THE DEPTH OF FINANCIAL INTEGRATION AND ITS EFFECTS ON FINANCIAL DEVELOPMENT AND ECONOMIC PERFORMANCE OF THE SACU COUNTRIES

A thesis submitted in accordance with the requirements of PhD degree in the Faculty of Economic and Management Sciences, Department of Economics at the University of the Free State

by

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DECLARATION

I declare that the thesis hereby submitted by me for the PhD degree at the University of the Free Sate is my own independent work and has not previously been submitted by me at another university/faculty. I further more cede copyright of the thesis in favour of the University of the Free State.

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May 2008

ABSTRACT

The study investigates the relationship between financial integration, financial development and economic growth in the SACU countries. The empirical analysis commenced with an examination of the degree of financial integration in each of the SACU countries using a battery of tests. Overall, the results provide overwhelming evidence that shows that individually the financial sectors of the SACU countries are highly integrated and are becoming increasingly more so. The indicators also highlight a clear asymmetry in the capital flows among the banks in the SACU countries with the capital flows significantly favouring South Africa and Namibia more than the other countries, which is attributed to the underlying characteristics of these countries, especially their weak institutional development.

The results further confirm the dominant role of South Africa among the SACU. Furthermore, the interest rates analyses unambiguously indicate a hierarchy of integration of the financial systems of each member state with that of South Africa, with Namibia at the top, followed by Swaziland, Lesotho and Botswana in that order. Moreover, the results suggest that the prevailing integration between the financial systems stems from both policy convergence and market convergence. However, apart from Namibia, the evidence suggests limited arbitrage activities between the countries, which might result from both weak institutional development and limited investment opportunities and inability of investors to explore such opportunities in the smaller countries.

The empirical analyses of the relationships between financial development, financial integration and economic performance based on cointegration and error correction modelling techniques using the Johansen approach produce mixed results among the SACU countries. On the relationship between financial development and output growth, the results vary from country to country and depend on the measure of financial development used. Overall, the results lend some support for *supply-leading* finance as proposed by Patrick (1966) across the SACU countries. On the effects of FD, the weight of evidence suggests a negative long-run causal effect of financial development, especially using the credit indicator, on output level in the SACU countries. The tests for the effect of the deposit indicator on the output level were largely inconclusive, with the exception of Swaziland, where a robust positive effect was found. The weak effect of financial development on economic growth is attributed to inefficiencies in the credit

allocation mechanism due to weak regulations, banking supervision and underdeveloped financial systems as well as political, institutional and structural problems in some of the countries.

The results further confirm a long-run relationship between financial development and financial integration across the SACU countries. The results also confirm a strong feedback relationship between financial development and financial integration across the countries. Overall, the effect of financial integration on financial development and *vice versa* is ambiguous and varies across the SACU countries. In addition to the variation across the countries, the evidence depends on the kinds of stock of capital and measure of financial development used. Hence, it is difficult to conclude in general whether financial integration is a *complement* or *substitute* to domestic financial development across the SACU.

Lastly, the results show that in the four countries, output is predominantly endogenous while financial integration is mainly exogenous. This suggests a limited feedback relation from output to financial integration. Regarding the effects of financial integration on the output level, the results are mixed; the effects vary from country to country and depend on the types of capital. The effect of FDI was negative in Botswana, positive in South Africa but ambiguous in Swaziland. The ratio of foreign assets of banks has an ambiguous effect in Botswana, Lesotho and South Africa while no effect was detected in Swaziland. Lastly, the ratio of foreign liabilities of banks has a positive effect in Lesotho and Swaziland and a negative effect in South Africa, while the effect is ambiguous in Botswana.

Key words: Financial integration, financial development, economic growth, SACU, VECM, Principal component analysis.

DIE DIEPTE VAN FINANSIËLE INTEGRASIE EN DIE EFFEK DAARVAN OP DIE FINANSIËLE ONTWIKKELING EN EKONOMIESE PRESTASIE VAN DIE SADU LANDE

OPSOMMING

Die studie ondersoek die verhouding tussen finansiële integrasie, finansiële ontwikkeling en ekonomiese groei in die SADU lande. Die empiriese analise begin met ŉ ondersoek na die graad van finansiële integrasie in elk van die SADU lande, deur ŉ battery van toetse te gebruik. Die resultaat verskaf in alle opsigte oorweldigende bewyse wat aantoon dat die finansiële sektore van die SADU lande individueel hoogs geïntegreer is en dat dit toeneem. Die aanwysers beklemtoon ook ŉ duidelike asimmetrie in die kapitaalvloei tussen die banke en die SADU lande, met die kapitaalvloei betekenisvol ten gunste van Suid-Afrika en Namibië in vergelyking met die ander lande. Dit word toegeskryf aan die onderliggende eienskappe van hierdie lande, spesifiek hul swak institusionele ontwikkeling.

Die resultate bevestig verder Suid-Afrika se dominante rol in die SADU. Die rentekoersanalises dui ook ondubbelsinnig op ŉ hiërargie van die integrasie van die finansiële stelsels van elke lidstaat met die van Suid-Afrika. Namibië is bo-aan die lys, gevolg deur Swaziland, Lesotho en Botswana, in daardie volgorde. Die resultate dui verder ook aan dat die heersende integrasie tussen die finansiële stelsels voortspruit uit beide beleidkonvergensie en markkonvergensie. Die resultate toon egter ook dat, behalwe in Namibië, daar beperkte aktiwiteite tussen die lande bestaan, wat die gevolg kan wees van beide swak institusionele ontwikkeling en beperkte beleggingsgeleenthede, en die onvermoë van beleggers om sodanige geleenthede in die kleiner lande te verken.

Die empiriese analise van die verhouding tussen finansiële ontwikkeling, finansiële integrasie en ekonomiese prestasie, wat gebaseer is op ko-integrasie en foutkorrigerende modelleringstegnieke deur die Johansen-benadering te gebruik, verskaf gemengde resultate tussen die SADU lande. By die verhouding tussen finansiële ontwikkeling en uitsetgroei varieer die resultate van land tot land en hang dit van die maatstaf van finansiële ontwikkeling wat gebruik is af. As 'n geheel verleen die resultaat ŉ mate van ondersteuning aan *aanbod-leidende* finansies oor die SADU lande heen, soos voorgestel deur Patrick (1966). Oor die effek van FO, dui die oorwig van die bewyse op ŉ negatiewe jare-lange oorsaaklike effek van finansiële ontwikkeling op die uitsetvlak in die SADU

lande, veral as die kredietaanwyser gebruik word. Die toetse vir die effek van die deposito-aanwyser op die uitsetvlak was grootliks onoortuigend, met die uitsondering van Swaziland, waar ŉ robuuste positiewe effek gevind is. Die swak effek van finansiële ontwikkeling op ekonomiese groei word toegeskryf aan ondoeltreffendhede in die kredietallokasiemeganisme, weens swak regulasies, banktoesighouding en onderontwikkelde finansiële stelsels asook politieke, institusionele en strukturele probleme in party van die lande.

Die resultate bevestig verder ŉ langtermyn verhouding tussen finansiële ontwikkeling en finansiële integrasie oor die SADU lande heen. Die resultate bevestig ook ŉ sterk terugvoer-verhouding tussen finansiële ontwikkeling en finansiële integrasie oor die lande heen. In alle opsigte is die effek van finansiële integrasie op finansiële ontwikkelinge en *vice versa* dubbelsinnig en dit varieer oor die SADU lande heen. Bykomend tot die variasie oor die lande heen, hang die bewyse af van die soort kapitaalvoorraad en die maatstaf wat vir finansiële ontwikkeling gebruik is. Dit is derhalwe moeilik om in die algemeen te beslis of finansiële integrasie ŉ *aanvulling* of *plaasvervanger* vir finansiële ontwikkeling oor die SADU heen is.

Laastens toon die resultate aan dat uitset oorheersend endogeen in die vier lande is, terwyl finansiële integrasie hoofsaaklik eksogeen is. Dit suggereer ŉ beperkte terugvoerverhouding vanaf uitsette na finansiële integrasie. Wat die effek van finansiële integrasie op die uitsetvlak betref is die resultate gemeng; die effekte varieer van land tot land en hang van die soort kapitaal af. Die effek van Direkte Buitelandse Investering was negatief in Botswana, positief in Suid-Afrika, maar dubbelsinnig in Swaziland. Die verhouding van buitelandse bates van banke het ŉ dubbelsinnige effek in Botswana, Lesotho en Suid-Afrika, terwyl geen effek in Swaziland bespeur is nie. Laastens het die verhouding van buitelandse laste ŉ positiewe effek in Lesotho en Swaziland, en ŉ negatiewe effek in Suid-Afrika, terwyl die effek in Botswana dubbelsinnig is.

Sleutelwoorde: Finansiële integrasie, finansiële ontwikkeling, ekonomiese groei, SADU, Vektor-foutkorrigerende meganisme, hoofkomponente-analise.

DEDICATION

The thesis is dedicated to Jehovah, the Almighty God, my wife, Philomina and my parents, Mr and Mrs Aziakpono.

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However, any remaining error in the thesis is mine.

Meshach Jesse Aziakpono

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CONTENTS

PAGE

CHAPTER 3:
FINANCIAL INTEGRATION AND FINANCIAL DEVELOPMENT: THEORY AND EVIDENCE

CHAPTER 4:
FINANCIAL INTEGRATION AND ECONOMIC GROWTH: THEORY AND EVIDENCE

CHAPTER 5:

THE DEPTH OF FINANCIAL INTEGRATION IN THE SACU COUNTRIES

CHAPTER 6:

FINANCIAL DEVELOPMENT AND ECONOMIC PERFORMANCE OF SACU COUNTRIES: EMPIRICAL EVIDENCE

CHAPTER 7:

FINANCIAL INTEGRATION AND FINANCIAL DEVELOPMENT IN THE SACU COUNTRIES: EMPIRICAL EVIDENCE

CHAPTER 8:

FINANCIAL INTEGRATION AND ECONOMIC PERFORMANCE OF THE SACU COUNTRIES: EMPIRICAL EVIDENCE

CHAPTER 9:

CONCLUSION

LIST OF FIGURES

Text Figures

Appendix Figures

LIST OF TABLES

Text Tables

Appendix Tables

ACRONYMS

2SLS: Two Stage Least Squares
ADB: African Development Bank
ADF: Augment Dickey Fuller
AIC: Akaike Information Criterion
AREAR: Annual Report on Exchange Arrangements and Exchange Restrictions
AU: African Union
BLNS: Botswana, Lesotho, Namibia, Swaziland
BR: Bank Rate
CID: Covered Interest Differential
CIP: Covered Interest Parity
CLIP: Closed Interest Parity
CMA: Common Monetary Area
CPI: Consumer Price Index
CV: Control Variable
DF: Dickey-Fuller
DF-GLS: Dickey-Fuller
DGP: Data Generating Process
DR: Deposit Rate
ECB: European Central Bank
ECM: Error Correction Model
EMG: Emerging Market Economies
EMH: Efficient Market Hypothesis
EMU: European Monetary Union
EU: European Union
FD: Financial Development
FDI: Foreign Direct Investment
GDH: German Dominant Hypothesis
GDP: Gross Domestic Product
GDS: Gross Domestic Saving
GE: Government Expenditure
GLS: Generalised Least Squares
GMM: Generalised Method of Moment
GNP: Gross National Product

GNS: Gross National Saving

IAPM: International Arbitrage Pricing Model

ICAPM: international capital asset pricing model

IFI: Financial Integration

IFS: International Financial Statistics

IIP: International Investment Position

IMF: International Monetary Funds

IND: Index of Industrial Production

INF: Inflation

INV: Investment

IRD: Interest Rate Differential

I-S: Investment-Saving

IV: Instrumental Variable

LADB: Lesotho Agricultural Development Bank

LDC: Less Developed Country

LNS: Lesotho, Namibia, Swaziland

LR: Lending Rate

MENA: Middle East and North Africa

MMR: Money Market Rate

MPC: Monetary Policy Committee

NEPAD: New Partnership for African Development

OAU: Organisation of African Unity

OECD: Organisation for Economic Co-operation and Development

OLS: Ordinary Least Squares

PC: Principal Component

PCA: Principal Component Analysis

PP: Philip-Perron

PPP: Purchasing Power Parity

RIP: Real Interest Parity

RMA: Rand Monetary Area

SACU: Southern African Customs Union

SADC: Southern African Development Community

SADH: South African Dominant Hypothesis

SARB: South African Reserve Bank

SIC: Schwartz Information Criteria

TBR: Treasury Bill Rate

TVT: Total Value of Shares Traded

UID: Uncovered Interest Rate Differential

UIP: Uncovered Interest Parity

VAR: Vector Autoregression

VECM: Vector Error Correction Model

WLS: Weighted Least Squares

CHAPTER 1:

INTRODUCTION

1.1 BACKGROUND AND MOTIVATION

The increasing integration of financial markets across international borders is a remarkable feature of the last two decades. A major factor responsible for this is the increasing adoption by many countries of market-oriented economic and financial reforms that involve capital account liberalisation (removal of restrictions and controls on inflow and outflow of capital), deregulation of domestic financial markets, and the dismantling of restrictions on foreign direct investment (Agénor, 2003:1089). The result has been an increased globalisation of capital flows seeking higher rates of return and risk diversification.

Economic theory suggests that financial integration promotes economic growth by providing opportunities for a more efficient allocation of resources, and portfolio and risk diversification. Financial integration could also allow for higher profitability of investment and promote financial development (cf. Obstfeld and Taylor, 2004; Agénor, 2003; Lane and Milesi-Ferretti, 2003; De Gregorio, 1998).

The experience of industrialised nations has been used to justify the claim that financial integration will offer enormous benefits to countries opening their financial markets. Many have attributed efficiency gains, increased diversification opportunities and financial development in industrialised countries to the opening up of their financial markets (Edison *et al.*, 2004:4). In addition, evidence suggests that the policy reforms of the 1980s and 1990s in many emerging market economies have been associated with record high growth in capital inflows. For instance, net private capital flows to developing countries grew rapidly from around US$ 36 billion per year to US$ 230 billion per year during 1995-97 (World Bank, 1998).

This experience seems to be consistent with the theoretical argument that carefully following a proper sequence of internal and external financial liberalisation should allow developing countries to access capital flows and that this, in turn, will have positive effects on welfare and development (Nissanke and Stein, 2003:289). The logic of the argument is that free capital mobility results in funds flowing from countries where capital has a low marginal product to countries where capital has a high marginal product. Given the standard assumptions of diminishing returns to capital, the latter should yield higher rates of return in developing countries where the existing capital intensity is lower than in industrialised economies. Financial integration and globalisation, so the argument goes, will help to channel resources to developing countries as the capital markets work to equalise risk-adjusted marginal products of capital across borders (Nissanke and Stein, 2003:289).

Many economists and international financial institutions (notably the International Monetary Fund and the World Bank) use the dramatic rise of capital flows to emerging market economies, noted above, as a demonstration of the contribution to catch-up growth offered by financial integration and financial development (Nissanke and Stein, 2003:289). This would be a 'win-win' situation arising from 'mutually beneficial actions' by international investors seeking globally diversified portfolios, promising higher returns and developing countries removing barriers to international capital flows and expanding domestic stock markets in their efforts to accelerate economic growth (Nissanke and Stein, 2003:289; Demirguc-Kunt and Levine, 1996a; World Bank, 1997; 1989).

With an eye on the ultimate goal of integration into a global financial system, many countries are coordinating their financial liberalisation and integration efforts with neighbouring countries. The history of regional, even continent-wide, integration and cooperation initiatives in Africa is fairly long, albeit with very little success in achieving the desired goals of such initiatives (Oyejide, 2000:7). Following the launch of a common currency which heralded the final stage of the European Economic and Monetary Union (EMU) in 1999, there has been an increase in regional and continent-wide cooperation in Africa. As a mark of this renewed enthusiasm in Africa, the African Union (AU) and its implementation plan, the New Partnership for African Development (NEPAD), were launched in 2002[1] with a view to, among other things, increase African integration. Included also are the integration of the financial markets and ultimately, if possible, a single monetary union.

[1] In July 2001 the summit of African leaders in Lusaka, Zambia, announced the replacement of the Organisation of African Unity (OAU) with the African Union (AU) and the creation of NEPAD. The AU was formerly inaugurated in July 2002 at a summit in Durban, South Africa.

But the arguments do not all run in the same direction, and critics of the trend towards financial integration have raised doubts about the merits of international financial integration. Amongst these critics are prominent mainstream economists, such as Jagdish Bhagwati, who strongly favours free trade in goods and services, but argues that the risks of global financial integration outweigh the benefits. In an influential article published in *Foreign Affairs*, Bhagwati (1998:7), argues that the “claims of enormous benefits from free capital mobility are not persuasive” and added that the “substantial gains (from capital account liberalisation) have been asserted, not demonstrated.”

There has been much criticism from heterodox economists as well. For instance, Eatwell (1996) provides a body of evidence to argue that since the 1960s free international capital flows have been associated with a deterioration in economic efficiency (as measured by growth and unemployment).

Empirical studies have not resolved these controversies. While some studies find support for a positive effect of financial integration, others do not. An analysis of many of the previous studies on the effects of financial integration reveals that the contradictory conclusions may reflect several differences across the studies: the measures of financial integration used, the sample of countries used, the time periods covered, the econometric methodology and the set of right-hand side variables used. These issues need to be carefully evaluated to highlight the specific aspects that any new empirical studies must carefully address to provide more robust results.

In addition, the majority of the previous studies on the subject employ cross-sectional and panel frameworks in which developed and developing countries are grouped together in their analyses (cf. Klein, 2003; Arteta *et al.* 2001; Edwards, 2001; Klein and Olivei, 1999; Kraay, 1998; Rodrik, 1998; Quinn, 1997)[2]. The differences in the level of institutional development, economic performance and the varied political environments in developing countries, call into question the usefulness of broad generalisations based on such samples. Thus, the heterogeneity of the countries might render the findings of such studies irrelevant for country specific policies.

[2] See Chapter 4 for a detailed review of the literature.

One important question that is central to both the theoretical and the empirical literature is whether improved economic performance and financial development precede financial integration or the reverse. Often, empirical analyses of such questions are carried out by using causality tests. This is another area where cross-sectional and panel data frameworks are weak, since causality patterns are likely to be different across countries. Arestis and Demetriades (1996), for example, provide evidence that shows that the causal link between finance and growth is crucially affected by the nature and operation of the financial institutions and policies pursued in each country. This further calls for country-specific studies to understand the nature of the causal relationship between financial integration, on the one hand, and economic performance and financial development on the other.

In addition to the empirical research, a nuanced literature has proceeded to identify necessary conditions to realise the benefits of integration (cf. Prasad *et al.,* 2003; Le, 2000; Rodrik, 1999). Rodrik (1999:30), for instance, notes that “openness to international capital flows can be especially dangerous if the appropriate controls, regulatory apparatus and macroeconomic frameworks are not in place”. Also, commenting on the subject after a review of the issues, the then Chief Economist and Director of Research of the IMF, Kenneth Rogoff, noted that “these days everyone agrees that a more eclectic approach to capital account liberalisation is required” (Rogoff, 2002:55). These authors underscore the importance of a good institutional, governance and macroeconomic environment for financial integration.

This literature has also led to conceptual refinements, differentiating between *de jure* and *de facto* financial integration (Prasad *et al.,* 2003) or financial openness and financial integration (Le, 2000). According to Prasad *et al.* (2003:7) *de jure* financial integration represents policies associated with capital account liberalisation, while *de facto* financial integration represents actual capital flows. Esen (2000:5) notes that the removal of regulatory and administrative impediments, that is, financial openness or external financial liberalisation (*de jure* financial integration), allows residents to “move their funds and to hold financial assets abroad, private firms to borrow freely in foreign financial markets, residents to make financial transactions in foreign currencies” as well as “non-residents to invest freely in domestic markets”. Thus, capital account liberalisation or financial openness is expected to lead to international capital flows (Edison *et al*., 2002:2-3).

However, Prasad *et al.* (2003:7) note that governments have only a limited control over *de facto* financial integration. They argue that despite tight capital controls on paper in a given country, the degree of *de facto* financial integration might in practice still be high, if such controls are easily evaded. Accordingly, Prasad *et al.* (2003:7) split the actual experience of countries into four categories: First, drawing from the experience of industrialised countries, they observe that the removal of restrictions on capital flows could lead to a high level of actual capital flows. Secondly, citing the experience from some developing countries such as the Latin American countries in the 1970s and 1980s, capital account restrictions may be ineffective in controlling actual capital flows. This may occur, for instance, in the event of capital flight that could result in *involuntary de facto financial integration* in economies that are *de jure* closed to financial flows, i.e. *integration without capital account liberalisation*. Thirdly, according to Prasad *et al.* (2003:7) there can be liberalisation *without integration*, a situation in which countries (such as some African countries) have few capital account restrictions, but capital flows remain modest. Finally, it is possible to find a situation in which countries with closed capital accounts are also effectively closed in terms of capital flows.

According to Le (2000:4), financial openness (*de jure* integration) is a means to achieving financial integration, but while the former is a necessary condition for the latter, it is not a sufficient condition. Because of impediments such as asymmetric information problems – moral hazard and adverse selection, weak domestic financial systems, and country risks, as well as adverse macroeconomic and political environments, there may be a wide gap between financial openness (capital account liberalisation) and financial integration (Eichengreen *et al*., 1999; Eichengreen and Mussa, 1998; Roubini, 1998). Le (2000:4) contends that while financial integration always leads to welfare improvement, financial openness without full integration may induce welfare reduction. This underscores the need to establish the extent of *de facto* integration among countries that are *de jure* financially integrated. In other words, are countries with higher levels of *de facto* financial integration, especially in developing countries, deriving greater benefits from integration than those that are less integrated?

Lastly, an emerging line of investigation into the effect of financial integration is based on the argument that different types of financial flows would have different effects on the economic performance of a given country (IMF, 2007; Kose *et al.,* 2006a; Collins, 2004; Levine and Zervos, 1998b). To a large extent the debate centres on the relative effects of foreign direct investment (FDI) and debt flows. Because of the spillover effect that may arise from FDI, FDI flows might have a greater potential to stimulate economic growth than debt flows. However, the empirical literature has remained largely inconclusive on the matter (see a survey of the literature by Kose *et al.*, 2006a).

1.2 OBJECTIVE OF THE STUDY

The goal of this study is to explore the degree and the effects of financial integration on financial development and economic performance, and *vice versa*, in the five SACU countries, namely, Botswana, Lesotho, Namibia, South Africa and Swaziland. The specific objectives of the study include:

i. To use several indicators to determine the degree of financial integration among the SACU countries;
ii. To establish the extent to which the smaller SACU countries are integrated with South Africa;
iii. To explore the effects of domestic financial development on the economic performance of the SACU countries;
iv. To investigate, using different indicators, whether financial integration has truly stimulated domestic financial development and economic performance among the SACU countries;
v. To establish whether countries that are more financially integrated with South Africa benefit more from the integration process than those that are not; and
vi. To explore other factors that may have caused any disparity in the gains from financial integration among the SACU countries

1.3 WHY THE SACU COUNTRIES?

The SACU countries comprise the Common Monetary Area (CMA) and Botswana. Lesotho, Namibia, South Africa and Swaziland constitute the CMA. The SACU countries have been chosen for the analysis because they provide the opportunity for assessing some of the issues involved in the debate about financial integration. The SACU countries have a long history of both official economic and financial integration arrangements (see Box A-1.1 in the appendix to Chapter 1). They belong to a Customs Union that dates back to 1910, which allows for free movement of goods and services among member countries. In addition, four of the countries belong to the CMA.

The CMA is an example of a formal exchange rate union. Countries in a formal exchange rate union have separate currencies with rates fluctuating within narrow or zero margins and a strong degree of coordination among central banks (Masson and Pattillo, 2004:2). In the case of the CMA, the smaller members pegged their currencies at par with the South African rand, which circulates side by side with the currencies of member states and serves as legal tender in their respective countries. The CMA agreement also requires that a major proportion of their monetary liabilities be backed by the rand or other foreign assets. In addition, among the CMA countries there is no restriction on either current or capital account transactions. Thus, capital is allowed to flow to any country where it would earn the highest returns. The free movement of capital between the contracting parties should, all things being equal, create opportunities for arbitrage to equalise the returns on financial assets between member countries.

Of the member country central banks, only the South African Reserve Bank (SARB) engages in active discretionary monetary policy, while monetary policies in the other CMA members are managed along the line of the SARB policy. As noted by Kahn (2000:39), "whereas the agreements do involve some commitment to discussions, there is no obligation on the part of South Africa to include its CMA partners in the monetary policy decision process". In the past, because of political considerations, consultations were made more difficult. In recent years, some inputs have been made through the meetings of governors of central banks (twice a year) and heads of research departments (before the Monetary Policy Committee (MPC) of the SARB meets[3]) at the SARB in South Africa (Kahn, 2000:40). Despite such inputs, the SARB is still primarily responsible for monetary policy decisions through its MPC, which does not have representations from the other CMA countries.

In addition, the banking sector of the SACU countries is dominated by banks from South Africa. Except in a few instances, South African banks hold controlling interests in the major banks in the other countries. The high degree of South African ownership coupled

[3] The MPC meets approximately every six weeks.

with membership of the CMA ensures that the banking sectors in the other CMA countries follow South African trends in product innovation and pricing. Thus, it is expected that the financial systems in the CMA will be *de facto* integrated (given their *de jure* integration), and particularly that those of the other CMA countries (Lesotho, Namibia and Swaziland -LNS) will be integrated with that of South Africa.

Although Botswana opted out of the Rand Monetary Area (RMA) in 1976 to pursue an independent exchange rates system, it still shares several important features with the CMA members. First, the currency of Botswana, the pula, has in practice remained informally linked to the rand through a currency basket where since 1990 the rand carried a weight of around 60 to 70 percent. Botswana also continues to be a member of the SACU with a strong trade link with the other members, but predominantly with South Africa. In addition, most banks in Botswana are either branches of or are largely owned by South African banks. Thus, it is also expected that Botswana should be integrated with South Africa. Consequently, the Botswana case provides an interesting scenario for analysing the relative importance of a common currency versus common membership of trade agreements in stimulating financial integration and the resultant gains from the integrations.

The controversies regarding financial integration make it necessary to explain why financial integration has sometimes caused harm instead of providing the benefits predicted in theory. Or, as stated differently by Le (2000:4) “what are the costs of financial openness without, or with only a low level of, financial integration?” Thus, determining the degree of financial integration among the SACU countries will help to answer a number of questions regarding the nature of financial integration among the SACU countries. By virtue of the CMA agreement, member states are *de jure* financially integrated. However, are they also *de facto* integrated? Could a pattern possibly be established between the level of their financial integration and the gain they derive from the official integration arrangement?

One way to examine the extent of integration of the smaller SACU countries with South Africa is to determine the extent to which domestic monetary policy influences interest rates in each country. A strong domestic policy influence would suggest some policy autonomy and thus less integration (Agénor and Montiel, 1996:165). Since according to the CMA arrangement South Africa is to lead monetary policy formulation while the other countries will follow, it is expected that South Africa would have more policy autonomy than any of the BLNS countries. Hence, the response of market rates in South Africa to the Reserve Bank rate can be used as a benchmark for evaluating the degree of autonomy of the BLNS countries, which in turn will affect the degree of their integration.

Moreover, the relationship between interest rates in the BLNS and the South African Reserve Bank rate will be analysed to provide answers to a number of specific questions. For instance, to what extent do monetary authorities in the BLNS countries respond to a change in policy stance in South Africa? To what extent is the South African monetary authority independent of the monetary authorities in the BLNS? To what extent are the money markets of the BLNS countries directly affected by the South African monetary policy stance? A high response from the BLNS with causality running only from the South African Reserve Bank rate to the BLNS rates would indicate a clear dominant position of the South African Reserve Bank (SARB) in the SACU. Finally, to what extent do arbitrage opportunities exist between the South African money markets and each of the BLNS countries since there are no restriction to capital flows among the countries (with the exception of Botswana)? The presence or absence of arbitrage opportunities should indicate to some degree the extent of the institutional and structural differences as well as market imperfections within each of the economies.

Understanding the relationship between financial development and economic performance in developing countries, the third objective, has important policy implications for priorities that should be given to reforms of the financial sector by public authorities. If it can be established that financial development exerts a positive significant impact on economic growth, then it raises the degree of urgency required to improve the functioning of financial intermediaries in developing countries through the strengthening of the weak legal and regulatory systems and implementing appropriate policy reforms. However, a weak causal link does not imply that the authorities should relax their efforts at improving the functioning of the financial system. Rather, it would indicate an even greater urgency and efforts in doing so, since such a weak link might have resulted from inefficiencies in the financial system because of restrictive government policies and weak institutional, legal as well as regulatory environments (Levine *et al.*, 2000:32).

Investigating whether financial integration in the SACU countries has stimulated their domestic financial development and economic performance, i.e. the fourth objective, will provide insight into the benefits of financial integration in developing countries. The nature of the integration arrangements among the SACU countries, especially the CMA agreement, requires that the smaller member states be integrated more with South Africa than with each other. Hence, the study further investigates whether countries that are more integrated with South Africa benefit more from the integration process than those that are not.

Given the amount of time since the creation of the SACU (since 1910) and the CMA/RMA (since 1910 as an informal currency union), the effects of the integration arrangements should have manifested themselves by now. Thus, investigating the effects of financial integration among the SACU countries will serve to confirm whether or not financial integration has worked in the manner that its advocates claimed it would. It will also help to provide useful insight into possible pitfalls that must be avoided by developing countries that are in the process of regionally integrating. Hence, understanding how the process of integration has benefited or cost the SACU countries, may serve as a prognosis of what may happen to other developing countries that are becoming integrated with the rest of the world.

Thus, it is hoped that this study would provide useful insight into the issues involving financial integration in developing countries, particularly in Africa. The study also suggests specific ways to enhance the gains of integration in the SACU countries. The study will also draw immediate lessons for the Southern African countries where regional integration has been explored in the context of the Southern African Development Community (SADC)[4]. According to Masson and Pattillo (2004:3), though the focus of SADC is trade and structural policies, some consideration is also being given to expanding the CMA to include other SADC countries.

1.4 THE STRUCTURE OF THE STUDY

The thesis is organised into nine chapters. Chapters 2 to 4 explore theory and review the empirical literature, while Chapters 5-8 are empirical in nature. Figure 1.1 below

[4] Membership of the SADC at present include Angola, Botswana, DRC, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

provides the structure of Chapters 2 to 8. Three main sub-themes emerge from the central theme of this thesis: financial integration, financial development and economic growth. Based on these sub-themes, the thesis is organised along three main blocks with each block comprising a theoretical and an empirical component. The first block, represented by the lower part of Figure 1.1, explores the relationship between financial development and economic growth. As shown in Figure 1.1, Chapters 2 and 6 are devoted to the first block. The second block, covered in Chapters 3 and 7, focuses on the link between financial integration and financial development and is represented by the right-hand-side of Figure 1.1. Lastly, the third block explores the relationship between financial integration and economic growth and is represented on the left-hand-side of Figure 1.1. This is the subject matter of Chapters 4 and 8. At the centre of the Figure 1.1 is Chapter 5 which explores the depth of financial integration among the SACU countries. Finally, Chapter 9, which is not shown in Figure 1.1, concludes the thesis. A brief highlight of the content of each chapter is presented below.

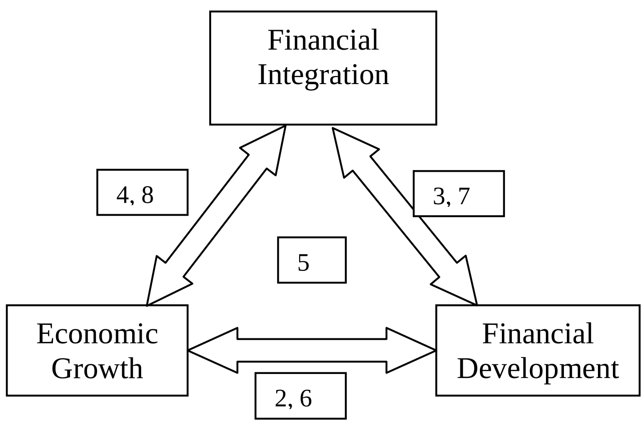


Figure 1.1: Structure of the thesis

Chapter 2 focuses on the role of domestic financial development. This lays the foundation for the remaining parts of the thesis with its focus on the international aspects of the financial systems. The chapter begins with a presentation of a simple endogenous growth model that describes the effects of financial development on economic growth. It further explores the causal relationship between financial development and economic growth. The chapter also provides a review of empirical studies on the finance-growth nexus.

Chapter 3 explores the theoretical links and reviews the modest empirical literature on the relationship between financial integration and financial development. To set the background for this chapter and the subsequent chapters, it begins with a conceptual definition and measurement of financial integration. Next, the chapter considers the theoretical relationships between financial development and financial integration, followed by a review of the empirical evidence.

Chapter 4 reviews the literature on the relationship between financial integration and economic growth. First, the chapter demonstrates (by extending the growth model presented in Chapter 2 to incorporate international aspects of the financial system) how financial integration can directly and indirectly affect the economic performance of a country. It identifies the potential benefits and costs of financial integration and highlights the channels through which the effects can be brought about. However, while the issues are explored in general, more emphasis is placed on developing countries. Following the review of theoretical work, the chapter proceeds with a review of the relevant empirical literature. The empirical review focuses on the extent to which previous studies corroborate or refute the theoretical predictions and highlights their pitfalls.

The goal of Chapter 5 is to provide empirical evidence on the degree of financial integration of the five SACU countries. First, the chapter explores in general terms and using country-specific measures the degree to which each of the SACU countries is integrated with the rest of the world. Secondly, the chapter determines the degree of integration of the smaller SACU countries with South Africa. To determine the degree of financial integration and to test a set of hypotheses regarding the nature of integration that exist among the countries, the chapter presents and discusses empirical analyses of four groups of measures of financial integration: gross capital stock analysis, saving-investment correlation, interest rate parity and principal component analysis.

Chapter 6 provides empirical evidence on the relationship between financial development and economic performance among the SACU countries. The analyses in the chapter are carried out against the backdrop of the issues raised in Chapters 2 and 5. Specifically, the chapter examines the issue of whether, how and to what extent financial development contributes to the growth process in each of the SACU countries. Also, as a corollary, it explores the extent to which economic growth affects the development of national financial systems. In addition, the chapter explores the robustness of the growth effect of financial development by controlling for other growth determining factors. However, the chapter does not focus on the other determinants *per se*. Lastly, the chapter explores the nature of the causal relationship between finance and economic performance. The chapter adopts a country-specific time-series framework based on a multivariate vector error correction modelling technique for each of the countries. It begins with a bivariate analysis followed by a multivariate analysis.

Chapter 7 focuses on the question of whether or not a high degree of financial integration leads to an increase in the level of financial development. In other words, do countries that are more integrated to the world financial markets have deeper financial systems? This chapter addresses this question by exploring empirically, in each of the SACU countries, the relationship between financial integration and financial development. The chapter also examines whether or not those economies that are more financially integrated with the South Africa financial system have more developed domestic financial systems than those that are not. The empirical analysis is based on a multivariate vector error correction modelling framework.

Based on the insight provided in the literature reviewed in Chapter 4, Chapter 8 empirically examines the effects of financial integration on economic performance of the SACU countries. The chapter, guided by the findings of Chapters 4 and 5, pursues three objectives. First, it examines the nature of the effects (whether positive or negative) of financial integration on economic performance of each of the SACU countries. As a corollary, it also examines whether or not the level of their economic performance has any effect on the degree of their financial integration, and if any, to what extent and how. Secondly, it explores the causal link between financial integration and economic performance of the SACU countries. Lastly, the chapter explores the question of whether the countries more integrated with South Africa gain more from integration in general than those that are not. In addressing these objectives, the chapter employs a multivariate vector error correction modelling framework similar to the one used in Chapters 6 and 7.

The last chapter summarises the findings of this study and highlights the policy implications. Lastly, lessons for other developing countries and area for further research are highlighted.

Appendix to Chapter 1

Box A-1.1: Official integration arrangements and implications for the SACU countries

Year/Period	Major Developments	Implications
		SACU
1910	SACU Agreement signed by South Africa, Basutoland (Lesotho), Swaziland and Bechuanaland (Botswana).	SACU Agreement provided for • Free flow of physical goods among member states. • A common external tariff. • A common excise tariff. • The BLS countries agree to maintain a custom duty structure similar to that in South Africa. • South Africa also agreed to compensate the BLS countries for lost of fiscal discretion.
1910-1960s	1910 Customs Agreement remained.	
1969	New Customs Agreement was signed.	
1990	Namibia gained independence and became a contracting party to the 1969 Agreement.	
2002	A new SACU Agreement was signed.	The new SACU Agreement provided for: • The establishment of an independent, democratic organisation to administer the process of tariff setting and other affairs of the SACU. • A new revenue-sharing formula to ensure an equitable sharing of revenue from SACU arrangement. • Economic policy issues. • Promotion of integration of members into global economy.
		CMA
1910-1974	Informal monetary union with a single currency - the British pound sterling. 1921–Establishment of South African Reserve Bank. 1961–South Africa introduced the rand, which replaced the pound as the single currency. 1974–Rand Monetary Area agreement with rand as the single currency.	Unrestricted flow of capital among member states hence greater financial integration
1974-1986	1974–Swaziland established monetary Authority. 1976–Botswana left RMA and introduced pula. 1979–Central Bank of Swaziland was established and issue lilangeni pegged to rand. 1979–Establishment of Lesotho monetary authority 1980–Lesotho introduced maloti pegged to rand. 1982–Establishment of Central Bank of Lesotho.	Restrictions of capital flows by Botswana Some restrictions of flow of funds e.g. compulsory minimum local asset requirement in the smaller RMA countries.
1986 to present	1986–Common Monetary Area (CMA) replaced RMA. 1986–Swaziland abolished rand as legal tender, but remains at par with the rand (thought the rand still circulates alongside the domestic currency). 1992–Namibia joined CMA. 1993–Namibia introduced Namibian dollar pegged to rand. 2004–South African rand declared a legal tender in Swaziland.	

CHAPTER 2:

FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: THE NEXUS

2.1 INTRODUCTION

Economists, notably Bagehot (1873), Joseph Schumpeter (1912) and Gurley and Shaw, (1955, 1960 and 1967) have long recognised the role of the financial system in economic development. Several theoretical studies in recent times have used the new growth (endogenous growth) theory to show a close relationship between financial development and economic growth (cf. Green and Ping, 2000; Hellwig, 2000; Becsi, Ping and Wynne, 1998; Wang and Williamson, 1998; Becsi and Ping, 1997; Amable and Chatelain, 1996; Berthelemy and Varoudakis, 1996; Boyd and Smith, 1992; Saint-Paul, 1992; Bencivenga and Smith, 1991; Levine, 1991; Greenwood and Jovanovic, 1990). Also, since the pioneering statistical works of Goldsmith (1969), Mackinnon (1973) and Shaw (1973), many studies have documented a positive association between financial development and economic growth.

A vast literature analysing the role of the financial system (be it domestic or international) suggests several reasons why the existence of the financial system is vital for economic growth. These include *inter alia* the provision of payments systems, mobilisation of savings, allocation of capital and monitoring and exerting corporate governance. This chapter explores how the performance of these roles could affect economic growth. The chapter focuses on the domestic financial system; this is to lay the foundation for the remaining parts of the thesis that focus on the international aspects of the financial system. In the domestic financial system, financial activities are confined to the borders of an economy while the international aspect involves cross-border financial transactions and provision of financial services. More specifically, this chapter focuses on the first axis, that is, the flow between financial development and economic growth as highlighted in Figure 2.1 below.

Section 2.2 of this chapter presents a simple endogenous growth model that demonstrates the effects of financial development on growth. Drawing on the theoretical model, Section 2.3 explores the role of the financial system. Section 2.4 considers the causal relationship between financial development and economic growth. Section 2.5 reviews the empirical studies on the finance-growth nexus, while section 2.6 concludes the chapter.

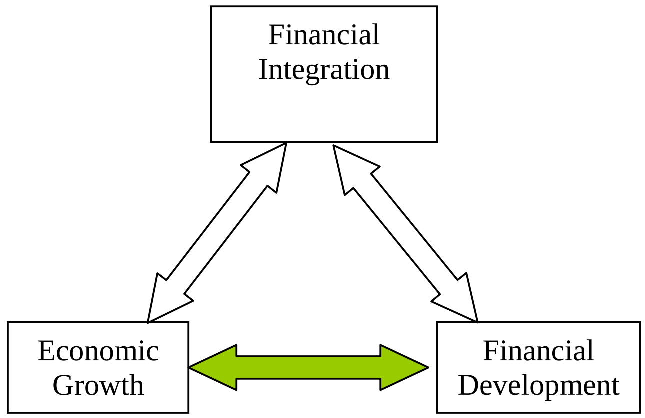


Figure 2.1: Structure of chapters

2.2 FINANCIAL SYSTEM AND ENDOGENOUS GROWTH

This section presents a simple endogenous growth model that demonstrates the effect of financial development on growth. The structure of the model presented here is not novel as it draws on Montiel (2003), Barro and Sala-I-Martin (1999: chapters 2 to 4) and Pagano (1993). As is typically assumed (cf. Montiel, 2003:208; Barro and Sala-I-Martin, 1999:143-144; Odedokun, 1998:206-209; Murinde, 1996:95-96; Pagano, 1993:614), in the model, growth occurs through an increase in total factor productivity and the accumulation of productive factors. The task is to demonstrate how the development of the financial system could affect economic performance through an increase in total factor productivity and an accumulation of productive factors.

The model assumes a closed economy since the focus in this chapter is on the domestic financial system. To explore the international aspects of the financial systems, Chapters 3 and 4 relax the closed economy assumption. Households and firms are the major actors in the economy and they are assumed to operate in a competitive environment. Both households and firms are rational economic agents, hence they strive to maximise utility and profit. In what follows the section first presents the characteristics of households, followed by those of firms. The section then combines these to derive the equilibrium condition in the economy. Based on this equilibrium condition, the chapter then addresses the question of how the financial system could stimulate growth.

2.2.1 The Households

Consider an economy with numerous households with an infinite time horizon (i.e. the households are assumed to be immortal, though individual members have finite lives). The households supply their labour services in exchange for wages, and they receive interest income on financial assets. In turn, the households use the wage and interest income to purchase goods and services for consumption, and save part of it by accumulating additional assets (both financial and real) (Barro and Sala-I-Martin, 1999:60-61). The households maximize utility over an infinite time horizon subject to their budget constraints. Assume that the size of the household at time t is $L(t) = e^{nt}$, where n is an exogenous constant rate at which the population grows, i.e. $\dot{L}/L = n \geq 0$. Total consumption at time t is $C(t)$, and $c(t) \equiv C(t)/L(t)$ is consumption *per capita*. Then the utility function (U) that each household wishes to maximize is (Barro and Sala-I-Martin, 1999:61):

$$U = \int_0^\infty u\left[c(t)\right] \cdot e^{nt} \cdot e^{-\rho t} dt \qquad (2.1)$$

subject to the budget constraint

$$\dot{a} = (r - n) \cdot a + w - c, \qquad (2.2)$$

In equation 2.1, it is assumed that $u(c)$ is increasing in c and concave, i.e. $u'(c) > 0, u''(c) < 0$. The concavity assumption implies that the households are keen to smooth consumption over time. As will be shown shortly, this can be facilitated through the financial system (Montiel, 2003:191). It is also assumed that $u(c)$ satisfies the Inada conditions: $u'(c) \to \infty$ as $c \to 0$, and $u'(c) \to 0$ as $c \to \infty$ (Barro and Sala-I-Martin, 1999:61). Lastly, ρ is the constant rate of time preference (the subjective discount rate), and $\rho > 0$, which means that individuals regard consuming now as better than consuming later. Typically, $u(c)$ is assumed to take the following functional form:

$$u(c) = \frac{c^{(1-\theta)} - 1}{(1-\theta)} \qquad (2.1a)$$

Equation 2.1a assumes constant intertemporal elasticity of substitution given as $\sigma = 1/\theta$, where $\theta > 0$, where θ is the relative risk aversion coefficient. The higher the value of θ the more rapid is the proportionate decline in $u'(c)$ in response to an increase in c. By substituting 2.1a into 2.1 the utility function becomes:

$$U = \int_0^{\infty} e^{-(\rho - n)t} \cdot \left[\frac{c^{(1-\theta)} - 1}{(1 - \theta)} \right] dt \quad (2.1b)$$

Equation 2.2 is the budget constraint, where a is household assets (both real and financial), r is the interest rate, w is the wage rate and n is the population growth rate. Households with surplus resources lend to deficit households. At equilibrium, a representative household holds zero net loans. Lending and borrowing between surplus and deficit households help to smooth consumption over time, while the financial system helps to facilitate the process by bringing lenders and borrowers together.

The present-value Hamiltonian of the maximisation problem is given as:

$$H = u(c)e^{-(\rho-n)t} + \mu[w + (r-n)a - c], \quad (2.3)$$

where the variable μ represents the present-value shadow price of income. The first-order conditions for this maximization problem are:

$$\partial H / \partial c = u'(c)e^{-(\rho-n)t} + \mu = 0 \;\; \Rightarrow -\mu = u'(c)e^{-(\rho-n)t} \quad (2.4)$$

$$\partial H / \partial a = -\mu \qquad \Rightarrow \dot{\mu} = -(r-n)\mu \quad (2.5)$$

By applying the form of $u(c)$ in equation 2.1a and using the first order conditions in the well-known Euler equation (see Barro and Sala-I-Martin, 1999:63) gives the following optimality condition:

$$\dot{c} / c = g_c = (1/\theta) \cdot (r - \rho) \quad (2.6)$$

This suggests that the rate of change in *per capita* consumption of households is a direct function of the gap between r (the interest rate) and ρ (the constant rate of time preference) and an inverse function of θ (the relative risk aversion coefficient). Thus, the relation between r and ρ determines whether households choose a pattern of *per capita* consumption that rises over time, stays constant, or falls over time. A high value of θ implies a lower willingness of households to substitute intertemporally, which in turn will lower the responsiveness of the rate of change in *per capita* consumption to the gap between r and ρ (Barro and Sala-I-Martin, 1999:65).

Finally, the transversality condition is given as:

$$\lim_{t \to \infty} \left\{ a(t) \cdot \exp\left[-\int_0^t [r(\mu) - n] d\mu \right] \right\} = 0 \quad (2.7)$$

Equation 2.7 implies that the households do not accumulate positive assets indefinitely, since doing so would mean that the household would operate below the optimal condition in the long run (Barro and Sala-I-Martin, 1999:65).

2.2.2 The Firms

Here we assume an economy with N identical firms, each employing capital to produce goods. In turn, the firms pay rents for the capital employed. All firms behave competitively and seek to maximize the present value of all future cash flows. Following Pagano (1993), Roubini and Sala-I-Martin (1991), Barro (1990) and Lucas (1988), the aggregate production function of the economy can be modelled using an 'AK' endogenous type model which specifies output as a linear function of the aggregate capital stock. Thus:

$$Y_t = AK_t \tag{2.8}$$

where Y is output, A is a technological parameter (assumed to be greater than zero, i.e. $A > 0$) and K is a broad measure of capital stock available in the economy (it encompasses physical capital, human capital, knowledge, and public infrastructure and it changes over time according to the amount of net investment undertaken each period) (Montiel, 2003:208). An essential feature of equation 2.8 is that it assumes absence of diminishing returns to the broad measure of capital. The assumption of non-diminishing returns to capital represents a major departure of this model from the neoclassical production function (see Barro and Sala-I-Martin, 1999:67).

Equation 2.8 can be represented in terms of *per capita* output as:

$$y = Ak \tag{2.9}$$

where $y = Y/\hat{L}$ and $k = K/\hat{L}$ represent quantities per unit of effective labour $\hat{L}$.

For simplicity, assume a closed economy producing a single good (i.e. one-sector production function), using the broad measure of capital stock (K). The optimization problem facing the representative firm is given as:

$$\max \int_0^{\infty} \left\{ \left(F(K) - I\lambda \right) \cdot \exp \left[- \int_0^t r(v)\,dv \right] \right\} dt \tag{2.10}$$

subject to:

$$\dot{K} = I - \delta K \tag{2.11}$$

where in equations 2.10 and 2.11: I is gross investment, $\lambda = I \cdot [1 + \varphi(I/K)]$ is the cost of investment and is assumed to be equal to 1 plus an adjustment cost, which is an increasing function of I in relation to K. $\dot{K}$ is the change in capital stock, while δ is depreciation.

