the context of SADC, there is evidence of bidirectional causality in Namibia, Botswana (Eita, 2009, 2010), and Tanzania (Odhiambo, 2005) and weak unidirectional causality from financial development to economic growth in Lesotho (Mohapi and Motelle, 2007). However, no study has been conducted to investigate this issue in the context of the entire SADC in a panel setup. This is an important area for future research whose findings can further inform regional integration initiatives in the region. The last area of future research emerges from the lessons drawn from the Eurozone crisis which underscore the importance of four pillars of regional economic integration such as political, banking, fiscal and monetary integration. The role of regulatory harmonisation and coordination for financial integration, financial sector development and financial stability should be investigated in this context.

⁴¹ See Aziakpono (2011) for a review of relevant literature on the subject.

REFERENCES

- Aziakpono, M. J. (2011), –Financial development and economic growth: Theory and a survey of empirical evidence,” *Studies in Economics and Econometrics*, 35(1): 15-43
- Eita, J. H. (2009), –The finance-growth nexus in Namibia,” *Africa Finance Journal*, Special issue: 162-178
- Eita, J. H. (2010), –A causality analysis between financial development and economic growth for Botswana,” *The Africa Finance Journal*, 12(1): 72-89
- King R. G. And R. Levine (1993), –Finance and growth: Schumpeter might be right,” *Quarterly Journal of Economics*, 108: 717-737
- Levine R. (1997), –Financial development and economic growth: Views and agenda,” *Journal of Economic Literature*, 35: 688-726
- Mohapi, P. L. and S. I. Motelle (2007), The finance-growth nexus in Lesotho: causality revelations from alternative proxies,” *Studies in Economics and Econometrics*, 31(3): 43-55
- Odhiambo, N. (2005), –Financial development and economic growth in Tanzania: A dynamic causality test,” *The Africa Finance Journal*, 7(1): 1-17
- Schmukler, S. L. (2004), –Financial globalisation: Gain and pain for developing countries,” *Federal Reserve of Bank of Atlanta Economic Review*, Quarter II: 39-66