The present-value Hamiltonian function is given as:

$$H_2 = \exp\left[-\int_0^t r(v)dv\right] \cdot \{(F(K) - I\lambda) + \varpi \cdot (I - \delta K)\} \tag{2.12}$$

where ϖ is the shadow price of change in capital stock.

The first-order conditions for maximization are:

$$\partial H_2 / \partial I = 0 = -\lambda \exp\left[-\int_0^t r(v)dv\right] + \varpi \tag{2.13}$$

$$\partial H_2 / \partial K = 0 = F_K \exp\left[-\int_0^t r(v)dv\right] - \varpi$$

(2.14)

and $\dot{v} = -\partial H_2 / \partial K$ (2.13)

where $\dot{v}$ is the change in present-value shadow price. A major implication of the AK endogenous growth model is that: $\lim_{k\to\infty}[f'(k)] = A > 0$, that is, the standard Inada condition (i.e. $\lim_{k\to\infty}[f'(k)] = 0$) does not hold. Hence, the marginal product of capital is $f'(k) = A$.

The optimal behaviour of the representative firm requires that the marginal product of capital equals the rental price ($R = r + \delta$) as follows:

$$f'(k) = r + \delta$$

$$\Rightarrow \quad r = A - \delta \tag{2.15}$$

2.2.3 The Equilibrium

The competitive market equilibrium can be obtained by combining the behaviour of the competitive household with that of the competitive firm. In a closed economy, $k = a$ at equilibrium, i.e. firm capital equals household assets. Assuming $w = 0$, substituting $k = a$, and $r = A - \delta$ into equations 2.2, 2.6 and 2.7 gives:

$$\dot{k} = (A - \delta - n) \cdot k - c \tag{2.16}$$

$$g_c = (1/\theta) \cdot (A - \delta - \rho) \tag{2.17}$$

$$\lim_{t\to\infty}\{k(t) \cdot e^{-(A-\delta-n)}\} = 0 \tag{2.18}$$

In the steady-state the *per capita* growth rates (consumption, capital stock and output) are constant and are represented by equation 2.17 thus:

$$g_c = g_k = g_y = (1/\theta) \cdot (A - \delta - \rho) \tag{2.19}$$

Equation 2.19 shows that the steady-state growth rate depends on preference parameters and technology and it can be extended to incorporate the gross saving rate ($s = S/Y$) to account for the cost of intermediation. Assuming an equilibrium capital market in a closed economy with no government, gross investment will equal ‘effective’ saving, that is, the portion of aggregate saving not absorbed by the process of financial intermediation (Montiel, 2003:208 and Pagano, 1993:614). Thus:

$$\phi S_t = I_t \tag{2.20}$$

where ϕ is the proportion of saving channelled to investment, while $1-\phi$ represents the leakage from the flow of saving in the process of intermediation. Following Pagano (1993:614) the steady-state growth rate in terms of the saving rate given in 2.11 and 2.20 can be expressed as follows:

$$g_y = A\phi s - \delta \tag{2.21}$$

This shows that the rate of growth depends on the marginal productivity of capital $A,$ the proportion of saving channelled to investment $\phi,$ and the saving rate s . As is evident from the parameters $A,\ \phi,\ s,\ \delta,\ \rho$ and θ , equations 2.19 and 2.21 are closely related. The parameters of the two equations will be used to show the role of the financial systems in the growth process. Of the five parameters, depreciation, δ , is the only one that is not related to the role of the financial systems. It will be demonstrated below that the financial system increases the productivity of capital, $A,$ the proportion of saving that is funnelled to investment, $\phi,$ and the saving rate s . The preference parameters ρ and θ directly affect the consumption and saving behaviour of households. To encourage saving, individuals must be compensated for the loss of utility for not consuming now in the form of interest earned on savings. The risk-averse parameter, θ , shows how individual risk preference affects the saving and investment levels.

The mechanisms through which the financial system affects these parameters, and through them economic growth, have been the focus of many theoretical studies on the finance-growth nexus. The next section explores how the financial system affects the productivity of capital, the proportion of saving channelled to investment, the saving rate and economic growth.

2.3 THE ROLE OF THE FINANCIAL SYSTEM

A cross-reading of the literature reveals different classification of the functions performed by the financial system (cf. Levine, 2004; Montiel, 2003; Dolar and Meh, 2002; Levine, 1997; and Berthelemy and Varoudakis, 1996). The functions can generally be subsumed under the following: the provision of payments systems, the mobilisation of savings, and the allocation of capital as well as monitoring and exerting corporate governance. The question to be addressed then is how would the performance of any of these functions lead to growth through the mechanisms suggested by equations 2.19 and 2.21 above, i.e. increasing the productivity of capital, the proportion of saving channelled to investment and the saving rate? The literature also distinguishes between the effect of these functions as performed by financial intermediaries such as banks and the financial markets (the bond and stock markets) (cf. Ndikumana, 2005; Levine, 2004; Beck and Levine, 2004; Montiel, 2003; Levine, 2002). Since banks dominate the financial system in most developing countries, most of the discussions that follow will focus on the roles of banks and explore how the performance of these functions could bring about economic growth.

2.3.1 The provision of efficient payment systems

An important role of the modern financial system is the payment system that it facilitates. The payment system comprises:

- Instruments (such as currency, cheques, and in an innovative financial environment different cards and electronic payments) that facilitate exchange of assets and services between economic units;
- The institutional and organisational structure (central banks, commercial banks etc.);
- The operational procedures; and
- The communication network.

An efficient payment system helps to reduce transaction and information costs, and financial risks and increases reliability and speed of exchanges. This, in turn, saves individuals time and energy that would have been wasted under a barter system with all its coordination problems (Berthelemy and Varoudakis, 1996:8).

Since they no longer have to worry about how they will exchange their goods or services for another, an important result of the payment system is that it affords economic agents the opportunity to specialise in a line of production and become more innovative as they focus attention on a particular production process. Thus, to the extent that the financial system, through the payment system, can promote specialisation and innovation, it will lead to productivity improvement and, in turn, economic growth. Similarly, Greenwood and Smith (1997:152) developed a model in which they demonstrated that lower transaction costs resulting from the payment system expands the set of "on-the-shelf" production processes that are economically attractive.

2.3.2 Savings mobilisation

The saving mobilisation function of the financial system relates to the saving rate, s, in equation 2.21 above. However, economic theory is less certain as to how the development of the financial system would affect the saving rate and, in turn, economic growth (cf. Berthelemy and Varoudakis, 1996:9-10 and Pagano, 1993:616-618). The dominant view held by many authors (cf. Levine, 2004:22; Dolar and Meh, 2002:7; Acemoglu and Zilibotti, 1997 and Pagano, 1993:617) is that an efficient financial system helps to mobilise saving from disparate savers, which makes large investment possible.

By pooling the saving of individuals and investing them in economically viable projects, the financial system can help to raise the expected returns on savings and at the same time diversify the risks associated with individual investment projects. Consequently, Berthelemy and Varoudakis (1996:9) argue that the expected returns and risk diversification will encourage saving that, in turn, will help deepen the financial system. In addition, Acemoglu and Zilibotti (1997) demonstrate in their theoretical model that the financial system would enhance the productivity of capital and thus economic growth by making more projects economically viable (hence ensuring opportunities for diversification) and by overcoming investment indivisibilities.

The net effect of the increase in expected investment returns on the saving rate and growth is uncertain on *a priori* grounds because of substitution and income effects that produce opposite effects on saving (Berthelemy and Varoudakis, 1996:9).

Besides the income effect, another way that the financial system could affect the saving rate and growth rate negatively is through the easing of the liquidity constraints that economic agents face. Under market imperfection or in an underdeveloped financial system the demand for loanable funds will often exceed the supply, thereby creating liquidity constraints. Using an overlapping generations model, Jappelli and Pagano (1994a) demonstrate that such liquidity constraints encourage households to increase their saving as they plan their life cycle intertemporal consumption. Given as suggested by equation 2.21 above that an increase in the saving rate strengthens growth, if productivity growth is endogenous, it follows that an efficient financial system that increases the access of households to credit eases the liquidity constraints, thereby reducing the incentive to save to smooth consumption over time. Using data from the OECD countries and cross-country regressions in which indicators of liquidity constraints of households are regressed on saving and growth rates, Jappelli and Pagano (1994a:98) confirm their theoretical argument. Specifically, they find that "financial deregulation in the 1980s contributed to the decline in national saving and growth rates in the OECD countries" (Jappelli and Pagano, 1994a:98).

Motivated by the findings of Jappelli and Pagano (1994a), De Gregorio (1996) also explored the effects of liquidity constraints on the saving rate and growth rate, but took into account the effects on human capital accumulation within an overlapping generation model. In the model, individuals are assumed to live for three periods: youth, middle age and old age. In the first period, the individuals acquire education (human capital) which helps to increase the efficiency of labour supply in their middle age. They also need resources to consume while they are acquiring education. Borrowing constraints imply that education involves an opportunity cost in the form of foregone labour income (De Gregorio, 1996:50). In an economy with borrowing constraints, the young individuals reduce time spent on education and increase time devoted to work, thus individuals will not maximize their lifelong wealth and lifetime utility (De Gregorio, 1996:55). In the model, De Gregorio further assumed that growth is sustained by the accumulation of both physical and human capital, while borrowing constraints affect growth by altering the composition of capital. Based on his model, De Gregorio demonstrates that borrowing constraints raise the saving rate and growth, but have negative effect on human capital and through the loss in human capital a negative effect on growth. The issue that arises is whether the positive effect through the increase in the saving rate outweighs the negative effect through loss that results from the loss of human capital.

To empirically determine the net effect of borrowing constraints on growth, De Gregorio uses a sample of OECD countries (as used by Jappelli and Pagano, 1994a) and developing countries. The weight of evidence provided in the empirical analysis of De Gregorio suggests that borrowing constraints result in lower growth. Surprisingly, even after controlling for human capital accumulation, the borrowing constraint still had a negative effect on growth. De Gregorio attributes this to the influence of other channels through which borrowing constraints affect growth. As noted by Pagano (1993a:618), the effect of the borrowing constraints on human capital will depend on the extent to which human capital formation is financed by household borrowing.

The upshot of the foregoing discussion is that the effect of financial system development on the saving rate and growth is ambiguous. Since savings may be misallocated, even if the financial system was to raise the saving rate by mobilising saving for investment, the quantity of the savings channelled to investment and the quality of their allocation to the various investment projects may matter most for economic growth. The next section considers the allocative role of the financial system.

2.3.3 Channelling of savings to investment

An efficient financial system can increase the quantity of savings channelled to investment, i.e. ϕ in equation 2.21. In an imperfect world with asymmetric information, the mobilisation of savings for investment is costly both to the financial system and to individual investors who attempt to mobilise savings directly from individual savers. However, compared to where investors obtain savings through the financial system, investment costs would be higher if individual investors were to mobilise savings from disparate individual savers directly. Hence, all things being equal, more savings will be channelled to investment with financial intermediation than without.

A proportion of saving, $(1-\phi)$, represents the costs of intermediation and is absorbed by the financial system. This may take the form of bank fees and charges, and the spread between borrowing and lending rates. The leakage may also represent X-inefficiency of the financial system and may result from the market power of the institutions (Murinde, 1996:96; Pagano, 1993:615). For instance, if the financial sector is not competitive, the spread and the charges may include a monopolistic premium. Under financial repression, the cost of intermediation will also include the cost of indirect government tax in the form of high reserve requirements and controlled interest rates. As the financial system develops, institutions such as banks gain experience, and the supply of financial services and competition among the financial service providers increases. This will lead to a reduction in the cost of financial intermediation. With lower intermediation costs, a larger share of the savings mobilised by the financial system will find its way to the ultimate borrowers, that is, ϕ will increase. Since economic growth is linked positively to the amount of investment, the decrease in transaction costs accelerates economic growth.

2.3.4 Savings allocation

Financial intermediaries can also improve the quality of the allocation of savings by ensuring that the funds are allocated to projects with the highest marginal product of capital. This will increase the marginal productivity of capital, i.e. A in equation 2.19 and 2.21, which, in turn, will affect growth positively (Montiel, 2003:2009; Pagano, 1993:615). The theoretical literature identifies several mechanisms through which the financial system can improve the allocation of savings to ensure a higher productivity of capital. These include the ability of the financial system to evaluate, screen and monitor projects and to diversify and manage risk (Thadder, 1995; Obstfeld, 1994; King and Levine, 1993a; Levine, 1992a; Bencivenga and Smith, 1991; Levine 1991; Greenwood and Jovanovic, 1990; Bernanke and Gertler, 1989; Williamson, 1987; Boyd and Prescott, 1986; Diamond, 1984; Townsend, 1979).

2.4 CAUSAL RELATIONSHIP BETWEEN FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH

Thus far, the discussion has focused on how financial system development affects economic growth, and it suggests that the development of the financial system should cause economic growth to improve. However, the theoretical relationship between financial development and economic growth is by no means simple and clear cut. It is also possible that economic growth could lead to the development of the financial system, thus a two-way relationship may exist. The first to offer the framework for analysing a two-way relationship between financial development and economic growth was Patrick (1966). He characterised the relationship between financial development and the growth of the real economy as ‘demand-following and supply-leading phenomena’.

According to Patrick (1966:174) the *demand-following* phenomenon occurs when "the creation of modern financial institutions, their financial assets and liabilities, and related financial services is in response to the demand for these services by investors and savers in the real economy". In this view, the financial system adapts itself to the financial needs of the real sector and fits in with its autonomous development, playing a relatively passive role in the growth process. The demand-following finance implies a causal relationship running from economic growth to financial development. In contrast, the *supply-leading* phenomenon suggests a causal relationship running from financial development to economic growth. Patrick (1966:175) explains this phenomenon as occurring when "the creation of financial institutions and the supply of their financial assets, liabilities, and related financial services are in advance of demand for them, especially the demand of entrepreneurs in the modern, growth-inducing sectors". In this respect, the modern financial system plays an active role in the growth process by helping to "transfer resources from traditional (non-growth) sectors to modern sectors, and to promote and stimulate an entrepreneurial response in the modern sectors" (Patrick, 1966:175). Thus, the framework of Patrick (1966) highlights a feedback relationship between financial development and economic growth.

Although Patrick (1966:177) agrees that in practice, there may be different possible interactions between demand-following and supply-leading phenomena, he hypothesises the following sequential causality in the growth process: In the early stage of economic development, before modern industrial growth resumes, the supply-leading financial development dominates and helps to induce innovative-type investments. As the modern industrial growth gets under way, the demand-following finance gradually becomes more important.

However, the hypothesis of Patrick has been criticised as incomplete because it does not take into account the complementarity between the two phenomena (Berthelemy and Varoudakis, 1996:18). Based on earlier works (cf. Levine, 1992b; Greenwood and Jovanovic, 1990), Berthelemy and Varoudakis (1996:18) suggest that instead of a sequential causal relationship as hypothesised by Patrick, there is a two-way relationship between financial development and economic growth in which there is mutual reinforcement between the two. The authors also suggest a threshold effect arising from the two-way relationship between financial development and growth, in which the choice of the intermediation system would depend on whether or not a country has attained a certain exogenously determined critical *per capita* income threshold. Based on the critical threshold *per capita* income, Berthelemy and Varoudakis (1996:19) suggest two possible scenarios on the relationships between financial development and economic growth. The first refers to a virtuous cycle where a high level of income induces a high level of financial system development, which in turn further stimulates economic growth. The second refers to a vicious cycle where a low level of income prevents the development of the financial system which, in turn, hinders economic growth. An underdeveloped financial system would be unable to perform most of the desirable functions of a good financial system effectively, thereby causing an inefficient productive structure if income is too low. In both scenarios, a two-way causality is suggested.

In sum, therefore, the theoretical literature suggests several possibilities concerning the relationship between financial system development and economic growth. The first possibility, widely supported in the theoretical literature, is that financial system development will lead to economic growth. There is also the view that due to the income effect and by eliminating liquidity constraints financial development could reduce economic growth. Patrick (1966) hypothesised a sequential two-way causality between financial development and economic growth, in which, first, financial development causes economic growth and later growth stimulates financial development. Lastly, a simultaneous two-way relationship in which a threshold effect occurs in the relationship between financial development and economic growth is increasingly becoming popular. Given the conflicting views, what prevails in a particular country becomes an empirical issue. Understanding the nature of the relationship between financial development and economic growth will help to ensure that adequate policies for both financial system development and economic growth are implemented. Little wonder therefore that a considerable number of empirical studies have been carried out in an attempt to understand the finance-growth nexus. The next section reviews the empirical literature.

2.5 THE EMPIRICAL RELEVANCE OF FINANCIAL SYSTEM DEVELOPMENT IN GROWTH ANALYSIS

This section provides a brief overview of the growing empirical literature on the finance-growth nexus, focusing particularly on studies in developing countries. The review also highlights the econometric approaches and ensuing issues pertaining to the studies of the finance-growth nexus.

A major focus of many of the empirical studies is to establish whether or not there is a significant causal link running from financial development to economic growth. In doing this authors often use indicators of financial development based on economy-wide aggregated data. They use these indicators in regression models that apply either cross-sectional or panel data techniques to a number of countries (cf. King and Levine, 1993a, b; 1992; Roubini and Sala-I-Martin, 1992; Jung, 1986) or time-series techniques to individual countries (cf. Luintel and Khan, 1999; Agung and Ford, 1998; Demetriades and Hussein, 1996; Lyons and Murinde, 1994; Murinde and Eng, 1994; Wood, 1993; Odedokun, 1989).

In addition to those using economy-wide aggregate data, there are studies based on disaggregated and micro level data such as case studies, industry and firm level studies. Case studies and micro level studies include Dehejia and Lleras-Muney (2003), Guiso, Sapienza and Zingales (2004a) and Jayaratne and Strahan (1996). Examples of the industry level studies are Claessens and Laeven (2004) and Beck, Demirguc-Kunt, Laeven, and Levine (2004), Cetorelli and Gambera (2001), Wurgler (2000) and Rajan and Zingales (1998). Firm level studies include Love (2003), Dyck and Zingales (2004), Beck, Demirguc-Kunt, Levine and Maksimovic (2001) and Demirguc-Kunt and Maksimovic (1998). For a comprehensive review of the literature see Levine (2004 and 1997).

The evidence from the empirical literature remains largely inconclusive as to the impact of financial development on economic growth. What is noteworthy is that a majority of the cross-sectional and panel data studies, irrespective of whether they use aggregate or industry/firm level data, tend to produce evidence of a significant positive relationship between an indicator of financial development and economic growth. In contrast, the bulk of the opposing literature consists of time series country-specific studies (cf. Sinha and Macri, 2001; Shan *et al.*, 2001; Ram, 1999; Arestis and Demetriades, 1997; Berthelemy and Varoudakis, 1996; Demetriades and Hussein, 1996; Neusser and Kugler, 1996). In what follows, this section reviews a few studies, namely King and Levine (1992), Demetriades and Hussein (1996), Arestis and Demetriades (1997), Odedokun (1998), Luintel and Khan (1999), Levine, Loayza and Beck (2000) and Bloch and Tang (2003), to demonstrate the conflicting nature of the results and to draw some lessons for further empirical studies. The choice of the studies is based on their relevance to the issues being demonstrated and with some emphasis on studies that will provide insight into developing countries.

The review begins with the highly cited study of King and Levine (1992). This study is novel in that it used four indicators that represent the broadest selection of indicators of financial development up to that time to analyse the empirical linkages between long-run growth and financial development. The indicators are the ratio of M1 to GDP, the ratio of liquid liabilities of the financial system to GDP (here the financial system included both the banking system and the non-bank financial intermediaries), the ratio of quasi-liquid liabilities of the financial system to GDP (where quasi-liquid liabilities are defined as liquid liabilities minus M1), and the ratio of claims on the private sector of the central bank and deposit money banks to GDP (i.e. the ratio of domestic credit to GDP). In the analysis King and Levine (1992) employ both the average values of the four indicators over the sample period 1960-1989 and their initial value in 1960. Using the initial value of indicators enabled them to answer two questions – whether or not countries that began the sample periods with relatively larger financial systems tended to grow faster than countries that began with smaller financial systems, and whether or not the causal link runs from financial development to economic growth (King and Levine, 1992:6).

In addition, the study explored the channels of influence by which financial indicators are related to growth. The authors decomposed growth into two components, investment share and efficiency of investment. Based on a sample of 119 developed and developing countries (including Botswana, Lesotho and Swaziland), the authors conducted simple bivariate correlations between each indicator of financial development and the growth components, cross-country regressions as well as pooled cross-country time-series regressions. King and Levine (1992:4) found that many of the financial indicators were statistically significantly correlated with growth. The indicators remained significant even after controlling for other factors such as initial conditions, dummy variables for countries in sub-Saharan Africa and Latin America, and measures of monetary, fiscal and trade policy in the regression.

In a closely related study, King and Levine (1993a:717-718) using cross-country regressions and simple correlations, find that "higher levels of financial development are significantly and robustly correlated with faster current and future rates of economic growth, physical capital accumulation and economic efficiency improvements". Based on their findings, King and Levine (1993a:730) conclude that the relationship between financial development and growth is such that "finance seems to importantly lead economic growth".

In assessing the evidence on the relationship between financial development and economic growth, Arestis and Demetriades (1997:784) highlighted some of the limitations of the cross-country regressions upon which the King and Levine (1993) studies were based. These include the facts that the results are sensitive to the set of control variables used, the slope coefficients are treated as homogenous across countries but often are heterogeneous, and the techniques are predicated on the existence of stable growth paths, but in reality these are unstable. In the presence of these limitations, Arestis and Demetriades (1997:784) argue that the cross-country variations in results are difficult to interpret. More applicable to the study of King and Levine (1993c) and to some extent King and Levine (1992), Arestis and Demetriades (1997:784) contend that the King and Levine "causal interpretation is based on a fragile statistical basis". While not disagreeing with the finding of King and Levine that a significant correlation exists between financial development and economic growth, Arestis and Demetriades (1997:785) strongly doubt whether or not the question of causality can satisfactorily be addressed using cross-country regressions. More specifically, they note that since cross-country regressions refer to the average effects of a variable across countries, such effects cannot be applied to a specific country, since causality varies from country to country and depends on the nature and operation of the financial institutions and policies pursued in each country.

Despite the above criticisms of the King and Levine (1992 and 1993a) studies, two important lessons can be drawn from them. First, the studies highlight the importance of using appropriate indicators of financial development, particularly those that account for how the financial system allocates credit rather than using simple proxies that measure the size of the financial system (King and Levine, 1992:4). However, the authors also observe high correlations between the different indicators employed, and noted that the basic correlations between the indicators of financial development and economic growth were not highly dependent on the measures of financial development used. This implies that the broad aggregate measures of financial development, to some extent, should produce comparable results. Second, the study underscores the need to pay attention to the channels through which financial development impacts growth.

Another cross-country study that focuses on developing countries is Odedokun (1998). Similar to King and Levine (1992), Odedokun explores the channels through which financial development promotes growth. However, he adopts a slightly different framework where financial development promotes growth through two channels: "the first is the enhancement of productivity of the factor inputs employed in the financial sector *vis-à-vis* those employed in the non-financial sector of the economy while the other is the creation of positive external effects or repercussions by the financial sector on the non-financial sector" (Odedokun, 1998:220). Also, similar to King and Levine, Odedokun employs a cross-country regression analysis. However, unlike King and Levine, in recognition of the limitations of the cross-country regression framework, he does not interpret his results in terms of causality between financial development and economic growth. Odedokun (1998) employs two measures of financial development – the stock of domestic credit and the stock of liquid liabilities, both based on the consolidated balance sheet of the financial sector, each expressed as percentage of GDP. Using OLS and a sample of 90 developing countries for the period 1970 to 1990, he estimated three sets of cross-country regressions. In the first set of regressions, he used the entire sample of countries, while he estimated the second and third set of regressions for two sub-samples of low- and high-income developing countries to determine whether or not the effects of financial development on economic growth in developing countries depend on the stage of economic development. The estimations were carried out first for the entire period and then for two sub periods, 1970-1980 and 1980-1990.

Odedokun (1998:214) found overwhelming evidence that financial development is associated with economic growth through both the externality and factor productivity differential channels. However, the results do show some differences in the effects of financial development on growth between the low-and high-income countries, with the former recording stronger positive results.

Using a cross-country, instrumental variable procedure and dynamic panel techniques, Levine, Loayza and Beck (2000) also found that exogenous development of financial intermediaries is positively and significantly associated with economic growth. The results were obtained after controlling for other growth determining factors and the possibility of simultaneity biases as well as unobserved country-specific effects. The authors based their analysis on 74 countries (including Lesotho and South Africa) for the period 1960-1995. As measures of financial development, they used the liquid liabilities of the financial systems divided by GDP, the ratio of commercial bank assets divided by the sum of commercial bank and central bank assets, and the ratio of credits by financial intermediaries to the private sector to GDP. However, the study could not resolve the question of the causal link between financial development and economic growth.

The fact that causality might vary across countries, which represents a major criticism of cross-country regression methods, has been a major rationale for time series econometric approaches that explored the link between financial development and growth. Demetriades and Hussein (1996) provided evidence from 16 developing countries (including South Africa) using time-series analysis applied to individual countries. The authors started by testing for cointegration using both the Engle and Granger (1987) two-step procedure and the Johansen (1988) maximum likelihood method, followed by tests of causality using ECM-based tests[5] and level VAR methods. They used two measures of financial development – the ratio of bank deposit liabilities to nominal GDP and the ratio of bank claims on the private sector to nominal GDP, while economic growth was measured as natural log of real *per capita* GDP as opposed to the first difference of the natural log of real *per capita* GDP suggested by growth theories. Each of the countries had at least 27 continuous observations on each variable used for the analysis (Demetriades and Hussein, 1996:396). The authors obtained mixed results across the countries and the results depend on the measure of financial development and econometric technique used. As shown in Table 2.1, their results provide little support to the view that finance leads economic development. Instead, their results give considerable evidence of bi-directional causality and, in more instances, a reverse causation, i.e. from growth to financial development. Therefore, the study of Demetriades

[5] The tests are based on the notion of weak and strong exogeneity (see Demetriades and Hussein 1996:392-394 for a description of the methods).

and Hussein (1996) highlights the limitation of the cross-country studies as far as causality testing is concerned.

Table 2.1: Summary of results of cointegration and causality tests

Country	Tests using Liquid liabilities.			Test using credit		
	Cointegration	Finance causes growth	Growth causes finance	Cointegration	Finance causes growth	Growth causes finance
Costa Rica	Yes	No	Yes	No	No	No
El Salvador	Yes	No	Yes	Yes	No	No
Greece	Yes	No	Yes	Yes	No	Yes
Guatemala	Yes	No	Yes	Yes	Yes	Yes
Honduras	Yes	Yes	Yes	Yes	Yes	No
India	Yes	Yes	Yes	No	No	Yes
Korea	Yes	Yes	Yes	Yes	No	Yes
Mauritius	Yes	Yes	Yes	Yes	No	No
Pakistan	Yes	No	Yes	No	No	Yes
Portugal	Yes	No	Yes	Yes	No	Yes
South Africa	Yes	No	Yes	No	No	No
Spain	No	Yes	No	No	Yes	No
Sri Lanka	Yes	No	Yes	Yes	No	No
Thailand	Yes	Yes	Yes	Yes	No	Yes
Turkey	Yes	No	Yes	Yes	No	Yes
Venezuela	Yes	Yes	Yes	Yes	No	Yes

Source: Demetriades and Hussein (1996:406). The summary result was based on the Johansen cointegration method.

The results of the study of Demetriades and Hussein (1996) for South Africa are noteworthy here. Based on the Engle-Granger cointegration test, the two measures of financial development were found to be cointegrated with the log of real *per capita* GDP, but when the Johansen method was employed, evidence of cointegration was found only for the ratio of liquid liabilities to GDP. When they repeated the test using the ratio of total domestic credit to GDP (which includes credit to both private and public sectors, thus representing a broader measure of credit) no evidence of cointegration was found. The authors speculate that this may reflect the relatively important role played by the South African public sector in the determination of output and investment (Demetriades and Hussein, 1996:400).

With specific reference to the causality test between financial development and economic growth in South Africa, the results based on the Engle-Granger ECM shows that causality runs only from growth to financial development as measured by liquid liabilities. However, when they used the credit indicator, they found no evidence of causality in either direction. When they used the Johansen ECM framework and a liquid liability measure, the results give only evidence of reverse causality, from growth to finance.

Another study that applies a time-series method is Luintel and Khan (1999). The study employs a multivariate vector autoregressive (VAR) model to assess the long run causal relationship between financial development and economic growth using data from 10 countries, including South Africa. The VAR model of Luintel and Khan consists of four variables – a measure of financial development (ratio of total deposit liabilities of deposit banks to one period lagged nominal GDP), the log of real *per capita* GDP, the real interest rate and the log of the real *per capita* stock of capital. They based their analysis on annual data with series ranging from 36 to 41 observations and used the notion of weak exogeneity based on the Johansen (1988) maximum likelihood procedure and the techniques proposed by Toda and Phillips (1993) to test for causality. Luintel and Khan (1999) obtained a negative contemporaneous correlation between the level of financial development and growth, but a highly positive contemporaneous correlation between the levels of financial development and growth of output *per capita*, which makes them argue that the relationship between the two variables is a long-run one.

Luintel and Khan (1999) found two cointegrating vectors for each country, with the first cointegrating vector normalised as a financial development relationship and the second vector normalised as an output relationship. The results of the first cointegrating vector for each country show that financial development is influenced significantly and positively by *per capita* output. On the other hand, in the second cointegrating vector, the level of *per capita* output is predominantly determined by the *per capita* stock of capital. The causality test results were consistent in all the methods used and show that both financial development and *per capita* output were endogenous, implying a bi-directional causality between the two variables (Luintel and Khan, 1999:399-400).

The finding of a strong bi-directional causality between financial development and *per capita* output as obtained by Luintel and Khan (1999) differs from the study of Demetriades and Hussein (1996) that reported mixed results on the direction of causality. Luintel and Khan (1999:402) attributed the seemingly weaker results of Demetriades and Hussein (1996) to possible mis-specification of their bi-variate model. While it may be true that the relatively better results of Luintel and Khan could be due to the model and tests methods used, it is worth noting that the study of Luintel and Khan was based on only one indicator of financial development (the liquid liabilities ratio), which also performed better in the Demetriades and Hussein study. In addition, the liquid liabilities ratio in Luintel and Khan's study was measured in a slightly different way. In the study of Luintel and Khan (1999), the denominator was one period lagged nominal GDP, while in the case of the Demetriades and Hussein it was the contemporaneous nominal GDP. This makes absolute comparison of the results of the studies difficult.

In an earlier study by Arestis and Demetriades (1997), where they used a multivariate VAR model comprising four variables (log real GDP *per capita*, log of M2/nominal GDP, log of stock market capitalisation and log of stock market volatility) for Germany and the US, the results were also mixed. For Germany the authors found evidence of uni-directional causality from financial development to real output, whereas for the United States there was no evidence to suggest that financial development causes real output. However, there was strong evidence of a reverse causality in the US, i.e. real output promotes both the banking system and capital market development (Arestis and Demetriades, 1997:790). Thus, even in developed countries with similar levels of institutional development, the pattern of causality is not uniform across countries. This further highlights the need for a country-specific approach for a proper understanding of the relationship between financial development and economic growth.

Following a review of evidence on the relationship between financial development and economic growth, the unresolved nature of the results motivated Bloch and Tang (2003) to provide further evidence on the issue for 75 countries using both time-series country-specific and cross-country approaches. The majority of the countries studied were developing economies, together with some emerging market economies. Bloch and Tang found that only 26 countries out of 75 showed a positive correlation between financial development and economic growth, with only one country having a significant relationship at the 5% level, whereas 49 countries showed a negative correlation, out of which 21 were statistically significant at the 5% level. This casts further doubt on the conclusion that there is a positive correlation between financial development and economic growth. However, when the authors employed cross-country regression techniques they obtained a highly significant coefficient of the financial indicator as an explanatory variable of growth in *per capita* GDP. The coefficient was equally significant when they used a balanced panel data approach. Bloch and Tang blamed the contrasting results, among other things, on the weaknesses of the cross-country/panel data methods. As they noted, "these approaches often give all countries, either small or large, an equal weighting since they are assumed to be homogeneous; and the coefficients represent only an average relationship, which may or may not apply to individual countries in the sample" (Bloch and Tang, 2003:250). They thus echo the criticism of the cross-country or panel data approaches raised earlier by Arestis and Demetriades (1997) and Demetriades and Hussein (1996).

With specific reference to the SACU countries, empirical evidence on the relationship between financial development and output is very slim. What is common is a case where a study includes *some* of the SACU countries along with other countries in a cross-country/panel analysis such as those noted above. One notable study is Allen and Ndikumana (1998) that focuses on the Southern Africa Development Community (SADC) comprising the 14 member states[6] including all the SACU countries. However, because of data limitation, the authors included only eight of the countries in their analysis, of which four were SACU countries (excluding Namibia). Their analysis covers the period 1970-1996. The authors used four indicators of financial development – credit to the private sector, volume of credit provided by banks, liquid liabilities of the financial system (measured as M3) and an index of financial development that combines the other three indicators (Allen and Ndikumana, 1998:13). They also used different panel techniques – simple pooled cross-country OLS regressions, regressions including country-specific fixed effects estimated with a two-stage least squares instrumental variable procedure, and the same set regressions that includes a high-income dummy. When they used the liquid liability indicator, they found a positive and significant relationship between financial development and the growth of real *per capita* GDP for the SADC countries. The effects of credit and the overall index of financial development were also positive though not significant. Thus, the authors found a consistent positive relationship between financial development and economic growth even though the evidence was not strong for most of the indicators used.

[6] SADC members are Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, Swaziland, Tanzania, Zambia and Zimbabwe.

Like other cross-country/panel data studies, the study can also be criticised on the ground that it fails to take into consideration the heterogeneous nature of the economies concerned. They also did not test for causality. In addition, given that the SACU countries are more integrated among themselves than with the other SADC countries (cf. Jenkins and Thomas, 1998:153-156; African Development Bank, 2000:152-154), it would be more revealing to carry out a separate analysis for the SACU countries. Such an analysis would enable one to take into account the effect of their integration on the results. This thesis will address this in Chapter 7.

2.6 SUMMARY

This chapter explored the roles of domestic financial system in economic growth. The theoretical sections demonstrated the channels through which a domestic financial system could foster economic growth. The core channels identified include: increasing the productivity of capital, the saving rate and the proportion of savings channelled to investment. The chapter also discussed the causal link between financial development and economic growth. In addition, the chapter reviewed empirical studies on the effects of financial development on economic growth. The discussions in this chapter highlight a number of issues.

First, though the theoretical literature suggests overwhelmingly that a developed financial system will lead to economic growth, there are also some indications that under certain circumstances, such as when the income level is below a certain threshold, the effect may be negative. Secondly, on the causal relationship, the theoretical literature tends to suggest a two-way relationship between financial development and economic growth, but whether or not it is sequential as proposed by Patrick (1966) or simultaneous as suggested by Berthelemy and Varoudakis (1996) remains unclear.

From an empirical point of view the results remain mixed. The ambiguity arises along three lines. First, the sign of the coefficient of financial development are not uniform – some positive and others negative. Secondly, for studies that obtained the same sign on the coefficient of financial development, the magnitude of the coefficient and its significance vary. Thirdly, the causality results are mixed ranging from no evidence of causality to those that found a two-way causality; while in between there are those that found one-way causality that runs either from financial development to growth or *vice versa*.

The time series country-specific results also overwhelmingly underscore the weaknesses of cross-country or panel data techniques in analysing the relationship between financial development and economic growth among different countries. Lastly, the empirical literature highlights the importance of using different measures of financial development in studying its relationship with growth.

In the next chapter, the analysis is extended to explore the role of international aspects of the financial systems. Specifically, the chapter explores the theoretical channels through which financial integration impacts on domestic financial development and reviews the empirical evidence thereof.

CHAPTER 3:

FINANCIAL INTEGRATION AND FINANCIAL DEVELOPMENT: THEORY AND EVIDENCE

3.1 INTRODUCTION

A common argument often used to support financial integration is that it may lead to the development of the domestic financial system (Agénor, 2003:1096). Although it is generally accepted that international financial integration could promote economic growth through its effects on domestic financial markets (cf. Agénor, 2003; Klein and Olivei, 1999), its role in promoting financial development has been under studied. Nevertheless, the theoretical and empirical literature does address the question of whether economies that are more financially integrated really experience greater financial development and, if they do, how such effects will be brought about.

This chapter explores the theoretical links and reviews the slim empirical evidence on the relationship between financial integration and financial development. It focuses on the relationship highlighted in Figure 3.1 below and it lays the foundation for Chapter 8 that empirically explores the relationship using data from the SACU countries. To set the background for this chapter and subsequent chapters, this chapter begins with a conceptual definition and measurement of financial integration. Next, the chapter considers the theoretical relationships between financial development and financial integration, followed by a review of the empirical evidence found in the literature.

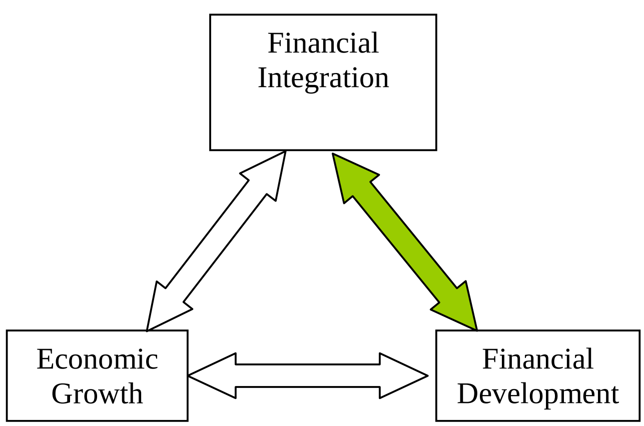


Figure 3.1: Structure of chapters

3.2 FINANCIAL INTEGRATION: DEFINITIONS

The international finance and economic literature does not offer a unique definition of financial integration. Terms such as financial openness, external financial liberalisation, financial globalisation and capital account liberalisation have also been used in connection to financial integration. Especially in the empirical literature, they are often measured in the same way. Edison *et al.* (2002:750) refer to international financial integration as “the degree to which an economy does not restrict cross-border financial transactions”. Schmukler and Zoido-Lobaton (2001:1) define financial globalisation as “the integration of the local financial system of a country with international financial markets and institutions”. In addition, they noted that this financial integration typically requires the domestic financial liberalisation and removal of capital account restrictions. Thus, according to them, financial integration occurs when economies that liberalised their financial sectors and capital accounts, experience growth in cross-border capital flows, and local borrowers and lenders actively use international markets and intermediaries.

According to Prasad *et al.* (2003:4) financial globalisation and financial integration are different concepts. In their view, while financial globalisation is an aggregate term that refers to global linkages through cross-border financial flows, financial integration refers to the linkage of an individual country to international financial markets. However, they argue that the two terms are very much related, in that increasing financial globalisation brings along increasing financial integration. Hence, the authors use the two terms interchangeably. Moreover, Prasad *et al.* (2003:7) differentiate between *de jure* and *de facto* financial integration. *De jure* financial integration represents policies associated with capital account liberalisation, while *de facto* financial integration represents actual capital flows. They note that the government of a country cannot easily regulate *de facto* financial integration. For instance, they argue that in practice even though a country may have strict capital control measures on paper, the degree of *de facto* financial integration might still be high if such controls can be easily evaded. Conversely, some countries, especially in Africa, may have few official controls on capital account transactions, but fail to experience significant capital flows; hence, they have low *de facto* financial integration.

Held *et al.* (1999:189) contend that financial integration strictly represents the "extent to which the prices of, and returns to, assets are equalised between different national financial markets". This view is also held by Adam *et al.* (2002:4), who state that "financial markets are integrated when the law of one price holds". According to them, if the markets are integrated, identical financial assets with similar cash flows should yield the same returns, irrespective of the domicile of the issuer and of the asset holder.

The different views about financial integration in the literature can generally be grouped into two categories: those that emphasises the extent to which the prerequisites for financial integration are satisfied, and those that view integration in terms of the consequences or integration outcomes.

3.2.1 Prerequisites for financial integration

A common precondition for financial integration is the removal of any administrative and market-based restrictions on capital movement across borders and the removal of regulatory, legal and tax discrimination between foreign and domestic suppliers of financial services (Brahmbhatt, 1998:3; von Furstenberg, 1998:56). While some of these barriers may be obvious (capital control or restrictions on entry of foreign banks), others are more subtle 'behind-the-border' barriers such as those that arise from differences in national regulatory systems, licensing of service providers or government procurement practices that discriminate against foreign suppliers (Brahmbhatt, 1998:3). A classical example is when a government requires all its agencies to hold their accounts only with domestic banks.

Von Furstenberg (1998:57) also identifies institutional prerequisites that range from the introduction of standardised, internationally tradable financial products and of quotations and trading systems to the development of international conventions. Furthermore, the prerequisites include the adoption of mutually recognised regulatory, supervisory, large-value transfer and final-settlement practices. Some of these systems and standards can result from private laws and industry protocols, while others call for the direct involvement of governments and their international agents (see von Furstenberg, 1998:57 for an account of the evolution of some of these systems).

Prasad *et al.* (2003:10) also argue that good macroeconomic policies and domestic governance (which includes transparency of government operations and a low level of corruption) are important factors in investment flows from international mutual funds.

Other institutional prerequisites include the existence of a transparent and efficient legal system and quality law enforcement as well as respect for property rights and good accounting standards (Kose *et al.,* 2006a:43).

The removal of these regulatory and administrative impediments, that is, financial openness or external financial liberalisation, allows residents to move their funds freely and to hold financial assets abroad. Furthermore, it allows private firms to borrow freely in foreign financial markets, residents to make financial transactions in foreign currencies, and non-residents to invest freely in domestic markets (Esen, 2000:5). Thus, capital account liberalisation or financial openness may lead to international capital mobility.

However, the removal of regulatory restrictions may not always imply financial integration, which is much more difficult to achieve. This point is illustrated in Prasad *et al.* (2004:9), who, as noted earlier, distinguish between *de jure* and *de facto* financial integration. The *de jure* integration focuses on the degree of capital account restrictions or restriction on capital flows, while the *de facto* integration captures the realised capital flows.

In addition to the integration resulting from private and public portfolio decisions, financial integration also requires freedom to trade in financial services through both cross-border provisions and foreign establishments (von Furstenberg, 1998:55). Thus, financial integration entails more than just the freedom of individuals or firms (both domestic and foreign) to move their funds across borders and to make transactions in foreign currencies, it also involves the cross-border penetrations of financial institutions themselves. Von Furstenberg (1998:55) notes that foreign involvement in the financial system of a country can help to bring the financial development of a country up to international standards as well as helping to mobilise domestic savings. This, as noted by von Furstenberg (1998:55), can contribute to international financial integration without appreciable net international flows of capital being associated with a particular activity. Thus, while obstacles to cross-border capital movements could prevent financial integration, elimination of such obstacles is not sufficient to achieve it. Indeed, it is vital to consider also the outcomes of potential integration.

3.2.2 Financial integration outcomes

If markets have become integrated it should be possible to see evidence of that in both prices and quantities emerging from trades on the respective markets. Consequently, the outcome-based definitions of financial integration focus either on quantities or on prices of financial services/products, or yield of assets. To avoid duplication, a detailed review of the outcome-based approach to financial integration is presented in section 3.3 under measures of financial integration. Here it suffices to highlight briefly how they are used to define financial integration.

The traditional quantity outcome-based definition of financial integration relates to the volume of capital flow across countries, investment-savings correlation and consumption correlation. Using capital flow, financial integration is defined in terms of the magnitude of flow, either in relative or absolute terms, with a higher flow denoting greater financial integration (cf. Kraay, 1998; Held *et al.*, 1999; Edison *et al*. 2002; Lane and Milesi-Ferretti, 2002; Prasad *et al.*, 2004).

The central idea of the investment-saving correlation is put forward by Feldstein and Horioka (1980) who argue that "with perfect world capital mobility, there should be no relation between domestic saving and domestic investment". Thus, a large correlation between national saving and investment would indicate strong segmentation of financial markets, that is, low financial integration in the world or in the region concerned. The consumption correlation-based definition suggests that full financial integration implies the convergence of the growth in *per capita* consumption of all the integrating nations (Bayoumi and MacDonald, 1995:557).

In contrast with the quantity-based measures, the commonly used price-based definitions of financial integration derive from interest parity conditions such as closed interest parity condition (CLIP), covered interest parity (CIP), uncovered interest parity (UIP), and real interest parity (RIP). Based on these parity conditions full financial integration is defined as the situation in which interest rates on similar financial assets are equalised across international financial markets. This is because in the absence of barriers to capital movement, interest rates or returns should move very closely together across countries or markets. If, on the other hand, there are constraints to capital mobility between a country and the international markets, then the two interest rates will diverge significantly.

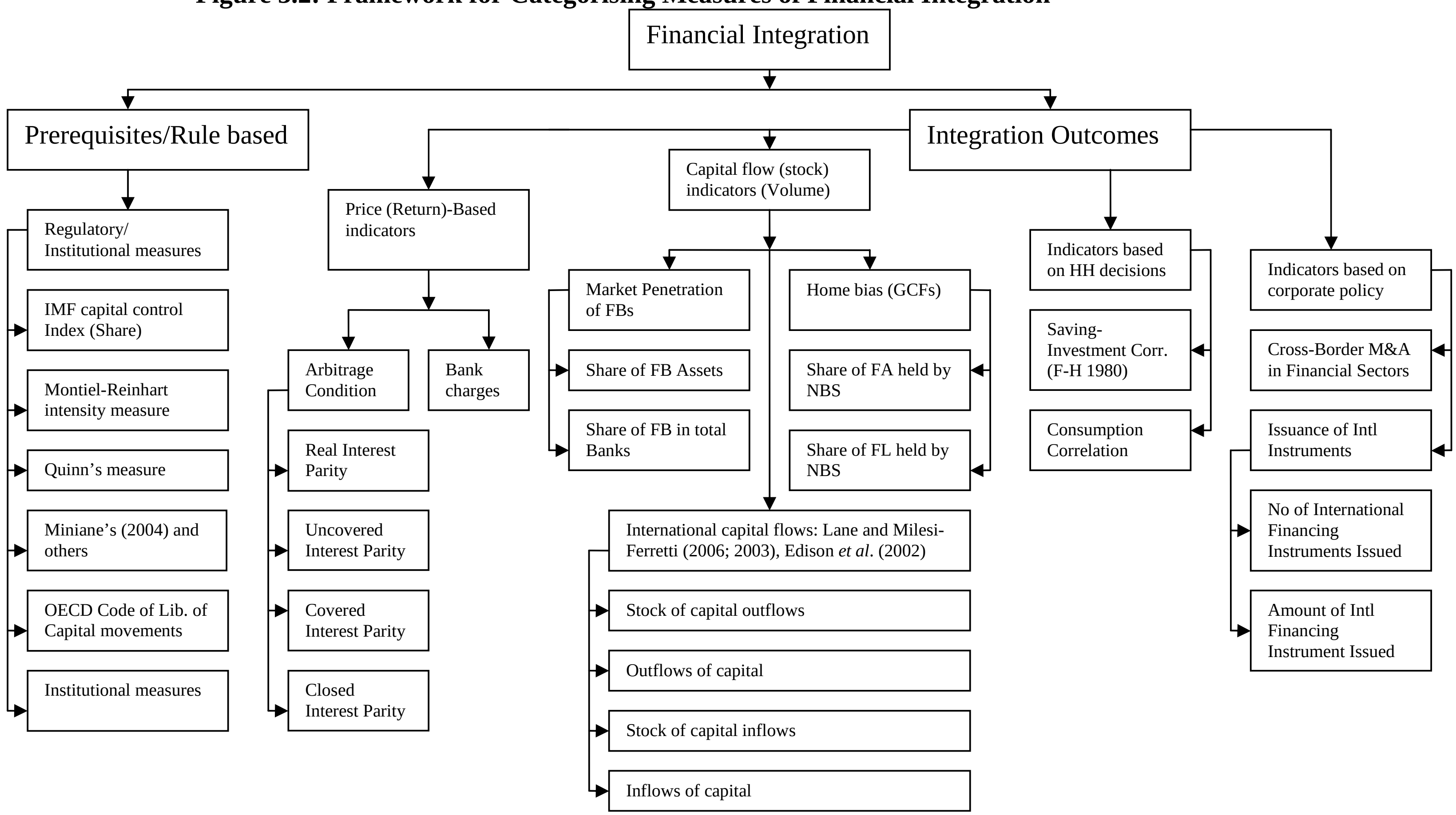
In summary, the message that emerges from a review of the definitions of financial integration is that the removal of legal barriers to capital mobility may not instantaneously result in financial integration. Instead, financial integration will gradually result from an organised process that requires many formal and practical elements of institutionalisation, a system of rules to allow international financial markets to develop and to function both competitively and securely. When a country removes existing administrative and market-based controls on capital movement as well as barriers to entry to foreign financial institutions, it sets financial integration in motion. Gradually, the financial market structure and products of the country may become similar to the international markets. As other enabling environments emerge, the domestic financial markets gradually become part of the world financial market, with interest rate movements, saving and investment activities and the accumulation of physical capital stocks being synchronised (Le, 2000:4). With full integration, domestic interest rates become exogenous (determined outside the economy) in a small open economy, and choices of households between consumption/saving and investment become completely separated.

Since countries around the world can hardly fulfil the entire necessary preconditions stated above, it is not expected that most countries will have full financial integration. Instead, financial integration will exist in a continuum – ranging from those that have very low to those with high levels of financial integration. The question that arises is: how do we measure financial integration? The next section reviews some of the measures that have commonly been used to establish the degree of financial integration of a country.

3.3 MEASURING FINANCIAL INTEGRATION

Measuring financial integration is as difficult as defining it. In practice, different measures of financial integration have been proposed and used to determine the degree of financial integration among countries. The measures can generally be grouped into two kinds: the rule-based/institutional or *de jure* measures (focusing on prerequisites for integrations) and outcome-based measures that are based on integration outcomes. The outcome-based indicators can further be grouped into four categories: price- or return-based indicators, capital flow indicators, indicators based on household decisions, and indicators based on corporate policy. Figure 3.2 below provides a framework for categorising the measures of financial integration. This section provides a selective review of some of the most commonly used measures of financial integration, beginning with rule-based measures and followed by the outcome-based measures.

Figure 3.2: Framework for Categorising Measures of Financial Integration



KEY: GCFs – Gross capital flows, FB – foreign bank, NBS – National banking sector, HH – Household, FA – Foreign assets, FL – Foreign liabilities, F-H – Feldstein and Horioka, M&A – Merger and acquisition

Source: Compiled by the author based on the different literature

3.3.1 Rule-based (Regulatory) / institutional measures

i. The IMF-restriction measure

The most popular rule-based measure of financial integration is based on the *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER) of the IMF. AREAER includes a summary table in which a row (line E.2 titled 'Restriction on payments for capital transaction') contains annual information on capital controls for different countries for the period between 1966 and 1995. From the 1996 edition, the report expanded the categories of items that reflect the presence of capital controls to include 13 groups. For the first time, it makes the distinction between restriction on inflows and restrictions on outflows. The change in how the information is reported since 1996 introduces a structural break to the IMF measure. Because of this break in the measure, most authors use it only for the earlier period – 1966 to 1995 (cf. Eichengreen and Leblang, 2003; Edison *et al.*, 2002:6).

The IMF-restriction measure 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 (Edison *et al*., 2002:6). In practice, the measure has been used in slightly different ways to measure the level of financial openness (integration). For instance, several authors (cf. Klein and Olivei, 2001; Rodrik, 1998; Grilli and Milesi-Ferretti, 1995) used the average of the 0/1 measure for the entire period, in this case, the higher the value, the more the restrictions and thus the less openness.

Another variation of the measure is referred to as *Share* in Edison *et al.* (2003:6). *Share* is a variable that reflects the proportion of years that a country has no capital accounts restrictions. For instance, if, out of 10 years, the IMF AREAER indicates capital accounts were restricted in 5 years, then the *Share* would be 0.5 (cf. Klein and Olivei, 2001; Rodrik, 1998; Grilli and Milesi-Ferretti, 1995).

As pointed out by Edison *et al*. (2002:2), an advantage of this method is that it provides a direct proxy for government impediments. However, as noted by the same authors, it is difficult to use the measure to accurately gauge the magnitude and effectiveness of government restrictions, because the IMF restriction measure fails to distinguish between when capital controls are strongly or weakly administered (Edison *et al.*, 2003:7). Also, the indicator measures controls on residents rather than non-residents (Kraay, 1998:5). An added problem arising from the IMF measure relates to the break in the measure since 1996 because of the change from one entry to 13 entries. This means that the measure is only available until 1995. Thus, any analysis of financial integration post-1996 cannot make use of the measure unless it only uses the post-1996 data.

ii. The Montiel-Reinhart intensity measure

Montiel and Reinhart, in a series of papers, made an attempt to overcome the inability of the IMF-restriction indicator to distinguish between different intensities of capital restrictions (Montiel, 1996; Reinhart and Reinhart, 1999; and Montiel and Reinhart, 1999). Combining the IMF and country-specific information, the authors constructed an index of capital control intensity in 15 countries for the period 1990-1996. Their index takes three values, 0, 1 or 2, to indicate a closed, semi-closed (or partially open) and an open capital account. As noted by Edwards (2001:7), despite the improvement over the IMF indicators, the index remains very general and does not capture the subtleties of actual capital restrictions. Furthermore, the 15 countries for which Montiel and Reinhart constructed the index do not include any Southern African countries.

iii. The Quinn measure

By attempting to capture the intensity of enforcement of controls on both capital and current account transactions, the Quinn (1997) measure represents a major improvement on the IMF-restriction measure and its variants. Quinn constructed the index for 64 countries (including South Africa) for 1958 to 1990. Based on the IMF's narrative description of capital account restrictions, Quinn assigned scores to gauge the intensity of capital restrictions. For inward and outward capital account transactions, he scored the countries on a scale of 0-4; while for current account transactions he uses a scale of 0-8. These were combined to form a 0-12 score, ranging from most closed (0) to most open (12) economy. Furthermore, Quinn (1997:535) added another dimension for international legal agreements that constrain a nation's ability to restrict exchange and capital flows; its scoring was 0, 0.5, 1, 1.5, or 2, ranging from not at all to very constrained. Combined with the previous scoring, Quinn obtained a 0-14 measure of financial openness. He then took the first difference of the financial openness index to generate a measure of change in international financial regulation. Similarly, by taking the first difference of the scoring for the capital account transactions, Quinn generated a measure of change in capital account liberalisation.

Unlike the IMF-restriction measure that classifies countries as closed or open, the Quinn measure provides information about the intensity of controls (Edison *et al.,* 2002:7). But like the IMF-restriction measure, it also directly measures government impediments. Since the Quinn index is computed over time, it makes it easy to investigate the effects of capital account liberalisation on economic growth over time. However, the measure is plagued by many problems. First, as noted by Edison *et al.* (2002:2), the measure does not accurately gauge the magnitude and effectiveness of government restrictions. Besides, it is highly subjective in that the scores assigned, based on the narrative descriptions, depend on the opinion of the researcher. In addition, the measure is rarely available for non-OECD countries, which limits its application to developing countries and for more recent years.

To overcome some of these problems, Lee and Jayadev (2005) use the same methods as Quinn (1997) to construct a similar indicator for the period 1973-1995, which represents a major update of the index and for a larger number of countries.

iv. Miniane's (2004) measure and its variants

Miniane (2004) constructed a capital control index in response to the change in the IMF reporting procedure in the AREAER since 1996. The index expands the set of items that reflects the presence of capital controls from one to 13 categories. The change in the reporting procedure as noted earlier introduces a structural break to the IMF capital control index and other measures based on it. Hence, indicators based on the AREAER were limited to the period before 1996. Other authors such as Johnston and Tamirisa (1998), and Tamirisa (2003; 1999) were the first to construct capital control indicators using the disaggregated AREAER classification for 45 countries. Their indicators represented averages over all possible 0/1 dummies in the new AREAER (Miniane, 2004:280). Despite the innovation, their indicators only cover the period after 1996, which make any analysis extending to the earlier period impossible. An attempt to overcome this limitation was made by Brune *et al*. (2001) who constructed a similar indicator covering 173 countries for the period 1973-1999. However, as noted by

Miniane (2004:280) a major weakness of Brune *et al*. (2001) is that their data are not publicly available, which raises questions as to how the results were obtained.

Following Johnston and Tamirisa (1998), Miniane (2004) used text information in the AREAER to extend the indicator to cover the period 1983 to 2000 for 34 countries. Miniane (2004:282) relies on the information in the AREAER for each country on exchange arrangement, administration of control, prescription of currency, regulation on import and import payment, payments for invisibles, exports and export proceeds, proceeds from invisibles, capital account transactions, and gold. Based on the text information in the AREAER, Miniane constructed a dummy variable for each of the new categories of the AREAER since 1996. However, as Miniane (2004:276) notes, the measure fails to track temporary control programmes designed to fight off crises. Moreover, the fact that the measure covers limited countries[7], including only South Africa among the SACU countries, makes its application in this study impossible.

v. *OECD Code of liberalisation of capital movements*

The Organisation for Economic Cooperation and Development (OECD) published the *Code of Liberalisation of Capital Movements* for the OECD member countries. This publication provides data on whether or not restrictions apply to eleven different kinds of international transactions, such as direct investment, liquidation of direct investment, admission of securities to capital markets, buying and selling of securities, buying and selling of collective investment securities, operations in real estate, financial credits and loans and personal capital movements. It also states whether or not the restrictions apply to commercial banks and other credit institutions and to institutional investors (Edison *et al.*, 2003:10).

Based on the OECD Code of Liberalisation of Capital Movement as above, Klein and Olivei (2001) constructed an indicator similar to the IMF *Share* to represent the extent of capital account liberalisation in a country. The indicator takes values ranging from 0 to 1, but unlike the *Share*, its value for a particular country in any year could vary with an increment of 1/11 (Edison *et al*., 2003:10). The OECD indicator is only available for

[7] Miniane (2004:281) notes that the selection of the 34 countries covered in the study is due to data availability.

OECD countries, which represents its major limitation for its application to other countries such as those under consideration in this study.

vi. Institutional measures

Closely related to the rule-based measures are institutional measures. The institutional features of a country can help to explain why the country is less financially integrated with the rest of the world. However, measuring institutional differences between countries is very difficult. One major institution that has far reaching ramifications on the extent of financial integration is the legal system of a country. An efficient legal system guarantees property rights and the speedy judicial enforcement of contracts. Djankov *et al*. (2001) proposed an indicator to measure the relative efficiency of different legal systems across countries called the index of regulation of dispute resolution. The index measures the extent to which legal procedures deviate from a hypothetical benchmark of a third party resolving a dispute between two other parties (Adams *et al*., 2002:19). The index takes a value from 0 to 7 with higher values corresponding to a more regulated dispute and longer expected time of dispute resolution, which implies an inefficient judicial system.

3.3.1.1. Limitations of rule-based (institutional) measures

The foregoing rule-based (regulatory) / institutional measures have a number of limitations that limit their application in the current study. First, since they have limited time series observations, they are mainly suitable for cross-sectional and panel data analysis. Secondly, due to data constraint most of the measures are rarely constructed for developing countries, including the SACU countries.

3.3.2 Outcome-based measures

Given the shortcomings of the rule-based and institutional measures, this study rather focuses on the outcome-based measures set out in this subsection. As shown in Figure 3.2 above, the outcome-based indicators can further be grouped into three categories, the first two of which derive information from market outcomes, i.e. prices and quantities. The final category draws on behavioural information from households. The three categories are considered in turn.

i. *Price-based measures*

Price-based measures are based on the extent to which prices of similar assets (financial products and services) are related across international borders. Under the assumption that there is free movement of capital and low or no transaction costs, the law of one price implies that similar assets should yield the same return irrespective of the country of domicile and the currency in which they are denominated. Two groups of price-based measures are common, namely arbitrage conditions and financial services charges/prices.

The arbitrage conditions equate interest rates of similar financial assets across different countries. The literature on arbitrage conditions uses the extent of the equality of interest rates to measure the degree or intensity of financial integration (cf. Cheung *et al.*, 2002). The different interest rate parity conditions include closed interest parity (CLIP), covered interest parity (CIP), uncovered interest parity (UIP) and real interest parity (RIP).

Broadly speaking, the tendency for interest rates to equalise can result from two causes. The first cause derives from the presence of arbitrage opportunities, in which interest rate movements are viewed as being determined by "financial flows in fluid, profit-seeking capital markets" (Barassi *et al*., 2000:5). The interest rate parity theory argues that, with a high degree of international capital mobility resulting from capital account liberalisation, financial assets of two countries would be substitutes for each other. Arbitrage brings interest rates of one country on par with the interest rates of the other, as well as with the forward premium on the two currencies. Thus, the two interest rates may move together over time when the forward premium has stationary time series properties (Zhou, 2003:572). The four parity conditions mentioned above relate to the presence of arbitrage opportunities. A more detailed consideration of each of the parity conditions is provided below. But, first consider the second cause of parity of interest rates, i.e. monetary policy.

The second cause arises from the use of interest rates as an instrument of monetary policy in the pursuit of nominal objectives such as an exchange rate or inflation target (Barassi *et al.,* 2000:5). In this view, co-movement in interest rates is considered as a product of policy convergence. This may occur when a smaller country (financial unit) aligns its interest rates (policy) with that of a dominant economy (financial unit), because of the possibly stronger influence the latter will exert on the former.

This view explains why the US and Japan have been dominant in international financial markets, with the result that many countries (financial markets) attempt to align their interest rates to reflect the trends in the US or Japan[8]. Within the European Monetary System established in 1978, Germany was central. Von Hagen and Fratianni (1990:359) assert that "Germany is the central country and runs monetary policy for the whole system". This has led to the test of what is often called the German Dominance Hypothesis (GDH). According to the GDH, the "EMS is a coercive arrangement forcing the other members to follow the disciplinary, low-inflation policy rule of the Bundesbank" and that membership of the EMS has meant that other countries surrender (part) of their monetary policy autonomy to the leadership of the Bundesbank (von Hagen and Fratianni, 1990:358).

Policy convergence can also occur within the framework of an economic and monetary union where monetary policy is coordinated from a central point. The European Central Bank (ECB) that coordinates monetary policy in the European Economic and Monetary Union (EMU) is a case in point. In this case, interest rates are also expected to converge. Next attention is turned to the four parity conditions.

Turning to the price-based measures of integration: The *closed interest parity* (CLIP) implies that the returns should be equal across countries for comparable financial instruments of the same currency that are traded in different markets such as onshore and offshore markets (von Furstenberg, 1998:65). A difference may arise because of transaction cost, capital controls, a political risk premium and country risk. Because of the existence of liquid offshore assets among developed countries, it is easy to measure a closed interest differential for most developed countries, and as shown by von Furstenberg (1998:65) the closed parity condition largely holds for them. However, measuring closed interest differential is not easy for most developing countries because most of these countries lack liquid offshore markets for most of their assets.

According to von Furstenberg (1998:64), the *covered interest parity* (CIP) relates to yields on identical assets that are issued in different international markets and are denominated in different currencies, where these assets are hedged against currency risk

[8] Empirical tests of the influence of the US and Japanese interest rates on other countries can be found, *inter alia*, in Phylaktis (1999) and the references therein.

in the foreign exchange markets or in swap markets. The CIP condition implies that interest rate differentials between identical assets denominated in local currencies must equal the difference between the current spot rate and the forward exchange rate. If hedges can be freely used, the arbitrage will ensure that CIP holds. Any disparity from this condition may also arise because of capital control, political and country risks and transaction costs.

Formally, the CIP can be expressed as follows:

$$i_t = i^*_t + f_{t,t+n} \tag{3.1}$$

where i_t is the domestic interest rate, i^*_t is the foreign interest rate, $f_{t,t+n}$ is the forward premium (discount on the domestic currency for n periods into the future) (Cavoli *et al.,* 2003:3). Equation 3.1 can be rewritten as:

$$i_t - i^*_t = f_{t,t+n} \tag{3.2}$$

where equation 3.2 represents the covered interest differential (CID). If the capital account is not restricted and there is an absence of transaction costs, the CIP is expected to hold, that is, the CID should not deviate significantly from zero. In practice, the use of CIP and CID to test for the degree of financial integration takes different forms. Two methods for estimating the CIP based on time series data have been suggested by Chinn and Frankel (1992). The first method involves estimating the following form of equation 3.2: $i_t - i^*_t = \alpha + \beta t + \varepsilon_t$, where the null hypothesis of full integration is given as $\alpha = 0,\ \beta = 0$, that is, both the constant and the slope coefficient equal zero.

The alternative method suggested by Chinn and Frankel (1992) entails estimating the following equation: $i_t = \alpha + \beta(i^*_t - f_{t,t+n}) + \varepsilon_t$, where the null for CIP is $\alpha = 0,\ \beta = 1$. The closer the value of β is to 1, the more integrated the financial market is.

De Brouwer (1999) suggested a slightly different equation from the second equation of Chinn and Frankel above, namely: $f_{t,t+n} = \alpha + \beta(i_t - i^*_t) + \varepsilon_t$, while the null hypothesis is tested in the same fashion.

Unlike the CIP, which provides for the hedging of the yield on investments against currency risks, the *uncovered interest parity* (UIP) does not. Instead, the UIP requires that unhedged returns on alternative investments in different currencies and countries be equal after accounting for expected changes in the exchange rate. According to this condition, the rate of change in any bilateral exchange rate is expected to offset the bilateral interest rate differential (von Furstenberg, 1998:64). Formally the UIP can be expressed as:

$$i_t = i^*{}_t + \Delta e^e{}_{t,t+n} \tag{3.3}$$

where $\Delta e^e{}_{t,t+n}$ is the expected change in the exchange rate in time t + n. According to Cavoli *et al*. (2003:6) the relationship between the CIP and the UIP can be obtained by decomposing equation (3.3) as follows:

$$i_t - i^*{}_t - \Delta e^e{}_{t,t+n} = [i_t - i^*{}_t - (f_{t,t+n} - e_t)] + (f_{t,t+n} - e^e{}_{t,t+n}) \tag{3.4}$$

where the first term in the first bracket on the right hand side is the CIP and the second term is the currency premium. Unlike the CIP, note that with the UIP, the concept of exchange rate expectation is introduced. The introduction of exchange rate expectation makes the UIP more computationally demanding and less precise, given that exchange rate expectations cannot be observed directly.

For empirical purpose, Montiel (1994) and de Brouwer (1999) estimate the following equation:

$$\Delta e^e{}_{t,t+n} = \alpha + \beta(i_t - i^*{}_t) + \varepsilon_t \tag{3.5}$$

and the null hypothesis for UIP is given as $\alpha = 0$ and $\beta = 1$. The empirical testing of the UIP begins with a measure of future exchange rate expectation. In practice, one way of overcoming the non-observableness of the expected exchange rate is to assume rational expectation, by which it is implied that the actual or ex-post spot exchange rate equals the expected spot exchange rate plus uncorrelated error term (Cavoli *et al.,* 2003:6; Montiel, 1994).

The last parity condition is the *real interest parity*. The RIP implies the equality of real interest rates of similar assets denominated in different currencies and traded in different countries. This requires that changes in expected exchange rate equal expected changes in relative national product price levels. Thus, for the RIP to hold, UIP and purchasing power parity (PPP) also need to hold simultaneously. Following Cavoli *et al.* (2003:9), the RIP can be expressed as:

$$r_t = r^*{}_t \tag{3.6}$$

Equation (3.6) is derived from a combination of both the UIP condition and the PPP condition, where the uncovered interest differential (UID) is given as:

$$\Delta e^{e}{}_{t,t+n} = i_t - i^{*}{}_{t} \tag{3.7}$$

And the PPP condition is expressed as:

$$e_t = p_t - p_t^{*} \tag{3.8}$$

where p_t and p_t^{*} are the log of the domestic and foreign prices. By substituting equation (3.7) into equation (3.8) and expressing it in the form of expectations (with π^e being inflation expectation) we have:

$$\Delta e^{e}{}_{t,t+n} = \pi^{e}{}_{t,t+n} - \pi^{e^{*}}{}_{t,t+n} \tag{3.9}$$

Finally, by imposing the Fisher equation that real interest rates equal nominal interest rate less expected inflation, *i.e.*, $r_t = i_t - \pi^{e}_{t,t+n}$, yields the expression for the RIP as in equation (3.6) above.

Following from the above, it is evident that that RIP requires that the UIP, the relative PPP and the Fisher hypothesis hold simultaneously. Therefore, since the UIP derives from financial integration driven by arbitrage between money and foreign exchange markets and relative PPP that relates to how easily goods and services are arbitraged, the RIP implies both financial and real market integration (Cheung *et al*., 2002:6).

Since many empirical studies have demonstrated that PPP only holds in the very long-run (cf. Rogoff 1996 for a review of evidence for PPP in the long run), it follows that the RIP too can only hold in the long-run.

A comparison of the different parity conditions shows that compared to the UIP and RIP, the CLIP and the CIP are narrower concepts and often hold for the industrialised countries (von Furstenberg, 1998:65). In addition, the UIP and RIP often hold only in the long run.

With regard to a common monetary area, where exchange rate risk is absent, the test of interest rate parity (arising from the parity conditions and the policy convergence) becomes simply a test of the co-movements between interest rates based on the equation:

$$i_t = \alpha_0 + \beta_1 i^*_t \tag{3.10}$$

where i_t and i^*_t denote interest rates in domestic and foreign countries, while α_0 and β_1 are parameters that in a state of perfect integration are expected to be equal to 0 and 1 (Adam *et al.*, 2002:6). Since most of the SACU countries are in a common monetary area with absence of exchange risk, this study uses equation 3.10 to test the interest rate parity among the countries. Chapter 5 further explores how the test is carried out for the SACU countries.

ii. *Financial service prices*

An alternative price measure of financial integration uses the differential in financial service prices, such as bank charges (Adam *et al*., 2002:6). Because of the entrance of foreign banks and the ability of domestic residents to access funds from abroad, increased competition should reduce the differentials in bank charges for similar products or services (such as credit cards, ATM cash withdrawals, stop orders) across integrating countries. Thus, in an integrated financial system, the differential in charges across countries should be close to zero.

3.3.3 The magnitude of capital flow/stock

Having considered the price-based measures of integration, it is now appropriate to consider the quantity-based measures. The magnitude of capital flow across countries as a measure of financial integration has featured prominently in the finance literature (cf. Prasad *et al.,* 2004; Adam *et al.,* 2002; Edison *et al.,* 2002; Lane and Milesi-Ferretti, 2002; Held *et al.,* 1999; Kraay, 1998). One can distinguish three categories of measures of financial integration that can be derived from the different classes of capital flow/stock. The first group is referred to as indicators of the *market penetration of foreign banks* (Adam *et al.,* 2002:27; Claessens *et al*., 2000:897), the second group is called *home bias* indicators (Adam *et al.,* 2002:20) and *international portfolio composition* indicators (Lane and Milesi-Ferretti, 2003; Edison *et al.,* 2002).

Adam *et al*. (2002:17) and Claessens *et al.* (2000) propose two measures that can be used to determine the extent of market penetration of foreign banks – the share of foreign banks in the total number of banks operating in a country, and the share of assets held by foreign banks. One question of interest in deriving these measures is what constitutes a foreign bank. Claessens *et al.* (2000:897) regard a bank as foreign-owned if foreign residents own 50 per cent or more of its capital. The first measure of foreign bank presence would be important if the number of domestic relative to foreign banks influence the level of competition in a country. For instance, domestic banks may adjust interest rates on loans and charges on other activities because of entry of foreign banks to prevent the foreign entrants from taking over a large share of the market. The second indicator, the ratio of foreign bank assets to total assets of banks in a country, is relevant if the impact of foreign bank entry on the pricing and profitability of domestic banks begins after the foreign banks have gained considerable market share (Claessens *et al.,* 2000:897).

The *home bias* indicators are based on the asset and liability structure of the national banking sector (deposit money banks), and measure the extent of home bias of the domestic banking sector. Adam *et al.* (2002:20) argue that when financial markets are perfectly integrated, the home bias should disappear. If the bank assets and liabilities are largely domestic, then they are home biased, hence less integration. The first indicator in this category expresses foreign assets as a ratio of the total assets of the national banking sector. A second indicator is the ratio of the foreign liabilities to total liabilities of the national banking sector. A third indicator in this group is the ratio of the sum of foreign assets and liabilities to the sum of total assets and liabilities of the banking sector. Lastly, the sum of the foreign assets and liabilities is expressed as a percentage of GDP.

The *international portfolio composition* provides broad measures of financial integration and is based on the flows of foreign assets and liabilities of a country, as reported in IMF International Financial Statistics under the International Investment Positions (IIP). These indicators follow the notion that with financial openness the ability of both (1) foreigners to invest in a country and (2) residents to invest abroad will increase. Some of the indicators based on this notion of financial integration are the ratio of the flow (or stock) of foreign assets to GDP and 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 (this could also be expressed as a ratio of total foreign trade – import plus export). Components of capital flows (stock) such as FDI and portfolio inflows and outflows as a share of GDP have also been used along this line as measures of financial integration (Edison *et al.,* 2002:753). Edison *et al.* (2002:754) note that the stock measures which accumulate flows over a long period are better than the flow measures, since the former exhibit considerable variation with short-term changes in the political and policy environment.

3.3.4 Indicators based on household decisions

The final category amongst the financial integration indicators are based on behavioural information. Two types of indicators based on household behaviour are common in the literature. The first measure, originally developed by Feldstein and Horioka (1980), uses the correlation between savings and investment across countries. The second measure is based on the consumption correlation across countries.

i. Investment-Savings correlation

The investment-savings (I-S) view of financial integration posit that with full financial integration, domestic investment should be largely independent of domestic saving given that investment can be financed from foreign saving. Feldstein and Horioka (1980:317) argue that "with perfect world capital mobility, there should be no relation between domestic saving and domestic investment: saving in each country responds to the worldwide opportunities for investment while investment in that country is financed by the worldwide pool of capital. Conversely, if incremental saving tends to be invested in the country of origin, differences among countries in investment rates should correspond closely to differences in saving rates". Thus, if the correlation between national saving and investment is large, it indicates that financial markets in the world or in the region concerned are segmented.

The I-S correlation measure is closely linked to the interest parity conditions discussed above in that the I-S correlation argument can only hold for financial integration if domestic interest rates are equal to the world interest rate. This is because both the I-S and the interest parity condition assume complete arbitrage in a perfect world capital market (Feldstein and Horioka, 1980:317).

One limitation of the I-S correlation as measure of financial integration arises because it focuses on aggregate saving and investment within an economy. Therefore, the approach does not identify which of the financial markets are insufficiently integrated and cause the correlations to be high (Adam *et al.*, 2002:9). Similarly, in the case of regional financial integration, the approach does not differentiate between capital flows within the integrating region and the rest of the world. Another weakness of the I-S approach is shown in the empirical literature reviewed by von Furstenberg (1998:72). The empirical investment-saving correlations yield measures without theory that defy substantive interpretation.

ii. Consumption correlation

The consumption correlation view of financial integration is based on consumer choices and the idea that the integration of financial markets allows for international risk sharing (von Furstenberg, 1998:73). It assumes that the time preference rates and the relative degree of risk aversion of consumers are the same in all the countries (von Furstenberg, 1998:73). In addition, all risk-sharing opportunities are fully exploited by the consumers (Adam *et al.*, 2002:10). Based on the above assumptions, full financial integration would imply the convergence of the growth in *per capita* consumption of all the integrating nations (Bayoumi and MacDonald, 1995:557). In other words, if *per capita* rates of consumption growth differ significantly between countries, then real interest rates are not the same and the capital markets are not integrated between the countries (Von Furstenberg, 1998:73).

3.3.5 Evaluation of the financial integration measures

For empirical purposes, the above indicators of financial integration can be used in two ways. First, all the indicators can be used to gauge the degree of financial integration, either between a pair of countries or between a country and the rest of the world. Though they vary from one to the other in terms of what each of them measures, each can help to provide some indication of the degree of financial integration that exists. Second, the indicators can be used to analyse the impact of financial integration on macroeconomic variables such as economic growth, financial development and inflation. However, while all the indicators described above can be used to gauge the extent of financial integration, only the regulatory and capital flow indicators are useful for studying the effects of financial integration, since the latter can be generated over time.

3.4 EFFECTS OF FINANCIAL INTEGRATION ON DOMESTIC FINANCIAL DEVELOPMENT

3.4.1 Theory

Economic literature highlights several channels through which international financial integration can affect the domestic financial system either positively or negatively (Agénor, 2003; Giannetti *et al.*, 2002; Caprio and Honohan, 1999; World Bank, 1997 and Levine, 1996). The opposing effects of financial integration on financial development can be summed up into two theoretical positions – financial integration as either a complement or a substitute to domestic financial development (Gourinchas, 2004:566).

First, as a complement, financial integration helps to boost domestic financial market development through greater competitive pressures on financial intermediaries and movement toward international best practices in accounting, financial regulation and supervision. Moreover, foreign ownership of banks may facilitate the transfer of technology and risk-management techniques or help stabilise domestic financial system. All of these may help to improve the quality and efficiency of local financial institutions and intermediaries, thereby boosting domestic financial development.

Secondly, financial integration is a substitute when it makes local financial development irrelevant or causes it to deteriorate. This may occur, for instance, when individuals and firms bypass inefficient domestic financial institutions to access more efficient foreign markets for their financial services needs. Thus, considering that financial integration permits private savings to move freely across countries, when a domestic financial system is repressed, financial integration may lead to a drying up of liquidity in such a country. Moreover, because of the agglomeration of financial activities resulting from integration, financial intermediaries in smaller countries or countries with weak domestic institutions may bypass the domestic financial markets to invest savings mobilised locally in foreign financial markets in larger countries. This may lead to higher costs for small and medium firms that may find it difficult to access foreign markets, which could further stifle the development of the domestic financial system (Gourinchas, 2004:566; Martin, 2004:562).

The first mechanism through which financial integration could complement domestic financial development is by promoting competition in the domestic financial systems.

Financial openness often results in the entrance of new and more sophisticated foreign banks. At the same time domestic firms and individuals may gain access to banks domiciled outside the country for credit and saving. It is expected that as domestic intermediaries face competitive pressure from the more sophisticated and cheaper foreign intermediaries, the cost of financial services to firms and households of countries with less developed financial systems will be reduced. In addition, new foreign bank entrants may bring along more sophisticated banking techniques and technology (such as more advanced risk management techniques) which may, in turn, help to reduce the cost of financial services. Moreover, a new foreign bank may introduce new financial innovation that can increase the range of financial services. New financial innovations could also reduce the cost of acquiring and processing information on potential borrowers, thereby improving the efficiency of the domestic financial system (Agénor, 2003:1096).

In addition, the entrance of foreign banks, either directly or through acquisition or merging with local banks, is likely to reduce the market power previously enjoyed by some local intermediaries and as such may erode the rents of local banks. If the mergers or acquisitions arising from financial integration enable banks to operate at a level where the banks provide services more efficiently, the cost of intermediation will be reduced (Guiso *et al.*, 2004a:3). The increased competition along with cost reduction may result in better credit conditions and thus stimulate demand for credit for investment and consumption. Hence, the domestic financial system would improve.

A second channel through which financial integration can complement the domestic financial system is through improvements in the bank supervisory and legal framework. Financial integration may force domestic regulatory authorities of countries with less developed financial systems to improve their banking supervision and national regulations (such as accounting standards, securities law and corporate governance) to bring them in line with best-practice regulation in the integrating area (Guiso *et al.*, 2004:6). Moreover, as Yusuf (2001:16) argues, by increasing the presence of and the role played by foreign banks, a country can supplement its own regulatory oversight with that conducted by regulators in the home countries of the investing banks, especially "if the local foreign banks are supervised on a consolidated basis with their parent banks". Such improvement in regulatory standards may help to reduce the problems of asymmetric information such as adverse selection, agency costs and distortions that may arise from inadequate / inappropriate regulations (Giannetti *et al.*, 2002:13). Ultimately, this may lead to the development of a less developed financial system.

Another possible reason why financial integration could lead to the development of domestic financial system is because of the access to international capital that it can afford a country. In a financially closed economy, investment must be funded by domestic savings, which may often be relatively scarce, especially in developing countries. Hence, the ability of banks to finance investment projects would be limited to the extent of the available domestic financial saving. However, with financial openness, individual investors are able to borrow and savers are able to lend internationally. To the extent that funds borrowed from abroad are utilised through the domestic financial system, such funds will help to strengthen the domestic financial system. Furthermore, domestic banks, especially the foreign-owned banks, are able to access international funds, either directly or through their parent banks, which may enhance domestic credit availability (Agénor, 2003:1096).

In addition to the channels discussed so far, financial integration can further promote the development of the domestic financial system by contributing to the stability of the domestic financial system and reducing volatility of financial flows. This may happen if, in periods of financial instability, rather than transferring assets abroad through capital flight, depositors shift their funds to domestic foreign institutions that are perceived to be sounder than domestically owned banks (Agénor, 2003:1096).

Lastly, according to Agénor (2003:1096), foreign banks may further contribute to an improvement in the overall quality of the loan portfolios of domestic banks. This is because foreign banks may be less susceptible to interference of government in the granting of loans to borrowers. Interference may be the case with domestic institutions, especially those that are partly owned by the government.

From the foregoing discussion, it is evident that financial integration can promote the development of the domestic financial system. However, it is also possible for financial integration to impact negatively on domestic financial systems.

One mechanism through which financial integration could impact negatively on financial development is that financial integration could lead to reckless lending as a result of sudden capital inflows. Experience shows that in countries where there is weak regulatory infrastructure and banking institutions, a sudden increase in capital inflow resulting from financial openness is often associated with deterioration in the portfolios of banks (cf. World Bank, 1997:231). This is because poorly managed and supervised banks often tend to invest in highly profitable but risky activities, with the result that portfolios are poorly diversified and resources misallocated. A typical example occurs when poorly supervised banks finance consumption booms and speculative activities, such as a boom in construction and real estate, which may increase macroeconomic vulnerability (World Bank, 1997:231). Such a surge in bank lending may exacerbate financial sector vulnerability and in extreme cases, as noted by the World Bank (1997:231), can lead to financial distress or crisis.

Another problem associated with financial openness relates to the entry of foreign banks. For example, Agénor (2003:1100-1101) notes the tendency of foreign banks to discriminate against small firms and households to a larger extent than domestic banks. Instead, foreign banks often concentrate their lending operations on larger firms and the most creditworthy corporate borrowers. This, as Agénor (2003:1100) notes, may make their presence "less likely to improve the overall efficiency of the financial sector".

Furthermore, mergers with and acquisition of domestic banks by the more sophisticated and lower cost foreign banks could eventually result in banking concentration. Concentration in the banking sector could create monopoly power that could, in turn, reduce the overall efficiency of the banking system and the availability of credit (Agénor, 2003:1101). The reduction in efficiency may manifest itself in higher interest rate spreads whereby the loan rates will be higher and deposit rates lower than in competitive credit and deposit markets. As a result, financial institutions may grant a lower amount of loans and mobilise lower deposits than a more competitive system.

Closely related to the problem of concentration in the banking system that could arise from merger and acquisition of domestic banks by foreign banks is the problem of 'too-big-to-fail'. This problem occurs when the monetary authorities fear, because of the large size of the banks, that the failure of a single large bank could seriously affect the economy (Agénor, 2003:1101). When a bank becomes too-big-to-fail, and realises that the authorities would come to its aid in the event of it running into crisis, the bank may become less careful in screening potential borrowers, hence causing a moral hazard problem on the part of the banks. As Agénor (2003:1101) notes, the problem of too-big-to-fail could be avoided through adequate prudential supervision and possibly through an outright ban on some mergers, especially those that are perceived to likely increase systemic risks. However, such interventions may lead to an unwanted expansion of the extent and costs of the official safety net.

Another problem involving the entry of foreign banks relates to their behaviour during economic recession. The foreign banks may withdraw abruptly or ‘cut and run’ during recession when default rates and non-performing loans may increase sharply. Such an abrupt withdrawal of foreign banks during crisis may further undermine the stability of the domestic financial system. Thus, while the entrance of foreign banks as a result of financial integration may be beneficial in strengthening the domestic financial system, they also constitute a considerable potential threat to the system if their presence or entrance is not properly managed.

Moreover, because the financial markets in most developing countries are highly fragmented with undercapitalised institutions, such markets may be unable to exploit economies of scale, which may, in turn, result in a higher cost of loans and lower compensation for deposits. This may cause individuals and firms to bypass inefficient domestic financial institutions to access more efficient foreign markets for their financial services needs. Thus, considering that financial integration permits private savings to move freely across countries, when a domestic financial system is repressed, financial integration may lead to liquidity constraints in such a country (Giannetti *et al.*, 2002:14; Guiso *et al.*, 2004:566).

In addition, because of the agglomeration of financial activities resulting from integration, financial intermediaries in smaller countries or countries with weak domestic institutions may bypass domestic financial markets to invest savings mobilised locally in foreign financial markets in larger countries. This may lead to higher costs for small and medium firms that may find it difficult to access foreign markets, which could further stifle the development of the domestic financial system (Gourinchas, 2004:566; Martin, 2004:562; Giannetti *et al.*, 2002:14).

The discussions so far suggest that causality runs from financial integration to domestic financial development and it shows that the effect of financial integration on domestic financial development is ambiguous. Since economic theory predicts both positive and negative effects for financial integration on domestic financial development, the issue requires empirical investigation on a country-by-country basis. Section 4.4.2 below provides a review of the rather slim empirical evidence on the issue. However, given that the development of the domestic financial system is often a necessary precondition for financial integration, causality could also run in the opposite direction (Prasad *et al.*, 2003:10; von Furstenberg, 1998:57). Therefore, before turning to a review of the empirical literature, the next paragraph briefly discusses how domestic financial development could affect financial integration.

There are two scenarios under which the domestic financial system will affect the level of financial integration. In the first instance, because an economy with a deep financial system will likely become much more attractive to foreign investors, financial integration may arise from inflows of capital. In the second scenario, financial integration may arise from capital outflow. This will occur if the domestic financial system is underdeveloped relative to world financial markets in an open financial system. Foreign investors will be largely absent and domestic investors might also move their capital to foreign markets. Although in such a case the degree of *de facto* financial integration will still increase, the integration will be outward rather than inward. This suggests that financial integration is potentially endogenous, determined by the development of the domestic financial system. It follows that it is also necessary to explore the potential endogeneity of financial integration in any empirical analysis of the relationship between financial integration and financial development.

4.4.2 Empirical Evidence

A large body of empirical work examines the effect of financial development on economic growth and the effect of financial integration on economic growth. However, only a very few empirical studies exist that examine the effect of financial openness on domestic financial development. The empirical literature on the effect of financial integration on financial development can generally be grouped into two categories: studies that use broad indicators of financial openness and financial depth and studies that use firm level data focusing on the impact of foreign bank entry on domestic financial institutions. Chinn and Ito (2006; 2002), Chinn (2001), Klein and Olivei (1999), and De Gregorio (1998) fall into the first category, while Clarke, Cull, Martinez Peria, and Sanchez (2002), Clarke, Cull and Martinez Peria (2001), Goldberg, *et al.* (2000), Claessens *et al.* (2000), Clarke, Cull, d'Amato and Mollinari (2000), Denizer (2000), Hasan and Marton (2000) and Demirguc-Kunt and Huizinga (1999) are examples of the second. The current study follows the first category, hence the review that follows focuses on the studies that use broad indicators of financial openness and financial development[9].

De Gregorio (1998) analyses empirically the relationship between financial integration and financial development, particularly focusing on "the question of whether economies exhibiting greater financial integration experience deeper financial development". The study further compares the effect of integration for both developed and developing countries. To study the effect of financial integration on financial development, De Gregorio (1998:20) estimated the following cross-country regression:

$$FD_i = \alpha + \beta FI_i + other\ \ regressors \tag{3.11}$$

where *FD* represents an indicator of financial development and *FI* is an indicator of financial integration. Other regressors are used as controlled variables in the model, and they include the initial level of GDP, inflation as measure of macroeconomic conditions, and trade openness measured as the sum of export and import over GDP.

De Gregorio (1998) uses four measures each of financial integration and financial development. The first indicator used to capture financial integration is the international arbitrage pricing model (IAPM) based on Levine and Zervos (1995). The second indicator utilises the international capital asset pricing model (ICAPM) as suggested by Levine and Zervos (1998b). The next indicator (GFR) is based on Montiel (1994) and was derived from the ratio of gross capital flows to GDP for the period 1980-89. The last

[9] The evidence from studies on the effect of foreign bank entry on domestic financial institutions remains largely inconclusive. While there is some consensus among the studies that the entry of foreign banks causes domestic banks to be more competitive, the extent varies from country to country (cf. Clarke *et al.*, 2000 for Argentina; Goldberg *et al.*, 2000 for Argentina and Mexico; Denizer, 2000 for Turkey; and Hasan and Marton, 2000 for Hungary).

indicator (CLAS) was constructed based on the ratio of gross capital flows to GDP, the Feldstein-Horioka saving-investment correlation coefficient, Euler equation estimates and tests of uncovered interest parity differential. The IAPM and the ICAPM were based on data from Levine and Zervos (1995) that include both developed and developing countries, while the last two indicators were drawn from Montiel (1994), which contains only developing countries.

The four measures of financial development used by De Gregorio are: the ratio of total loans extended by the banking system to the private sector to GDP (CREDIT), the value of listed shares as fraction of GDP (MCAP – which indicates the size of the stock market), the total value of shares traded in a year to GDP (TVT – this is a measure of liquidity of the stock market relative to the size of the economy), and a measure of volatility of the stock market (VOL – measured as the twelve-month rolling standard deviation based on a regression of stock returns). Of the four financial development measures De Gregorio uses, the CREDIT is the one relevant to the current study since it focuses on the banking system. Note in the SACU, most of the smaller countries do not have stock exchanges or liquid stock markets, hence, this section focuses on the result of De Gregorio on the CREDIT variable.

After controlling for the effects of the other variables (the initial level of GDP, inflation and trade openness), De Gregorio (1998:21) found that the indicator of the development of the banking system was affected by almost all of the indicators of financial integration. Of the four measures of financial integration, three (IAPM, ICAPM and CLAS) have positive and statistically significant coefficients. Hence, De Gregorio concluded that financial integration leads to an increase in the development of the domestic banking system. However, it is worth noting that the results also highlight the distinction between developed and developing countries. The two indicators containing only a sample from developing countries (GFR and CLAS) had mixed results, with the coefficient of GFR not only being statistically insignificant but also having a negative sign, while the coefficient of CLAS was only weakly significant (at 10%) after controlling for the effects of the control variables. Conversely, the coefficient of IAPM and ICAPM with a sample consisting of both industrialised and developing countries was consistently positive and significant. Thus, while financial integration leads to the development of the domestic banking system, the results seems to be driven by financial integration in the advanced countries rather than the less developed countries.

A closely related study to De Gregorio (1998) is Klein and Olivei (1999). They explore how financial openness affects financial deepness using a cross-section of 91 countries (21 advanced countries and 70 developing countries) over the period 1986 to 1995. Klein and Olivei (1999:1) observe that "countries with open capital accounts over some or all of these periods enjoyed a significantly greater increase in financial depth than countries with continuing capital account restrictions". Hence they wanted to know whether the observed association between financial openness and financial development, has empirical significance. For the purpose of the analysis, Klein and Olivei use three indicators of financial depth, namely: (LLY) – the ratio of liquid liabilities to GDP, where liquid liabilities is the broad monetary aggregate (M2); (PRIVY) – the ratio private sector credit to GDP; and (BANK) the ratio of assets of commercial bank assets to the sum of domestic assets of commercial bank and central bank. The PRIVY is similar to the CREDIT used by De Gregorio. The *Share* was used as indicator of capital account restriction and in their case it represents the proportion of years between 1986 and 1995 in which a country had unrestricted capital mobility (Klein and Olivei, 1999:7).

To analyse the relationship between capital account liberalisation and financial deepness, Klein and Olivei (1999:9) estimated the following cross-sectional regression:

$$\Delta \ln FD^{i} = \ln\left(\frac{FD^{i}{}_{95}}{FD^{i}{}_{86}}\right) = \beta_0 + \beta_1 \ln FD^{i}{}_{86} + \beta_2 SHARE^{i}{}_{86-95} + \beta_3 X^{i} + \varepsilon^{i} \qquad (3.12)$$

Where $FD^{i}{}_{95}$ is the measure of financial deepness for country i in 1995 (that is LLY_{95}, $PRIVY_{95}$, $BANK_{95}$) and $FD^{i}{}_{86}$ is the 1986 value, $SHARE^{i}{}_{86-95}$ indicates the stance of country i in terms of capital account liberalisation over the period 1986 to 1995, X^{i} represents other explanatory variables, including regional dummy variables, and ε^{i} is an error term.

Klein and Olivei found a statistically significant relationship between capital account liberalisation and financial deepness. Klein and Olivei also show that the industrialised countries included in the cross-section largely drove the significance of the link between the variables. Klein and Olivei argue that the weak link between capital account liberalisation and financial development in developing countries was not necessarily due to their late coming into the process of capital account liberalisation. Instead, according to Klein and Olivei (1999:20), “one interpretation of our findings is that countries require a constellation of economic, legal, and social institutions, institutions present in industrial countries but less common among developing counties, in order to have capital account liberalisation translate to greater financial depth”. Thus, in their view the lack of well-functioning economic, social, and legal institutions is what prevents the developing countries from realising the benefits of financial openness.

Chinn and Ito (2002) and Chinn (2001) are more recent studies on the relationship between financial development and financial openness. Both studies employ a sample of 105 countries over the period 1970 to 1997 and are quite innovative in several ways. They cover a larger sample of countries than the others. Among the countries included in these studies are four of the SACU countries: Botswana, Lesotho, South Africa and Swaziland. Unlike earlier studies that often analyse the financial development-growth and capital liberalisation-growth linkages, along with the issue of financial openness and financial development linkages these two studies focus on the link between financial openness and financial development. They also use more measures of financial development and financial openness than the previous studies. Both studies employ nine indicators of financial development – two banking system development indicators, four equity market development indicators and three bond market indicators; and five indicators of financial openness.

Chinn and Ito (2002) were even more innovative in two other respects. First, they grouped the countries into three categories: industrialised, emerging market economies (EMG) and less developed countries (LDC), of which South Africa is grouped among the EMG while Botswana, Lesotho and Swaziland are regarded as LDCs. This grouping enabled the authors to analyse the effects of the level of economic development of a country on the gains it derives from financial openness. Secondly, the study sheds light on how the effects of financial openness change depending upon the environment of institutions and legal systems. The importance of legal foundations and institutions governing financial transactions in financial development are fairly well documented in the literature (cf. Bardhan, 1996; Levine *et al.*, 2000***;*** La Porta *et al.*, 1998; Rother, 2001). The general consensus is that there will be limited incentives for loan activities in economies with weak legal system (i.e. a system that does not clearly define property rights or guarantee the enforcement of contracts). Likewise, financial decisions of economic agents are affected by the level of legal protections for creditors and the level of credibility and transparency of accounting rules.

Given the similarities of the findings of Chinn (2001) and Chinn and Ito (2002), and the fact that the latter study was a major extension of the former, this section focuses on the latter in what follows. Chinn and Ito specify a structural model of financial development in which financial openness enters as part of the explanatory variables. The models were estimated using the full sample, a sub-sample of LDC and the EMG. The results of the full sample show that financial openness exerts a statistically significant effect on changes in private credit, although the relationship was weaker when a liquid liability indicator was used. For the sub-sample of LDCs, the relationship between bank credit and financial openness became insignificant, whereas when the model was estimated using only the emerging market countries sub-sample, financial openness exerts a statistically significant effect on bank private credit. Thus Chinn and Ito clearly show that financial openness does not, on average, bring about the expected developments in banking credit in developing countries. In contrast, among emerging market countries, bank credit development does appear to be statistically significantly linked to financial openness.

Concerning the implication of legal/institutional development for the effect of financial openness on financial development, and based on their results, Chinn and Ito (2002:20) conclude that "in countries with a relatively strong legal institutions, private credit can develop and the size of stock markets tends to be larger in terms of both size and activeness, and also that both private credit and stock market value traded can grow with capital liberalisation, but with the latter developing even further if capital liberalisation is coupled with a highly developed legal environment". Thus, the results of Chinn and Ito confirm the widely held belief that financial systems in countries with a higher degree of legal / institutional development on average benefit more from financial openness than those with a weaker one (Chinn and Ito, 2002:20). An implication of these results for the SACU countries is that South Africa, being the only emerging market economy with a relatively well developed legal framework and institutions, may be the main beneficiary of the financial openness among them.

IMF (2007) is one of the more recent studies that examine the effects of financial integration on domestic financial sector development. To determine the effect of financial integration, the study regresses a *de jure* measure of financial integration (IMF index based on the AREAER) on the logarithm of private credit to GDP. In the study, the IMF index takes a value of one if a country is classified as open and zero if closed. The regression model also includes a range of other determinants, such as a lagged value of financial development, real per capita GDP, inflation and trade openness to control for their effect. The study uses a panel of non-overlapping 5-year averages for the period 1975 to 2004 and a sample of 59 countries in the model. The model was estimated using both a fixed effect panel and a system generalised method of moments (GMM) and the results show that the *de jure* financial integration and financial development are positively and statistically significantly correlated. Unlike the study of Chinn and Ito, the IMF study did not differentiate between developed and developing countries, hence it is difficult to tell the source (whether it is from the developed countries only or not) of the positive and significant effect of financial integration on credit market development.

Though these cross-country studies provide useful insight into the role of financial openness in domestic financial development, their results for developing countries should be treated with caution. A major weakness of these studies is that, despite their attempts to differentiate between developed and developing countries, the conclusions holds only on average across a large group of countries and cannot be construed as supportive evidence for any particular country. This is often the case with cross-sectional and panel data analyses. Bloch and Tang (2003:250) note, “these approaches often give all countries, either small or large, an equal weighting since they are assumed to be homogeneous; and the coefficients represent only an average relationship, which may or may not apply to individual countries in the sample”. Earlier, Arestis and Demetriades (1997) and Demetriades and Hussein (1996) similarly criticised the cross-country / panel data approach. Specifically, the authors note that a cross-sectional framework cannot satisfactorily be used to test for causality between financial development and economic growth because causality patterns may be different across countries. In the same vein, it would be misleading to interpret any relationship between financial integration and financial development in a cross-sectional / panel data framework as a causal link. Because of this limitation, Agénor (2003:1109) calls for empirical studies that will focus on individual countries or at a regional level.

Until now, no time-series study of the relationship between financial integration and financial development can be found. The few available country-level studies use firm level data (though none yet in the SACU countries) in a cross-sectional or panel data analysis. These include: Clarke *et al.* (2000) for Argentina, Goldberg *et al.* (2000) for Argentina and Mexico, Denizer (2000) for Turkey, and Hasan and Marton (2000) for Hungary. These studies focus on the question of whether foreign banks cause domestic banks to be more competitive. Given the limitations of the cross-country studies as highlighted above, there is a need to provide a country by country analysis that will give further insight into the nature of effect of financial integration on domestic financial development.

3.5 SUMMARY AND CONCLUSION

This chapter set out to provide a review of the literature on the effects of financial integration on domestic financial development. To lay the foundation for the review in the chapter and subsequent chapters, it also reviewed the conceptual definitions and the different measures of financial integration.

In general, the theoretical literature highlights several channels through which financial integration can affect the domestic financial system either positively or negatively. The opposing effects of financial integration on financial development can be summed up into two theoretical positions (Gourinchas, 2004:566). First, as a complement, financial integration can help to boost domestic financial market development through greater competitive pressures on financial intermediaries and movement toward international best practices in accounting, financial regulation and supervision. It is a substitute when financial integration makes the local financial system irrelevant or causes it to deteriorate. This may occur, for instance, when individuals and firms bypass inefficient domestic financial institutions to access more efficient foreign markets for their financial services needs. Thus, considering that financial integration permits private savings to move freely across countries, when a domestic financial system is underdeveloped, financial integration may lead to a drying up of liquidity in such a country. An important empirical question that emerges is whether or not developing countries that are more integrated into international financial markets have deeper financial systems.

Thus, while as a complement financial integration will promote the domestic financial development, when financial integration serves as a substitute it will further exacerbate the problems of an already weak financial system. Whether financial integration serves as a complement or a substitute in a country will crucially depend on the level of institutional development of the country vis-à-vis other integrating countries.

From an empirical point of view, the limited literature remains largely inconclusive. However, one message that comes out of some of the literature is that, where a significant positive association between financial development and financial integration is found, such an association appears to come from the developed countries present in the study. Given the fact that most of these studies are based on cross-country analysis using cross-sectional or panel data, it is difficult to apply their results to any one of the countries included in the sample. Considering the differences across countries, even among the developing countries, it is necessary to carry out country-specific studies to gain further insight into the effect of financial integration on financial development. Chapter 7 serves to fill this gap.

CHAPTER 4:
FINANCIAL INTEGRATION AND ECONOMIC GROWTH: THEORY AND EVIDENCE

4.3 INTRODUCTION

Economic theory provides conflicting views on the effects of financial integration on an economy. It suggests both benefits and costs of integration. The benefits can generally be viewed from two perspectives: in terms of economic growth and in terms of welfare effects (Obstfeld and Taylor, 2004:5). The theoretical literature offers, especially in developing countries, several channels through which financial integration can contribute positively to economic growth and welfare. Such channels include augmenting domestic savings, international risk sharing and consumption smoothing, transfer of technology and managerial know-how, stimulation of domestic financial sector development, macroeconomic discipline and signalling effect (cf. Klein, 2005; Prasad *et al*., 2004; Obstfeld and Taylor, 2004; Agénor, 2003; Van Wincoop, 1999; Gourinchas and Jeanne, 2003; Obstfeld, 1998; World Bank, 1997).

In addition to the potential benefits that may result from financial integration, economic theory also suggests some potential costs that may arise from integration. Such costs, as identified by Agénor (2003:1096), may include the geographical concentration of capital flows and a lack of access to capital flows by small countries, the domestic misallocation of capital flows, loss of macroeconomic stability, pro-cyclicality of short-term flows, volatility of capital flows and risk of entry by foreign banks. Agénor (2003:1101) notes that it is difficult to establish *a priori,* from a purely analytical point of view, whether or not the benefits of financial integration will outweigh its potential costs.

Moreover, the burgeoning and increasingly innovative empirical literature provides conflicting evidence of the effects of financial integration on economic growth and welfare. From an early literature that studied the effect of financial integration on economic growth by augmenting an empirical growth model with an indicator of financial integration, recent studies have been more innovative in several ways. These include using a wider range of measures of financial integration and more sophisticated econometric methods, as well as testing a more diverse set of hypotheses.

From a methodology perspective, studies have advanced from the use of simple ordinary least squares (OLS) cross-sectional regression analyses (cf. Klein, 2003; Arteta *et al.,* 2001; Edwards, 2001; Klein and Olivei, 1999; Kraay, 1998; Rodrik, 1998; Quinn, 1997) to more advanced dynamic panel estimation techniques that control for potential biases in the earlier methods (cf. Kim *et al.,* 2005; Laureti and Postiglione, 2005; Calderón *et al.,* 2004; Edison *et al.,* 2002; Reisen and Soto, 2001) and time series studies that employ the vector autoregressive (VAR) model (cf. Jin, 2006; Kim *et al.*, 2004).

Moreover, more recent studies have examined a range of other issues in addition to investigating the standard question of whether or not financial integration really promotes economic growth. Such issues include among others: (i) the conditions under which financial integration contributes to economic growth, e.g. institutional quality (cf. Klein, 2005, Edison *et al.*, 2004; Edison *et al.*, 2002), level of *per capita* income (cf. Klein, 2007; 2003; Edison *et al.,* 2004; Edison *et al.,* 2002), ethnic and linguistic heterogeneity (cf. Chanda, 2005); (ii) whether the effects of financial integration differ during different eras of financial globalisation (cf. Schularick and Steger, 2007; 2006) (iii) whether the effects of financial integration depend on the typology of capital inflows (cf. Laureti and Postiglione, 2005; Collins, 2004); and (iv) the sources of effects of integration (cf. Schularick and Steger, 2007; Collins, 2004).

This chapter reviews both the theoretical literature and the growing number of empirical studies. The focus of this is highlighted in Figure 4.1, i.e. the financial integration-growth relationship. The aim of the theoretical review is to identify the potential benefits and costs of financial integration as well as to highlight the channels through which the effects are brought about. However, while the issues will be explored in general, more emphasis will be placed on developing countries. The empirical review will help to show the extent to which data corroborates the theoretical predictions. The review begins with the theoretical literature and a review of the empirical evidence follows.

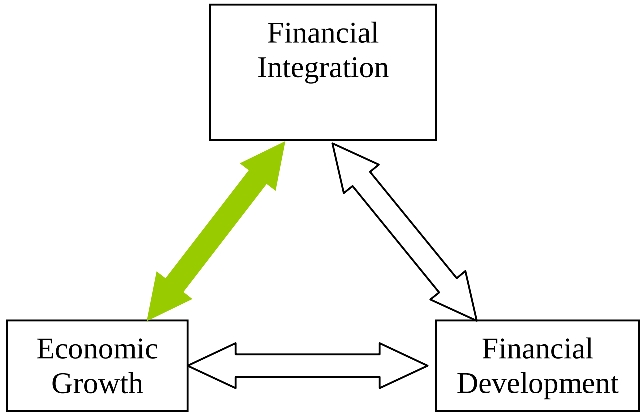


Figure 4.1: Structure of chapters

4.4 FINANCIAL INTEGRATION AND ECONOMIC GROWTH: THEORY

Underlying the benefits of financial integration and policy of financial openness are two basic propositions in economic theory. The first is the first theorem of welfare economics – that competitive markets are Pareto efficient, and the second is the efficient market hypothesis (EMH) – that financial markets use information efficiently (Eatwell, 1996:7). The fundamental welfare theorem assumes that a Pareto-efficient outcome is only attainable in a perfectly competitive market (Jehle and Reny, 2001:171-173). Hence, competitive markets are 'efficient' and any deviation, such as government interventions in the form of restrictions on the capital account, would be 'inefficient' (Eatwell, 1996:7). How then do these theoretical propositions provide the link between financial integration and economic growth?

A classical view in the economic literature is that economic growth can be driven by changes in the amount of factors of production (such as labour and capital) or increases in the efficiency by which the factors are used (total factor productivity). Hence, if international financial integration could lead to growth or efficiency gains, then it would promote economic growth. The combination of the fundamental theorem and the EMH present a picture in which economic efficiency depends on free markets for goods, labour and finance, and a minimal state (Eatwell, 1996:8). Therefore, market liberalisation (including financial openness) would be beneficial since it involves the removal of market distortions, which are by definition inefficient (Eatwell, 1996:8).

The question of how financial integration affects economic growth through the different channels mentioned above is far from simple. The various channels can be grouped into two broad views of how financial integration affects economic growth and welfare (Henry, 2006:1; Kose *et al.*, 2006a:3). The first view, based on the standard neoclassical framework is regarded as a direct channel, which Henry (2006:1) refers to as *allocative efficiency*. According to this view, financial integration will stimulate economic growth through increasing domestic investment by augmenting domestic saving and thereby reducing the cost of capital (Kose *et al.*, 2006a:5). The second view stresses indirect channels through which financial integration stimulates economic growth. According to this view, financial integration provides the catalyst for certain *collateral benefits* (such as domestic institutional development, better governance, macroeconomic discipline) that positively affect economic growth and welfare. Hence, the effects of financial integration on economic growth are indirect (Kose *et al.*, 2006a:30). Closely related to the second view is the perception that the effects of financial integration can be felt in a country after some critical level of institutional development and macroeconomic policies are in place (Kose *et al.*, 2006a:30). The next section explores each of these views and their implications for empirical study.

4.2.1 Direct channel

To illustrate how financial integration could directly affect economic growth, recall the marginal product of capital, capital market equilibrium and the steady-state output *per capita* growth rate represented by equations 2.15, 2.20 and 2.21 respectively in Chapter 2. For ease of reference they are restated here.

The steady state marginal product of capital:

$$f'(k) = r + \delta$$

$$\Rightarrow \qquad r = A - \delta \tag{4.1}$$

Capital market equilibrium:

$$\phi S_t = I_t \tag{4.2}$$

and the steady-state growth rate:

$$g_y = A\phi s - \delta \tag{4.3}$$

Equation 4.1 shows that the marginal product of capital is equal to the interest rate (the cost of capital), r, plus the rate of depreciation, δ. This represents the equilibrium condition for investment in a closed economy. Equation 4.2 represents capital market equilibrium, where in a closed economy, gross investment will equal ‘effective’ saving, that is, the portion of aggregate saving not absorbed by the process of financial intermediation. Total domestic saving is a constraint to total investment in a closed economy, and in a capital-poor country the cost of capital, and thus the interest rate, will be high due to limited saving. Equation 4.3 shows that the steady-state depends on the marginal productivity of capital A, the proportion of saving channelled to investment ϕ, and the saving rate, s.

As discussed in Chapter 2, financial development can increase economic growth (g_y) by increasing ϕ, A and s. Thus, comparing two economies, the first with a higher level of financial development and the second with a lower level of financial development, the analysis in Chapter 2 predicts the following outcomes, all other things being equal, for the two economies:

$$\phi^1 > \phi^2, \quad A^1 > A^2 \text{ and } s^1 > s^2 \quad \Rightarrow \quad g^1{}_y > g^2{}_y \tag{4.4}$$

where 1 and 2 represent the first and second country respectively.
This suggests that the country with a more developed financial system should have a higher economic growth rate.

With financial integration, capital is assumed to flow freely into and from the domestic economy, that is, the closed economy assumption is relaxed. The above equilibrium conditions can be modified to account for the effects of financial integration thus:

$$f'(k^*) = r^* + \delta$$

$$\Rightarrow \quad r^* = A^* - \delta \tag{4.1'}$$

where r^* represents the world interest rate,

$$\phi^*(S_t + CF_t) = I^*{}_t \tag{4.2'}$$

where CF_t is the net international capital flows. The new steady-state growth rate can now be represented as:

$$g^*{}_y = A^* \phi^* s^* - \delta \tag{4.3'}$$

If it happens that $A^* > A$, $\phi^* > \phi$ and $s^* > s$, with financial integration, then, other things being equal, $I_t^* > I_t$ and $g_y{}^* > g_y$.

The traditional argument used for encouraging developing countries to adopt a policy of international financial liberalisation based on the standard neoclassical model stresses the *allocative efficiency* and the *sharing and trading of risks* motives of investors (Mishkin, 2007:260). The central argument of the neoclassical model is that financial integration will facilitate a more efficient allocation of international resources by allowing funds to flow from where the existing capital intensity is lower rather than from where it is higher. Assuming this argument holds, capital should flow from rich countries (who are capital rich) to developing countries, who are capital poor but with a high marginal productivity of capital. Such inflows to developing countries would then complement their limited domestic saving, reduce their cost of capital and lead to increased investment and economic growth (Kose *et al.*, 2006a:5; Henry, 2006:1).

Thus, as is typically assumed, let r^* (world interest rate) be lower than the domestic interest rate in the developing country. Also assume that the rest of the world has more capital per unit of effective labour. Since the developing country is small, it does not affect the world prices (Henry, 2006:6). If the developing country opens its financial system to the rest of the world by liberalising its capital accounts, under the above assumptions, investors will move their funds to the country to take advantage of the higher returns until the differences in returns are eliminated. In the absence of any friction, the model suggests a sudden increase in the domestic availability of capital (i.e. $CF_t > 0$). The inflows of capital will help to augment domestic saving (hence $s^* > s$). If the capital inflow is used to finance investment and not consumption, the level of domestic investment will increase, resulting in a steady state depicted in equation 4.1' above. Consequently, the economy will grow, (i.e. $g_y{}^* > g_y$) if investments financed by foreign capital do not crowd out investments hitherto financed domestically (Bailliu, 2000:7).

Henry (2006:7) argued that such growth in the capital stock as predicted by the neoclassical model will be temporary with the consequence that the growth rate of output *per capita* will also experience a temporary increase during the transitional dynamics to the new steady state.

In contrast, the World Bank (1997:155) suggests that a permanent growth effect may come through an increase in the world saving rate and faster productivity growth. However, according to the World Bank (1997:155), whereas financial integration may boost domestic saving in some countries, it is unlikely that it would cause the world saving rate to rise. Instead the World Bank argues that a decline in world saving rates is most likely because financial integration allows for diversification of income fluctuation risk and provides access to international capital markets to smooth out temporary fluctuations in income, which, in turn, may discourage precautionary savings. Thus, permanent effects of financial integration on growth may likely arise only from the quality and not the quantity of investment (World Bank, 1997:155).

Obstfeld (1994) uses a global portfolio diversification model to show that international risk sharing and diversification resulting from financial integration can promote long term economic growth by improving the quality of investment *per capita*. The idea is similar to the one discussed in Section 2.3.4 of Chapter 2 about the role of domestic financial intermediaries in risk diversification and management. Obstfeld (1994) assumes a multi-country world economy, where each country can invest in two projects – one safe and one risky, with the riskier project having higher returns than the safe project. In the absence of international risk-sharing opportunities, domestic risk-averse investors will minimise investment in the riskier project, with the result that such projects will be under exploited. But Obstfeld (1994) shows that financial integration may enhance the productivity of investment by shifting the investment mix towards projects with higher returns. The shift in investment mix occurs because both domestic and foreign investors will be able to take advantage of the greater return to investment in the riskier project, but with the risks shared across a greater number of investors. Thus, financial openness will permit a switch from low return (productivity) projects to high return (productivity) projects, which will enhance the *per capita* productivity of an investment (i.e. $A^* > A$).

Moreover, the World Bank (1997:156) suggests that the growth-enhancing effects can further be improved if integration reduces project risks (World Bank, 1997:156). This may occur, for instance, "if openness is associated with an expansion of markets for domestic production" which hitherto was susceptible to fluctuation in domestic demand, thus permitting a move towards more specialised and more productive investment (World Bank, 1997:156).

Furthermore, Bailliu (2000:7) suggests that capital flows arising from financial integration could stimulate economic growth if they lead to investments that are linked to positive spillovers. And as long as capital inflows can lead to investments that produce positive external effects, this will lead to an increase in the marginal productivity of capital (thus $A^* > A$).

Foreign direct investment (FDI) is one such capital flow that is notably associated with positive external spin-offs (cf. Prasad *et al.*, 2004; Agénor, 2003; Bailliu, 2000; World Bank, 2000; Borensztein, De Gregorio and Jong-Wha, 1998; Blomstrom, 1991; Grossman and Helpman, 1991). Like other capital inflows, FDI can directly augment domestic investment and boost economic growth as just discussed. In addition to its direct effect, FDI can also indirectly affect economic growth positively. First, FDI may facilitate the transfer of managerial skills and technological know-how from more developed home countries to less developed host countries. This may come in the form of new capital inputs, improved skill composition of the labour force due to 'learning by doing' effects, investment in formal education and on-the-job training (Agénor, 2003:1093; World Bank, 2000:164). The skills and new technology may ultimately spread to the rest of the economy as employees of the FDI-based firms switch employment to locally owned firms or become entrepreneurs (Bailliu, 2000:8). Second, FDI can promote competition among firms in the host country. This may force local firms to improve their productivity by investing in human capital development and/or physical capital or by adopting more efficient methods of production (Bailliu, 2000:7; World Bank, 2000:165).

The upshot of the foregoing discussions is that financial integration may result in both temporary and permanent gains to *per capita* economic growth. In addition to these direct channels through which financial integration can affect economic growth, there are also indirect channels.

4.2.2 Indirect channels

The indirect channels referred to here are spill-over benefits due to financial integration that stimulate economic growth. As such financial integration in this context does not act directly to affect economic growth but through its effects on other factors within the economy. The spill-over benefits typically mentioned in the literature include domestic financial development, domestic institutional development, better governance, macroeconomic discipline and signalling effects (cf. Kose *et al.,* 2006a; Obstfeld and Taylor 2004; Prasad *et al.,* 2004; Agénor, 2003). Each of these will be discussed in turn.

i. Domestic financial development

First, financial integration can positively impact growth by stimulating the development of the domestic financial system as discussed in Chapter 3. At this point, it suffices to mention that, to the extent that financial integration can help the local financial institutions to be more efficient in their intermediation functions, it will lead to economic growth (Kose *et al.,* 2006a; Agénor, 2003). As noted in Chapter 3, financial integration can also cause the level of financial development to decline if domestic institutions are underdeveloped, in which case the effect of financial development on growth may be negative.

However, it is possible for financial integration to promote growth without promoting financial development. This may occur where the industrial sector, especially the big firms, of a country with an underdeveloped financial sector accesses foreign financing sources that hitherto were inaccessible without financial integration. This may take the form of loans or other financial services provided by foreign intermediaries directly to firms in the country. Hence, financial integration may give the industrial sector of the country the opportunity to expand, which in turn may lead to its growth (Guiso *et al.,* 2004b:560). The additional foreign finance will not show up in the private domestic credit of the recipient country. On balance, the overall effect of financial integration on growth in such a country will depend on the structure of the industrial sector, whether it is dominated by big businesses that can access foreign finance or by small and medium businesses that may not be able to access such finances. If the country is dominated by small and medium businesses, as noted in Chapter 3, financial integration in the presence of weak domestic institutions may lead to higher costs for such firms. As a result, the industrial sector of the country may shrink which, in turn, may cause the growth of the economy to fall.

ii. Institutional development and better governance

Kose *et al.* (2006a:43) broadly classify domestic institutions into two classes: (i) financial institutions as manifested in "banking sector development, credit worthiness and credit risk rating"; and (ii) property rights institutions reflected in the level of "control of corruption, control of expropriation risks, judicial independence and government transparency". Good governance can be manifested in both the corporate and public sectors (Kose *et al.,* 2006a:36). A number of authors have shown that financial integration, by helping to improve domestic institutions and governance, may promote economic growth (cf. Stulz, 2005; Doidge, Karolyi and Stulz, 2004; Rajan and Zingales, 2003).

For instance, Stulz (2005:1597) developed a model in which he identifies two agency problems that could hinder economic growth but that can be reduced by financial integration – "the agency problem of corporate insider discretion" and "the agency problem of the state ruler discretion". The first agency problem occurs when corporate insiders appropriate private benefits by expropriating outside investors. The insiders do this because they maximise their own welfare rather than the welfare of outside investors (Stulz, 2005:1597). Such expropriation could take the forms of outright theft or excessive spending on overheads that directly benefit insiders which will limit the payoff of any investment to outsiders.

The second agency problem occurs when state rulers, using their discretion and powers, take actions that improve their welfare or the welfare of those in their constituencies by reducing the return on corporate investments (Stulz, 2005:1597). Such actions may range from outright confiscation to regulations such as redistributive taxes that favour the rulers and those in their constituencies (Stulz, 2005:1597).

Stulz (2005:1597) notes that high expropriation risks resulting from the two agency problems will foster concentration of corporate ownership, which may limit economic growth, risk-sharing, financial development and the impact of financial integration. Thus, if the twin agency problems are severe, a closed financial system may lower investment and economic growth due to potential capital flight (Stulz, 2005:1598). Stulz (2005:1598) argues that financial integration "will lead to a reduction in the importance of the twin agency problems over time". He argues that financial openness provides means and incentives for corporate insiders to protect the rights of their minority investors better through improved corporate governance. Financial openness also reduces the power of the state rulers to expropriate returns from investors. Financial integration may also improve corporate governance because foreign investors may have better skills and information technologies that would allow them to have better oversight on management relative to local investors. Thus in his model Stulz demonstrates that by helping to improve both corporate and public governance (minimise the twin agency problems), financial integration may lead to increased investment and economic growth.

In a further investigation of the governance channel, Doidge *et al.* (2004) suggest that financial integration may also lead to greater investment in governance to reduce the cost of such investments. This, in turn, may lead to economic growth.

iii. Macroeconomic discipline

An important indirect channel through which financial integration can also cause an economy to grow is through enhancing macroeconomic discipline, which results in better macroeconomic policies. The central argument is that financial integration rewards good macroeconomic policies and penalises bad policies (e.g. large public sector deficits, over-expansionary fiscal and monetary policies, weak financial practices) (Obstfeld and Taylor, 2004:9). Bad policy could cause macroeconomic instability (e.g. high inflation rate) and capital flight. Hence, financial integration creates an incentive for governments to adopt good macroeconomic policies. As long as more policy discipline results in greater macroeconomic stability, it may lead to long-term economic growth (Agénor, 2003:1095).

iv. Signalling

The willingness of a country to open its financial system is also viewed as a signal that it wants to adopt sound macroeconomic policies (Agénor, 2003:1095; Prasad *et al.*, 2004:15). Bartolini and Drazen (1997) developed a model to demonstrate that adoption of external financial liberalisation can, through signalling, encourage capital inflow. In the model, Bartolini and Drazen (1997:139) view capital controls as potential signals of future government behaviour. According to Bartolini and Drazen (1997:139), "a regime of free capital mobility may signal that imposition of controls is less likely to occur in the future and that future policies are likely to be more favourable to investors". Since investors have imperfect information about the intention of governments and their constraints, Bartolini and Drazen argue that the investors may use the current policy towards investment to predict the course of future policy. Thus, governments would be inclined to use free capital mobility as a signal of favourable future investment policies to attract investors. If such a signal is effective, it will result in capital inflow (Bartolini and Drazen, 1997:139). As shown earlier, the increase in capital inflow may, in turn, increase the level of domestic investment and growth. In addition, Agénor (2003:1095) suggests that through the signalling role, financial openness may also encourage macroeconomic and financial stability that could increase the efficiency of resource allocation and, in turn, cause higher rates of economic growth.

Up to this point the discussion has focused on a direction of causality running from financial integration to economic growth. As highlighted in Section 3.2 of Chapter 3 above, there is abundant evidence in the literature to suggest that the level of financial integration can also be influenced by the existing level of economic performance and other macroeconomic environment (such as level of inflation rate) and institutional development in a country. Thus, while financial integration could promote economic growth, the degree of integration also crucially depends on the extent to which certain prerequisites are met. In addition, as discussed in Chapter 3, the removal of all legal restrictions on capital flow or capital account liberalisation is just one step. Capital account liberalisation without an existing enabling institutional and macroeconomic policy environment may lead to outward capital flow that may produce the opposite effects on growth. The attainment of an enabling environment will be manifested in different ways such as a transparent and efficient legal system, quality law enforcement, respect for property rights, good accounting standards, good macroeconomic policies and domestic governance (which includes transparency of government operations and a low level of corruption). The presence of such an institutional development could also positively affect economic growth as well as financial integration. A weak macroeconomic environment may be a sign of fundamental institutional problems such as the lack of institutions that restrain "rent-seeking political elites, ineffective enforcement of property rights, widespread corruption and political instability" (Kose *et al.*, 2006a:44).

4.2.3 Potential costs of financial integration

Despite the potential gains just discussed, the theory also highlights several possible costs of financial integration, especially to developing countries. As just noted above, capital account liberalisation in the presence of weak institutional environment may actually lead to outward capital flow that could hurt economic growth (Edison *et al.*, 2002:750). Agénor (2003:1097-1098) identifies five possible costs of integration:

i. volatility of capital flow,
ii. pro-cyclicality of short-term flow,
iii. loss of macroeconomic stability,
iv. geographical concentration of capital flows and a lack of access by small countries, and
v. domestic misallocation of capital flow.

A major issue often raised by critics of financial integration is that capital flows are extremely volatile and pro-cyclical (Symmonds, 2004:17 and Agénor, 2003:1099). The volatility of capital flows depends on its composition. A number of authors have suggested that compared to equity flows (i.e. equity portfolios and FDI), debt flows are more volatile and easily reversible during times of crises (cf. Kose *et al.*, 2006a; Wei, 2006). Such reversal (especially of short term debt) may arise not only because of changes in domestic fundamentals, such as terms-of-trade shocks affecting a country, but also due to changes in other economies that may alter the risk perception of international lenders (Agénor, 2003:1100). Because developing countries may have marginal creditworthiness, any negative risk perception can exacerbate the liquidity run resulting from a capital reversal and the consequent impact of any economic shock (Symmonds, 2004:17).

Symmonds (2004:17) and Agénor (2003:1098) also suggest that debt flows to developing countries are acutely pro-cyclical, that is, they tend to increase during good times but decrease rapidly in bad times when they are mostly needed. The pro-cyclicality and volatility of capital flow could further worsen any negative macroeconomic shock and thus impact negatively on growth.

Moreover, because large capital flows can cause a rapid monetary expansion, inflationary pressure, real exchange rate appreciation and an increase in current account deficits, such capital flows can negatively affect the macroeconomic stability of a recipient country (Symmonds, 2004:17 and Agénor, 2003:1098). The outcome of an increase in a current account deficit will depend on whether the exchange rate regime is flexible or fixed. As Agénor (2003:1098) argues, an external deficit tends to induce currency depreciation under a flexible exchange rate, which will induce a self-correcting mechanism that will eliminate the imbalances. In contrast, under a fixed exchange rate, a growing current account deficit may reduce the competitiveness of the economy, which may erode confidence in the viability and sustainability of the peg. As a consequence, a currency crisis and financial instability may result. Thus, compared to a flexible regime, the negative effect of a large inflow would be more pronounced under a fixed exchange rate regime.

Another negative feature of financial integration relates to the nature of capital flows that are often concentrated in a few countries while others lack access to them. Hence, even though financial integration has led to an increase in international capital flow, the evidence suggests that much of the flows are among the rich countries (north to north), while only a very limited amount flows to developing countries, especially in sub-Saharan Africa (Mishkin, 2007:260; Agénor, 2003:1098). Even then, the limited capital flows to developing countries benefit only a few countries (especially those with abundance natural resources) while others lack access (Agénor, 2003:1098). Thus, as Agénor (2003:1097) notes, "a number of developing countries (particularly the small ones) may simply be 'rationed out' of world capital markets – regardless of how open their capital account is".

The ability of a country to weather any of these potentially harmful consequences of financial integration will crucially depend on the level of development of domestic institutions. Thus the outcome of financial integration depends on the prevailing conditions in a country such as the level of institutional development. This may also determine the type of capital that flows to a country. Hence, since theory provides ambiguous expectations and because the local institutional set-up will be critical, the impact of financial integration on economic growth is, ultimately, an empirical question. The literature that grapples with this question is reviewed below.

4.3 EMPIRICAL EVIDENCE

This section reviews the growing empirical literature on the effects of financial integration on economic growth. The review covers a broad range of studies on related themes such as financial globalisation, financial openness, capital account liberalisation and control, and cross-border capital flows. The decision to review a particular study is made on the basis of the indicator(s) used and whether it falls within the broad range of indicators used for measuring financial integration as reviewed in Section 3.3 of Chapter

3. One can broadly group the studies into three categories, namely those that used cross-sectional/panel data approaches, firm/industry-level approaches and time series country-specific approaches. The studies can further be classified based on whether they are macroeconomic or microeconomic studies. The firm/industry level studies are microeconomic in nature. Given the goal of the current study, the empirical studies reviewed below will concentrate on the macroeconomic studies, ie., those focusing on the cross-sectional/panel data and country-specific time series studies[10].

4.3.3 Cross-sectional/panel data studies

The cross-sectional regression approach dominates the studies measuring the effects of financial integration on economic growth. The standard approach used in these studies is to estimate a cross-country growth regression in which an economic growth indicator is regressed on a measure of financial integration along with other control variables. Typically, the model is specified thus:

$$GROWTH_i = \alpha + \beta IFI_i + other\ regressors \qquad (4.5)$$

where $GROWTH_i$ represents the average growth of *per capita* real GDP in country i over a certain time period and IFI_i is an indicator of financial integration. Other regressors are used as control variables in the model. Since Equation 4.5 does not include time subscripts, it does not capture the variation over time in growth, financial integration or the other control variables within a given country. Financial integration is commonly represented in the model by some measures of *de facto* or *de jure* integration (where the latter includes the IMF capital control dummy or the proportion of years with or without capital controls based on the IMF capital control dummy (*Share)*, and the Quinn measure or some variant of these) (see Figure 3.2 of Chapter 3).

Among the earliest studies on the relationship between financial integration and economic growth are Alesina *et al.* (1994) and Grilli and Milesi-Ferretti (1995). Both papers focus on the effects of capital restrictions on economic growth. Alesina *et al.* (1994) examined the effects of capital controls among twenty OECD countries for the period 1950 to 1989. They use a dummy variable based on the IMF AREAER, where their dummy variable takes the value of one during years when there were controls and zero otherwise. The authors regress the growth of *per capita* real GDP and growth in real

[10] Alfaro and Charlton (2006) and Henry (2006) provide a modest review of the firm/industry-level studies.

GDP separately on the capital control dummy and they estimate the models using OLS and an annual pooled panel data set. They found no clear impact of capital controls on growth.

Similarly, Grilli and Milesi-Ferretti (1995) could not find any evidence of a robust effect of capital control on growth in *per capita* real GDP, for 61 countries covering the period 1966 to 1989. In their case, the study used the *Share* measure of capital control.

Quinn (1997) is one of the earliest influential studies to find a positive and significant relationship between financial integration and economic growth. The study is particularly noted for developing a measure of financial integration that has become very popular in the empirical literature. As discussed earlier, Quinn (1997) constructed a very comprehensive set of cross-country indicators that measure the intensity of capital control and change in capital account liberalisation. Quinn uses a scale of zero (most closed) to fourteen (most opened) to measure financial openness, while change in openness was calculated as the first difference of the openness index (p. 535). The indicators also cover several time periods which enable researchers to use it to study the relationship between capital account liberalisation and economic growth. Using the indicator for 64 nations (20 advanced and 44 emerging economies) over the period 1958 to 1989 in a cross-section regression, Quinn examines the impact of capital account openness and changes in openness on economic performance. He found that the coefficients of financial openness and change in openness were statistically significant and were robust to controlling for other growth determining variables.

Rodrik (1998) is another widely cited study on the financial openness and economic growth relationship. Using a sample of almost a hundred countries, which include developing and developed countries, in a cross-sectional regression covering the period between 1975 and 1989, Rodrik (1998:8-9) finds no significant effects of capital account liberalisation on economic growth. He uses the *Share* measure of financial openness and controlled for initial *per capita* income, secondary education, quality of governmental institutions, and dummies for East Asia, Latin America and sub-Saharan Africa. In addition, coefficients often had the wrong signs when he interacted the *Share* with indices of quality of public institutions. Furthermore, Rodrik regresses the average ratio of investment-to-GDP on *Share*, to determine whether or not the effect of capital account liberalisation on growth operates through the capital accumulation channel. The result was also insignificant. Based on his findings, Rodrik (1998:10) concluded that, if they do exist, the benefits of an open capital account are not apparent. The contrasting results of Rodrik to those of Quinn (1997) has spurred academic interest, and has in recent years produced a growing number of published works on this subject.

De Gregorio (1998) explores the long-run relationship between financial integration, financial development and economic growth for the period 1976-1993. Besides setting out to know whether countries that are more financially integrated have higher growth, De Gregorio was also concerned about the channels through which the effects of financial integration on growth are brought about. Specifically, he investigated whether there was another channel through which financial integration promotes growth besides the usual effect through the development of the domestic financial system (De Gregorio, 1998:16). He used a set of cross-sectional regression models in which different measures of financial integration were entered separately as explanatory variables along with other control variables. De Gregorio found no direct effect of financial integration on economic growth, but he found a significantly robust positive effect on financial development. Therefore, De Gregorio concludes that the beneficial effects of financial openness on economic growth come mainly through promoting the development of the domestic financial system.

Using a somewhat different approach from De Gregorio (1998), Klein and Olivei (1999) also found some significant positive effects of financial openness through financial development on economic growth. However, the positive association was limited to the OECD countries. When the OECD countries were excluded from the sample, the significant relationship disappeared. Unlike most studies that study the effect of financial openness directly on economic growth, Klein and Olivei first examined the effect of financial openness, using the *Share* measure, on domestic financial development in a cross-sectional regression. Next they estimated a cross-sectional growth regression with financial development and a change in financial development entering the model as explanatory variables.

The inclusion of the change in financial development represents the effect of financial openness. Since the variable introduces the possibility of endogeneity bias in its parameter, Klein and Olivei use the *Share* (a measure of capital account liberalisation) as an instrumental variable (IV) in its place. Thus, the resulting estimate of the change in financial development represents the effects of financial openness on economic growth via the deepening of the financial system of a country.

Klein and Olivei (1999:20) estimated the model using Two Stage Least Squares (2SLS) and OLS for a sample of 82 countries (20 OECD, 18 Latin American countries and 44 other developing countries, including South Africa and Swaziland). The estimation was done first for the full sample, then the sample of the 20 OECD countries and lastly the 18 Latin American countries. Klein and Olivei (1999:20-21) found very little evidence of financial openness promoting economic growth through its effects on financial deepening outside the OECD countries. Thus, Klein and Olivei (1999:21) suggest that capital account liberalisation in developing countries should come after adequate institutional and sound macroeconomic policies have been put in place.

The study by Kraay (1998) focuses on the medium to long-run macroeconomic effects of capital account liberalisation as manifested in growth, investment and inflation. In addition, Kraay (1998) investigates the role of capital controls in extenuating the adverse effects of financial crises. Kraay (1998) uses a sample of 117 countries and a variety of indicators of financial openness, such as the IMF measure, Quinn measure, and volume (ratio of capital inflow and outflow to GDP) for the period 1985-1997. Kraay (1998:10) combined a cross-sectional regression analysis with a less common event-study approach. For the cross-section analysis, Kraay regressed each dependent variable (real *per capita* GDP growth, real *per capita* GNP growth, domestic investment as a fraction of GDP, and the log of the average annual CPI inflation rate) on each of the financial openness variables separately along with other control variables. The estimations were carried out using both OLS and IV techniques.

The results obtained from the cross-sectional analysis were generally in line with other studies that reject the hypothesis that financial openness significantly promotes economic growth. Further analysis also rejects the hypothesis that financial openness has level effects on income and the hypothesis that capital account openness is successful in countries with a strong financial sector and a good policy environment (Kraay, 1998:11-

12). Similarly, the results of the event study[11] support the cross-sectional analysis, in that capital account liberalisation did not have much statistically significant effect on growth, investment and inflation. However, when Kraay took into account the risk-adjusted returns[12] of each country in the cross-sectional growth regressions, the coefficient of the resulting interaction variables become statistically significant. Consequently, Kraay (1998:11) concludes that “the growth impact of financial openness is larger in countries that are net capital importers.”

Edwards (2001) examines, among other things, the question of whether or not the effects of capital mobility and economic growth differ between emerging market economies and advanced countries. This stems from the criticism that the Quinn’s results did not account for the possibility of endogeneity of the financial openness variable, since policies towards the capital account may be affected by the level of income and the rate of growth (Eichengreen and Leblang, 2003:207). Also, countries whose income growth is high for reasons other than financial deepening may experience a simultaneous increase in financial development (Klein and Olivei, 1999:19) that, in turn, may foster financial openness. Employing the *Share* and the Quinn index of financial openness, Edwards estimated a cross-section regression using weighted least squares (WLS) and instrumental variable (IV) techniques. The results show that the coefficient of the Quinn index was positive and statistically significant, but the growth effect only occurs after a country has attained a certain level of economic development. For countries with very low levels of domestic financial development, capital account openness appears to have a negative effect on growth. Thus, the results of Edwards partly support Quinn’s (1997) finding of a positive impact of financial integration on growth.

A cross reading of the literature as summarised in Table A-4.1 of the appendix reflects the conflicting results just highlighted. Similarly, authoritative surveys of the literature by other authors, such as Kose *et al.* (2006a), Collins (2004), Edison *et al.* (2004) and Prasad

[11] In the event-study approach, Kraay computed the effect of capital account liberalisation as the difference between the average value of each dependent variable in the three years immediately following each liberalisation episode relative to its average value in the three years before the liberalisation episode (see Kraay (1998:12-13) for more details).

[12] The nature of risk-adjusted returns in a country should affect the flow of investment to and from that country. It is expected that investment and growth might increase in countries with risk-adjusted returns greater than the world average (Kraay, 1998:11). Since it is difficult to obtain data on risk-adjusted returns, the author proxies it by the flow data on the average balance of the financial account of the balance of payments over the sample period which was, in turn, interacted with each of the financial openness measures.

et al. (2004) found mixed evidence. For instance, in a recent survey by Kose *et al.* (2006a) of the studies, they found that most of the studies obtain no effect or the results were ambiguous (results that are not robust across alternative specifications) for developing countries. Hence, they concluded that "if financial integration has a positive effect on growth, it is apparently not robust, once the usual determinants of growth are controlled for" (p.13). Overall, while few studies, as in the case of Quinn (1997), have found significant positive effects of financial integration on growth, most evidence seems to lean in favour of the results of Rodrik (1998). As the summary in Table A-4.1 in appendix to Chapter 4 also shows, the mixed or conflicting results did not improve even after recent studies applied more advance panel data econometric methods such as the generalised method of moments (GMM) (cf. Schularick and Steger, 2006; 2007; Laureti and Postiglione, 2005; Lee and Jayadev, 2005; Bonfiglioli and Mendicino, 2004; Eichengreen and Leblang, 2003; Edison *et al*., 2002; McLean and Shrestha, 2002; McKenzie, 2001; Reisen and Soto, 2001; Bailliu, 2000).

An analysis of many of the previous studies on the effects of financial integration on growth reveals that the contradictory conclusions may reflect differences across the studies. Such differences include the measures of financial integration used, the sample of countries used, the time period, the econometric methodology and the set of the right-hand side variables used. These issues will be evaluated and discussed in turn. The purpose is to highlight the specific issues that any new empirical studies must carefully address to provide more robust results.

i. *Measures of financial integration*

As is evident from Table A-4.1 in appendix to Chapter 4, different studies have employed a wide range of indicators of financial integration. Typically, studies either employ one or two measures of *de jure* or *de facto* integration or use a combination of both measures. A careful analysis of the studies reveals two lines of contrasts in the findings based on the different measures. The first is between studies using the IMF dummy or *Share* and the Quinn index (both are *de jure* measures), while the second is between studies using some *de jure* measures and studies using *de facto* measures. Studies using the Quinn index found more evidence of significant positive effect of financial integration on growth than those using the IMF index (either dummy or *Share*). Of the eight studies that employ the Quinn index, seven found some effects (sometimes depending on some country characteristics), and only Kraay (1998) found no effect. In contrast, of the several studies that used the IMF index, only two (Klein and Olivei, 1999 and Bonfiglioli and Mendicino, 2004) found a positive and statistically significant effect of integration on growth. However, the positive effect of integration did not work directly; instead in both studies the effect works through financial development. The more robust results of the Quinn index may be attributed to the fact that it is a better measure of financial integration than the IMF index, since the Quinn index attempts to capture the degree of intensity of capital control (Kose *et al.,* 2006a:15 and Collins, 2004:75).

Regarding *de jure* versus *de facto* measures, the evidence shows that *de facto* measures uncover more robust effects of financial integration on growth than the *de jure* measures (cf. Edison *et al.,* 2002; O'Donnell, 2001; Bailliu, 2000; Kraay, 1998). The effects of the *de facto* capital flows were even more robust when specific kinds of capital flows or stocks (e.g. FDI and sum of FDI and portfolio equity inflows) were used instead of total capital flows or stocks (cf. Calderón *et al.,* 2004; Collins, 2004; McLean and Shrestha, 2002; Reisen and Soto, 2001).

Following a review of the various measures of financial integration used in the literature Kose *et al*. (2006:14) note that studies using "finer" (referring the Quinn measure) *de jure* and *de facto* measures found more evidence of positive effect of financial integration on growth. Consequently, they argue that an appropriate measure of financial integration is vital for detecting the growth effects.

ii. Country coverage

Studies also differ considerably in terms of countries covered. While some studies focus exclusively on advanced countries (cf. Alesina *et al.,* 1994), a few others consider emerging market economies and developing countries and still others combine the three groups. The findings of the studies are also very mixed with regard to countries covered. For instance, Quinn (1997) and Quinn and Toyoda (2007), using a combination of the three groups of countries, found a strong effect of financial integration on growth, while others such as Grilli and Milesi-Ferretti (1995) and Rodrik (1998) with similar combinations found no effect. Similarly, whereas, Alesina *et al.* (1994) focusing exclusively on the OECD countries found no significant effects, Edwards (2001) and

Edison *et al.* (2002) found a significant effects in developed countries, but not in developing countries.

Thus, a review of the different studies indicates that grouping heterogeneous countries together, as is usually done in cross-sectional or panel data approaches may lead to misleading conclusion. First, from a theoretical point, as noted by Henry (2006:16) financial integration should have opposite effects when comparing developing and developed countries since, according to the neoclassical model, financial integration will cause capital to flow from developed to developing countries. Hence, the results of studies combining both groups of countries may have a negative or no effect due to the opposing effects of integration on the subgroup of samples (Henry, 2006:16). Henry (2006:16) also observes that developing and developed countries implemented reforms in their capital accounts at different periods. Whereas developed countries liberalised their capital accounts in the late 1970s and early 1980s, developing countries only began in the late 1980s and early 1990s. Hence, studies that use sample periods that ended in the early 1990s would have excluded economic performance in developing countries since the effects of integration would only have started to manifest themselves (Henry, 2006:17).

Moreover, several studies have identified other country-specific characteristics that could substantially affect the outcome of financial integration. These include institutional quality (cf. Klein, 2005, Edison *et al.,* 2004; Edison *et al.,* 2002), level of financial development (Bailliu, 2000), the level of human capital development (Khoury and Savvides, 2006), the level of *per capita* income (cf. Edison *et al.,* 2004; Edison *et al.,* 2002; Klein, 2007; 2003), ethnic and linguistic heterogeneity (cf. Chanda, 2005), and the sequencing of liberalisation reforms (Fratzscher and Bussiére, 2004). Assuming that no two countries have precisely the same features, grouping them together would bias the results, since the results may reflect the true outcome for neither one nor the other. Hence, where possible, country-specific studies may provide better insight on the effects of financial integration.

iii. Time period covered

As shown in the summary in Table A-4.1 of the appendix to Chapter 4, studies also differ in terms of the time periods covered. The differences in time periods covered manifest in two ways. First, the range of the sample: while some authors used data dating back to the

1950s and 1960s (cf. Alesina *et al.,* 1994 (1950-1989); Grilli and Milesi-Ferretti, 1995 (1960-1989); Quinn, 1997 (1960-1989); McKenzie, 2001 (1960-1989)), others used data from the mid 1970s or even from the 1980s (Rodrik, 1998 (1975-1989); Kraay, 1998 (1985-1997); Edwards, 2001 (1980-1989); Reisen and Soto, 2001 (1986-97)).

Secondly, the sample period averages used are different across studies. Even though studies may cover a long time period in the data, each data point used in the analysis often represents some averages of shorter time periods within the entire time period covered. This may be 4-yearly averages (cf. Mody and Murshid, 2005), 5-yearly averages (IMF, 2007; Quinn *et al.,* 2001; Bailliu, 2000) or even sometimes up to 20-yearly average such as those used by Collins (2004). Kose *et al.* (2006a:14) noted that the choice of sample could make a difference given that different developments may take place in a country or countries at different times. One such development is the debt crisis of the 1980s which may weigh more in studies that cover much of the 1980s period as opposed to studies that cover much of the 1960s and 1970s (Kose *et al.,* 2006a:14).

Similarly, as noted above, countries implemented capital account liberalisation at different periods. As such, the result of a study will reflect the relative weight of implementation periods of countries included. In a recent comprehensive study in which they replicated six of the prominent earlier studies[13] in an attempt to reconcile the discrepancies in the results of different studies, Quinn and Toyoda (2007:23) attributed the differences in findings to the measures of financial integration used and the different periods covered in the estimations.

Therefore, in studying the effects of financial integration on economic growth, it is important that adequate consideration be given to choosing an appropriate period for the study. As noted by Kose *et al.* (2006a:31), a longer time span may be more suitable for investigating the effect of financial integration on economic growth, since all the effects (both direct and indirect) are not likely to materialise in the short run. However, the wave of financial integration in developing countries only began in the mid to late 1980s and early 1990s (Henry, 2006:17 and Kose *et al.,* 2006a:11). This limits the time span that can be covered for a study of developing countries to capture the effects of their financial

[13] Studies replicated were Grilli and Milesi-Ferretti (1995), Quinn (1997), Rodrik (1998), Arteta *et al.* (2001), Edwards (2001) and Edison *et al.* (2004).

integration. Consequently, empirical studies would need to be cautious in choosing the time coverage for the analysis such that the time chosen would reflect the actual time that financial integration takes effect.

iv. Differences in methods

Perhaps the most visible methodological differences across the studies relate to the econometric and statistical estimation techniques used. From earlier studies that estimated the cross-sectional regression using OLS, more recent studies employ a combination of several techniques such as instrumental variable (IV), two stage least squares (2SLS), weighted least squares (WLS), fixed effect panel data technique and the generalised methods of moments (GMM) (see Table A-4.1). Studies using a combination of techniques show that some differences in results can be obtained depending on the method of estimations used. For instance, Kraay (1998) and Edison *et al.* (2001) obtained a statistically significant positive effect of the *de facto* measure of financial integration using OLS, but when an IV was used the effect was no longer significant. What is not clear though is whether the differences in results are due to the quality of the instruments or the method used.

A major concern of most studies employing the variety of cross-sectional and panel data econometrics techniques just mentioned is to address the problem of possible endogeneity of financial integration and other right-hand side variables (Collins, 2004:78 and Kose *et al.,* 2006:15). A review of the literature provided by several authors points to the same conclusion that the endogeneity problem cannot be addressed satisfactorily by such frameworks due to a lack of valid instruments (cf. Henry, 2006; Kose *et al.,* 2006; Collins, 2004:81). Collins (2004:81), for instance, referring to the endogeneity problem noted that "[t]his problem is difficult to address fully and a cautious interpretation is that growth regressions provide a descriptive summary of the association among variables of interest that should not be given a causal interpretation". Thus, any study that could help to give a better understanding of the causality relationship between financial integration and economic growth would be a major contribution to knowledge in this regard.

v. Different right-hand side variables

It is now a standard practice in growth regressions to control for the effects of other variables outside the variable of interest (in the current study, financial integration).

While a number of variables have become fairly standard in most growth regressions used to examine the effects of financial integration, studies also differ significantly in the kinds of control variables employed. The conventional variables used include the initial level of *per capita* income, average years of schooling (as a proxy for human capital) and a measure of trade openness (cf. Quinn and Toyoda, 2007; Schularick and Steger, 2007; Quinn, 1997; Levine and Renelt, 1992; Barro and Sala-I-Martin, 1992).

A major problem is that contending studies hardly use similar models (cf. Levine and Renelt, 1992; Sala-I-Martin *et al.,* 2004; Collins, 2004). Levine and Renelt (1992) were among the earliest studies to investigate the robustness of the results of explanatory variables commonly used in growth regressions. They found that "only a few findings can withstand slight alterations in the list of explanatory variables". As noted by Collins (2004:79), a variable may appear significant in a model when included with some determinants, but not when combined with others such as standard determinants of growth. One possible reason is that two or more control variables may be highly correlated, which may lead to wrong parameter estimates and insignificant results (Schularick and Steger, 2006:4). In addition, some of the right-hand side variables may themselves be endogenous. Investment is one such potential control variable that appears controversial in its use on the ground of its potential endogeneity. While some authors choose not to include it because of its potential endogeneity (cf. Obstfeld and Taylor, 2003; Eichengreen and Leblang, 2003; Edison *et al.*, 2002; McLean and Shrestha, 2002; Klein and Olivei, 2001) others such as Schularick and Steger (2006), Klein (2005), Arteta *et al.* (2001), Edwards (2001) and Rodrik (1998) explicitly controlled for investment. For such variables that may be endogenous, the lack of valid instruments has further led to differences among studies, as authors seek to use alternative instruments. As noted earlier, the problem of endogeneity of right-hand side variables is difficult to solve within the cross-sectional/panel framework.

What is evident from the foregoing discussion is that many of the empirical models used for studying the effects of financial integration differ in important ways, for example in terms of countries covered, time period of study, method used and variables used. This makes comparison of the results of empirical models fairly difficult. Besides, and more importantly, the frameworks used, such as the cross-sectional and panel data approaches, are fraught with several problems that render their results less reliable. One notable problem highlighted above is the inability of the approaches to adequately cater for the endogeneity of financial integration and some of the right-hand side variables; hence they cannot be used to establish a causal relationship between economic growth and such variables. In addition, the coefficient estimates are only average effects for a sample of countries covered and do not represent any particular country in the sample. This makes it difficult to draw country-specific policy conclusions based on such results. One way to address some of these problems is to use a country-specific time-series approach. But despite the foregoing limitations of the cross-sectional and panel data frameworks, they have remained popular because of limited time-series data to carry out time-series studies. Nevertheless, there is a little literature based on time-series studies and these papers are reviewed below.

4.3.2 Country-specific studies

A major weakness of cross-country and panel data studies is that they only capture the cross-country variation in average growth rates and financial openness for the countries concerned. Such studies cannot identify country-specific differences. However, country-specific studies are very rare.

One attempt to analyse the effects of capital account liberalisation on the macroeconomy in a particular country was Esen (2000), who focused on Turkey. He uses descriptive statistics to provide a historical account of the effect of developments in capital account liberalisation on the macroeconomy of Turkey. Based on the historical analysis of the macroeconomic development vis-à-vis the financial liberalisation policies, Esen (2000:5) reaches the conclusion that "contrary to theoretical expectations, the opening of the capital account induced adverse effects on financial intermediation, saving, investment, growth and foreign debt". One major limitation of Essen's method is that it does not provide any indication of the statistical significance of the effects suggested by the analysis.

Kim *et al.* (2004) is another country-specific study and one of the few, strictly speaking, pure time-series studies on the subject. They investigated the macroeconomic effects of capital account liberalisation in Korea using a vector autoregressive (VAR) model. First, Kim *et al.* (2004:625) were concerned with the "basic properties of capital flows before and after capital account liberalisation". To this end they tested whether or not the capital account (capital flows) became less dependent on current account movements and more independent during the 1990s when the capital market became more liberalised. Next, they examined the interrelations between capital flows and macroeconomic variables – output, inflation, exchange rate, interest rate and money. Kim *et al.* (2004) use the ratio of capital account flows to GDP as a proxy for financial integration. This corresponds to the *volume* measure in Figure 3.2 of Chapter 3. The analysis was carried out for the period 1980 to 1999 using quarterly data. The period was further divided into two sub-periods – 1980-1989 and 1990-1999, with the 1980s representing the era of capital account restrictions and the 1990s representing the era of liberalisation. Also for the 1990s, the authors used a sample that omits the crisis period (1997:4 and 1998:1). The analyses were based on variance decomposition and impulse responses using bi-variate and tri-variate level VAR models. The impulse response analysis was based on standard errors identified with the Cholesky decomposition as suggested by Sims (1980).

The variance decomposition results show that in the 1980s, 40-44% of capital account movements were explained by current account shocks, but this dropped to 21-25% (without the crisis period) and 31-37% (with the crisis period) in the 1990s. The authors therefore conclude that capital account liberalisation "substantially changed the nature and composition of capital flows". The impulse response results also show that the "effects of autonomous capital flow shocks on macroeconomic variables are considerably different before and after capital account liberalisation". More specifically, capital inflows substantially increased output in the 1990s but not in the 1980s (Kim *et al.*, 2004: 629 and 631).

Another study closely related to Kim *et al.* (2004) is Jin (2006), who employs a seven-variable VAR model to explore the relationship between financial openness and economic growth for Korea and Japan. The dynamic analysis is also based on the Cholesky decomposition with quarterly data. However, unlike Kim *et al*. (2004) who employ seasonally adjusted series, Jin (2006) uses seasonally unadjusted series. The VAR model uses quarterly data for the period 1973:1-1997:3. Given that the series were non-stationary in levels and not cointegrated, the author estimated the VAR system with all variables in first differences with no error correction terms. Hence, Jin (2006) models short-run relationships, unlike the long run relationship of Kim *et al*. (2004). The variables used in Jin (2006) are: real GDP, the GDP deflator, the narrow money supply, real government expenditures, the trade/GDP ratio as a proxy for openness, the index of industrial production of industrial countries as proxy for foreign output shock, and the world commodity price index of industrial countries as a proxy for foreign price shocks. Financial openness was measured using two indicators, namely the ratio of FDI to GDP and the spread between domestic and foreign interest rates, where a large spread represents a small degree of openness (Jin, 2006:237).

Jin (2006:238) finds that the short-run effects of financial openness on the growth rate of output and of the price level in Korea were all negative and significant, while the effects were not significant in Japan. According to the author, the "contrasting results in Japan and Korea suggest that banking and financial institutions in Japan were more or less internationalised and relatively immune to foreign shocks, and thus the macroeconomic effects of financial market openness were found to be insignificant in Japan; but it is not the case in Korea".

What is more striking is the contrast between the results of Kim *et al.* (2004) and those of Jin, both for Korea. While Kim *et al*. (2004) found a significant positive effect of capital flows on real output, Jin (2006) found the opposite. One possible reason for the contrasting results may be due to the fact that Jin's (2006) study did not differentiate between the eras of capital account restrictions and liberalisation as was done by Kim *et al.* (2004). They showed that the response of real GDP to the capital flows in the 1980s (the capital control era) was not only insignificant, but also negative, and became positive and significant in the 1990s when liberalisation was in place (Kim *et al.*, 2004:631). Hence, estimating the model for the entire period might have biased Jin's results. This is even more so, when one considers the fact that Jin's study covered more of the restriction era (from 1977:1 instead of 1980:1 in Kim *et al*. 2004) and less of the liberalisation era (up to 1997:3 instead of 1999:4 in Kim *et al*. 2004) than in Kim *et al.* (2004). It is also possible that the contrasting results may be due to the different measure of financial openness used. Whatever the reasons may be, no consensus has emerged from the few time-series carried out. Hence, more studies are needed to unravel the relationship between financial integration and economic growth. It also highlights the need for careful selection of the period of analysis and the indicators for measuring financial openness.

Despite the long-standing experience of financial openness among the SACU countries, there is no known study so far that investigates the possible effect it might have had on economic performance of the counties. A study of the relationship between financial openness and financial development, especially among the smaller SACU countries, could provide useful lessons for other developing countries in Africa. To fill this gap, Chapter 8 will focus on empirical examinations of the issues among the SACU counties.

4.5 SUMMARY AND CONCLUSION

This chapter reviews the theoretical and empirical literature on the relationship between financial integration and economic growth. From a theoretical point of view, the evidence from the literature suggests that financial integration can have both direct and indirect effects on economic growth. The direct impact results from financial integration stimulating economic growth through increasing domestic investment by augmenting domestic saving and thereby reducing the cost of capital (Kose *et al.*, 2006a:5). In addition, financial integration can improve the quality of investment *per capita* by promoting international risk sharing and diversification, thereby directly stimulating economic growth. The indirect channels suggest that financial integration promotes growth through the stimulation of domestic financial and institutional development, macroeconomic discipline, and through signalling effect. Through these channels financial integration can positively affect the rate of economic growth in a country.

Conversely, the theoretical literature also suggests a possible negative effect of financial integration on growth arising from the volatility of capital flow, pro-cyclicality of short-term flow, loss of macroeconomic stability, concentration of capital flow and a lack of access by small countries as well as the domestic misallocation of capital flow.

Despite the growing number of studies and the advancement in methods used, the empirical literature reviewed in this chapter provides largely inconclusive evidence on the effects of financial integration on economic growth. While many studies found a negative effect, some others found the effect to be positive and yet others found no significant effect. A careful examination of the studies highlights a number of differences across the studies that may account for the conflicting results and which any new empirical studies must carefully address to provide robust results. These include the measures of financial integration used, the sample of countries used, the time period covered, the econometric methods and the set of right-hand-side variables used.

A major weakness of most previous studies relates to the frameworks used, such as the cross-sectional and panel data approaches, which are fraught with several problems that render their results less reliable. One notable problem is the inability of the approaches to cater adequately for the endogeneity of financial integration and some of the right-hand side variables; hence they cannot be used to establish causal relationship between economic growth and such variables. In addition, the coefficient estimates are only average effects for a sample of countries covered and do not represent any particular country in the sample. This makes it difficult to draw country-specific policy conclusions based on such results.

The inconclusive nature of the results of the previous studies calls for further studies on the relationship between financial integration and economic growth. This study, specifically Chapter 8, is an attempt to provide further insight on the subject. In doing this, the current study focuses attention on addressing the weak framework used in most previous studies as well as how financial integration is measured and the countries covered.

Table A-4.1: Summary of Studies on the Relationship between Financial Integration and Economic Growth

Study	Country cover	Year cover	Estimation method(s)	Variables		Summary of findings
				Dependent	Financial integration measure	
Alesina, Grilli and Milesi-Ferretti (1994)	20 OECD	1950-1989	Cross-country linear regression	Real GDP growth rate and *per capita* real GDP growth	Dummy for capital control	No effect: A positive but not significant impact of capital controls on economic growth
Grilli and Milesi-Ferretti (1995)	61	1966-1989	Panel pooled (OLS)	*Per capita* real GDP growth	Share	No effect: No evidence of a robust correlation between capital control and economic growth
Quinn (1997)	64 Developed and less developed.	1950-1994	Cross-section (OLS)	*Per capita* real GDP growth (1960-1989)	Quinn and Δ Quinn (1988-1958)	Capital account liberalisation is robustly and positively associated with economic growth
De Gregorio (1998)	24 Dev. & less Dev.	1976-1993	Cross-section (OLS)	*Per capita* real GDP growth	IAPM (Levin and Zervos 1995), ICAMP (Levine and Zervos, 1998b), GFR and CLAS (Montiel, 1994)	Financial integration has no additional effects on economic growth other than it may have on financial deepening of the domestic financial market.
Kraay (1998)	64, 94, or 117 Developed and less developed.	1985-1997	Cross-section (OLS & IV)	*Per capita* real GDP growth	Share (117 sample), Quinn (64 sample) & Volume (94 sample)	Coefficient of Share and Quinn were insignificant with mixed signs, coefficient of Volume was significant and positive.
Rodrik (1998)	100	1975-1989	Cross-section (OLS)	*Per capita* GDP growth	Share	No effect: financial integration has any significant effect on economic growth.
Bosworth and Collins (1999)	58	1978-1995	Annual panel (Country and/or industry fixed	I/Y, S/Y	Volume	Mixed: FDI significantly fosters domestic investment, portfolio flows have no discernible effect, and international flows have insignificant impact on saving.

				Variables		
			effect)			
Klein and Olivei (1999)	93	1986-1995	Cross-section (OLS, 2SLS)	*Per capita* real GDP growth	Share	Positive and significant: But the significant effects were driven by the OECD countries in the sample.
Bailliu (2000)	40	1975-1995	5-yearly dynamic panel (GMM)	*Per capita* real GDP growth	Volume	Mixed: Capital inflows have positive and significant impact on economic growth, but only in economies where the banking sector has reached a certain level of development.
Esen (2000)	Turkey	1980-1993	Descriptive statistics	Not specified	Volume	The opening of capital account induced adverse effects on financial intermediation, savings, investment, growth and foreign debt.
Arteta, Eichengreen and Wyplosz (2001)	51-61	1973-81, 1982-87, 1988-92 or pool for these 3 periods	Cross-section (OLS, 2SLS); sub-period panel pooled (OLS)	*Per capita* real GDP growth	Share, Δ Quinn	Mixed: Some evidence of positive association between IFI and growth, but the effects vary with time, with how IFI is measured and the estimation method.
Edwards (2001)	55-62	1980-1989	Cross- section, WLS (1985 GDP), IV	*Per capita* real GDP growth (1980-1989)	Share, Quinn in 1988, Δ Quinn 1988-73	Quinn coefficient was statistically significant and positive, but growth effect only manifests itself after a country has reached a certain degree of development. For countries with very low levels of domestic financial development a more open capital account may have a negative effect on growth.
Bekaert, Harvey and Lundblad (2001)	95	1981-1997, Overlapping data	Cross-section, (OLS)	*Per capita* GDP growth	Date of stock market liberalisation	Coefficient stock market liberalisation was significant and positive, with the largest effects occurring shortly after liberalisation.
McKenzie (2001)	112	1960-1989	Cross-section, (OLS), 5-yearly dynamic panel (GMM)	*Per capita* GDP growth	Dummy variable	Mixed: The effect of capital control on economic growth was not robustly significant.

				Variables		
O'Donnell (2001)	94	1971-1994, 1975-1995	Cross-section (OLS, IV)	*Per capita* GDP growth	Share and Volume, include interaction between Share and FD, and Volume and FD.	Mixed: Neither Share nor interaction of Share and FD were significant, but Volume and interaction of Volume and FD were sometimes significant.
Quinn, Inclan and Toyoda (2001)	76	1960-1998	5-yearly panel, (Fixed effect)	*Per capita* real GDP growth	Share, Δ Quinn	Positive/mixed: Financial openness has robust positive impact on growth in most countries.
Reisen and Soto (2001)	44	1986-97	Dynamic panel data (GMM)	*Per capita* real GNP growth	Volume – FDI, Portfolio equity flows, Portfolio bond flows, Long-term bank credit, Short-term bank credit	Mixed: FDI and Portfolio equity investment exert a significant positive effect on growth, while long and short-term bank credits exert negative and significant effect on growth. This implies that equity investment is better than debt instruments.
Edison, Levine, Ricci, and Slok (2002)	57	1980-2000	Cross-section (OLS & 2SLS), dynamic panel data (GMM)	*Per capita* real GDP growth	Share, Volume – stock of capital flows, flow of capital, stock of capital inflow, and Inflow of capital.	No effect/mixed: In most cases financial integration measures do not exert significant impact, though in many cases, positively associated with economic growth, even when controlled for particular economic, financial, institutional, and policy characteristics.
McLean and Shrestha (2002)	40	1976-1995	Panel regression (2SLS)	*Per capita* real GDP growth (averaged over five non-overlapping years)	Volume (capital inflows- total, FDI, Portfolio, Bank loans)	Mixed: For the combination of developed and developing countries the coefficient of total flow has a positive and significant (at 10%) effect on growth, while the coefficient of FDI and portfolio is positive and significant at 5% and 1% respectively. But bank loans were negative and insignificant. For developing countries only, the coefficient of total flows and bank loans were negative and only bank loan was significant (10%). FDI and portfolio were positive and significant.

				Variables		
Edison, Klein, Recci and Slok (2003, 2004)	45-89	1970-1989, 1973-1992, 1976-1995, 1980-1995	Cross-section (OLS)	*Per capita* real GDP growth	Quinn, Share, Volume, Date of stock market liberalisation	Mixed: Effect of capital account openness on economic growth not significant if the regressions include an indicator of government reputation. But offers consistent effect of capital account openness and stock market liberalisation on economic growth for middle-income countries, though not for poorer countries nor for richer countries.
Eichengreen and Leblang (2003)	21 and 47	1888-1997 1975-1995	Dynamic panel estimator (country-specific fixed effects)	*Per capita* real GDP growth (over successive non-overlapping five-year periods)	Dummy, Share and interaction term for each five-year period and interaction with monetary regime	Mixed: The coefficients of capital control were positive and significant for the entire period, it was significant during the interwar years but insignificant during the Bretton Woods years. The coefficient is positive in period of financial instability, but negative when crises are absent (then open capital account exerts positive effects).
Klein (2003)	51-85	1976-1995	Cross-section (OLS, IV)	*Per capita* real GDP growth	Share, Quinn (average for 1973, 1982, 1988)	Mixed: The coefficient of Quinn and Share were positive and significant in some middle income (49th to the 75th and 58th to the 88th percentiles of income respectively) countries, but not for rich countries or poor countries.
Prasad, Rogoff, Wei and Kose (2003)	24	1980-2000	Descriptive, simple correlation test and scatter plot	*Per capita* real GDP growth	Volume (gross private capital inflows + gross private capital outflows/GDP)	No effect: No association between financial integration and economic growth. Financial integration is not a necessary condition for achieving a high growth and it is not a sufficient condition for a fast economic growth.
Bonfiglioli and Mendicino (2004)	90	1975-1999	5-yearly dynamic panel model (GMM)	*Per capita* real GDP growth	Dummy	Mixed: Financial openness has positive effect on growth but mainly through indirect channels – mitigating effects of banking crisis.

				Variables		
Calderón, Loayza and Schmidt-Hebbel (2004)	76	1970-2000	Dynamic panel model (GMM)	*Per capita* real GDP growth (non-overlapping five-year periods)	IMF dummy, Volume (ratio of portfolio and FDI liabilities to GDP) average over five years.	Significant effect: Robust evidence of a non-linear relationship between financial openness and economic growth. Upper-middle income countries appear to reap the most benefit of financial openness.
Collins (2004)	84 (cover 95% of global GDP)	1960-1980 1980-2000 (full 20 year)	20 Year annual average Cross-section (OLS & 2SLS), dynamic panel data (GMM)	*Per capita* real GDP growth	Total capital inflow/GDP and FDI inflow/GDP.	Total capital inflows: mixed but not strong association with growth. FDI inflows: positive and statistically significant for all sample, but becomes marginally significant for LDC sample and Africa.
Fratzscher and Bussiére (2004)	45	1980-2002	5-yearly dynamic panel model (GMM)	*Per capita* real GDP growth	Volume	Mixed: Positive short-run growth impact of financial openness, but the long run depends on the institutional qualities, FDI flows and liberalisation sequencing.
Kim, Kim and Wang (2004)	Korea	1980-1999 (1980-89 and 1990-99) (Quarterly data)	VAR (Forecast error variance decomposition and impulse response)	Real GDP (and other variables)	Volume (Capital inflow)	Capital account liberalisation substantially changed the nature and composition of capital flows. The effects of autonomous capital flow shocks on macroeconomic variables are considerably different before and after capital account liberalisation. Capital inflows substantially increased output in the 1990s but not in the 1980s before.
Prasad *et al.* (2004)	76 (21 developed and 55 developing)	1970-1999 1980-2000 1982-1997	Descriptive statistics	*Per capita* real GDP growth	Gross capital flows: bank lending, portfolio flows and FDI; and foreign ownership restriction index	There was no robust causal relationship between financial integration and economic growth. However, evidence suggests that some developing countries may have experienced greater consumption volatility as result of financial integration.
Vanassche (2004)	45	1980-1997	Cross-section (OLS, IV)	Δ IND	Share, Quinn	Positive: Financial openness has a positive effect on sectoral value added growth but with greater relative impact on those sectors more reliant on external financing.

				Variables		
Chanda (2005)	82 of which 57 are non-OECD	1975-1995	Cross-section, OLS	*Per capita* GDP growth	Share, Share interact with measure of ethnic heterogeneity	Mixed: Capital control leads to greater inefficiencies and lower economic growth in ethnically heterogeneous countries, while in countries with less heterogeneity, capital control worked to enhanced economic growth.
Klein (2005)	71	1976-1995	Cross-section (OLS, IV, non-linear LS Spline)	*Per capita* real GDP growth	Share	Mixed: The coefficient of Share exerts a statistically significant positive influence on economic growth, with the estimated effects varying with institutional quality, with the most benefit accruing to the upper-middle income countries.
Kose, Prasad and Terrones (2005)	85 (21 Developed. and 64 less developed)	1960-2000	Cross-section (OLS), panel data (OLS, fixed effect, IV, LAD)	*Per capita* real GDP growth (average for each 10-year period)	Date of stock market liberalisation, Volume (gross capital flow/GDP), and interaction term with volatility	The coefficient of financial openness is negative. In all the role of financial integration tends to be less robust.
Laureti and Postiglione (2005)	11	1990-2000	Dynamic panel model (GMM)	*Per capita* real GDP growth (ppp)	Volume (FDI, Portfolio equity flows, portfolio bond flows, bank credits, short term debt flows)	Mixed: The different forms of capital inflows have a different impact on growth. FDI have insignificant impact on growth. Portfolio equity flows has a negative and not significant relationship with growth. Portfolio bond flows have a positive and significant relationship in many cases. Bank credits are not positively correlated with economic growth. Short term debt flows have a positive effect on growth.
Lee and Jayadev (2005)	29 -140	1976-1995	Cross-section (OLS), panel model (OLS with fixed effects)	*Per capita* real GDP growth	Quinn (constructed by Lee and Jayadev)	Mixed: Authors find no evidence that capital account liberalisation spurs economic growth in cross country regression. Panel regressions show mixed results.

				Variables		
Mody and Murshid (2005)	60	1979-1999	Annual and 4-yearly panels, fixed effect, IV dynamic panel model (GMM)	I/Y	Volume, Sum of dummy	Mixed: FDI had the strongest positive impact on domestic investment, the relationship between capital flows and growth in investment is greater during stronger policies.
Vlachos and Waldenstrom (2005)	42	1980-1990	Cross-section (fixed effects, OLS, and IV)	Δ IND	Dummy, Volume	Mixed: Positive effect on growth and number of firms.
Jin (2006)	2 (Japan and Korea)	Quarterly data: 1970:1-1997:7	VAR model: impulse response functions and variance decomposition	Growth rate of real GDP	FDI inflows/GDP and interest rate differential between domestic and foreign interest rates**	Mixed: FDI has a negative effect on growth of real GDP – significant in Korea and not significant in Japan. Interest rate differential: Statistically insignificant effect on growth in real GDP in both countries.
Khoury and Savvides (2006)	60	1990-2000	Cross-section (OLS) and threshold model	Average annual growth rate	Financial openness based on market structure, foreign equity, and Dailami's (2000) capital control index	Mixed: positive and significant relationship between financial openness and growth for countries with income *per capita* above a threshold and no significant relationship for countries below the threshold. Also countries with high human capital benefit from greater openness in financial services.
Schularick and Steger (2006)	54 (1980-2002) 24 (1880-1914)	1880-913 1980-2002	Cross-section (OLS, IV) and dynamic panel (GMM)	*Per capita* real GDP growth	Volume (gross inflows of FDI and portfolio flows over GDP)	Mixed: For the first era (1880-1913) the effects of financial integration was robustly positive and significant. For the second era (1980-2002) the effect was not robust and insignificant in almost all the cases
IMF (2007)	73	1975-2004	Cross-country regressions (OLS)	*Per capita* real GDP growth	Volume(total external liabilities, FDI)	Mixed: *De facto* measures have positive effects and some were statistically significant. *De jure* measure has a negative effect and not significant.
Schularick and Steger (2007)	54 (1980-2002) 24 (1880-1914)	1880-1913 1980-2002	Cross-section (OLS, IV) and dynamic panel (GMM)	*Per capita* real GDP growth	Volume (inflows of portfolio and equity over GDP)	Mixed: In the first era (1880-1913) financial integration has a robust and statistically significant positive effect on growth. In the second era (1980-2002): positive effect but not

				Variables		
						statistically significant.
Quinn and Toyoda (2007)	94	1955-2004	Cross-section (OLS, IV) and dynamic panel (GMM)	*Per capita* real GDP growth	Quinn, Δ Quinn, Miniane index, Equity	Positive and significant: The effects of capital account openness were associated with growth and were not contingent on the presence or absence of other influences, and the relationship between openness and growth appears to be linear.

*Capital control is defined as "Restriction on payments on capital transactions" by IMF; with dummy variable taking value of one when capital controls are in place and zero otherwise.
**A large gap between domestic and foreign interest rates represents a small degree of openness.

Key to abbreviations: OLS – Ordinary least squares, 2SLS – Two stage least squares, GMM – Generalised method of moments, IV – Instrumental variable technique, VAR – Vector autoregression, WLS – Weighted least square, FD – Financial development, IFI – Financial integration, IND – Index of industrial production, I/Y – Ratio of investment to GDP, IAPM – international arbitrage pricing model, ICAMP – international capital asset pricing model, CLAS – constructed based on the ratio of gross capital flows to GDP, the Feldstein-Horioka saving–investment correlation coefficient, Euler equation estimates and tests of uncovered interest parity differential, GFR – ratio of gross capital flows to GDP,

Source: Summary by Author.

CHAPTER 5:

THE DEPTH OF FINANCIAL INTEGRATION IN THE SACU COUNTRIES

5.1 INTRODUCTION

This chapter uses different measures of financial integration to provide empirical evidence on the degree of financial integration of the five SACU countries. In doing this, the chapter pursues two broad objectives. First, the chapter explores, in general terms, the degree of financial integration of each of the SACU countries. Secondly, the chapter seeks to determine the degree of integration of the smaller SACU countries with South Africa.

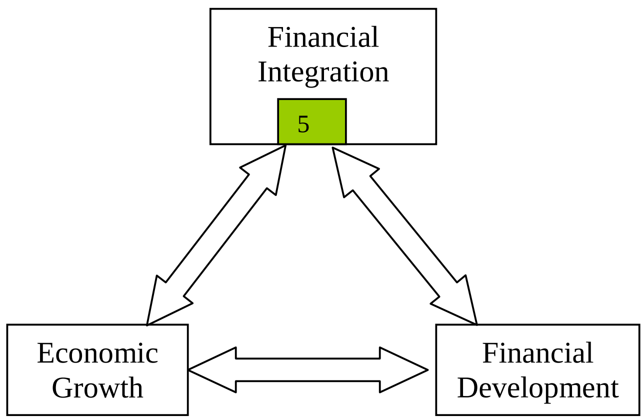


Figure 5.1: Structure of chapters

To pursue these objectives, the chapter uses the analytical framework presented in Chapter 2, which draws on price and quantity data to identify two market-based categories for identifying financial integration. International interest rate differentials and exchange rates are the relevant price information, while capital flows are the relevant quantity data. Household decisions about saving and investment in the local and international markets have been used as a third category to measure financial integration. This chapter uses all three categories: starting with the quantity-based measures of capital flows, followed by the price-based measures and ending with measures of saving and investment behaviour.

The choice of an indicator is largely determined by available data. A battery of tests is used to establish the degree of financial integration. The use of several indicators is particularly necessary given that each indicator has its limitations. If a range of measures point to similar conclusions about the nature of integration, one can have more confidence in the conclusions than if one relies on one particular method. In analysing each of the indicators the analysis first focuses on what it indicates about the extent of financial integration of each of the SACU countries. Second, where applicable, the chapter uses the indicators to demonstrate the extent to which the smaller countries are integrated with South Africa.

5.2 MEASURES BASED ON STOCK OF CAPITAL

The literature commonly uses two groups of capital stock and flow as measures of financial integration. As shown in Chapter 3, the first group uses the foreign assets and liabilities of the national banking sector (deposit money banks). The second group is based on external assets and liabilities of a country. The indicators based on the Lane and Milesi-Ferretti (2006) data set falls within this second group. This section will discuss each set of indicators in turn.

The first group of indicators measures the extent of home bias of the domestic banking sector. Adam *et al.* (2002:20) argue that the home bias should disappear when financial markets are perfectly integrated. If the assets and liabilities of banks are largely domestic, they are home biased, which means there is less integration. The first indicator in this category is FIA, which expresses foreign assets as a ratio of the total assets of the national banking sector. The second indicator, FIL, is the ratio of the national banking sector foreign liabilities to total liabilities. The third indicator in this group is FIT, which is the ratio of the sum of foreign assets and liabilities to the sum of total assets and liabilities of the banking sector.

For the purpose of this study it would have been preferable to use the actual stocks of assets and liabilities that banks hold in other SACU countries in the computations. However, due to lack of data on cross-country capital flows among the SACU countries this was not possible. Consequently, the study uses the aggregate stock of capital reported in the International Financial Statistics (IFS) of the International Monetary Fund (IMF). Therefore, the integration captured within these data represents integration with the rest of the world and not just with SACU member states. Nevertheless, since by virtue of the CMA/SACU agreements, capital is allowed to flow freely among the countries, but is restricted with the rest of the world, the data would represent largely integration with themselves, especially with South Africa. The share of foreign assets and liabilities of banks should increase with greater integration, hence it is expected that each of the indicators will rise over time as they become more financially integrated (Adam *et al.*, 2002:22).

The second group also provides broad measures of financial integration and is based on the external assets and liabilities of a country, as reported in the IFS database under the international investment positions (IIP). The IIP data report the stocks of external assets and liabilities at the end of the recording period, while the balance of payments data records the corresponding flow items (Lane and Milesi-Ferretti, 2006:6). In the IIP data, international assets and liabilities holdings are classified into the following broad groups (Lane and Milesi-Ferretti, 2006:6):

i. portfolio investment (which is subdivided into equity securities and debt securities – including bonds and money market instruments);
ii. foreign direct investment (FDI) – i.e. equity participations above 10 percent;
iii. other investment – including debt instruments such as loans, deposits, and trade credits;
iv. financial derivatives; and
v. reserve assets.

Measures of financial integration based on the foreign asset and liability holding follow the notion that, with financial openness, the ability of both (1) foreigners to invest in a country and (2) residents of the country to invest abroad will increase. Different indicators have been computed based on this notion of financial integration, such as stocks of foreign assets, stocks of foreign liabilities, the sum of foreign assets and liabilities expressed as a ratio of GDP (or total foreign trade – import plus export) (Edison *et al.*, 2002). The use of these indicators is constrained by a lack of data since the IMF began publishing data on the IIP for many countries only very recently. Consequently, due to the data limitation for the SACU countries, capital stocks based on the IIP from the IMF could not be used in this study to gauge the degree of their financial integration.

However, Lane and Milesi-Ferretti (2006) have constructed stocks of external assets and liabilities similar to the IIP of the IFS over the period 1970 to 2004 for 145 countries including Botswana, Namibia, South Africa and Swaziland. Their capital stock data is now regarded by many scholars as the best *de facto* measure of financial integration (cf. Quinn and Toyoda, 2007; Kose *et al.*, 2006a). The methodology of Lane and Milesi-Ferretti (2006:5) relies both on direct estimates of the stocks of capital, assembled from a variety of sources, and on indirect estimates constructed using cumulative flows with valuation adjustments.

This section uses the stocks of foreign assets and liabilities of domestic banks from the IMF, and the stocks of external assets and liabilities of countries derived from the Lane and Milesi-Ferretti (2006) data. In both cases, a higher value denotes greater integration. Whereas the first set of indicators includes the five SACU countries, the Lane and Milesi-Ferretti (2006) data does not include Lesotho. Although both sets of indicators can be computed either as a flow measure or a stock measure, the study uses the stock measures. A major advantage of the stock measure is that it accumulates flows over a long time period. This makes it more stable over time, unlike the flow measure that fluctuates with short-term changes in the political and policy environment (Edison *et al.*, 2002:754).

5.2.1 Foreign assets and liabilities of domestic banks

In what follows the three measures – FIT, FIA and FIL – based on the foreign assets and liabilities of domestic banks are used to gauge the degree of financial integration in the five countries. Table 5.1 provides summary statistics of these indicators of financial integration and two measures of financial development (FDC – the ratios of private credit granted by commercial banks to nominal GDP and FDL – the liquid liabilities of commercial banks to nominal GDP). Figures A-5.1-5.3 in the appendix to Chapter 5 present a graphical representation of the three indicators in the SACU countries. This section uses the two indicators of financial development in conjunction with the capital stock measures to create a better picture of the nature of capital stock among the SACU countries. The discussions that follow are based on Table 5.1.

The first indicator (FIT) is the sum of foreign assets and liabilities of banks as a percentage of the sum of their total assets and liabilities. Using this measure, one can see that in general the level of integration has evolved gradually, with Lesotho and Swaziland having the highest level of integration. It appears that since 1995 most of the countries recorded some increase in the degree of their integration. The pattern of integration reflected in FIT may be due to either the accumulation of foreign assets or liabilities by the domestic banking sector. The last two indicators (FIA and FIL) highlight the structural composition of the total stock of capital just discussed.

Table 5.1: Summary of indicators of financial development and capital flows in SACU

Country	Years	FDC	FDL	FIT	FIA	FIL
Botswana	1990-94	13.63	19.59	6.46	8.54	4.19
	1995-04	15.52	26.37	10.1	16.1	3.43
	1990-04	14.89	24.11	8.87	13.6	3.69
Lesotho	1990-94	16.71	34.66	14.7	24.1	3.70
	1995-04	15.22	28.96	16.3	25.1	5.34
	1990-04	15.75	30.99	15.7	24.8	4.79
Namibia	1990-94	25.75	29.55	7.10	13.6	6.20
	1995-04	37.62	37.92	9.02	7.59	10.7
	1990-04	32.68	34.43	8.54	9.73	9.55
South Africa	1990-94	55.40	48.20	4.51	1.00	8.55
	1995-04	70.20	55.20	7.81	5.61	10.4
	1990-04	65.29	52.90	6.71	4.08	9.77
Swaziland	1990-94	23.06	30.85	10.2	15.0	5.13
	1995-04	15.38	21.73	15.4	25.2	4.29
	1990-04	18.13	24.99	13.7	21.8	4.58

Note: FDC is the ratio of private credit to GDP; FDL is the ratio of bank deposit liabilities to GDP; FIT is the ratio of the sum of foreign assets and liabilities to total assets and liabilities of domestic banks; FIA is the ratio foreign assets to total assets of domestic banks and FIL is the ratio of foreign liabilities to total liabilities of domestic banks

Source: Computed by author based on data from IMF International Financial Statistics CD-ROM

Using the second indicator, FIA, as reported in Table 5.1, one can see that the banking sectors in Lesotho and Swaziland, in that order, have higher ratios of foreign assets than the other three SACU countries. Of the remaining three, Botswana has the highest stock of foreign assets of banks, followed by Namibia and South Africa. The ratio of banking sector foreign assets to total assets has grown since 1994 in all the countries, with the exception of Namibia. Understandably, the South African banking sector, with an assets ratio of approximately 1%, had few external transactions during its political and economic isolation. While the trend has changed since 1995, South African banking remains largely home-biased compared to the rest of the SACU countries.

With regard to the third indicator of capital stock, FIL, which represents the willingness of foreign investors (banks) to invest in the domestic banking system, South Africa had the highest ratio of foreign liabilities, followed by Namibia. The others (Botswana, Lesotho and Swaziland) had significantly lower foreign liability ratios. The period since 1994 experienced an increase in this indicator in Lesotho, Namibia and South Africa, whereas in Botswana and Swaziland it declined.

Based on the FIT and FIA, it is evident that the banking sectors of the different countries have become modestly more externally integrated. The data also suggest asymmetric movement of capital among banks in the SACU countries. Even though the indicators did not specifically capture the actual capital movements across the SACU countries, combining them with the pattern of the indicators of financial development presented in columns 3 and 4 of Table 5.1 suggests that the flows favour South Africa and Namibia, in that order, more than the other countries.

One possible reason for the apparent asymmetry in the stock of capital among the SACU countries becomes evident when one observes the spread between nominal deposit rates in South Africa and the other countries (see Figure A-5.4). The spread is calculated by subtracting the rates of the other countries from that of South Africa (a positive spread implies that the South African rate is higher than that of the other countries). Contrary to the standard neoclassical reasoning whereby the risk adjusted rate of return on capital should be lowest in the most capital-rich economy, South Africa in this case, the graph suggests that South African interest rates have often been higher (Figure A-5.4 and A-5.5 in the appendix)[14].

A close examination shows that the pattern of the spreads mirrors the nature of the financial development and foreign asset and liabilities of banks in the SACU countries as reported in Table 5.1. Consider, for instance, Lesotho and Swaziland, that have the highest deposit rate spread (in that order) on average. Banks in both countries recorded a decline in their deposit liabilities (including foreign liabilities) and a dwindling domestic private credit. For example, between 1990-1994 and 1995-2004 period the ratio of credit

[14]The relevant rate of return on capital implied by theory might however not be the deposit rate. The reasons for this are that, first, the rate of return on capital is long-term in nature and in turn not well proxied by the deposit rate, and secondly, that the deposit and lending rates could be depressed by financial repression in developing countries.

to GDP dropped from 16.7% to 15.2% in Lesotho and from 23.1% to 15.4% in Swaziland. Similarly, for the same period, the ratio of deposit liabilities to GDP dropped from 34.7% to 28.9% in Lesotho and from 30.9% to 21.7% in Swaziland. In contrast, the foreign assets of their banks rose during the same period from 24.1% to 25.1% in Lesotho and from 15.0% to 25.2% in Swaziland. Hence it appears that both individuals and firms seem to be bypassing the domestic banks, and the banks themselves bypassing the domestic economy in the uses of their funds. Likewise, foreign banks seem to be less interested in investing in the domestic banks by way of holding foreign bank assets in the domestic banks. Namibia has the lowest spread and recorded a decrease in foreign assets of domestic banks, while foreign liabilities of its banks have improved. In the case of Botswana, the spread has been quite volatile with the result that domestic banks increased their foreign assets and decreased their foreign liabilities, though the two indicators of financial development indicate some increases.

Thus, overall, the analysis of the interest rate spread and the nature of financial development, as well as the capital flows, are theoretically plausible. According to standard portfolio theory, if capital is freely mobile across national boundaries, existence of differentials in returns across countries will cause financial capital to move rapidly to arbitrage such international yield differentials (Feldstein and Horioka, 1980:315). Consequently, given the nature of the differential yields, one would expect capital to flow from the smaller countries to South Africa until the yields are equalised. However, given the relatively small size of these economies and their financial systems, it is not likely that any capital flows from the other SACU countries to South Africa will make any significant difference in the yields of the latter. Hence, capital may continue to flow in perpetuity to South Africa if no other measures are taken. Such measures in the other SACU countries could include reduction of country risks, and increased competition among banks and institutional developments. Reduction of country risks and institutional development could make domestic investment more profitable and less risky and as such enhance financing by banks in the other SACU countries. Increasing competition among banks could also help to increase the deposit rates and lower lending rates by reducing the monopoly rents earned by banks.

5.2.2 Aggregate stock of external assets and liabilities

The Lane and Milesi-Ferretti (2006) data offer a broader scope for analysing the extent of integration in each of the SACU countries by considering the aggregate external assets and liabilities of each country. In addition to providing a broad range of external asset and liability classes that can be used to compute a variety of financial integration measures for the individual countries, Lane and Milesi-Ferretti (2006) also used their data to measure the degree of financial integration over time for a group of industrialised countries, emerging market economies and developing countries. Their result established a benchmark for comparing the extent of integration in the SACU countries, and was followed to calculate comparable data for SACU[15]. The purpose is to explore fully some of the structural features of stocks of capital in the SACU countries. These are briefly described as they are applied below. For each of the indicators, a higher value will indicate a greater degree of financial integration with the world. To show their evolution over time, Tables 5.2 and 5.3 report the averages of the various measures for three periods (1980-1994, 1995-1999 and 2000-2004). Figures A-5.6 - 5.14 in the appendix also present a graphical plot of some of the aggregate indicators. The discussion that follows is based on Tables 5.2 and 5.3 below.

Table 5.2 presents two sets of aggregate measures of financial integration. The first set of indicators expresses the variables as a ratio of GDP while the second set expresses the variables as a ratio of the total external position (sum of total assets and liabilities). In line with Lane and Milesi-Ferretti (2006:14) the first indicator of financial integration is the sum of total external assets and liabilities as ratio of GDP, thus:

$$TOTAL/GDP_{it} = \frac{TA_{it} + TL_{it}}{GDP_{it}} \tag{5.1}$$

where TA_{it} and TL_{it} denote the total stocks of external assets and liabilities for country i at time t. According to Table 5.2, this indicator shows that all the SACU countries included are highly integrated and are becoming increasingly so. Compared to the value of a similar indicator computed by Lane and Milesi-Ferretti in their study for developed and emerging market economies and developing countries (Lane and Milesi-Ferretti,

[15] Collins (2004), Obstfeld and Taylor (2004) and Lane and Milesi-Ferretti (2003) have also calculated indicators similar to Lane and Milesi-Ferretti (2006) to measure the degree of financial integration.

2006:37 Figure 3), the ratios for the SACU countries seem to suggest a higher integration than the average for emerging market and developing countries[16]. The indicator also shows an increasing level of integration in each of the SACU countries, albeit at different degrees. Botswana seems to experience the lowest increase in integration using this measure, while Namibia recorded the highest increase in integration.

Since according to the neoclassical model capital is expected to move from capital-rich (industrial) countries to capital-poor (developing) countries and not the other way round, one would expect the level and growth in the total stocks of capital to result from the stocks of external liabilities rather than that of assets. To explore this possibility, this section presents two sets of indicators of financial integration based on the Lane and Milesi-Ferretti data set. The first expresses total external assets and liabilities, each as a ratio of GDP, and the second expresses each of them as a ratio of their sum. Table 5.2 also reports these indicators. Contrary to expectation, it is only in South Africa where the ratios of total liabilities are consistently higher than the ratios of total assets. Also, in South Africa the growth in the ratio of total liabilities as a percentage of GDP is higher than that of total assets. In Botswana and Swaziland, beside the fact that the ratios of stocks of assets are significantly higher than those of liabilities, the liabilities ratios are declining. In Namibia the liability ratios grew (though slower than the asset ratios). In addition, in Namibia the ratio of stocks of assets are significantly higher than those of liabilities. Thus, the experience of the smaller SACU countries, though showing higher degrees of integration, represents an example of capital flows from poor countries to richer countries. This is consistent with Mishkin (2007:260) who suggests that because of weaker institutional environment in poor countries, which may not encourage domestic investment, capital might flow from poor to rich countries to facilitate diversification of their portfolios.

The next two sets of indicators reported in Table 5.2 are the ratio of total equity (sum of assets and liabilities of portfolios and FDI) and total debts (sum of stocks of debt assets and liabilities), expressed as ratio of either GDP (Figures A-5.9 and A-5.10 in the

[16] The average value for the combine emerging markets and developing countries range from 70% in 1980 to 158% in 2004 compared to Botswana (104% in 1980 to 135% in 2004), Namibia (37% in 1990 to 211% in 2004), South Africa (58% in 1980 to 135% in 2004) and Swaziland (133 in 1980 to 151% in 2003).

appendix) or the sum of total external assets and liabilities. Botswana and South Africa, in that order, on average recorded higher ratios of equities than debts, while the reverse is the case for Namibia and Swaziland. In addition, the debt ratios experienced significant increases in Namibia and Swaziland, but the increases are marginal in Botswana and South Africa. While equity-based financing improves international risk sharing, greater reliance on debt by an economy has been viewed as undesirable since it may increase the vulnerability of a country to external shocks (Kose *et al.*,2006a:26; Lane and Milesi-Ferretti, 2006:16). Hence the relatively higher debt stocks in some of the countries could potentially be risky if the composition leans towards stock of debt liabilities rather than assets.

The pattern of total equity ratios in SACU mirrors the trend in emerging markets and developing countries as documented by Lane and Milesi-Ferretti (2006:17). Typically, the more developed the stock market of a country is, the greater will be its ability to accumulate stocks of foreign equity capital, hence higher integration. Accordingly, South Africa, with a more developed stock market, followed by Namibia, accumulated the highest stocks of equity compared to the rest of the SACU countries. However, contrary to the trend reported in Lane and Milesi-Ferretti (2006:17), which shows that the ratio of total debts to GDP in emerging markets and developing countries is declining, all the SACU countries experienced an increase in their debt ratios (Namibia and Swaziland have recorded some decline since 2002-2004 – see Figure A-5.10 in the appendix).

The high value of the indicators and the increasing trend of most of the indicators examined so far suggest that all of the SACU countries are highly externally integrated and in some cases are becoming more so.

Turning now to the composition of external assets and liabilities, the following paragraphs consider the component parts of these stocks of capital. Specifically, each component of assets or liabilities is expressed as a percentage of the total assets or total liabilities respectively. The purpose is to show the weight of each component of the external assets and liabilities of the countries. Since different types of capital could have a different effect on the economy, this analysis will help to shed light on the likely effect of financial integration in the SACU countries. These sets of indicators are reported in Table 5.3 below (see also Figures A-5.11-14 in the appendix).

Of the five components, portfolio equity and financial derivatives account for the smallest part of the stocks of foreign assets for most of the SACU countries. Financial derivatives (both assets and liabilities) are virtually non-existent in most of these countries. Portfolio equity, on the other hand, is rising in importance and accounted for 42%, 15%, 11% and 8% of total external assets during 2000-2004 for South Africa, Swaziland, Namibia and Botswana respectively.

The stock of FDI assets have featured prominently in the external assets of the SACU countries, but the share of FDI is declining. The decrease has been most noticeable for Namibia and South Africa, while it is marginal in Swaziland. In general, the decline may reflect the relatively low cost of portfolio investment in South Africa and the increasing availability of other investment avenues such as portfolio equity and debt instruments. In the case of South Africa, it may also reflect changes in opportunities for investment following the end of apartheid. Economic instability and political uncertainty during apartheid South Africa led to corporate investment by foreign investors (largely disinvesting from South Africa) in some of the other SACU countries (especially Swaziland) (World Bank, 1996:28). However, with the end of apartheid, the inflows of such investments into the other SACU countries have dwindled. In addition, in some cases, we have witnessed disinvestment to relocate to South Africa, to take advantage of the bigger market and better infrastructure (including those for exports) (World Bank, 1996:28). Consequently, this has led to a reduction of the stock of FDI assets in the other SACU countries.

The share of the stock of foreign debt assets accounts for the largest part of the accumulated stock of foreign assets in some of the countries such as Namibia and Swaziland. Total reserves account for the largest part of foreign assets in Botswana, though its share has continued to decline steadily. Similar declines in the share of reserves are also occurring in Namibia and Swaziland. Though the share of reserves in total external assets in South Africa is small compared to the other countries, it has increased consistently over time.

Table 5.3 reports the composition of the stock of external liabilities in the SACU countries. The composition of the stock of external liabilities of a country is crucial as it could determine to some extent the vulnerability of the country to external shocks (Kose *et al.,* 2006a:19). It could also represent a crucial source of foreign capital for domestic investment necessary for economic growth. The relative shares of total equity (portfolio equity and FDI) liabilities and debt (long and short term) liabilities in the stock of external liabilities have received much attention in the literature (cf. Kose *et al.,* 2006a). A common view in the literature is that a higher share of equity liabilities offers greater growth potential than a stock of debt liabilities (cf. Kose *et al.,* 2006a:19). This is because equity (especially the FDI component) offers other positive spillovers such as technological spillovers and human capital development that could lead to economic growth (Kose *et al.,* 2006a:26).

Therefore it is encouraging to see that in all the SACU countries, the share of equity liabilities represents a significant part of total liabilities and has recorded an increase over time, except for Botswana where it declined. Of the two equity components (portfolio equity and FDI), FDI has the higher proportion in all the SACU countries. For instance, as shown in Table 5.3, in Botswana for 2000-2004, FDI and portfolio equity accounted for 52% and 2.3% respectively of total liabilities while debt accounts for the balance of 45.7%. In Namibia, the shares of FDI and portfolio equity in total liabilities for the same period are 61.2% and 10.1%. In South Africa their shares for the same period are 40.6% and 26.8%. Lastly, in Swaziland, FDI accounts for 54.5% and portfolio equity 2.1%, with the balance of 43.4% coming from debt. The low share of portfolio equity, except for South Africa, reflects the underdevelopment of the stock markets of the other countries. Though the share of debt liabilities has continued to fall (except in Botswana), it still remains very high in all the countries.

So far, the analysis in this section, based on *de facto* stocks of external capital, has shown that the level of financial integration is high and has increased in the SACU countries. In addition, analysis of the composition of external assets and liabilities also reveals that some shifts in the composition of assets and liabilities have occurred in the SACU countries. Chapters 7 and 8 will consider the extent to which the growing *de facto* financial integration and its components have affected the level of financial development and economic performance in the SACU countries. The next section turns attention to the price-based indicator of financial integration.

Table 5.2: Aggregate indicators of stock of capital in SACU

Country	Years	TOTAL/GDP	TA/GDP	TL/GDP	TEQ/GDP	TD/GDP	TR/GDP	NEP/GDP	TA/TOTAL	TL/TOTAL	TEQ/TOTAL	TD/TOTAL
Botswana	1980-93	149.7	72.27	77.42	50.39	31.45	67.86	-5.15	46.25	53.75	35.45	21.07
	1994-99	164.9	119.8	45.05	27.83	27.18	109.7	74.75	72.61	27.39	16.90	16.44
	2000-04	164.6	122.9	41.66	40.64	30.54	93.39	81.25	75.06	24.94	25.45	18.74
Namibia	1990-93	54.03	23.68	30.34	16.18	35.11	2.74	-6.66	42.11	57.89	29.71	65.14
	1995-99	119.4	69.62	49.76	34.49	77.95	6.94	19.87	57.76	42.24	28.80	65.27
	2000-04	212.9	133.3	79.57	72.84	131.9	8.15	53.78	62.66	37.34	34.12	62.05
South Africa	1980-93	61.97	19.11	42.86	31.43	29.79	0.75	-23.75	31.35	68.65	51.23	47.50
	1995-99	85.94	34.97	50.96	54.00	29.42	2.52	-15.99	40.04	59.96	60.83	36.38
	2000-04	136.2	64.26	71.90	94.31	36.71	5.13	-7.64	47.15	52.85	69.26	26.95
Swaziland	1980-93	148.6	59.07	89.55	46.48	80.24	21.89	-30.48	38.52	61.48	31.29	54.03
	1995-99	170.5	99.95	70.54	55.81	91.17	23.51	29.41	58.61	41.39	32.70	53.55
	2000-04	192.2	121.6	70.56	59.13	112.0	21.00	51.04	63.12	36.88	30.92	58.17

Note: Total - sum of total assets and liabilities; TA – Total assets; TL – Total liabilities; TEQ – Total equity (sum of assets and liabilities of portfolio and FDI); TD – Total debt (sum of stock of debt assets and liabilities); TR - Total reserves minus gold; GDP – Gross domestic products; NEP – Net external position.

Source: Computed by author based on data from Lane and Milesi-Ferretti (2006)

Table 5.3: Structure of external capital stocks in SACU

Country	Years	PEA/TA	FDIA/TA	DA/TA	FDA/ TA	TR/TA	TA	PEL/TL	FDIL/TL	DL/TL	FDL/TL	TL	EQL/TL
Botswana	1980-93	0.00	0.40	4.80	0.00	94.8	100.0	0.00	64.6	35.4	0.00	100.0	64.6
	1994-99	1.20	1.32	5.67	0.07	91.7	100.0	1.46	53.6	45.0	0.02	100.0	55.0
	2000-04	7.81	7.58	9.77	0.00	74.9	100.0	2.32	52.0	45.7	0.00	100.0	54.3
Namibia	1990-93	3.45	11.9	71.5	0.00	13.1	100.0	0.33	41.4	58.3	0.00	100.0	41.7
	1995-99	3.85	2.50	83.3	0.00	10.3	100.0	8.01	51.9	40.1	0.00	100.0	59.9
	2000-04	11.4	0.57	82.0	0.00	6.11	100.0	10.1	61.2	28.7	0.00	100.0	71.3
South Africa	1980-93	10.3	64.0	21.6	0.00	4.12	100.0	9.89	29.9	60.2	0.00	100.0	39.8
	1995-99	24.7	54.9	13.5	0.00	6.90	100.0	21.3	27.2	51.5	0.01	100.0	48.5
	2000-04	41.7	29.9	20.3	0.00	8.06	100.0	26.8	40.6	32.7	0.00	100.0	67.3
Swaziland	1980-93	0.01	9.37	49.7	0.00	41.0	100.0	1.05	44.6	54.3	0.00	100.0	45.7
	1995-99	0.42	17.4	58.7	0.00	23.5	100.0	1.82	51.9	46.3	0.00	100.0	53.7
	2000-04	15.3	15.3	67.0	0.00	17.3	100.0	2.09	54.5	43.4	0.00	100.0	56.6

Note: PEA – Portfolio equity assets; PEL – Portfolio equity liabilities; FDIA – FDI assets; FDIL – FDI liabilities; DA – Debt assets (portfolio debt + other investment); DL – Debt liabilities (portfolio debt + other investment); EQL – Total equity liabilities (portfolio and FDI); FDA – Financial derivatives (assets); FDL – Financial derivatives (liabilities); TR – Total reserves minus; gold; TA – Total assets; TL – Total liabilities; NEP - Net external position; CNEO – Cumulative net errors and omissions

Source: Computed by author based on data from Lane and Milesi-Ferretti (2006)

5.3 PRICE (RETURN)-BASED INDICATORS

As shown in Figure 3.2 of Chapter 3, two classes of price-based indicators can be used: the interest rate parity conditions and prices of financial services. This section focuses attention first on the latter, while the former follow later.

5.3.1 Bank charges

A price-based measure of financial integration uses the differential in prices of financial services, such as bank charges, to assess the degree of financial integration (Adam *et al.*, 2002:6). Increased competition due to the entrance of foreign banks and the ability of domestic residents to access funds from abroad should reduce the differentials in bank charges for similar products or services (such as credit cards, ATM cash withdrawals, stop orders) across integrating countries. Thus, in an integrated financial system, the differential in charges across countries should be close to zero.

Table 5.4: Commercial banking charges in SACU countries 2003/2004

Item	Botsw	Lesotho	Namibia	S. Africa	Swazi	Med-Value	SD-SACU	SD-CMA
Current Account								
Cash withdrawals-ATM (R250)	3	2.13	3.98	4.83	4.13	3.98	1.06	1.15
Cash withdrawals – OTC (R250)	27.4	10.3	9.04	10.4	7.38	10.3	8.19	1.41
Savings Account								
Cash withdrawals–ATM (R250)	9.27	2.05	4.97	4.45	3.75	4.45	2.68	1.27
Cash withdrawals – OTC (R250)	7.6	8.5	19.1	20.5	18.5	18.5	6.25	5.5
Cost of cheque book	26.6	27	19.9	15.3	16.5	19.9	5.51	5.26
Cash deposit (R1500)	4.8	10.9	16.1	15.9	13.1	13.1	4.64	2.48
Bank statement – ATM	1.25	0.5	0.96	0.83	1	0.96	0.27	0.23
Bank statement – OTC	28.9	6	4.26	4.38	4.13	4.38	10.9	0.88
Stop order	15.2	18.8	6.83	26.5	14.6	15.2	7.14	8.21
Special Clearances	148	100	44.9	45	67.5	67.5	43.7	26
No of highest charged services	5	1	1	3	0			
No of lowest charged services	2	3	1	1	3			
No of times ≤ med-value	4	6	7	5	8			

Note: The charges are in rand. SD-SACU is the standard deviation for the entire SACU countries and SD-CMA is the standard deviation for the CMA countries, Med-value is the median value of each of the bank charges.

Source: Central Bank of Lesotho (2003:11)

This analysis of bank charges in the SACU countries relies on data from the Central Bank of Lesotho (2003) based on a study of the cost of banking services in SACU countries. For the study, the Central Bank of Lesotho collected data from individual commercial banks operating in each country. The sample represents the key banks[17] in each country and data was collected on various items of bank charges such as: current account cash withdrawals at the Automatic Teller Machine (ATM) and over-the-counter (OTC), savings account cash withdrawals at ATMs and OTCs, cost of a cheque book, cash deposits, bank statement at ATMs and OTCs, stop orders and special clearances (cf. Central Bank of Lesotho, 2003:4 for a detailed description).

Table 5.4 above reports the average value for each item for all the commercial banks in the sample for each country. The statistics show that Botswana has the highest number of items with the highest bank charges, followed by South Africa, while Lesotho, Namibia and Swaziland have approximately the same number of items with the highest bank charges. Of the eight items covered in the analysis, Botswana recorded the highest charges in five and the lowest charges in two, and South Africa recorded the highest charges in three and the lowest charges in one. Lesotho recorded the highest charges in one item, and the lowest charges in three. In the case of Namibia, the highest and the lowest charges occur once each. Swaziland does not record a highest charge in any category, but recorded the lowest charges in three. Looking at the number of charges equal to or below the median charge confirms that Botswana has the highest charges followed by South Africa, then Lesotho, Namibia and Swaziland in that order. Overall, as expected, the standard deviation suggests that the CMA countries are more integrated than when Botswana is added, since the standard deviation increased in most of the items when Botswana is added.

5.3.2 Interest rate analysis

The empirical literature on interest rate parity uses the extent of equality of interest rates to measure the degree or intensity of financial integration (see, for instance, Cheung *et al.*, 2002). As discussed in Chapter 3, the tendency for interest rates to equalise can result

[17] For South Africa the four main banks (ABSA, FNB, NedBank and Standard Bank) are used. For the other countries, all the banks were used, since there were few banks operating.

from two causes. The first cause derives from the presence of arbitrage opportunities, in which interest rate movements are viewed as being determined by "financial flows in fluid, profit-seeking capital markets" (Barassi *et al.*, 2000:5). In this case, two interest rates may move together over time when the forward premium has stationary time series properties (Zhou, 2003:572). In the context of a currency bloc, such as a common monetary area, where exchange rate risk (uncertainty about the future value of a currency) is absent, an empirical test of the arbitrage conditions simply measures the co-movement between any two interest rates in different markets (Adam *et al.*, 2002:6).

The second cause arises from the use of interest rates as an instrument of monetary policy in the pursuit of nominal objectives such as exchange rate or inflation target (Barassi *et al.*, 2000:5). In this regard, co-movement in interest rates is as a result of policy convergence. This may occur when a smaller country aligns its interest rates with that of a dominant economy because of the possible stronger influence the latter may exert on the former. Policy convergence can also occur within the framework of an economic and monetary union where monetary policy is coordinated from a central point, such as the European Central Bank (ECB) which coordinates monetary policy in the European Economic and Monetary Union (EMU). In this case also, interest rates are expected to converge.

On *a priori* grounds, because of the CMA arrangement mentioned earlier, the tendency toward parity of interest rates among the SACU countries should result from both causes – policy convergence and arbitrage. The presence or absence of the arbitrage activity will indicate the extent of market imperfections within each of the economies, while the existence or lack of policy convergence would suggest an extent of policy autonomy in each of the countries. This section will test for both causes of interest rate convergence. The extent of interest rate convergence will be analysed using both the cointegration approach and principal component analysis (PCA). These are discussed in turn, starting with the cointegration analysis.

(a) Cointegration analysis

The primary model showing the relationship between the interest rates is commonly specified as:

$$r^j{}_t = \alpha_0 + \beta_1 r^i{}_t + \varepsilon_t \tag{5.2}$$

where $r^j{}_t$ and $r^i{}_t$ denote interest rates in countries j and i, respectively, and ε_t is the error term, while α_0 and β_1 are the parameters that in a state of perfect integration are expected to equal 0 and 1. Because of market imperfections, such as transaction costs, perfect integration may not be attained, hence they are expected to take values different from 0 and 1.

With regard to the extent of monetary and financial autonomy, a high β_1 (value close to one) would signal low autonomy while a value close to zero would indicate policy independence. If monetary authorities are independent, each would be able to develop its own policy without recourse to the other, focusing on country specific idiosyncratic shocks. Of course, common shocks such as financial and climatic conditions may affect many countries concurrently and international business cycles may be synchronised across countries, which, in turn, may influence the monetary authorities to choose a similar policy stance and hence similar interest rate patterns (Frankel *et al.*, 2004:704).

In addition, the extent of common shocks across countries would be heightened when their financial systems are integrated. Hence, whether the co-movement in interest rates across countries is due to actual common shocks without integration or because they are integrated becomes difficult to disentangle. However, in *de jure* financially integrated economies with policy coordination, rigidity and market imperfections in an economy could slow down its response to the central policy stance, thereby not exhibiting a similar pattern in interest rates. This makes the measure of the extent of policy independence somewhat ambiguous. What is certain, though, is that a low value of β_1 would suggest policy independence or existence of market imperfections, hence low *de facto* integration.

In the case of within country analysis, Equation 5.3 can be re-specified thus:

$$r_t = \alpha_0 + \beta_1 R_t + \varepsilon_t \tag{5.3}$$

where r_t denotes the domestic market rates and R_t denote the official bank rate, while α_0 and β_1 are the parameters. The interpretation of β_1 would be the opposite in the case of within country analysis. That is, a high value of β_1 would mean a high response of domestic interest rates to the domestic policy stance, which suggests autonomy. But more importantly, a higher response to domestic policy stance *vis-à-vis* the central policy stance (in this case, South Africa official rate) as in Equation 5.2 would indicate a higher level of independence and *vice versa*.

In estimating Equations 5.2 and 5.3, it is important to first establish whether or not the series are stationary. As shown by Stock (1987:1042), if the series are non-stationary, their estimated parameters will be consistent, but their estimated standard errors will not be consistent. To overcome this problem, several authors applied the cointegration framework (e.g. Karfakis and Moschos, 1990; Phylaktis, 1999; Haug *et al.,* 2000; Ahlgren and Antell, 2002; and Zhou, 2003).

Cointegration analysis suggests that if two series, such as interest rates in two different markets, are non-stationary, a linear combination of the two series might still be stationary. In that case the two interest rates are cointegrated with a cointegrating parameter β_1. For the purpose of this analysis, following current trends in the literature, Equations 5.2 and 5.3 will be estimated using the Johansen (1988) and Johansen and Jesulius (1992) cointegration method. See Appendix A-5.2 for a discussion of how the analysis is carried out. Besides obtaining the long-run parameters and using them to measure the intensity of financial integration, the cointegration framework also offers the opportunity to test other hypotheses regarding the nature of financial integration among the SACU countries and financial and monetary interdependence between South Africa and the BLNS countries. For instance, the existence of cointegration implies that causality must at least run from one interest rate to the other. Figure 5.2 below illustrates the expected causal relationships between the interest rates.

The two arrows marked (1) show the response of market interest rates (deposit, lending, money market and Treasury bill rates) in each SACU country to changes in domestic central bank rates – based on Equation 5.3. In this relationship, if the market rates respond significantly (i.e. β_1 coefficient is high and statistically significantly different from zero but not significantly different from one) to the domestic official interest rate, and causality runs from the official rate to the market rates, it is taken as an indication of strong domestic policy influence.

The arrow marked (2) represents the response of official rates in the other SACU countries to changes in the official interest rate in South Africa – based on Equation 5.2. The arrow marked (3) represents the response of market interest rates in the other SACU countries to changes in the official interest rate in South Africa – also based on Equation 5.2. In the relationships marked (2) and (3), if interest rates in the BLNS respond significantly to changes in interest rates in South Africa, with causality running only from the South African rates to the BLNS rates, it will be taken as evidence of the leadership (or dominance) of the South African monetary authority over the other SACU countries. This will be referred to as the South African dominant hypothesis (SADH). A feedback relationship will give evidence of interdependence, in which case the other country exercises some influence on South Africa.

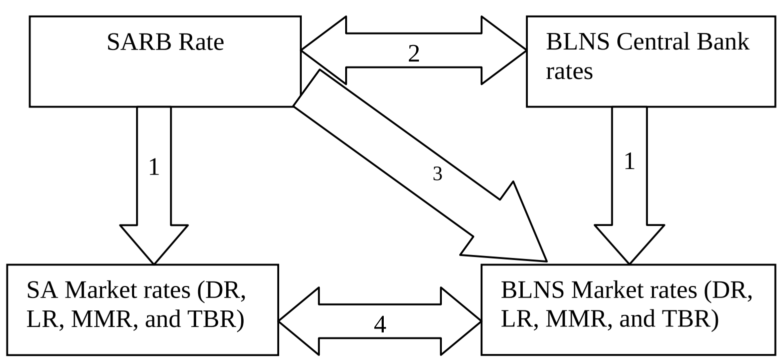


Figure 5.2: Interest rate transmission channels

The arrow marked (4) shows the response of market interest rates in the other SACU countries to changes in market interest rates in South Africa – again based on Equation 5.2. A bi-directional causality between South African market interest rates and any of the other SACU countries will imply the existence of arbitrage activities between the two countries.

This study uses monthly nominal interest rates series from January 1990 to December 2005[18], all of which were obtained from the IMF CD-ROM July 2007. Nominal interest rates have been chosen as opposed to real interest rates in line with many previous studies (cf. Sander and Kleimeier, 2006:216, Barassi *et al*., 2005:11, Haug *et al*., 2000:424). Moreover, in a currency union such as the CMA where exchange rate risk is absent, if inflation rates of member countries are highly correlated, then it would make no different whether nominal or real rates are used. Pairwise correlation tests suggest high coefficients between the inflation rate of South Africa and Botswana, Lesotho, Namibia and Swaziland – 0.66, 0.91, 0.82 and 0.56 respectively. Given these relatively high correlation coefficients, it is expected that their real interest rates should be correlated. Therefore, it further justifies the use of the nominal rates.

For each country where data is available, five interest rates are used, namely, the bank rate (BR), deposit rate (DR), lending rate (LR), money market rate (MMR) and treasury bill rate (TBR). The bank rate[19] is the lending rate of the respective central banks (line 60 of the IMF *IFS)*; the deposit rate is the rate on 88-91 day notice fixed deposits (line 60l); the lending rate represents the prime lending rates of major commercial banks (line 60p); the money market rate is the lower margin of interbank deposits at call (line 60b); while the treasury bill rate is the tender rate on 91-day bills (line 60c). All rates are measured in levels.

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[18] The series for Namibia begins as follows: January 1991 (DR and LR) and September 1991 (BR, MMR and TBR).

[19] From March 1998, the South African Reserve Bank (SARB) rate is the repurchase agreement rate (repo rate).

The analysis begins with a test of the unit root using the DF-GLS and Ng and Perron (2001) tests (see Appendix A-5.1). The results of these tests presented in Table A-5.1 in the appendix show that all the series are integrated of order one, i.e. I(1).

Consequent upon the results of the unit root tests, the test for the presence or absence of cointegrating relationship(s) in the series was conducted using the trace statistic and maximal eigenvalues as discussed in Appendix A-5.2. Tables 5.4, 5.5 and 5.6 present the results of the cointegration tests. In addition, the tables report the normalised cointegrating parameters, as well as the weak exogeneity test results. For the cointegrated long-run β parameter, two tests of significance are performed based on t-statistics. The first is based on the null hypothesis that $\beta = 0$ while the second is based on the null hypothesis that $\beta = 1$. The tables also report the relevant VAR orders, the applicable deterministic trend assumptions[20] and the relevant residual diagnostic tests. Following Seddighi *et al.* (2000:309), the specification of the lag length of the VAR is tested sequentially, using the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SIC).

i. Relationship between market rates and the domestic central bank rates in the SACU

Table 5.5 presents the results of the cointegration analysis between market interest rates and the domestic central bank rates for each country. The aim here is to determine the extent to which domestic monetary policy influences market interest rates behaviour in

[20] These are: (1) The level data X has no deterministic trend and the cointegrating equations do not have intercepts; (2) The level data X has no deterministic trend and the cointegrating equations have intercepts; (3) The level data X has linear trends, while the cointegrating equations have intercepts but no trends; (4) Both the level data X and the cointegrating equations have linear trends; and (5) The level data X has quadratic trends and the cointegrating equations have linear trends (E-view 5 manual). The choice of the deterministic trend assumption is based on the nature of data generating process (DGP), determined from the unit root test and visual inspection of the graphs of the relevant series. E-view 5 suggests the following rough guide to choosing the assumption: use case 2, if none of the series appear to have a trend, for trending series; use case 3, if it is believed that all trends are stochastic, and case 4 if some of the series are trend stationary. Cases 1 and 5 are rarely used in practice because of their limitations. Case 1 is used if all series have zero mean and case 5 may produce a good fit in-sample, but will produce an implausible out-of-sample forecast (E-view 5 manual). For the purpose of this analysis, only cases 2, 3 and 4 are explored.

each country. A strong domestic policy influence would suggest some policy autonomy and thus less integration. Since according to the CMA arrangement South Africa is to lead monetary policy formulation while the other countries would follow, it is expected that South Africa will have more policy autonomy than any of the BLNS countries. Hence the response of market rates in South Africa to the Reserve Bank rate is used as a benchmark for evaluating the BLNS countries.

The results reported in Table 5.5 show that all the market interest rates in South Africa are cointegrated with the official rate and the weak exogeneity tests also suggest that in all the cases causality runs from the official rate to the other rates. The degree of interest rate pass-through from the official rate to the market rates as measured by the β coefficients is also very high, ranging from 85% to 97%. The t-statistics shows that all the β coefficients are statistically significantly different from zero and are not statistically significantly different from one, except the coefficient of the Treasury bill rate. Similarly, the coefficients of adjustment are well behaved with a significant and negative sign ranging in value from 11% to 30% with the values skewed toward the lower end of the range.

Compared to the other BLNS countries, the results for Namibia are the most comparable with those of South Africa. As in South Africa, all the market rates are cointegrated with the Namibian Central Bank rate and in all, except DR, causality runs from the official rate to the other rates. In the case of DR a two-way causality occurred. The endogeneity of the official rate in this case implies that there is a limit to the autonomy of the Namibia Central Bank, as the CMA arrangement would suggest. Noteworthy are the β coefficients and the coefficients of adjustment, which suggest higher interest rate pass-through and higher speed of adjustment to equilibrium than those of South Africa. The long-run pass-through in Namibia ranges from 85% to 120%, with the distribution skewed toward the centre of the range. The β coefficients are all statistically different from zero. The hypothesis of $\beta = 1$ was rejected in two cases (MMR and TBR) but not in the other two (DR and LR). In the two cases where the null hypothesis of $\beta = 1$ is rejected, the tests show that the parameters are statistically significantly greater than one, suggesting that there is overshooting in the responses. The speed of adjustment ranges from11% to 39% and values are distributed around the middle of the range.

To further explore whether or not the long-run parameters between Namibia and South Africa are significantly different from each other, another t-test is carried out with the null hypothesis of $\beta_{NA} = \beta_{SA}$. The results[21] show that the β of their lending rates are the same, while the other three rates are statistically significantly different. In the three rates (DR, MMR and TBR), the responses are statistically significantly greater in Namibia than in South Africa. Thus, apart from the credit markets, it is evident that the domestic money market is more responsive to domestic policy in Namibia than in South Africa.

In the cases of Botswana and Lesotho, there is no co-movement between the official rates and the other interest rates. In Swaziland, of the four market rates tested cointegration was found only between the official rate and lending rate. In the long-run relationship, both the official rate and the lending rate are endogenous, suggesting a two-way causality between them. The long-run pass-through from the official rate to lending rate as reflected in the β coefficients is very high (94%) and statistically significantly different from zero, but not from one.

Overall, the evidence suggests that domestic policies in the three economies (Botswana, Lesotho and Swaziland) are not independent since domestic market interest rates did not respond to the domestic policy rate, while they all respond to South African rate. What is surprising is the result for Botswana. Since Botswana is not an official member of the CMA, one would expect that there would be more policy autonomy there than in the other countries. This further suggests that treating Botswana as a *de facto* CMA member may not be wrong. Next is the analysis of the relationship between interest rates (including the official rates) in the BLNS and the South African official rate.

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[21] The t-values for the test are 1.93[c] (DR), 0.18 (LR), 4.74[a] (MMR) and 5.41[a] (TBR), where a, b and c are 1%, 5% and 10% level of significance.

Table 5.5: Cointegration analysis between domestic market interest rates and domestic central bank rate

	Obs	K	A	Trace		Max		Exogeneity							
				$r = 0$	$r \leq 1$	$r = 0$	$r = 1$	MR	BR	Intercept	β^*	t-value**	R^2	ECM	S.Cor
Namibia															
DR	169	3	4	28.0[0.03]	4.22[0.71]	23.8[0.01]	4.22[0.71]	9.81[0.00]	5.08[0.02]	7.45	0.98(15.8)[a]	0.25	0.41	-0.11(-3.44)[a]	3.71[0.45]
LR	169	3	4	43.6[0.00]	9.17[0.17]	34.4[0.00]	9.17[0.17]	25.5[0.00]	0.13[0.72]	-2.46	0.96(17.6)[a]	0.71	0.44	-0.39(-5.96)[a]	5.14[0.27]
MMR	163	2	4	30.4[0.01]	4.79[0.63]	25.6[0.01]	4.79[0.63]	16.4[0.00]	0.43[0.51]	9.39	1.20(17.8)[a]	2.96[a]	0.24	-0.27(-4.57)[a]	7.17[0.13]
TBR	168	4	4	37.2[0.00]	7.55[0.29]	29.6[0.00]	7.55[0.29]	11.8[0.00]	2.59[0.11]	6.33	1.09(24.5)[a]	2.01[b]	0.42	-0.26(-3.95)[a]	5.21[0.27]
South Africa															
DR	189	3	3	20.9[0.04]	6.63[0.15]	14.3[0.09]	6.63[0.15]	5.13[0.02]	0.29[0.59]	-0.40	0.86(9.99)[a]	1.62	0.34	-0.11(-2.99)[b]	6.75[0.15]
LR	189	3	3	19.6[0.01]	1.75[0.19]	17.9[0.01]	1.75[0.19]	10.4[0.00]	0.41[0.52]	-3.67	0.97(43.8)[a]	1.29	0.5	-0.30(-3.38)[a]	7.51[0.11]
MMR	188	4	3	18.7[0.02]	2.46[0.12]	16.3[0.02]	2.46[0.12]	12.2[0.00]	0.38[0.54]	-0.47	0.88(10.9)[a]	1.46	0.42	-0.13(-3.78)[a]	2.59[0.63]
TBR	189	3	3	19.3[0.01]	2.06[0.15]	17.3[0.02]	2.06[0.15]	11.2[0.00]	0.00[0.95]	-0.89	0.85(17.1)[a]	2.99[a]	0.51	-0.14(-3.57)[a]	4.39[0.36]
Swaziland															
LR	185	7	3	16.0[0.04]	1.92[0.17]	14.1[0.05]	1.92[0.17]	5.21[0.02]	2.83[0.09]	-3.87	0.94(47.6)[a]	3.31[a]	0.12	-0.39(-2.38)[a]	2.64[0.62]

Note: Parentheses [ ] are used to denote probability value, and ( ) represent t-values; a and b represent 1% and 5% significance levels respectively; k is the VAR Order as selected by an appropriate information criterion; MR is money market rates and BR is central bank rate . The t-values reported under $\beta *$ and t-value** are based on the null hypothesis of $\beta = 0$ and $\beta = 1$ respectively.

A is the deterministic trend assumption: (2) The level data X has no deterministic trend and the cointegrating equations have intercepts; (3) The level data X has linear trends, but the cointegrating equations have only intercepts; (4) Both the level data X and the cointegrating equations have linear trends.

Source: Computed by author.

ii. Relationship between interest rates in the BLNS and the central bank rate in South Africa

An analysis of the relationship between interest rates in the BLNS and the South African central bank rate should provide answers to a number of questions. To what extent do monetary authorities in the BLNS countries respond to a change in policy stance in South Africa? To what extent is the South African monetary authority independent of the monetary authorities in the BLNS? To what extent are the money markets of the BLNS countries directly affected by the South African policy stance? A high response indicated by a high and significant β coefficient, with causality running only from the South African bank rate to the BLNS rates, would indicate a clear dominant position for the SARB in SACU.

The results reported in Table 5.6 show that of the 17 paired series estimated, 15 are cointegrated. In all the 15 relationships where cointegration is found, causality runs from the South African bank rate to the other interest rates. Only in two instances is the South African bank rate found to be seemingly endogenous, but even then, not strongly so. Thus, it is evident that the SARB overwhelmingly influences policy stance and the money market behaviours of all the member states. A cursory look at the degree of pass-through (β coefficients) and the speed of adjustments reported in Table 5.6 further confirms the dominance of the South African monetary authority in the SACU. As can be seen from the two tables, all the long-run slope coefficients are statistically significantly different from zero, though most of them are statistically different from one, indicating less than perfect integration. The only exceptions are the lending and money market rates in Namibia which are statistically equal to one. The fact that most of the long-run pass-throughs are not statistically equal to one suggests that the integration arising from the response to SARB monetary policy stance is less than perfect.

Table 5.6: Cointegration analysis between other SACU interest rates and SA Bank rate

	Obs	K	A	Trace		Max		Exogeneity							
				$r = 0$	$r \leq 1$	$r = 0$	$r = 1$	Others	BR_SA	Intercept	β^*	t-value**	R^2	ECM	S.Cor
Botswana															
BR	190	2	3	21.3[0.01]	3.17[0.07]	18.1[0.01]	3.17[0.07]	13.4[0.00]	1.33[0.25]	-15.6	0.17(1.74)^{c}	8.35^{a}	0.09	-0.08(-4.08)^{a}	3.59[0.47]
DR	187	5	4	26.4[0.04]	5.57[0.52]	20.9[0.03]	5.57[0.52]	11.5[0.00]	3.22[0.08]	-17.1	0.31(2.45)^{b}	5.35^{a}	0.23	-0.12(-3.92)^{a}	0.77[0.94]
LR	189	3	3	16.3[0.04]	3.74[0.05]	12.6[0.09]	3.74[0.05]	7.41[0.01]	1.16[0.28]	-17.1	0.20(1.48)	5.92^{a}	0.07	-0.05(-3.24)^{a}	4.32[0.36]
Lesotho															
BR	190	2	3	16.5[0.03]	2.41[0.12]	14.1[0.05]	2.41[0.12]	6.34[0.01]	5.15[0.02]	-10.5	0.39(3.33)^{a}	5.15^{a}	0.16	-0.09(-2.76)^{a}	11.8[0.02]
DR	no														
LR	190	2	3	21.4[0.01]	1.90[0.17]	19.5[0.01]	1.90[0.17]	16.7[0.00]	2.15[0.14]	-7.27	0.71(9.59)^{a}	3.90^{a}	0.32	-0.26(-4.36)^{a}	16.6[0.00]
TBR	190	2	3	26.1[0.00]	1.79[0.18]	24.3[0.00]	1.79[0.18]	22.5[0.00]	0.38[0.54]	-1.25	0.79(12.6)^{a}	3.28^{a}	0.2	-0.22(-5.04)^{a}	49.8[0.00]
Namibia															
BR	168	4	4	25.1[0.06]	4.25[0.71]	20.9[0.03]	4.25[0.71]	10.5[0.00]	1.43[0.23]	-10.4	0.55(7.31)^{a}	5.92^{a}	0.27	-0.14(-3.60)^{a}	5.24[0.26]
DR	no														
LR	178	2	3	21.9[0.00]	1.54[0.21]	20.3[0.00]	1.54[0.21]	18.4[0.00]	0.98[0.32]	-3.17	1.04(12.9)^{a}	0.54	0.42	-0.17(-4.54)^{a}	6.26[0.18]
MMR	163	2	3	18.4[0.02]	1.99[0.16]	16.4[0.02]	1.99[0.16]	12.1[0.00]	0.31[0.58]	0.79	0.95(14.9)^{a}	0.86	0.38	-0.19(-3.75)^{a}	6.29[0.18]
TBR	168	4	4	34.6[0.00]	8.15[0.24]	26.5[0.00]	8.15[0.24]	15.8[0.00]	0.10[0.75]	-1.86	0.81(16.7)^{a}	3.85^{a}	0.48	-0.18(-3.87)^{a}	0.46[0.98]
Swaziland															
BR	183	9	3	16.4[0.04]	1.45[0.23]	14.9[0.04]	1.45[0.22]	6.52[0.01]	0.75[0.39]	-1.62	0.80(7.62)^{a}	1.89^{c}	0.33	-0.06(-2.57)^{b}	5.12[0.28]
DR	188	4	3	15.8[0.04]	2.07[0.15]	13.7[0.06]	2.07[0.15]	7.56[0.01]	0.22[0.64]	1.82	0.76(9.68)^{a}	2.98^{a}	0.24	-0.08(-2.95)^{a}	3.28[0.51]
LR	186	6	3	15.8[0.04]	2.46[0.12]	13.4[0.07]	2.46[0.12]	7.21[0.01]	0.07[0.79]	-5.92	0.70(6.09)^{a}	2.56^{b}	0.3	-0.06(-2.91)^{a}	4.00[0.41]
MMR	190	2	3	19.9[0.01]	1.85[0.17]	18.1[0.01]	1.85[0.17]	15.3[0.00]	0.05[0.83]	2.66	0.79(11.6)^{a}	3.13^{a}	0.25	-0.13(-4.17)^{a}	4.00[0.41]
TBR	190	2	3	15.5[0.04]	2.11[0.14]	13.4[0.07]	2.12[0.14]	11.2[0.00]	0.19[0.66]	-0.52	0.73(6.44)^{a}	2.38^{b}	0.13	-0.11(-3.67)^{a}	1.11[0.89]

Note: Parentheses [ ] are used to denote probability value, and ( ) represent t-values; a and b represent 1% and 5% significance levels respectively; k is the VAR Order as selected by an appropriate information criterion; Others represents interest rates in other SACU countries and BR_SA represents SARB rate. The t-values reported under $\beta *$ and t-value** are based on the null hypothesis of $\beta = 0$ and $\beta = 1$ respectively.

A is the deterministic trend assumption: (2) The level data X has no deterministic trend and the cointegrating equations have intercepts; (3) The level data X has linear trends, but the cointegrating equations have only intercepts; (4) Both the level data X and the cointegrating equations have linear trends.

Source: Computed by author.

The endogeneity of domestic interest rates in Botswana with respect to SARB's policy rate is striking. In the only instance in which the SARB rate appears to be endogenous, the hypothesis of weak exogeneity is weakly rejected at a 8% level of significance, while the reverse hypothesis is rejected in all the Botswana interest rates at a less than 1% level of significance. This suggests that interest rates in Botswana are influenced by SARB policy action and justifies the treatment of Botswana as a *de facto* CMA member.

However, the extent of the influence of the SARB on the BLNS varies from country to country. The transmission of monetary policy stance to the different interest rates also varies from rate to rate. Focusing first on the response of market rates to SARB rate, as Table 5.6 shows, Namibia has the highest interest rate pass-through ranging from 81% to 104% in the long-run with the values skewed toward the upper end of the range. The speed of adjustment ranges from 17% to 19% in a month and the values are normally distributed. Namibia is followed by Swaziland with long-run pass-through ranging from 70% to 79% and the values are normally distributed. The speed of adjustment for Swaziland ranges from 6% to 13% with an average of 8.8%. Next is Lesotho with long-run pass-through ranging from 71% to 79% for lending and Treasury bill rates and corresponding speed of adjustment being 26% and 22%. Botswana comes last, with long-run pass-through being 31% and 20% for deposit and lending rates respectively and their speeds of adjustment are 12% and 5%. Of all the market rates, with the exception of Swaziland, the deposit rate appears to be most rigid and they have the lowest response to changes in the monetary stance in South Africa.

The response of central bank rates to SARB rate reveals the same order of transmission from the SARB to the BLNS countries, except that Swaziland has the highest response instead of Namibia as in the market rates. The long-run pass-through from the SARB rate to the Swaziland central bank rate is 80% with a speed of adjustment of 6%. The other countries show a considerably less than one-for-one response, with the official rate in Namibia responding by 55%, Lesotho by 39% and Botswana by 17%, in the long-run.

Overall, the degree of integration with South Africa by the BLNS countries occurs in hierarchy from the highest to the lowest as: Namibia, Swaziland, Lesotho and Botswana.

iii. Relationship between market interest rates in the BLNS and market rates in South Africa

The concern in this section is with the market integration and the extent to which arbitrage opportunities exist between the South African money market rates and interest rates in each of the BLNS countries. Table 5.7 presents the cointegration results for this analysis. The results show cointegration between all the pairs of market rates between South Africa and those of Botswana, Namibia, and Swaziland. In Lesotho, cointegration exists between the lending and Treasury bill rates and their South African counterparts, but not for the deposit and money market rates.

To examine the possibility of arbitrage opportunities among SACU countries[22], especially between South Africa and each of the other member states, the weak exogeneity test is carried out. What stands out in the results is the two-way causal relationship between interest rates in Namibia and South Africa, except for the money market and Treasury bill rates where the causal relationship runs solely from South Africa to Namibia. Thus, the results suggest the presence of some arbitrage activities between Namibia and South Africa working to ensure parity of interest rates. In the other countries for which there are cointegrating relationships, the hypothesis that South Africa is exogenous could not be rejected, while the reverse is not true. This shows that causality runs solely from South Africa to these other member states, thereby confirming again the SADH. Hence, in the case of Botswana, Lesotho and Swaziland, market interest rate parity arises from the efforts of money market players (the banks) trying to align their interest rates with those of South Africa.

In this analysis, the degree of financial integration, as represented by the β coefficients, reveals similar patterns to those discussed earlier. Again Namibia shows the highest level of integration with South Africa, followed by Swaziland, Lesotho and Botswana. In addition, the rejection of the null hypothesis of $\beta = 1$ in most of the cointegrated

[22] The potential causal relationships between each of the interest rates of the smaller member states (e.g. the deposit rates in Botswana and Lesotho) are not explored, since the nature of the CMA agreement would suggest that any integration among the countries would arise from the tendency of the interest rates of each member to converge with those of South Africa rather than with each other. Besides, given the better investment opportunities in South Africa relative to the other member states, all investment choices would in most likelihood be between South Africa and the domestic economy of each of the other countries. Hence, the existence of arbitrage activities between the other countries would be minimal, if they exist at all.

relationships suggests that the market integration between South African and the other SACU countries is not perfect.

In sum, the foregoing cointegration analysis confirms the dominant role of South Africa among the SACU countries and indicates a hierarchy of integration of the financial systems of each member state with that of South Africa, with Namibia at the top, followed by Swaziland, then Lesotho and Botswana at the bottom. Furthermore, interest rates in each of the BLNS countries respond to both domestic policy measures, as represented by changes in their domestic bank rates, and to the SARB rate. They also respond to market rates in South Africa. However, a comparison of the results of the three sets of analyses above shows the main driver of the integration process. The results show that the response of money market rates of the other SACU countries to the money market rate in South Africa is the main driver of their integration process. This reflects the fact that most banks in the smaller SACU counties are branches of South African banks. Hence, the banks in the BLNS respond quickly to developments in the South African money markets. The response to policy changes by both the domestic monetary authorities (as reflected in their central bank rates) and the money market players appears to be a significant force in their integration process. However, the response of money market players to policy change South Africa is far stronger than the response of domestic monetary authorities to the same. The response of the central bank and money market rates of the BLNS to the official rate in South Africa and the response of the market rates of the BLNS to money market rates in South Africa are also found to be individually, on average, greater than the domestic money market rates response to changes in the domestic policy stance. Thus, the results of the cointegration analysis of interest rates in the SACU countries confirm the existence of both market and policy convergence among the SACU countries.

Table 5.7: Cointegration analysis between market rates and SA money market rate

	Obs	K	A	Trace		Max		Exogeneity							
				$r = 0$	$r \leq 1$	$r = 0$	$r = 1$	MR_O	MR_SA	Intercept	β^*	t-value**	R^2	ECM	S.Cor
Botswana															
DR	189	3	3	16.2[0.03]	3.30[0.07]	12.8[0.08]	3.31[0.07]	10.0[0.00]	0.66[0.42]	-5.03	0.41(2.22)[b]	3.24[a]	0.22	-0.06(-3.52)[a]	6.33[0.18]
LR	189	3	2	22.2[0.03]	6.99[0.13]	15.2[0.06]	6.99[0.13]	7.87[0.01]	0.25[0.62]	-17.8	0.16(1.08)	5.88[a]	0.08	-0.05(-3.84)[a]	2.58[0.63]
Lesotho															
DR	no														
LR	190	2	3	17.2[0.03]	2.09[0.15]	15.1[0.04]	2.09[0.15]	12.7[0.00]	2.11[0.15]	-5.26	0.69(7.66)[a]	3.42[a]	0.3	-0.22(-3.88)[a]	25.5[0.00]
TBR	189	3	2	28.6[0.02]	10.2[0.12]	18.4[0.07]	10.2[0.12]	6.75[0.01]	0.22[0.64]	2.6	1.07(13.2)[a]	0.82	0.4	-0.20(-3.89)[a]	12.1[0.02]
Namibia															
DR	177	3	3	17.5[0.02]	2.04[0.15]	15.4[0.03]	2.04[0.15]	6.76[0.01]	3.43[0.06]	-0.34	0.79(13.6)[a]	3.53[a]	0.32	-0.08(-2.77)[a]	6.29[0.18]
LR	177	3	3	19.3[0.01]	1.80[0.18]	17.5[0.01]	1.80[0.18]	11.4[0.00]	3.14[0.08]	1.43	1.11(12.1)[a]	1.22	0.38	-0.13(-3.56)[a]	1.92[0.75]
MMR	163	2	3	23.1[0.00]	2.61[0.11]	20.5[0.04]	2.61[0.11]	3.09[0.07]	2.15[0.14]	-0.03	0.98(25.6)[a]	0.42	0.18	-0.16(-1.86)[c]	3.41[0.49]
TBR	171	1	3	29.6[0.00]	1.68[0.20]	27.9[0.00]	1.68[0.20]	12.2[0.00]	0.82[0.37]	0.19	1.04(33.7)[a]	1.17	0.07	-0.30(-3.65)[a]	3.40[0.49]
Swaziland															
DR	189	3	3	21.4[0.01]	3.45[0.06]	17.9[0.01]	3.45[0.06]	7.65[0.01]	2.69[0.10]	2.44	0.89(8.09)[a]	0.93	0.16	-0.05(-3.06)[a]	5.88[0.21]
LR	186	6	3	15.9[0.04]	2.88[0.09]	13.1[0.08]	2.88[0.09]	4.13[0.04]	0.26[0.61]	-3.29	0.72(6.36)[a]	2.43[b]	0.17	-0.05(-2.24)[b]	3.83[0.43]
MMR	190	2	3	27.4[0.00]	3.11[0.08]	24.3[0.00]	3.11[0.08]	15.1[0.00]	0.09[0.76]	1.8	0.79(11.3)[a]	3.02[a]	0.11	-0.11(-4.21)[a]	1.91[0.75]
TBR	190	2	3	18.5[0.02]	2.37[0.12]	16.1[0.03]	2.37[0.12]	12.9[0.00]	0.92[0.34]	0.18	0.85(7.13)[a]	1.23	0.18	-0.10(-3.94)[a]	2.92[0.57]

Note: Parentheses [ ] are used to denote probability value, and ( ) represent t-values; a and b, represent 1% and 5% significance levels respectively; k is the VAR Order as selected by an appropriate information criterion; MR_O represent money market rate in the other SACU countries, and MR_SA represent money market rate in South Africa. The t-values reported under $\beta *$ and t-value** are based on the null hypothesis of $\beta = 0$ and $\beta = 1$ respectively.

A is the deterministic trend assumption: (2) The level data X has no deterministic trend and the cointegrating equations have intercepts; (3) The level data X has linear trends, but the cointegrating equations have only intercepts; (4) Both the level data X and the cointegrating equations have linear trends.

Source: Source: Computed by author.

(b) Principal component analysis

The use of principal component analysis (PCA) for determining the degree of financial integration has become very popular (cf. Perignon *et al*., 2007; Becker and Hall, 2006; Gilmore *et al*., 2006; Figueira *et al.*, 2005; Siliverstovs *et al.*, 2005; Fernandez-Izquierdo and Lafuente, 2004; Nellis, 1982). The idea is to determine whether a single or a few uncorrelated factors, called principal components, exist that best account for the correlation among the variables of interest (in the current analysis the interest rates) in the different countries. In the case of full integration the correlation structure of the interest rates would be best described by one common factor explaining their long-run behaviour or co-movement. However, the higher the number of factors that is needed to explain the interrelations between the interest rates, the lower the degree of financial integration.

The principal component analysis problem can be expressed thus:

$$P = AX \tag{5.4}$$

where P is a vector of orthogonal factors or principal components (PC). These PCs are a linear combination of the original series (the set of interest rates in the current analysis); X is the observed sets of interest rate variables and A is a matrix of coefficients or factor loadings with each coefficient representing the weight of the corresponding original variable in the relevant PC. The number of PCs is equal to the number of the original variables; however, the PCs are orthogonal, i.e. independent of each other. The PCA derives the PCs in such a way that they explain the variations in the set of original variables in a descending order. Thus, the first PC accounts for the main part of the variation of the original variables; the second PC will explain the main part of the remaining variations in the variables after the effects of the first PC have been removed from the data (Figueira *et al.,* 2005:4).

To determine the explanatory power of each of the PCs, two measures are conventionally used: the eigenvalue and the cumulative R^2 of the PCs. The study employs the Kaiser rule of eigenvalue greater or equal to 1 (Kaiser, 1960)[23] to determine the significance of a PC. The cumulative R^2 has the same interpretation as the ordinary regression analysis (i.e. $0 \leq R^2 \leq 1$), with a value close to one indicating high explanatory power, while a value close to zero indicates low explanatory power. Next, the relative contribution of an

[23] For a discussion of weaknesses and alternative rules see Jolliffe (2002:112-131). For applications see for instance Nellis (1982), Figueira *et al.* (2005), and Meric *et al*. (2007).

interest rate of a country to the significant PCs is determined using the factor loadings or the coefficients of the PCs (i.e. the A in Equation 5.4). According to Jolliffe (2002:67) the sign of the coefficients of any PC is completely arbitrary. However, the pattern of variation of the signs from one factor loading to the other can be used to determine the co-movement of the variables (Becker and Hall, 2006:8). In the current analysis, following Becker and Hall (2006:8), a largely random factor loading (with variable signs and sizes) would imply that the variables move largely independently of each other, hence indicating low integration. However, if the interest rates move together (i.e. integrated), the PC coefficients will exhibit a more systematic pattern (same sign and size). Similarly, a country with a factor loading that moves in a more systematic pattern with that of South Africa is taken as evidence of greater integration with it, given the dominance of South Africa in SACU as confirmed by the cointegration analysis just discussed.

The empirical results reported here employ three of the same interest rates (bank rate, deposit rate and lending) as in the previous analysis. The other two interest rates (Treasury bill rate and money market rate) are not used since data for them are only available for a few countries. The analysis is carried out for four periods. The first analysis covers the entire period from 1991 to December 2005. The other analyses are carried out for three sub- periods – 1991-1994, 1995-1999 and 2000-2005 – to explore the dynamics of integration since the change in political environment in South Africa after 1994. The PCA requires balanced data (i.e. equal observation) for all the interest rates. Hence, due to missing data in Namibia, the starting dates for the entire period and the first sub-period vary across the interest rates. For the Bank rate the starting period is September 1991, while for both deposit and lending rates the starting date is January 1991. The analysis is further carried out for the CMA and the SACU (i.e. CMA plus Botswana) countries separately. This will help to compare the extent of integration within the CMA and the SACU. Given that the PCA makes no assumptions about the underlying properties of the data series, there is no need, for instance, to determine the stationarity properties of each variable for the purpose of the analysis.

Table 5.8 in the text and Figure A-5.15 in the appendix present a summary of the PCA results. Table 5.8 reports the Eigenvalues for the first and second principal components and the cumulative R^2 for the first principal component for the three interest rates and the CMA and SACU. From the results, as expected, the CMA countries are more integrated than the SACU countries. For the CMA, the three interest rates show strong evidence of co-movement for all the periods as there is only one significant principal component with very high R^2. The only slight exception is during the period 1995-1999 when the interest rates had a nearly significant second principal component, with eigenvalues of 0.962, 0.835 and 0.839 for bank, deposit and lending rates respectively.

Table 5.8: Principal Component Analysis of Interest Rates: 1991-2005

	Bank Rate			Deposit Rate			Lending Rate		
	Eigenvalue: 1st	Eigenvalue: 2nd	R^2 -1st PC	Eigenvalue: 1st	Eigenvalue: 2nd	R^2 -1st PC	Eigenvalue: 1st	Eigenvalue: 2nd	R^2 -1st PC
CMA									
1990-2005	3.310	0.533	0.828	3.704	0.202	0.926	3.545	0.223	0.886
1990-1994	3.753	0.154	0.938	3.677	0.228	0.919	3.584	0.201	0.896
1995-1999	2.768	0.963	0.692	2.940	0.835	0.735	3.355	0.418	0.839
2000-2005	3.495	0.486	0.874	3.412	0.342	0.853	3.734	0.204	0.933
SACU									
1990-2005	3.756	0.629	0.751	3.709	1.001	0.742	4.003	0.683	0.801
1990-1994	4.049	0.736	0.810	3.709	1.022	0.742	4.161	0.505	0.832
1995-1999	3.048	0.973	0.610	2.994	1.372	0.599	3.473	0.986	0.695
2000-2005	3.639	1.008	0.728	3.786	0.676	0.757	3.994	0.839	0.799

Note: 1st PC and 2nd PC are the first and second principal components. The starting date for Bank rate for the entire period and the first subperiod is September 1991 while for deposit and lending rates it was January 1991.

Source: Computed by author.

The possible reasons for the slight drop in the degree of financial integration during the 1995-1999 periods become apparent if one examines the factor loading for the CMA as illustrated in Figure A-5.15 in the appendix. As can be observed from the factor loading of the first PC, the countries moved in the same direction, as expected, because of the CMA Agreement. However, the coefficients for Lesotho are lower, implying a lower weighting in the integration for the region. This is particularly manifest in the central bank rate and the lending rate which are significantly lower during that period. The results confirm the events in the country during that period. From the mid 1990s, the financial system in Lesotho experienced considerable distress, which culminated in the liquidation of the Lesotho Agricultural Development Bank (LADB) in 2000 and the Lesotho Bank in 2001, despite several attempts by the Government to rescue the banks.

The loan books of the Lesotho Bank were eventually taken over by Standard Bank (a South African private bank) and began operation as a new independent entity with the name Lesotho Bank in 1999. To worsen the situation, in August and September 1998 Lesotho experienced a political crisis that led to the destruction of property, heavy stock looting and the burning down of several companies. The uncertainty created by the crisis resulted in a further decline in domestic banking activities (Aziakpono, 2004b). However, the period 2000-2005 has recorded a turnaround in the pattern, with the coefficient for Lesotho almost equalling the rest.

As one would expect, since Botswana is not part of the CMA agreement, the addition of Botswana to the CMA countries lowered the degree of financial integration. Unlike the CMA countries where there was only one significant principal component in all the periods and across interest rates, when Botswana is added to the analysis, the PCA results show, in some instances, more than one significant principal component. This is particularly pronounced with the deposit rate where, in three out of the four periods, two components are statistically significant. In the case of the bank rate, two significant principal components are obtained during the 2000-2005 sub-periods and another nearly significant second component in the 1995-1999 sub-periods. Again the 1995-1999 sub-periods experienced the least financial integration among the SACU countries. The results for the 1995-1999 period may also be partly due to the crisis in Lesotho as just explained. Overall, however, the results suggest that the level of financial integration among the SACU countries improved during the 2000-2005 period.

From the second row of Figure A-5.15 in the appendix to Chapter 5, that shows the coefficients of the first PC for SACU countries, one can observe the relative contributions of each country to the observed integration patterns. Evidently, the pattern of movement of the CMA countries remained the same as in the first row when analysing the CMA countries alone. However, Botswana moved in a consistent manner in all the periods and independently of the CMA countries for most of the periods analysed and it is irrespective of the interest rates used. Surprisingly, for all the instances where the factor loadings showed that countries moved together, it is the CMA countries that appear to converge towards Botswana and not the opposite. This is rather surprising, since the cointegration analysis shows that South Africa dominates the other SACU countries. Even in the immediate period after the change in the political dispensation is South

Africa in 1994, which brought along with it a more friendly relationship with Botswana, which had hitherto maintained a strong opposition to apartheid South Africa, there is no noticeable change in the level of integration. One would have expected that the concomitant relaxation of the political tension between the two countries should have manifested in some synchronisation of their financial system. This does not appear to have occurred until around 2000.

The pattern since 2000 could be explained by two possible factors. First, in February 1999 Botswana adopted a more liberal foreign exchange policy by abolishing exchange control and adopting full capital account convertibility. This policy action, which signalled a move towards openness of the financial system, might have contributed to a higher synchronisation of interest rates with South Africa, and by implication the other CMA countries. However, given the fact that the factor loadings for Botswana for all the interest rates have maintained a consistent pattern over time, the change in policy stance in 1999 may not have been the major driver of the synchronisation of interest rates with those of the CMA countries. Second, in 2000 South Africa adopted an inflation targeting monetary policy framework, which resulted in a drop in both the inflation rate and the market interest rates. An important implication of the new policy is the stability it brought to the market interest rates relative to the past. This then harmonises with Botswana which up till then had maintained a more stable and lower interest rates stance.

Overall, a comparison of the different interest rates for SACU and CMA shows that the retail lending rate gave the strongest evidence of convergence. For the CMA with Botswana, the deposit rate follows the lending rate. Even with the inclusion of Botswana, the emerging evidence (as shown in the period 2000-2005) suggests that the deposit rate ranked second. Thus, the PCA results confirm the earlier results based on cointegration analysis which found evidence for both market and policy convergence.

5.4 INVESTMENT AND SAVING CORRELATION

As discussed in Chapter 3, the investment-saving (I-S) correlation as measure of financial integration was pioneered by Feldstein and Horioka (1980). The central argument is that in a financially open economy domestic investment will be largely independent of domestic saving because the former might be financed from a pool of world saving. Thus, financial integration will imply a low correlation between domestic investment and saving, while a high correlation will suggest that the markets are segmented.

Feldstein and Horioka (1980) tested their proposition by estimating the following I-S model:

$$\frac{I}{Y}_{it} = \alpha + \beta \frac{S}{Y}_{it} \tag{5.5}$$

where (I/Y_{it}) is the ratio of gross domestic investment to GDP in country i at time t and (S/Y_{it}) is the corresponding ratio of gross domestic saving to GDP. α and β are the parameters to be estimated. Feldstein and Horioka (1980:318) postulate that in a small open economy relative to the world economy, the value of β would be zero, while for a relatively large country, the value of β would only be the order of magnitude of its share of total world capital. Even though a high value of β could reflect other common causes of the variation in both investment and saving, Feldstein and Horioka (1980:318) argue that a finding of a high value of β would be evidence against the hypothesis of perfect capital mobility. In essence, the value of β would vary from zero to one (i.e. $0 \leq \beta \leq 1$), where a zero implies perfect capital mobility (full integration) and a value of one implies no capital movement[24].

Extending Feldstein and Horioka's (1980:318) proposition about a small versus a large country to the SACU countries would imply a relatively lower β value for the smaller SACU countries than that of South Africa[25]. Moreover, given the economic isolation of South Africa during the apartheid era, all things being equal, one would expect the value of β to be higher prior to the abolishment of apartheid.

Most empirical studies of the I-S relation employ cross-sectional analysis based on ordinary least square (OLS) or the instrumental variable technique (see Obstfeld and Taylor, 2004 and Lemmen and Eijffinger, 1998 for a review of the literature). One major

[24] Feldstein and Horioka (1980) estimated a cross-sectional model of the I-S correlation using data for the 1960s to 1980 for 21 OECD countries. Contrary to their expectation they found high I-S correlation, that is, their results suggest low capital mobility in the countries studied. Their surprisingly high I-S correlation is now popularly known as the Feldstein-Horioka 'puzzle'.

[25] Note that in a world context, South Africa is also a small country, but relative to the other SACU countries, it is a large country.

limitation of such an approach as highlighted by Lemmen and Eijffinger (1998:15) is that "the cross-section β coefficients simply reflect capital mobility between a sample of countries taken as a unit to and from the rest of the world and not capital mobility between individual countries". Moreover, cross-sectional analysis assumes the same degree of capital mobility for each individual country in the sample (Lemmen and Eijffinger, 1998:15). A practical solution to the cross-sectional analysis proposed by some authors (cf. Obstfeld and Taylor, 2004 and Lemmen and Eijffinger, 1998) is to use country-specific time series analysis to account for the correlation in individual countries.

The possibility of endogeneity of the saving variable is another issue that empirical studies of the investment-saving correlation often face, since economic variables or shocks may influence both investment and saving rates jointly (Lemmen and Eijffinger, 1998:15). According to Lemmen and Eijffinger (1998:15), endogeneity of the saving rate may arise in both time-series and cross-sectional analyses. In cross-sectional analysis, the problem is usually addressed by using an instrumental variable that is highly correlated with saving but not with the model error term. However, obtaining reliable instruments remains a major challenge to such an approach.

This study adopts a country-specific time series approach to determine the degree of I-S correlation in each of the SACU countries. Specifically, the study employs the maximum likelihood based cointegration and error correction model proposed by Johansen and Jesulius (1992) to estimate Equation 5.5. In addition to accounting for non-stationarity of time series data that may lead to spurious results, it offers a direct approach of testing for the endogeneity of the variables based on the weak exogeneity test (see Appendix A-5.2 for details).

Following previous studies, the study employs two measures of saving – the gross domestic saving (GDS) and the gross national saving (GNS) (cf. Obstfeld and Taylor, 2004; Lemmen and Eijffinger, 1998; Feldstein and Horioka, 1980). Investment is represented by gross capital formation in line with the practice in most studies of the I-S relationship. Both investment and saving series are expressed as a ratio of nominal GDP in domestic currencies. All the data are sourced from the World Bank World Development Indicators, 2007 CD-ROM. The analysis uses annual data covering the period 1970 to 2005, except for GNS in Swaziland that starts from 1974. As a first step all the variables are tested for unit root using the DF-GLS and Ng and Perron (2001) tests (see Appendix A-5.1). As can be seen from the unit root results reported in Table A-5.1 in the appendix, most of the variables are I(1). In few instances, the unit root tests produces mixed results. For instance, in Botswana the null hypothesis of unit root was rejected at 10% for investment in level series. Thus investment in Botswana is weakly integrated of order zero. In Swaziland, the DF-GLS suggest that investment is I(1) while the Ng and Perron method suggest that it is I(0). In both cases investment is used in testing for cointegration since it is possible for cointegration to be present when there is a mix of I(0) and I(1) variables in a model (Harris, 1995:80).

Based on the unit root results, bivariate cointegration tests are carried out for a pair of investment and saving variables using the trace statistic and the maximal eigenvalue statistic test. In models where cointegration is found, each variable is tested for weak exogeneity to determine their endogeneity status. The I-S model specification in Equation 5.5 requires that the model is normalised on investment if investment is found to be endogenous. However, if investment is exogenous but the saving variable is endogenous, then the model is normalised on the saving variable to obtain the long-run parameters.

Table 5.9 reports the results of the cointegration analyses and the exogeneity tests. The table also reports the VAR order (k), the trend assumption (A), and the residual diagnostic test results. Overall, the results in Table 5.9 show that all the pairs of variables in the models are cointegrated except the model with gross domestic saving (GDS) in Lesotho. Also, though the evidence is not strong, in Lesotho the model with gross national saving (GNS), where cointegration is found investment is exogenous while the GNS appears to be endogenous. For Botswana, South Africa and Swaziland, investment is endogenous in all the models. In Botswana and Swaziland, the GDS and GNS respectively are endogenous. In South Africa, the null hypothesis of weak exogeneity is rejected for the two saving ratios, hence they are also endogenous. In line with Equation 5.5 above, the subsequent analysis focuses on the models that are normalised on investment.

Overall, the results appear to be consistent with the theoretical expectation that South Africa would have a higher I-S correlation than the other SACU countries. The results are also consistent in confirming that the smaller SACU countries are more integrated given their low I-S correlation. The I-S correlations for Botswana are 0.27 and 0.30 for GDS and GNS and for Swaziland they are 0.09 and 0.46. Strikingly, the two coefficients in Botswana and the coefficient of GNS in Swaziland all have negative signs. A negative coefficient of savings in the I-S model suggests that an increase in saving rate causes domestic investment to fall. Though some other studies (such as Lemmen and Eijffinger, 1998) have found a negative coefficient, no explanation for the negative coefficient was provided. Intuitively, an increase in saving rate should cause domestic investment to increase, since according to the Mackinnon-Shaw hypothesis, prior saving is needed to promote domestic investment and growth (Mackinnon, 1974 and Shaw, 1973). Nevertheless, a negative relationship is not impossible, especially in an open economy such as Botswana and Swaziland. A possible explanation is that, in an open economy where capital is allowed to flow freely across international borders, domestic saving may flow into foreign markets without offsetting inflows from the rest of the world. If such outflows reach a level where domestic investors are denied essential capital for investment, domestic investment may decrease even though domestic saving may remain high. This may explain the situation in Swaziland where, as noted earlier, domestic bank credit has decreased faster than bank deposit liabilities and aggregate external liabilities have continued to decrease while aggregate external assets have continued to increase (see Tables 5.1 and 5.2 above). Thus, Swaziland is a typical case where financial openness permits capital outflows without offsetting inflows, thereby restricting domestic investment.

The imbalance in external capital flows may also partly explain the negative coefficients of I-S model in Botswana, since, as shown in Table 5.2 above, the external liabilities have continued to decline while the external assets have increased over time. This might have affected the amount of capital available for domestic investment. However, in addition to this, the negative coefficient may partly be due to inefficiency in the allocation of domestic saving, especially through the banking system. While the evidence, as reported in Table 5.1, suggests that credit to the private sector by banks has increased moderately, however, much of the credits are increasingly shifting to household (consumption) rather than business finance. Given that most of the household consumption is imported goods with virtually no value added in Botswana, such credit would have no real positive effect on domestic investment.

Lastly, for South Africa, the I-S correlations are 0.90 and 0.98 for GDS and GNS. With the values of the β coefficient close to one, South Africa appears to have a very low level of integration. This is not surprising given the history of South Africa with a period of sanctions and isolation which make the economy to be closed. It may also reflect the effect of capital control regime pursued during the 1980s up to the early 1990s before the end of the apartheid regime in South Africa. Nevertheless, given the evidence presented earlier in this chapter that shows increasing integration (see Section 5.2.2), it is likely that the coefficient would lower if one were to estimate a model for the recent period.

Lemmen and Eijffinger (1998:9-10) suggest a number of other reasons why savings and investment ratios may be correlated even in the presence of perfect capital mobility. One such reason that may be applicable to South Africa is the effect of the size of the country. They argue that in small, less diversified countries saving and investments shocks do not balance each other and therefore raise the need to borrow from abroad. But, as a country becomes larger it also becomes more diversified and thus reduces the need to borrow from abroad in the event of shocks. Therefore, I-S correlation will be lower in small countries than in large countries. Hence, the high I-S correlation in South Africa may arguably be a reflection of a more diversified economy. Notably, Lemmen and Eijffinger (1998:19, 25), using cointegration analysis, also found very high β coefficients for many of the OECD countries such as Austria (0.91 for 1960-1993 and 1.23 for 1979-1993), Finland (0.92 for 1960-1993 and 0.86 for 1979-1993) and France (0.92 for 1970Q1-1994Q4 and 1.02 for 1979Q1-1994Q4). As their results show, the coefficients are still very high after the formation of the EMS in 1979 when capital flows presumably increased among the countries.

In summary, given the low β for the smaller SACU countries, the I-S correlation analysis further confirms that the SACU countries are highly integrated. However, the nature of their external integration seems to be discouraging domestic investment.

Table 5.9: Saving-Investment correlation model 1970-2005

	Obs	K	A	Trace		Max		Exogeneity							
				$r = 0$	$r \leq 1$	$r = 0$	$r = 1$	I/Y	S/Y	Intercept	B	R^2	ECM	S.Cor	Het
Botswana															
GDS	33	2	3	23.2[0.00]	1.87[0.17]	21.3[0.00]	1.87[0.17]	24.6[0.00]	4.11[0.04]	-38.18	-0.27(-5.30)[a]	0.62	-0.35(-5.87)[a]	5.22[0.27]	15.9[0.60]
GNS	33	2	3	25.9[0.00]	1.41[0.23]	24.5[0.00]	1.41[0.23]	27.6[0.00]	0.37[0.54]	-39.67	-0.30(-3.13)[a]	0.67	-0.34(-6.47)[a]	6.86[0.14]	13.2[0.78]
Lesotho															
GNS	32	3	2	22.0[0.03]	7.63[0.10]	14.4[0.09]	7.63[0.10]	0.45[0.50]	0.82[0.36]	-1.071	**0.69(2.24)[b]**	0.18	-0.28(-2.04)[b]	4.09[0.39]	34.4[0.26]
South Africa															
GDS	34	1	3	20.6[0.00]	0.65[0.42]	19.9[0.01]	0.65[0.42]	5.78[0.02]	12.6[0.00]	1.45	0.90(9.06)[a]	0.18	-0.21(-2.39)[b]	4.41[0.35]	24.1[0.15]
GNS	32	1	3	21.5[0.01]	0.66[0.42]	20.8[0.00]	0.66[0.42]	7.14[0.01]	12.5[0.00]	0.283	0.98(9.24)[a]	0.22	-0.22(-2.69)[b]	6.54[0.16]	21.9[0.24]
Swaziland															
GDS	32	3	2	22.4[0.02]	5.00[0.28]	17.4[0.03]	5.00[0.28]	3.35[0.07]	0.52[0.47]	-21.57	0.09(0.59)	0.16	-0.46(-2.87)[a]	3.94[0.41]	21.2[0.88]
GNS	29	2	4	31.3[0.01]	10.6[0.10]	20.8[0.03]	10.6[0.10]	6.62[0.01]	4.52[0.03]	-44.94	-0.46(-3.12)[a]	0.28	-0.74(-3.72)[a]	2.38[0.67]	16.8[0.53]

Note: For values in bold, the dependent variable for the model is normalised on the saving ratio, while for the unbolded values the model is normalised on the investment ratio. GDS is the ratio of gross domestic saving and GNS is the ratio of gross national saving to GDP.
Parentheses [ ] are used to denote probability value, and ( ) represent t-values; a and b represent 1% and 5% significance levels respectively; k is the VAR Order as selected by an appropriate information criterion;
A is the deterministic trend assumption: (2) The level data X has no deterministic trend and the cointegrating equations have intercepts; (3) The level data X has linear trends, but the cointegrating equations have only intercepts; (4) Both the level data X and the cointegrating equations have linear trends.

Source: Computed by author.

5.5 SUMMARY AND CONCLUSION

This chapter sets out to examine the degree of financial integration in each of the SACU countries and to investigate the extent to which the smaller SACU countries are integrated with South Africa. The study employed a battery of tests based on three broad categories of outcome-based measures of financial integration with a view to arriving at a robust conclusion about the nature of financial integration among the SACU countries. The broad categories of outcome-based measures explored are the stock of capital, price (return)-based measures focusing on the behaviour of interest rates, and the investment-saving correlation in the countries.

Overall, the analyses in this chapter provide very strong evidence that individually the financial and monetary sectors of the SACU countries are becoming increasingly integrated. The results are also rarely unambiguous in confirming the dominant role of South Africa in SACU and indicate a hierarchy of integration of the financial systems of each member state with that of South Africa, with Namibia at the top, followed by Swaziland, then Lesotho and Botswana at the bottom.

More specifically, based on the analysis of the stocks of foreign assets and liabilities of domestic banks in the countries, the study first shows that the banking sectors have become more integrated as suggested by the increasing stock of capital. The indicators used also highlight a clear asymmetry in the stock of capital among the banks in the SACU countries. Even though the indicators did not specifically capture the actual capital flows across banks in the SACU countries, combining them with the pattern of financial development indicators as well as interest rate spread analysis conducted, suggest that the flows significantly favour South Africa, followed by Namibia more than the other countries.

Second, the analysis of the composition of the stock of external assets and liabilities also reveals that some shifts in the components of assets and liabilities have occurred in the SACU countries.

The third category of indicators used are based on asset prices (returns) focusing on the behaviour of interest rates in the countries. Both cointegration analysis based on the Johansen maximum likelihood approach and principal component analysis further explore the extent of integration based on the behaviour of interest rates. A primary concern using the cointegration method was to analyse the extent of interest rate pass-through from South Africa to the other members of SACU vis-à-vis domestic pass-through. The pass-through analysis helps to determine the degree of financial and monetary autonomy and interdependence between South Africa and the other SACU countries. Similarly, the PCA helps to explore the extent of financial integration among the SACU countries. The interest rate analysis confirms that the SACU countries are financially integrated and highlights two key features of their integration.

First, the results based on the interest rate analysis confirm the dominant role of South Africa in SACU. This suggests that if monetary unification is to be pursued, with the SARB and the rand being the sole central bank and currency respectively for the countries, monetary policy transmission would likely become more effective in each country. However, an important qualification to this assertion is that the extent to which a monetary union will help to improve the domestic monetary transmission mechanism will vary from country to country and depends on the prevailing situation in each country. For countries with a relatively inefficient domestic monetary policy transmission, such as Botswana, Lesotho and Swaziland, it is not likely that a single central bank will worsen the transmission of monetary policy in such countries. Indeed, for Botswana and Lesotho, the results suggest that there would be a significant improvement. In a country like Namibia, where the domestic policy seems to be more effective, a single central bank may slightly slow down the monetary transmission in the country. However, this should not be a major cause for concern since the pass-through from SARB to Namibia is also very high (97%).

Second, the results suggest that the prevailing integration between the financial systems stems from both policy convergence and market convergence. Policy convergence refers to the response of interest rates (BR, DR, LR, MMR and TBR) in the other SACU countries to changes in the official rate in South Africa and the response of market rates

(DR, LR, MMR and TBR) to their corresponding counterpart rates in South Africa is referred to as market convergence. However, the evidence suggests limited arbitrage activities between the countries, which might result both from weak institutional development and limited investment opportunities and inability of investors to explore such opportunities in the smaller countries.

Lastly, the analysis of the I-S correlation further confirms that the smaller SACU countries are highly integrated. However, the nature of their external integration seems to be discouraging domestic investment. This is also inline with composition of stocks of capital, which is skewed towards accumulation of foreign assets rather than foreign liabilities.

Chapters 7 and 8 will examine the effects of the growing *de facto* financial integration and its components on the level of financial development and economic performance. The chapters also focus attention on the question of whether or not countries that are more integrated with South Africa gain more from the integration process than those that are less integrated.

Appendix A-5

Appendix A-5.1: Unit root tests

This study uses the modified Dickey-Fuller (DF) test, based on generalised least squares (GLS) detrending series (commonly called the DF-GLS test), as proposed by Elliot *et al.* (1996) and the Ng and Perron (2001) tests for unit root. In contrast to the standard Dickey-Fuller and Philip-Perron (PP) tests commonly used, which have been criticised for their poor size and power properties, Elliot *et al*. (1996) have shown that the DF-GLS test has good size and power properties. Similarly the Ng and Perron (2001) test, which is another modification to the standard argument Dickey-Fuller (ADF) test, has good size and power properties (Rapach and Weber, 2004:411). The poor size and power properties refer to the tendency to over-reject the null hypothesis of non-stationarity when it is true and under-reject it when it is false. See Harris (1995:39) for a detailed discussion of these problems as they relate to ADF and PP unit root tests. In both tests the unit root hypothesis is tested against the alternative of no unit root.

Appendix A-5.2: The cointegration and error correction framework

This box describes the maximum likelihood based on the Johansen bi-variate cointegration test. Here a pair of variables is used to illustrate its application. The same principle will be applied when the test is used elsewhere in this study. A multivariate version of the procedure is described in Chapter 6.

Following the practice in standard econometric literature, a typical $VAR(k)$ model can be represented as:

$$\Delta X_t = \Pi X_{t-1} + \sum_{t=i}^{k} \Gamma_i \Delta X_{t-i} + \varepsilon_{k\,t} \qquad \text{(A5.1)}$$

where $X_t = (X_{1t}, X_{2t})$ is an 2x1 vector of $I(1)$ variables, ΔX_t are all $I(0)$, Γ_i are 2x2 coefficient matrices; ε_{kt} are normally and independently distributed error terms; and $\Pi = 0$ if there is no cointegration.

$\Delta X_t ... \Delta X_{t-k+1}$ are all $I(0)$, while X_t is $I(1)$. In order for Equation A5.1 to be consistent, Π_i would not be of full rank, i.e. equal to 2 in the bi-variate model. Assume that its full rank is n (=2 in a two-variate case) and its reduced rank r, if r = 2, then the variables in X_t are $I(0)$, while if the rank of Π_i = 0, then there are no cointegrating relations (Harris, 1995:79). Usually Π_i has a reduced rank, that is $r \leq (n-1)$, in which case it can be decomposed as:

$$\Pi_i = \alpha\beta' \qquad \text{(A5.2)}$$

where α is a $n \times r$ matrix and β' is a $r \times n$ matrix. Then $\beta' X_{t-1}$ are the r cointegrated variables, β' is the matrix of coefficients of the cointegrating vectors, i.e. the long-run coefficients, and α has the interpretation of the matrix of error correction terms. This is Granger's representation theorem.

The rank of the matrix Π_i and the number of cointegrating relation(s) will be determined using the two commonly used likelihood ratio (LR) test statistics, proposed by Johansen (1988), i.e.: the trace statistic (λ_{trace}) and the maximal eigenvalues ($\lambda_{\max}$) with their test statistics given respectively as follows:

$$\lambda_{trace} = -T \sum_{i=r+1}^{n} \log(1 - \hat{\lambda}_i) \qquad \text{(A5.3)}$$

$$\lambda_{\max} = -T \log(1 - \hat{\lambda}_{r+1}) \qquad \text{(A5.4)}$$

where λ_i is the $i-th$ largest eigenvalue of the Π_i matrix in Equation A5.2. The tests will be conducted both under the null hypothesis that r = 0 and then that r = 1. Following Haug *et al*. (2000:424) we employed p-values to test for cointegration and the null hypothesis is tested sequentially from low to high values of r. The testing in the sequence ends when the null hypothesis is not rejected for the first time.

Once cointegration is found among the variables, the next step is to place a normalisation restriction to identify the true cointegrating vector (Luintel and Khan, 1999). Following Arestis and Demetriades (1997), each vector will be normalised on the variable for which clear evidence of error correction is found. Consider our bi-variate VAR model using (X_{1t}) and (X_{2t}), and assuming the tests suggest one cointegrating relation, the normalisation restriction, $\beta_{11} = 1$, is used thus:

$$\begin{pmatrix} \Delta X_{1t} \\ \Delta X_{2t} \end{pmatrix} = \begin{pmatrix} \alpha_{11} \\ \alpha_{12} \end{pmatrix} \begin{pmatrix} 1 & \beta_{12} \end{pmatrix} \begin{pmatrix} X_{1t-1} \\ X_{2t-1} \end{pmatrix} \qquad \text{(A5.5)}$$

Given the objective of the study, the inclination would be to normalize on X_{1t} as in Equation A5.5, if the corresponding loading factor, α_{11} is negative and significant.

If an economically meaningful cointegrating relation is established, it would also be interesting to know the direction of causation between the two interest rates. Several causality test methods exist and the choice of a particular method depends on whether the time series are stationary or not, and if non-stationary, whether they are cointegrated or not. For stationary series, the standard Granger causality test would be applicable, while for non-stationary but non-cointegrated series, the Granger causality test would be applied to the series in first difference (Demetriades and Hussein, 1996). In the case of cointegrated series, several authors (cf. Hall and Wickens, 1993; Hall and Milne, 1994; Toda and Phillips, 1993 and Luintel and Khan, 1999) have proposed the test for causality in an ECM framework. Following Hall and Milne (1994) and Luintel and Khan (1999), the notion of a weak exogeneity test suggested by Johansen (1992a) is used to test for long run causality between the variables[26]. A variable is said to be weakly exogenous if the error correction term is statistically insignificant in the relevant equation, in which case the variable is not adjusting to the long-run equilibrium path (Boulila and Trabelsi, 2003:12). This is tested by placing a zero restriction on the column of α_i, *i.e.* Ho: α_i = 0, in the matrix $\Pi_i = \alpha\beta'$ (Equation A5.2 above).

Using the example above, if the null hypothesis that $\alpha_{12} = 0$ is rejected, then X_{1t} is not weakly exogenous in the vector, implying that X_{2t} does Granger cause X_{1t} in the long run. Similarly, rejection of the null hypothesis that $\alpha_{11} = 0$ means that the SARB rate is

[26] A similar application of the test in the finance-growth relationship can be found in Demetriades and Hussein (1996) and Arestis and Demetriades (1997).

not weakly exogenous, thus the X_{1t} Granger causes X_{2t}. However, a non-rejection of $\alpha_{11} = 0 \cap \alpha_{12} = 0$ implies an independent relationship between the two interest rates. A similar procedure will be followed in testing all the pairs of interest rates in the SACU and other bi-variate analysis in this study.

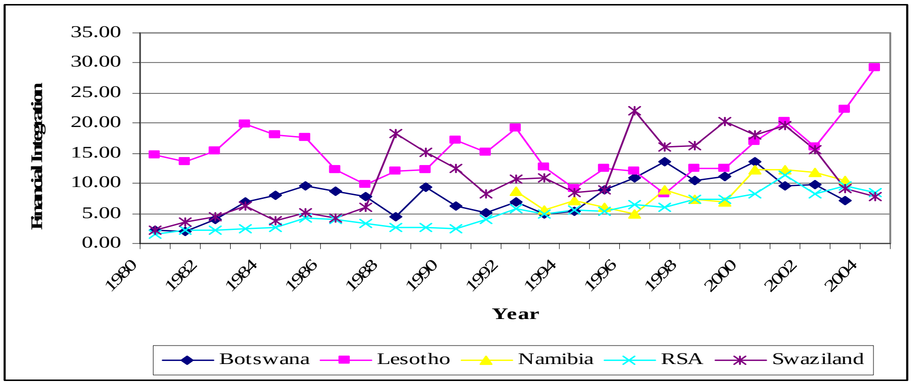
Table A-5.1: Unit Root Tests Results

			BR	DR	LR	MMR	TBR	INV	GDS	GNS
Botswana										
	Level	Intercept	0.1	-0.64	0.26			0.79	-0.44	-1.45
		Intercept & Trend	-1.07	-1.23	-1.12			-2.99^{c}	-3.24^{b}	-3.13^{c}
	1st Diff	Intercept	-14.9^{a}	-7.85^{a}	-12.8^{a}			-0.13	-1.24	-4.13^{a}
DF-GLS		Intercept & Trend	-15.0^{a}	-7.92^{a}	-12.9^{a}			-1.62	-4.07^{a}	-5.58^{a}
	Level	Intercept	0.14	-1	0.3			0.54	-1.13	-3.09
		Intercept & Trend	-2.39	-3.31	-2.75			-9.39	-71.1^{a}	-11.26
	1st Diff	Intercept	-94.9^{a}	-49.9^{a}	-95.0^{a}			-3.64	-4.16	-10.64^{b}
NP		Intercept & Trend	-94.7^{a}	-51.2^{a}	-95.1^{a}			-0.03	-27.5^{a}	-13.81
Lesotho										
	Level	Intercept	-1.53	-0.42	-0.8		-0.36	-1.19	-1.27	-1.59
		Intercept & Trend	-2.36	-2.28	-2.29		-2.1	-1.60	-2.13	-1.75
	1st Diff	Intercept	-13.5^{a}	-15.9^{a}	-19.7^{a}		-2.96^{a}	-6.39^{a}	-6.04^{a}	-6.75^{a}
DF-GLS		Intercept & Trend	-13.5^{a}	-15.9^{a}	-19.8^{a}		-4.83^{a}	-6.75^{a}	-6.94^{a}	-7.55^{a}
	Level	Intercept	-5.6	-0.82	-2.5		-0.78	-1.80	-3.21	-3.91
		Intercept & Trend	-10.7	-9.87	-10.6		-8.52	-5.04	-5.14	-5.12
	1st Diff	Intercept	-95.5^{a}	-93.5^{a}	-84.1^{a}		-26.6^{a}	-17.3^{a}	-17.9^{a}	-15.8^{a}
NP		Intercept & Trend	-95.5^{a}	-93.4^{a}	-83.9^{a}		-44.9^{a}	-16.9^{c}	-16.7^{c}	-15.1^{c}
Namibia										
	Level	Intercept	-0.01	0.05	0.77	-0.45	-0.41			
		Intercept & Trend	-2.52	-1.64	-1.73	-1.89	-2.11			
	1st Diff	Intercept	-5.96^{a}	-10.5^{a}	-5.40^{a}	-8.37^{a}	-6.38^{a}			
DF-GLS		Intercept & Trend	-6.02^{a}	-10.5^{a}	-17.9^{a}	-9.61^{a}	-6.37^{a}			
	Level	Intercept	0	0.11	0.95	-1.11	-1.09			
		Intercept & Trend	-13.86	-5.48	-5.78	-7.34	-10.3			
	1st Diff	Intercept	-45.9^{a}	-86.8^{a}	-15.9^{a}	-60.4^{a}	-158.7^{a}			
NP		Intercept & Trend	-46.6^{a}	-85.2^{a}	-124.4^{a}	-72.4^{a}	-157.4^{a}			
South Africa										
	Level	Intercept	-0.15	-0.56	-0.72	0.13	-0.46	-1.20	-1.06	-1.18
		Intercept & Trend	-2.01	-2.72^{c}	-2.58	-1.79	-2.54	-2.38	-2.40	-2.60
	1st Diff	Intercept	-9.60^{a}	-3.18^{a}	-6.59^{a}	-1.84^{c}	-8.38^{a}	-3.59^{a}	-5.20^{a}	-5.12^{a}
DF-GLS		Intercept & Trend	-9.66^{a}	-4.89^{a}	-6.63^{a}	-3.58^{a}	-8.42^{a}	-3.98^{a}	-5.87^{a}	-5.87^{a}
	Level	Intercept	-0.33	-1.15	-2.24	0.2	-1.13	-2.64	-2.79	-3.25
		Intercept & Trend	-8.46	-15.6^{c}	-14.8^{c}	-6.24	-13.03	-12.9	-6.93	-7.88
	1st Diff	Intercept	-84.2^{a}	-20.8^{a}	-59.3^{a}	-9.47^{b}	-75.2^{a}	-13.2^{b}	-16.2^{a}	-15.6^{a}
NP		Intercept & Trend	-84.5^{a}	-39.8^{a}	-59.9^{a}	-29.2^{a}	-75.7^{a}	-14.7^{c}	-16.9^{c}	-16.8^{c}
Swaziland										
	Level	Intercept	-1.49	-0.81	-1.53	-0.68	-1.41	-2.18	-1.51	-1.68
		Intercept & Trend	-1.75	-1.43	-1.68	-1.56	-1.77	-2.72	-1.80	-2.74
	1st Diff	Intercept	-5.30^{a}	-11.1^{a}	-7.21^{a}	-12.9^{a}	-3.65^{a}	-4.37^{a}	-5.65^{a}	-3.22^{a}
DF-GLS		Intercept & Trend	-5.38^{a}	-11.2^{a}	-7.31^{a}	-13.0^{a}	-13.9^{a}	-4.62^{a}	-5.73^{a}	-5.93^{a}
	Level	Intercept	-6.58^{c}	-2.43	-6.34^{c}	-1.85	-4.72	-168^{a}	-3.54	-3.80
		Intercept & Trend	-7.73	-4.68	-7.1	-5.13	-6.34	-117^{a}	-5.61	-97.9^{a}
	1st Diff	Intercept	-37.3^{a}	-91.4^{a}	-62.7^{a}	-95.2^{a}	-21.6^{a}	-301^{a}	-17.7^{a}	-352^{a}
NP		Intercept & Trend	-38.4^{a}	-91.6^{a}	-63.8^{a}	-95.2^{a}	-91.6^{a}	-441^{a}	-17.4^{b}	-15.3^{c}

Note: a, b, c – significant at 1%, 5% and 10% respectively. The NP statistic was based on the quadratic spectral kernel and the Andrews (1991) automatic bandwidth selection procedure. Both the DF-GLS and Ng and Perron tests were carried out with intercept and linear trend.

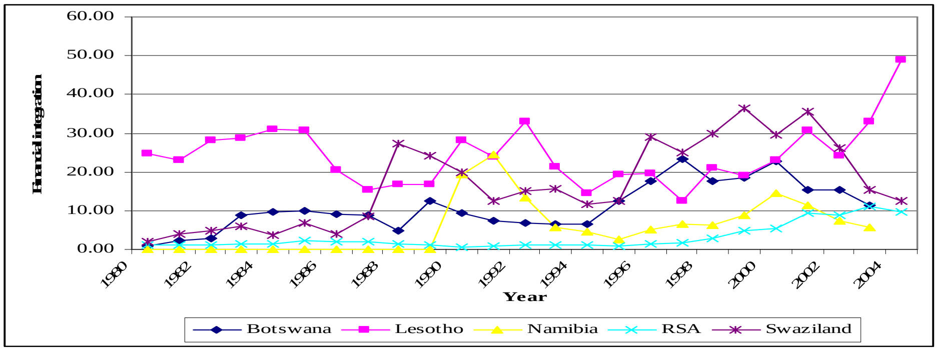
Source: Computed by author.

Figure A-5.1: Sum of foreign assets and liabilities as percent of total assets and liabilities of banks: 1980-2004



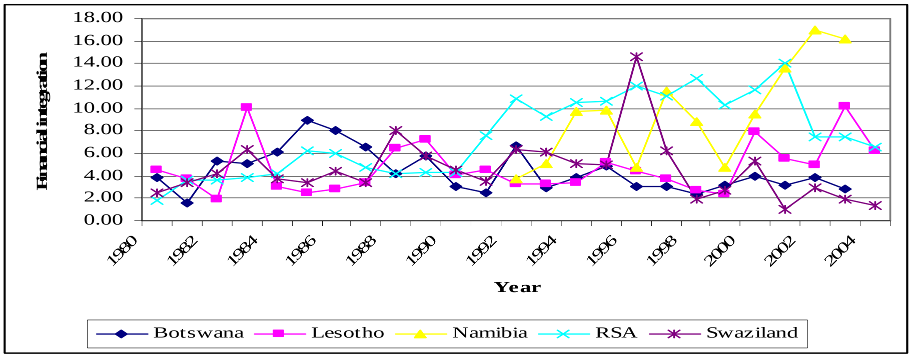
Source: Computed based data from IMF International Financial Statistics CD-ROM

Figure A-5.2: Foreign asset of banks as percent of total assets of banks: 1980-2004



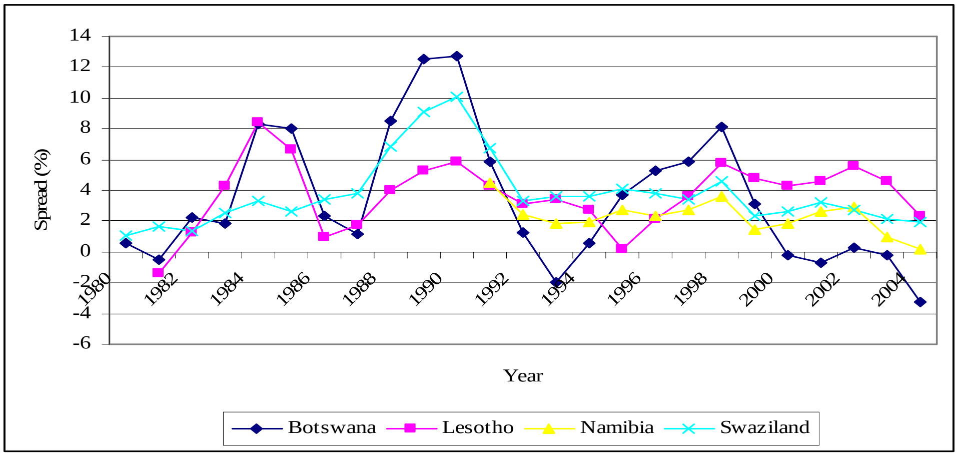
Source: Computed based data from IMF International Financial Statistics CD-ROM

Figure A-5.3: Foreign liabilities of banks as percent of total liabilities of banks: 1980-2004



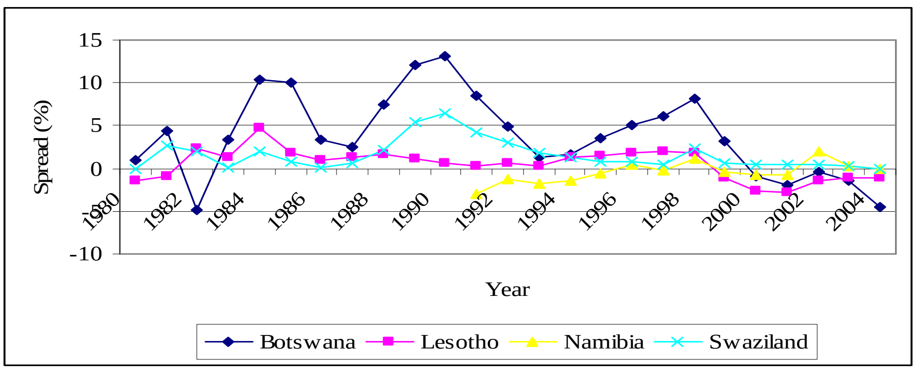
Source: Computed based data from IMF International Financial Statistics CD-ROM

Figure A-5.4: Deposit rates spread between South Africa and other SACU countries: 1980-2004



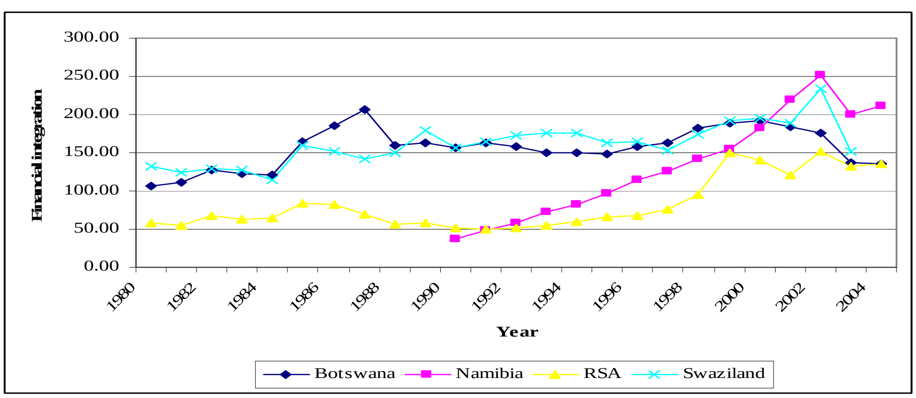
Source: Computed based data from IMF International Financial Statistics CD-ROM

Figure A-5.5: Lending rates spread between South Africa and other SACU countries: 1980-2004



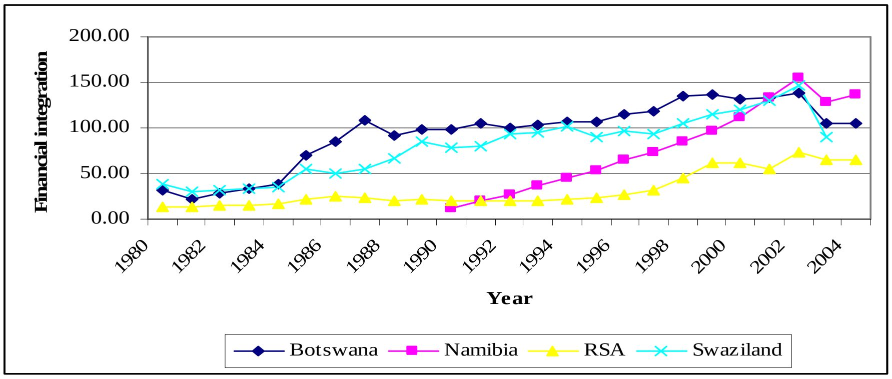
Source: Computed based data from IMF International Financial Statistics CD-ROM

Figure A-5.6: Total external assets and liabilities as a percent of GDP: 1980-2004



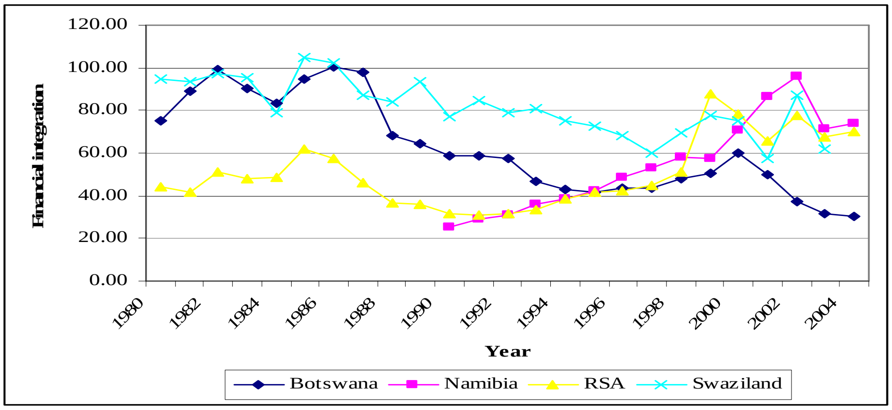
Source: Computed by author based on data from Lane and Milesi-Ferretti (2006)

Figure A-5.7: Total external assets as a percent of GDP: 1980-2004



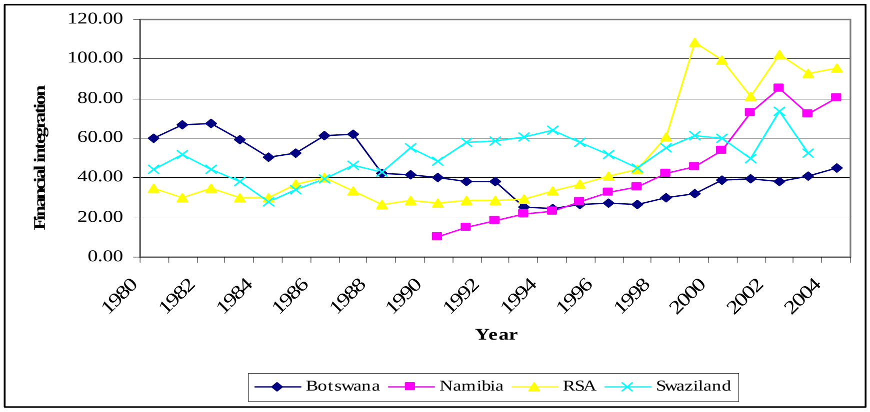
Source: Computed by author based on data from Lane and Milesi-Ferretti (2006)

Figure A-5.8: Total external liabilities as a percentage of GDP: 1980-2004



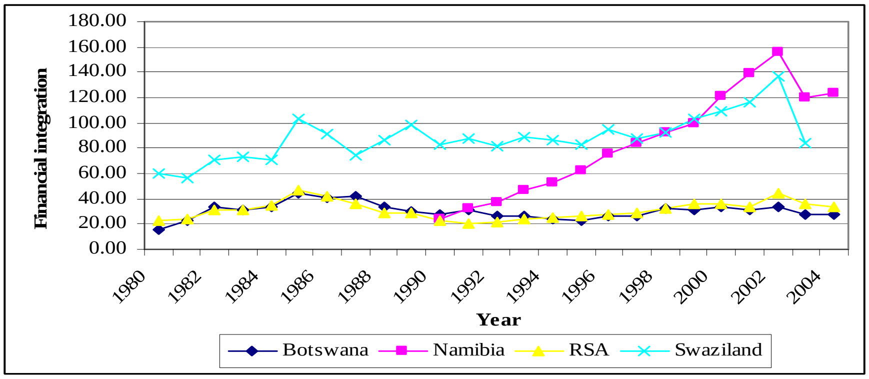
Source: Computed by author based on data from Lane and Milesi-Ferretti (2006)

Figure A-5.9: Total external equities as a percentage of GDP: 1980-2004



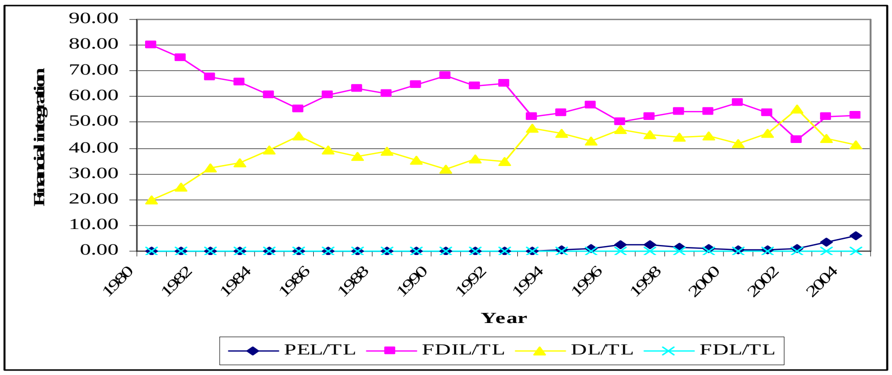
Source: Computed by author based on data from Lane and Milesi-Ferretti (2006)

Figure A-5.10: Total external debts as a percentage of GDP: 1980-2004



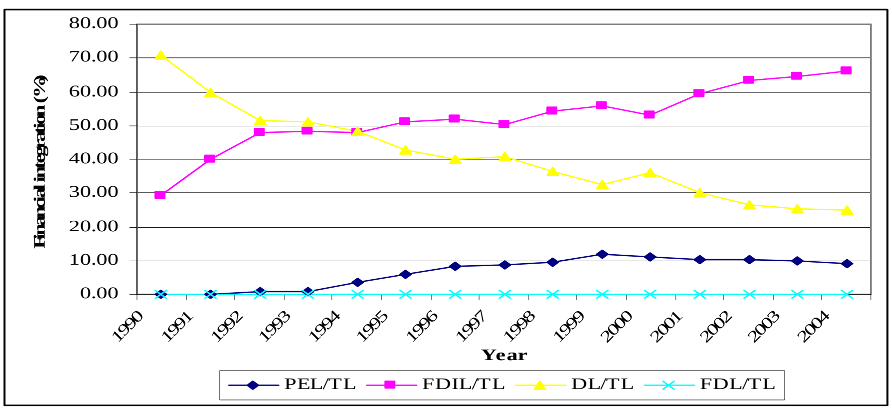
Source: Computed by author based on data from Lane and Milesi-Ferretti (2006)

Figure A-5.11: Composition of external liabilities in Botswana: 1980-2004 (%)



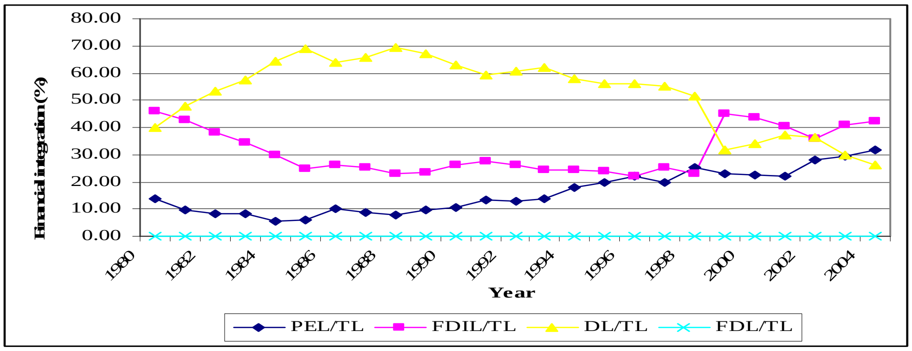
Source: Computed by author based on data from Lane and Milesi-Ferretti (2006)

Figure A-5.12: Composition of external liabilities in Namibia: 1990-2004 (%)



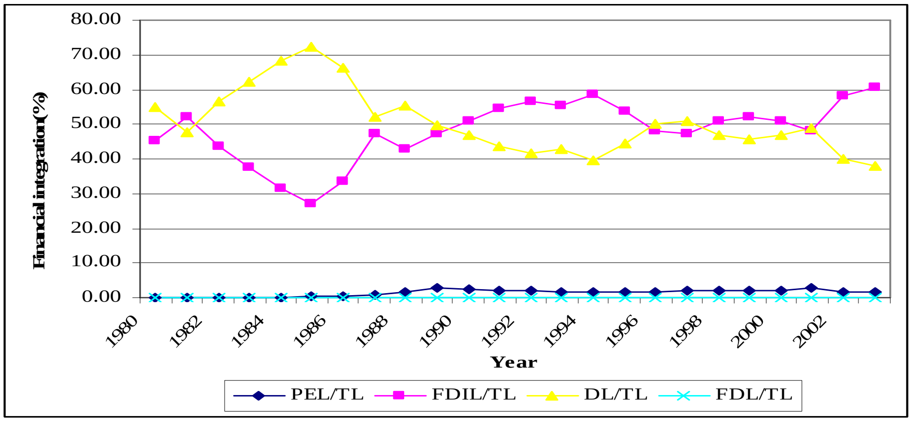
Source: Computed by author based on data from Lane and Milesi-Ferretti (2006)

Figure A-5.13: Composition of external liabilities in South Africa: 1980-2004 (%)



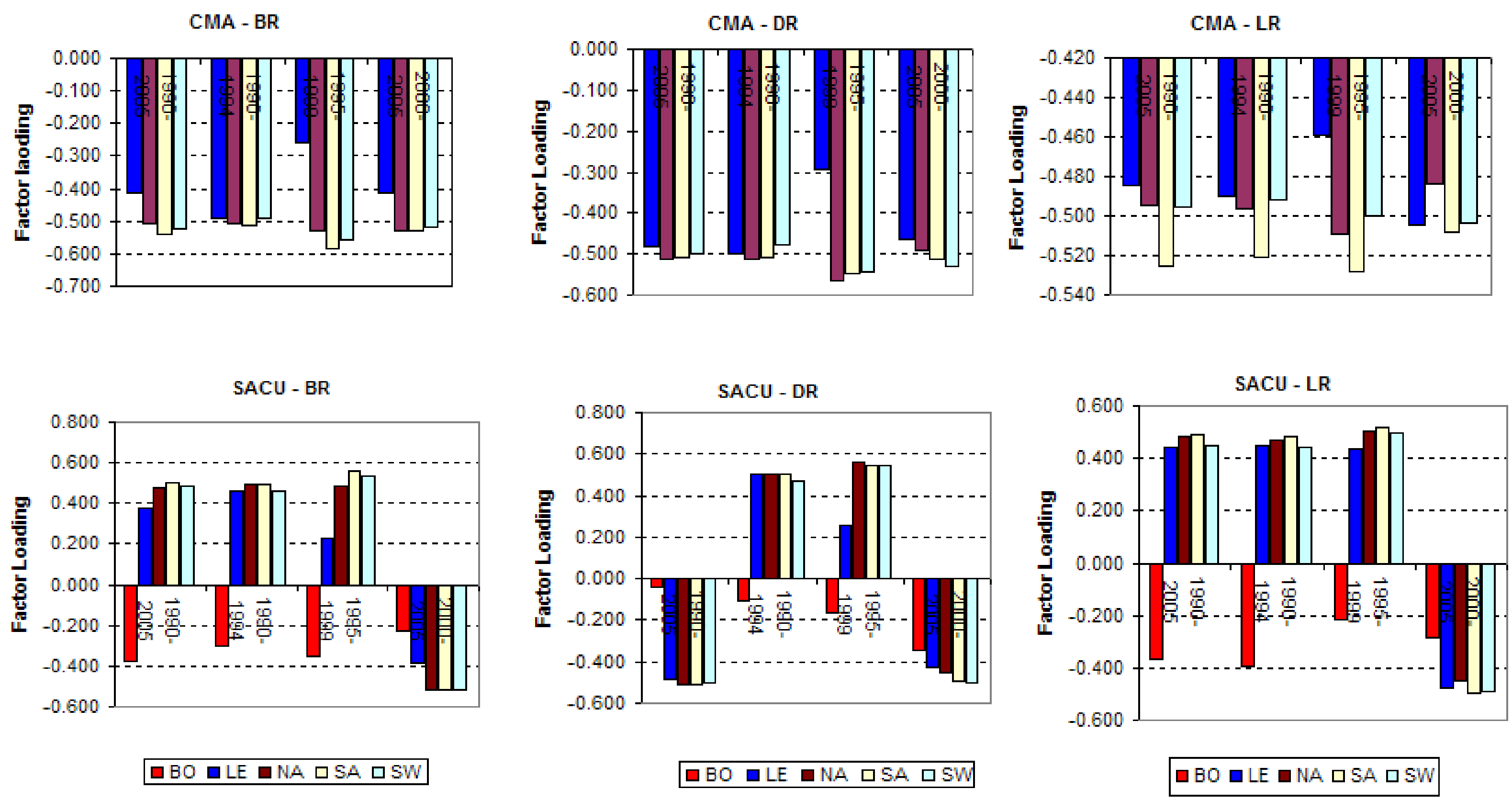
Source: Computed by author based on data from Lane and Milesi-Ferretti (2006)

Figure A-5.14: Composition of external liabilities in Swaziland: 1980-2004 (%)



Source: Computed by author based on data from Lane and Milesi-Ferretti (2006)

Figure A-5.15: Factor Loading of First PCs as Indicator of Financial Integration



Note: Definition of variables: BR –Bank rate, DR- Deposit rate and LR- Lending rate. The country abbreviations are respectively Botswana, Lesotho, Namibia, South Africa and Swaziland. The factor loadings are those of the first principal component.
Source: Based on author computer.

CHAPTER 6:

FINANCIAL DEVELOPMENT AND ECONOMIC PERFORMANCE OF SACU COUNTRIES: EMPIRICAL EVIDENCE

6.1 INTRODUCTION

As highlighted in Figure 6.1 below, this chapter explores empirically the relationship between financial development (FD) and the economic performance of the SACU countries.

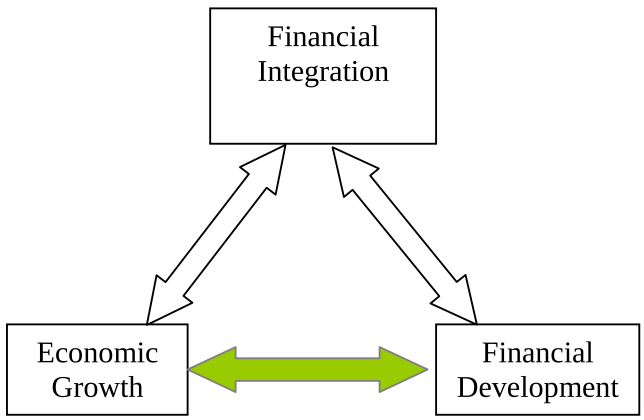


Figure 6.1: Structure of chapters

The theoretical and empirical literature reviewed in Chapter 2 highlight a number of issues for empirical modelling of the relationship between FD and economic performance. For instance, although the theoretical literature suggests overwhelmingly that a developed financial system will lead to economic growth; there are also some indications that under certain circumstances, such as when the income level is below a certain threshold, the effect may be negative.

Berthelemy and Varoudakis (1996:19) suggest that the causal relations between FD and economic growth may produce either a virtuous or vicious cycle, depending on the level of development of an economy. With a virtuous cycle, a high level of income may induce a high level of financial system development, which, in turn, may further stimulate economic growth. However, with a vicious cycle, a low level of income may prevent the development of the financial system which, in turn, may hinder economic growth. An underdeveloped financial system would be unable to perform effectively most of the desirable functions of a good financial system and hence lead to an inefficient productive structure if income is too low. Thus, in both scenarios, a two-way causality between FD and economic growth is expected, though with quite different results. Given the wide dispersion of *per capita* income and level of economic development in the SACU countries, the question arises whether the relationship between FD and growth has been similar or dissimilar for these countries.

From an empirical point of view the results remain mixed. The ambiguity, as shown in the literature review in Chapter 2, arises along three lines. First, the signs of the coefficient of FD are not uniform – while some are positive, others are negative. Secondly, for studies that obtained the same sign on the coefficient of FD, the magnitude of the coefficient and its significance vary. Thirdly, the causality results are mixed, ranging from those that obtained no evidence of causality to those that found two-way causality; while in between there are those that found one-way causality that either runs from finance to growth or *vice versa*.

The few time-series country-specific studies results also underscore the limitation of cross-country or panel data techniques in analysing the relationship between FD and economic growth among different countries. One such weakness is the inability of the cross-country or panel data techniques to account for the possible endogeneity of FD in the growth model. Indeed, some time-series studies reviewed in Chapter 2 show that causality could run from economic performance to FD. Further, the fact that cross-country or panel data studies have difficulty in accounting adequately for heterogeneity among the countries being studied represents a major limitation of such studies.

Finally, the different, and sometimes inconsistent, results achieved with alternative measures of FD highlights the importance of using different proxies of FD in a study such as this.

The task in this chapter is to adopt an appropriate empirical framework that will help to address these issues so as to obtain robust results on the relationship between FD and economic performance for each of the SACU countries. The specific issues that are addressed in this chapter are:

i. The issue of whether, how and to what extent FD contributes to the growth process in each of the SACU countries and, as a corollary, to what extent economic growth affects the development of their financial system.
ii. To determine whether the growth effect of FD is robust after controlling for other growth determining variables. Note that the concern here is not to assess the effects of the other determinants on growth *per se*.
iii. To determine the nature of the causal relationship between finance and economic performance.

Following Bloch and Tang (2003), Luintel and Khan (1999), Arestis and Demetriades (1997), Demetriades and Hussein (1996) and Murinde and Eng (1994), this study adopts a country-specific time-series framework. This is based on cointegration and an error correction modelling framework for each of the countries.

6.3 ANALYTICAL FRAMEWORK

Traditionally, empirical studies investigating the relationship between economic performance and financial development (FD) regress a measure of economic performance (LPY) on FD along with other control variables (CV), i.e. $LPY = F(FD,\ CV)$, (cf. Aziakpono, 2005a, b; Luintel and Khan, 1999; Agung and Ford, 1998; Demetriades and Hussein, 1996; Lyons and Murinde,1994; Murinde and Eng, 1994; Wood, 1993; King and Levine, 1992, 1993a, b; Roubini and Sala-I-Martin, 1992; Odedokun, 1989; Jung, 1986). Similarly, models of FD seeking to explain its behaviour often regresses FD on a measure of economic performance along with other control variables, thus: $FD = F(LPY, CV)$ (cf. Aziakpono, 2004a, b; Rother, 2001 and Garcia and Liu, 1999). Thus, given the focus of this study, it is convenient to describe the structure of the model using a vector autoregressive (VAR) and error correction model framework in which the variables (LPY, FD and CV) enter as dependent variables. In what follows the chapter first focuses attention on the variables and their measurement, and then describes the econometric procedure used for the estimation.

6.2.1 Measuring financial development and economic performance

As the review in Chapter 2 shows, several measures of FD have appeared in the literature. Because of data availability and to conform to the practice in many studies to facilitate comparison of results, this study employs two indicators of FD (cf. McKinnon, 1973; King and Levine, 1993a and 1993b; Demetriades and Hussein, 1996; Levine, 1998; Levine and Zervos, 1998a; Luintel and Khan, 1999 and Levine, Loayza and Beck, 2000). These are FDC (the ratio of credit extended to the private sector by commercial banks to nominal GDP) and FDL (the ratio of liquid liabilities of commercial banks to nominal GDP, where liquid liabilities equal demand deposit plus time and savings deposits). Besides the fact that both indicators are frequently used in empirical studies and are well based on theory, the availability of comparable data for the indicators in SACU countries also led to their choice. The variables are transformed into log forms, where LFDC and LFDL are the corresponding log forms of each of the two measures of financial development.

Basically, the two indicators focus on the development of the banking sector. A potential weakness of the two indicators of FD is that they do not capture FD taking place outside banks. Other aspects of the financial system include equity and bond markets and other non-bank financial institutions such as insurance companies, building society etc. By issuing bonds and equities and selling them directly to the public, enterprises can attract capital for investments; at the same time households receive an opportunity to store wealth. As Levine (1997:712-713) has shown, the degree of development of stock and bond exchanges would usually contribute to the depth of the financial system. However, given the underdeveloped nature of these institutions in most developing countries (including the SACU countries, with the exception of South Africa), it can be argued that their exclusion is unlikely to affect the results significantly (Rother, 2001:84). The impact of non-bank financial intermediaries, such as building societies and insurance companies, which also provide some financial intermediation, is also not captured. However, their importance for financial development appears low, as they usually do not provide insurance against the liquidity risk of depositors. Moreover, as Rother (2001:85) argues, the contributions to economic growth of these institutions in their role as financial intermediaries appear limited, especially in developing countries.

In the case of South Africa where the stock and bond markets as well as the non-bank financial institutions are well developed, the use of the bank-based measures of financial development may under estimate the level of financial development in the country. However, to be consistent with the other countries of SACU, the analysis uses the same indicators.

The measure of economic performance in the literature is less controversial than that of FD, but nonetheless not unique across studies. Two broad categories of proxies for economic performance are common – those based on growth rates such as growth of *per capita* GDP (cf. King and Levine, 1992; Jung, 1986), growth of real GDP itself (Wood, 1993) or total productivity growth (King and Levine, 1993b; 1993c), and those that use level series such as the level of *per capita* GDP (cf. Demetriades and Hussein, 1996; Arestis and Demetriades, 1997; Luintel and Khan, 1999), or real GDP (Murinde and Eng, 1994) or an index of industrial production (Gupta, 1984). In general, and in line with empirical growth literature, cross-country and panel data studies tend to use growth in *per capita* GDP or other forms of growth rate proxies (Barro and Sala-I-Martin, 1995; Levine and Renelt, 1992; Barro, 1991). The use of the level series is most common in time-series studies.

In line with standard practice in most time-series studies (cf. Demetriades and Hussein, 1996; Arestis and Demetriades, 1997; Luintel and Khan, 1999), this study uses the level of *per capita* real GDP as a measure of economic performance among the SACU countries and it is calculated as a ratio of real GDP to the total population of each country. The variable is also expressed in log form.

6.2.2 Control variables

A review of the empirical growth and FD studies suggest the following control variables: inflation as a measure of macroeconomic stability or monetary policy, trade openness measured as the sum of export plus import over GDP, the spread between lending and deposit rates as a measure of the efficiency of financial intermediation, a measure of human capital development such as primary or secondary school enrolment, population growth, the ratio of domestic investment to GDP and the ratio of government expenditure to GDP as well as the measure of financial integration (cf. Barro, 1991; Levine and Renelt, 1992; Quinn, 1997; Klein and Olivei, 1999; Edison *et al.*, 2002). Growth theory suggests a positive relationship between education and economic growth (see Barro, 1991).

For the purpose of this study, where data is available, the study, in addition to four measures of financial integration, uses five control variables: investment (INV), inflation (INF), trade openness (OPN), the interest rate spread (IRD) and government expenditure over GDP (GE). The four measures of financial integration that the study uses are LFDIL, LDL, LFIA and LFIL. LFDIL is the ratio of foreign direct investment liabilities to GDP; LDL is the ratio of total debt liabilities to GDP; LFIA is the ratio of foreign assets to total assets of the national banking sector and LFIL is the ratio of the foreign liabilities to total liabilities of the national banking sector. The control variables are chosen not only to conform to the standard practice in most previous studies, but also to avoid the measurement problems associated with some of the other control variables such as human capital. With the exception of financial integration variables, the following presents a brief discussion of the expected effects of each of the control variables and their measurement. The measures of financial integration are reserved for detailed description in Chapters 7 and 8 where the role of financial integration will be the focus.

i. Inflation

Several studies use the inflation rate and its volatility as indicators of macroeconomic stability (cf. Easterly and Rebelo, 1993; Fischer, 1993; Allen and Ndikumana, 1998; Garcia and Liu, 1999 and Levine *et al.*, 2000) or as a measure of monetary policy (cf. Kose *et al.*, 2006a). As noted by Garcia and Liu (1999:35), while a stable inflation may not represent much instability, a volatile inflation rate represents an unstable macroeconomic environment. High inflation could distort economic activity and reduce investment in productive enterprises, thus reducing economic growth.

However, the effect of inflation on FD is unclear. Because high inflation creates uncertainty about financial conditions even at short horizons, it could inhibit the development of the financial system. For instance, high inflation may lead to the disappearance of long-term contracts, while short-term contracts and highly liquid securities could emerge to hedge against inflation (De Gregorio, 1998:20). Though theoretical prediction is mixed, most empirical studies found a statistically significant negative relationship between inflation and financial market performance (cf. Garcia and Liu, 1999; Rother, 2001). Inflation is measured in this analysis as the percentage change in CPI (with 2000 as the base year).

ii. Government

Government expenditure is used as a proxy for the effect of fiscal policy. Government expenditure could reduce economic growth because of the crowding out effect on private investment and the inflationary pressures it can cause (Allen and Ndikumana, 1998). The size of government is measured as the percentage share of government expenditure to nominal GDP.

iii. Trade openness

The trade literature suggests a positive relationship between openness and growth. Similarly, the different financial services involved in international transactions may promote financial system development (De Gregorio, 1998:20). With regard to the smaller SACU countries, since much of their trade constitutes imports of finished consumer goods, especially from South Africa, with little or no value added in the domestic economy, trade openness may inhibit their growth. Similarly, domestic financial systems may be adversely affected if, in an attempt to ease the payment for imports, residents and firms in the BLNS choose to open accounts with banks in South Africa. The effect of international trade on growth and FD is captured by the openness variable, which is measured using three indicators: the sum of imports and exports as a percentage of nominal GDP (OPN), the ratio of export to GDP (OPE) and the ratio of import to GDP (OPM) (Levine *et al.*, 2000).

iv. Investment

Theoretically, investment should promote economic growth, and if such investment is financed through financial intermediaries, that should, all things being equal, also help to promote the development of the financial system. Most empirical studies have overwhelmingly confirmed a positive effect of investment on growth. For instance, of the 29 regression studies of the determinants of economic growth reviewed by Fagerberg (1994), 21 of the 23 that included investment found its coefficient to be positive and statistically significant. In the current study investment is measured as the ratio of gross fixed capital formation to GDP.

v. *Interest rate spread*

The interest rates on loans and deposits as well as the spread between them affect the demand for and supply of financial intermediation. On the demand side (both for loans and deposits by households and firms) the effect of interest rates on financial intermediation is ambiguous. On the one hand, the deposit rate is expected to have a positive impact on the level of deposits as financial saving becomes more attractive than non-financial savings, with higher interest rates. On the other hand, a high real interest rate is expected to have a negative effect on the demand for loans. Thus, the overall effect of the interest rate level on financial development is uncertain *a priori*, depending on the elasticities of demand and supply of deposit and loans. Nevertheless, the effect of the interest rate spread on the demand for financial intermediation should be negative, while the supply of financial intermediation is positively related to the interest rate spread. This study uses the spread between lending and deposit rates, where the deposit rate is the rate on 88-91 day notice fixed deposit and the lending rate represents the prime lending rates of major commercial banks.

6.2.3 Data scope and sources

Data for the model estimation covers the period 1970 to 2004, although, for many series, data was not available for the entire period. The series ranges from 29 to 34 continuous annual observations. See Table A-6.1 in the appendix to Chapter 6 for a detailed description of the data and coverage. Namibia is not included in this analysis because of limited observation. The 1970-2004 period has been chosen for the analysis because of data limitation. Specifically, the data used to measure financial integration obtained from the dataset on *External Wealth of Nations Mark II* by Lane and Milesi-Ferretti (2006) is only available for the period 1970-2004. Given the central role of financial integration in this study and to ensure comparability across models, the analyses in this chapter and the subsequent two chapters have been limited to this time period.

Though they have limited observations, annual series have been preferred in many empirical time-series studies of the finance-growth relationship (e.g. Demetriades and Hussein, 1996; Luintel and Khan, 1999), since they provide a more robust long-run relationship (Hakkio and Rush, 1991). The problems of limited observations have remained an issue for most time-series studies of the finance-growth relationship. Demetriades and Hussein (1996:396) included countries that have at least 27 continuous annual observations and, as shown in their results, in some instances, they included countries with as few as 23 observations (see Demetriades and Hussein 1996:405, Table 6). Similarly, Luintel and Khan (1999:386) use annual observations ranging from a minimum of 36 years to a maximum of 41 years.

With the exception of the inflation rates and interest rate spread, all the variables used for the models are transformed into natural logarithms. The data for total stock of external liabilities, FDI liabilities and debt liabilities are obtained from Lane and Milesi-Ferretti (2006) while the rest of the data is obtained from IMF IFS 2007 CD-ROM. The next section discusses the econometric procedure used in the subsequent analysis.

6.2.4 Econometric procedure

The empirical analysis employs a vector autoregressive (VAR) and error correction model framework based on the Johansen maximum likelihood approach. The analysis adopts a multivariate time-series analysis to avoid the problem of omitted variable bias associated with a bivariate model that could lead to erroneous causal inference (Luintel and Khan, 1999:385). However, considering the low degree of freedom due to the small sample size, the study follows Kim *et al.* (2004:630) in including only three variables in each model (i.e. a trivariate model). Thus, only a single control variable is added to the model at a time to address the possible misspecification problem inherent in bivariate analysis. In addition, by sequentially adding and subtracting a control variable, it is possible to test the robustness of the long-run relationship obtained in the models, i.e. whether or not the long-run effect is dependent on the control variables.

The estimation procedure begins with unit root tests followed by tests for cointegration using the trace and maximal eigenvalues test statistics. Where cointegration is found, a weak exogeneity test is performed to establish exogeneity and the causal relationship between the variables. Finally, the estimation procedure imposes normalisation restrictions to obtain the long-run coefficients.

The multivariate vector error correction model (VECM (k)) is specified as:

$$\Delta X_t = \Pi X_{t-1} + \sum_{t=i}^{k} \Gamma_i \Delta X_{t-i} + \varepsilon_{kt} \tag{6.1}$$

where $X_t = (LPY, FD, CV)$ is a 3x1 vector of $I(1)$ variables, ΔX_t are all $I(0)$, Γ_i are 3x3 short-run coefficient matrices; ε_{kt} are normally and independently distributed error terms. In the trivariate case (i.e. n = 3), the full rank of Π_i equals 3 and its reduced rank is r; if r = 3, then the variables in X_t are $I(0)$, while if the rank of Π_i is zero, there are no cointegrating relations (Harris, 1995:79). Π_i might have a reduced rank, that is $r \leq (n-1)$. In the trivariate model, two reduced rank cases are possible: $r = 1$ (i.e. one cointegrating vector) or $r = 2$ (i.e. two cointegrating vectors). In the first case, $r = 1$, Π_i can be decomposed as:

$$\Pi_i = \alpha\beta' = \begin{pmatrix} \alpha_{11} \\ \alpha_{21} \\ \alpha_{31} \end{pmatrix} \begin{pmatrix} \beta_{11} & \beta_{21} & \beta_{31} \end{pmatrix} \tag{6.2}$$

While in the case of $r = 2$, the Π_i can be decomposed as:

$$\Pi_i = \alpha\beta' = \begin{pmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \\ \alpha_{31} & \alpha_{32} \end{pmatrix} \begin{pmatrix} \beta_{11} & \beta_{21} & \beta_{31} \\ \beta_{12} & \beta_{22} & \beta_{32} \end{pmatrix} \tag{6.3}$$

where α is a $n \times r$ matrix and β' is a $r \times n$ matrix. The $\beta' X_{t-1}$ are the r cointegrated variables, β' is the matrix of coefficients of the cointegrating vectors, i.e. the long-run coefficients, and α is the matrix of error correction terms.

The rank of the matrix Π_i and the number of cointegrating relation(s) are determined using the two commonly used likelihood ratio (LR) tests statistics proposed by Johansen (1988), i.e. the trace statistic and the maximal eigenvalues as discussed in Appendix A-5.2 of Chapter 5. If cointegration is found among the variables, the next step is to estimate the VECM of Equation 6.1 above to obtain the α and β parameters. However, these parameters are not unique since there are many possible α and β matrices that contain the cointegrating relations or linear transformations of them (Lutkepohl, 2004:90). A unique estimate of the long-run parameters, $\hat{\beta}$, (that is an economically interpretable long-run relationship), is obtained by normalising on the eigenvectors, which will make the $\hat{\alpha}$ adjust accordingly. The identifying restriction amounts to normalising the coefficient of the first variable to be equal to one. But as noted by Lutkepohl (2004:98), such normalisation restriction requires some care in choosing the order of the variables, because there may be a cointegration relation only between a subset of variables in a given system. Thus, as noted by Lutkepohl (2004:98), an arbitrary normalisation on a coefficient may lead to "dividing by an estimate corresponding to a parameter that is actually zero because the associated variable does not belong in the cointegrating relation". For the purpose of the analysis in this chapter, since the objective is to model output and financial development, the primary ordering of the VAR variables will be as follows:

$$X = f(LPY, FD, CV) \tag{6.4}$$

In the trivariate model, two sets of normalisation are possible depending on the number of cointegrating vectors. As noted above, for a trivariate model, it is possible to have one or two cointegrating vectors. The first set of normalisation is performed when one cointegrating vector (r =1) is found. In this scenario, using the ordering in Equation 6.4 above, the normalisation is performed as follow:

$$\begin{pmatrix} \Delta LPY \\ \Delta LFD \\ \Delta CV \end{pmatrix} = \begin{pmatrix} \alpha_{11} \\ \alpha_{21} \\ \alpha_{31} \end{pmatrix} \begin{pmatrix} 1 & -\beta_{21} & -\beta_{31} \end{pmatrix} \begin{pmatrix} LPY_{t-1} \\ LFD_{t-1} \\ CV_{t-1} \end{pmatrix} \tag{6.5}$$

However, if as noted above, LPY is not endogenous, but FD is, then the ordering will be changed to $X = f(FD, LPY, CV)$ and then the model is normalised on the coefficient of FD. Where both LPY and FD are endogenous in the model, the analysis normalises on their coefficients in turn. In a case where both LPY and FD are not endogenous, but the control variable is endogenous with a well-behaved error correction term, such a model will not be reported in view of the aim of this study which is primarily to model output and FD.

Normalisations can also be performed where two cointegrating vectors (r =2) are found. In this case, the ordering will remain as: $X = f(LPY, FD, CV)$ and the normalisation restrictions are placed on the coefficients of LPY and FD if both of them are endogenous in the system with well behaved error correction terms as in Equation 6.6 below. However, if for instance, LPY and the control variable are endogenous, but not FD, then the ordering will change to $X = f(LPY, CV, FD)$ and the normalisation restriction placed on the coefficients of LPY and CV. In such instance, only the first vector (LPY) is reported in line with the objective of this study.

$$\begin{pmatrix} \Delta LPY \\ \Delta LFD \\ \Delta CV \end{pmatrix} = \begin{pmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \\ \alpha_{31} & \alpha_{32} \end{pmatrix} \begin{pmatrix} 1 & -\beta_{21} & -\beta_{31} \\ -\beta_{12} & 1 & -\beta_{32} \end{pmatrix} \begin{pmatrix} LYP_{t-1} \\ LFD_{t-1} \\ CV_{t-1} \end{pmatrix} \tag{6.6}$$

A weak exogeneity test is performed in the case of a model with one cointegrating vector, by placing a zero restriction on the corresponding error correction term in the VECM of Equation 6.5 (i.e. $\alpha_{11} = 0$ for the first variable). But for a model with two cointegrating vectors, two sets of tests are carried out. First, the restriction is placed separately on the α of each of the two vectors of Equation 6.6. For model with two cointegrating vectors, two sets of tests are carried out. First, the restriction is placed separately on the α of each of the two vectors. Second, after the model has been adequately identified[27], the weak exogeneity of each of the variables to the system is tested by placing a joint zero restriction on the error correction terms for each variable in the two vectors (i.e. $\alpha_{11}\alpha_{12} = 0$, $\alpha_{21}\alpha_{22} = 0$ and $\alpha_{31}\alpha_{32} = 0$ for the first, second and third variables respectively).

[27] The identification of the two vector model in trivariate system requires that dependent variable in each vector is explained by only one explanatory variable instead of two.

The specification of the lag length of the VAR is tested sequentially[28], using the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SIC). Given that the series are annual and the limited number of observation, the VAR order is selected from a maximum of 5 lags. The cointegration test begins with the minimum lag selected by either the AIC or SIC. Where this failed to produce economically meaningful results with white noise residuals, the lag is increased sequentially until a maximum of 4 lags. The maximum of lag 4 is chosen to ensure that there are sufficient degrees of freedom for the model estimation. In cases where the number of observations of the series is small, a lower lag is used. If cointegration is not detected after the testing from a maximum of 4 lags, then the test is ended and it is concluded that there is no cointegration. Moreover, corresponding to each VAR order used for testing for cointegration, the applicable deterministic trend assumptions[29] are explored and the reported model is the one with the most meaningful results from an economic perspective.

Finally, the quality of models where cointegration is found and the variable of interest (in this chapter LPY or FD) is endogenous in the model is evaluated using two criteria. First, as noted above, the models reported must pass the residual diagnostic tests – serial correlation and heteroskedasticity tests. For the serial correlation test, the null hypothesis is that there is no serial correlation. A rejection of the null hypothesis, that is, the presence of serial correlation, would suggest underlying model misspecification. Hence, any model where the null hypothesis of no serial correlation is rejected after four lags is not reported. This is to ensure that models that are reported and analysed are of good quality, free of possible misspecification error. In the case of heteroskedasticity test, the null hypothesis is there is no heteroskedasticity. A rejection of the null hypothesis will

[28] The need to conform to economic theory and all the *a priori* knowledge that is associated with this theory as suggested by Seddighi *et al.* (2000:309), lends support for the use of the sequential approach in this study.

[29] These are: (1) The level data X has no deterministic trend and the cointegrating equations do not have intercepts; (2) The level data X has no deterministic trend and the cointegrating equations have intercepts; (3) The level data X has linear trends, while the cointegrating equations have intercepts but no trend; (4) Both the level data X and the cointegrating equations have linear trends; and (5) The level data X has quadratic trends and the cointegrating equations have linear trends (E-view 5 manual). The choice of the deterministic trend assumption is based on the nature of data generating process (DGP), determined from the unit root test and visual inspection of the graphs of the relevant series. E-view 5 suggests the following rough guide to choosing the assumption: use case 2, if none of the series appear to have a trend. For trending series, use case 3, if it is believed that all trends are stochastic, and case 4 if some of the series are trend stationary. Cases 1 and 5 are rarely used in practice because of their limitations. Case 1 is used if all series have zero mean and case 5 may produce a good fit in-sample, but will produce an implausible out-of-sample forecast (E-view 5 manual). For the purpose of this analysis, only cases 2, 3 and 4 are explored.

imply that the residual variances of the model are not constant, thus rendering the usual hypothesis testing, such as t-tests, invalid. The non-rejection of the null hypothesis of no heteroskedasticity is crucial for this analysis, given that this chapter and the subsequent two chapters are specifically concerned with evaluation of structural parameters of the models (in this chapter, the effect of FD on the level of output, or *vice versa*) for which hypothesis testing, using t-statistics, regarding the significance of the parameters of the models is needed. Hence, this and the subsequent two chapters did not report for analysis any models where heteroskedasticity is a problem.

Secondly, the quality of the models reported is further judged on the basis of their explanatory power using the adjusted R^2. Specifically, this and the subsequent two chapters use a threshold of 30% explanatory power for any model to be reported for analysis (i.e. models are required to explain at least 30% of the variation of the dependent variable to be included in the analysis). Thus, any model with adjusted R^2 below 30% is not reported for analysis. Though the 30% explanatory power is arbitrary, it was used to ensure that a model has a relatively good fit for it to be used (e.g. one cannot treat a model with an adjusted R^2 of 0.1 or 0.2 as seriously as a model with an adjusted R^2 of say 0.55).

The above framework has a number of advantages over both cross-sectional/panel data studies and the previous time-series studies (e.g. Luintel and Khan, 1999; Demetriades and Hussein, 1996; Arestis and Demetriades, 1996). In relation to cross-sectional/panel data studies, the current framework has the advantage that it provides country-specific estimates, thereby fully accounting for possible heterogeneity across the countries. It also fully accounts for the endogeneity of each variable in the model, thereby avoiding the risk of reporting an incorrect model where the modelled variable is actually not endogenous. As such, both the effect of FD on output and the causality relationship between them can be estimated more reliably, instead of a mere degree of association as is often obtained in cross-country/panel studies that could not be given causal interpretation.

The fact that in this analysis several control variables are explored represents a major improvement on previous time-series studies. Hence, unlike Demetriades and Hussein, (1996) who estimated a bivariate model that is susceptible to omitted variable bias, the use of several control variables may help, at least, to minimise that problem (Luintel and Khan, 1999:384). Moreover, unlike Luintel and Khan (1999:386) who used only one control variable each in the output and financial development models, the use of several relevant control variables, employed one at a time in the current framework, makes it possible to explore the robustness of the results obtained in the analysis. This is necessary since it is possible that the effects and causal relationship(s) between FD and output may be sensitive to the control variables used (Quinn, 1997:536).

6.3 EMPIRICAL RESULTS

6.3.1 Unit root results

The analysis begins with the determination of the order of integration of each variable using the DF-GLS and Ng and Perron (2001) tests. In each case, the null hypothesis of a unit root is tested against the alternative hypothesis that the variable is stationary. Each test is carried out for levels and at first difference with an intercept and intercept and trend to establish the data generating process (DGP) of each series. The unit root test results are presented in Table A-6.2 in the Appendix. As Table A-6.2 shows, overall most of the variables are first difference stationary (i.e. I(1)). A few exceptions exist though, where the results show that the variable is either level stationary or the results are inconclusive, with some tests indicating that a variable is I(0), while the others indicate it is I(1). For instance, in Botswana the log of *per capita* output shows very weak evidence of being first difference stationary. The null hypothesis of a unit root in first difference with intercept is only rejected at a 10% level of significance using the DF-GLS test. Also in Botswana, both tests show that investment (INV) and inflation (INF) are level stationary, while the results are mixed in the case of government (GE).

In Lesotho, both test methods suggest that all the variables except inflation are I(1). The inflation rate, which is a percentage change in CPI, is level stationary. In South Africa, all the variables including inflation were first difference stationary. The only exception is openness (OPN), where both tests indicate that the series is level stationary. In the case of

Swaziland, in quite a few of the variables (LFIA, INV, GE, INF and OPE)[30], the null of unit root in level is rejected at least at a 5% level of significance, thus suggesting that they are level stationary.

Overall, the unit root tests results also indicate that some of the series have an intercept without a trend, while in others the trend element appears important. The former occurs where the null hypothesis of a unit root is significantly rejected when only an intercept is used, but became less significant with intercept and trend. However, where the tests only became significant with intercept and trend but not with intercept only, it suggests that the trend element is present in the DGP of the series. The nature of the DGP as uncovered by the unit root test is important for the choice of a deterministic assumption for the cointegration analysis. As noted in footnote 27 above, for the cointegration analysis, three deterministic assumptions are explored and the results are reported for the one that produced the most meaningful results from an economic perspective.

6.3.2 Cointegration test results

The next step is to test whether the variables are cointegrated. Table 6.1 reports a summary of the cointegration tests results while Tables A-6.3a-d in the appendix report the detailed results. Table 6.1 reports both the results for the trace and maximal eigenvalues test, as well as the corresponding VAR order (k). In the table, the results are reported in two panels, where the first panel is named model A, and the second panel is model B. Model A uses the ratio of private sector credit to GDP (LFDC) as a measure of financial development, while model B uses the liquid liabilities ratio (LFDL) measure. The control variable in each model is listed under control variables in the table. In addition, the table reports models where cointegration is found and either FD or output or both are endogenous. In cases where only the measure of financial integration is endogenous, such models are reported in Chapter 7 or 8 since these chapters focus on the effect of financial integration.

[30] Even though some of the variables are level stationary, they are included in the models since theory suggests that they are important variables in explaining both output level and financial development. As Harris (1995:80) notes, the inclusion of I(0) variables may play "a key role in establishing a sensible long-run relationship between non-stationary variables if theory *a priori* suggests that such variables should be included". On the other hand, no I(2) series is used in the models since they may complicate the analysis.

Table 6.1: Summary of Johansen Cointegration tests results: VAR={LPY, FD, CV} for SACU

Variable		Botswana		Lesotho		South Africa		Swaziland	
FD	CV	Trace	Max	Trace	Max	Trace	Max	Trace	Max
Model A: LFDC									
	LDL	*	*	x	x	0	0	0	1
	LFDIL	1	1	x	x	1	1	*	*
	LFIA	+	+	+	+	1	0	+	+
	LFIL	1	1	+	+	0	0	+	+
	INV	1	1	+	+	1	0	+	+
	GE	1	1	x	x	1	1	0	0
	INF	1	1	1	1	1	0	+	+
	OPN	1	1	+	+	+	+	+	+
	OPM	+	+	+	+	+	+	+	+
	OPE	1	1	+	+	+	+	1	1
	IDR	+	+	x	x	0	1	0	0
Model B: LFDL									
	LDL	1	1	x	x	*	*	0	0
	LFDIL	1	0	x	x	+	+	1	1
	LFIA	+	+	1	1	0	0	*	*
	LFIL	1	1	1	1	1	0	0	0
	INV	1	1	1	1	+	+	1	1
	GE	1	1	x	x	+	+	0	0
	INF	1	1	1	1	+	+	2	1
	OPN	1	1	+	+	+	+	1	1
	OPM	1	0	1	2	+	+	+	+
	OPE	+	+	1	1	+	+	+	+
	IDR	1	1	x	x	1	0	+	+

Note: The variables are as defined in Table A-6.1 of the Appendix. CV – control variables. Trace – trace test results and Max – maximal eigenvalue test results. In Model A, LFDC is used to as a measure of financial development. In Model B, LFDL is used as a measure of financial development. X denotes where the model could not be estimated because of lack of data. * denotes model where cointegration is found but can only be normalised on the measure of financial integration. The numbers 1 and 2 represent one and two cointegrating vector(s) respectively. + Models eliminated due to poor residual diagnostic tests and/or explanatory power below 30%.

Source: Estimates by author.

Overall, this chapter estimates 22 models each for Botswana, South Africa and Swaziland, and due to data limitation only 14 models for Lesotho. However, based on the quality of the models – using the residual diagnostic tests and the explanatory power of the model as explained above – the chapter reports 16 models for Botswana, seven each for Lesotho and South Africa and six for Swaziland. For the models reported, in most cases at least one of the test statistics found evidence of cointegration between the variables, and in most cases, only one cointegrating vector is found. In very few instances, the tests found two cointegrating relations. In line with the literature, the trace test is more consistent in obtaining evidence of cointegration than the maximal eigenvalue test (Luintel and Khan, 1999:392). Specifically, in the case of Botswana, for the model with the LFDIL and OPM variables in model B, only the trace test found evidence of cointegration, while in the rest of the models, both tests confirm the existence of one cointegrating vector.

As shown in Table 6.1, for Lesotho, in model A, the cointegration results reported for the model with INF as control variables, both tests found evidence of one cointegrating vector. In model B of the six models reported, only when OPM is used as the control variable, the maximal eigenvalue test found two cointegrating relations while the trace test found one vector. For South Africa, of the seven models reported (five in model A and two in model B), the tests suggest only one cointegrating vector in each case. In the case of Swaziland, of the 6 models reported (two in model A and four in model B), evidence of one cointegrating vector is found in five and in one (when INF is used as control variable in model B), the trace test suggests two vectors while the maximal eigenvalue test found one vector.

Thus, overall, the results suggest the existence of long-run relationship irrespective of the measure of financial development used in each of the SACU countries. However, evidence of cointegration alone does not provide much information about the underlying relationship, the estimation of which requires further investigation beginning with tests for weak exogeneity.

6.3.3 Weak exogeneity and causality tests results

The presence of cointegration between output and financial development suggests that causality must at least run from one of the variables to the other, in which case, at least one of the variables will be endogenous. The study uses the weak exogeneity test to determine the causal relation between the variables in a model. The weak exogeneity test results are reported in Tables 6.2A-D. With one table per country, each table reports two sets of results – first the weak exogeneity test results and second the causality results, for each variable in the model. First, for the weak exogeneity tests, the χ^2 (Chi-square) statistics and the probability value of the test are reported. Secondly, based on the weak exogeneity test results, the table reports the causality pattern between FD and the level of output. Here the study explores three null hypotheses – the null of two-way causality between FD and LPY, the null of one-way causality running from LPY to FD and the null of one-way causality running from FD to LPY. In the tables, a “Yes” denotes where the null hypothesis could not be rejected, while a “No” denotes where the null hypothesis is rejected.

Overall, the results of the weak exogeneity tests are consistent with previous time-series studies that obtained mixed causality results; that is, some bi-directional causality and some one-way causality where causality runs either from FD to output or *vice versa* (Demetriades and Hussein, 1996; Arestis and Demetriades,1997; Luintel and Khan, 1999). However, consistent with cointegration theory and the cointegration results discussed above, in all the models reported there is at least one-way causality running from either FD to LPY or from LPY to FD. The chapter now discusses the specific results for each of the SACU countries in turn.

i. Botswana

Table 6.2A reports the weak exogeneity test results for Botswana. The null hypothesis of weak exogeneity is rejected for output in all the 16 models reported. Conversely, in the case of FD, the null hypothesis of weak exogeneity could only be rejected in six models – two in model A and four in model B.

Of all the control variables used, the null hypothesis of weak exogeneity is rejected in five (GE and INF – model A and GE, OPN and IDR – model B). This suggests that government expenditure and inflation rate in model A and openness measured as ratio of total trade to GDP and interest rate differential in model B are endogenous.

The weak exogeneity tests results robustly indicate that output is endogenous, while FD is mainly exogenous in Botswana. In the few instances (six models) where FD is endogenous, the results suggest a two-way causality between output and FD. Nevertheless, the weight of evidence suggests that a one-way long-run causality running from FD to LPY exists in Botswana. Whether or not the causal effect is positive or negative will be considered shortly.

Table 6.2A: Weak exogeneity test results for Botswana

Variable					Weak Exogeneity test			Causality between LPY and FD		
FD	CV	Obs	K	A	LPY	FD	CV	Null hypothesis		
								LPY↔FD	LPY→FD	LPY←FD
Model A: LFDC										
	LFDIL	27	2	4	12.1[0.00]	4.55[0.03]	0.12[0.73]	Yes	Yes	Yes
	LFIA	31	1	4	12.5[0.00]	0.04[0.84]	1.87[0.17]	No	No	Yes
	LFIL	29	3	4	9.54[0.00]	11.4[0.00]	1.53[0.22]	Yes	Yes	Yes
	GE	31	1	3	16.3[0.00]	1.55[0.22]	6.38[0.01]	No	No	Yes
	INF	29	1	3	12.9[0.00]	1.84[0.18]	3.17[0.07]	No	No	Yes
	OPN	31	1	4	25.6[0.00]	0.21[0.65]	2.22[0.14]	No	No	Yes
	OPE	29	3	4	14.2[0.00]	0.20[0.66]	1.16[0.28]	No	No	Yes
Model B: LFDL										
	LDL	28	2	4	16.2[0.00]	0.00[0.99]	0.12[0.73]	No	No	Yes
	LFDIL	28	2	4	6.87[0.01]	3.75[0.05]	0.90[0.34]	Yes	Yes	Yes
	LFIL	29	3	3	7.26[0.01]	13.2[0.00]	1.29[0.26]	Yes	Yes	Yes
	INV	30	3	4	24.7[0.00]	2.39[0.12]	0.17[0.68]	No	No	Yes
	GE	31	1	3	11.8[0.00]	3.73[0.05]	7.59[0.01]	Yes	Yes	Yes
	INF	28	1	3	12.8[0.00]	3.48[0.06]	2.72[0.10]	Yes	Yes	Yes
	OPN	31	1	4	24.5[0.00]	2.27[0.13]	2.93[0.09]	No	No	Yes
	OPM	31	1	4	7.19[0.01]	0.23[0.63]	1.16[0.28]	No	No	Yes
	IDR	22	2	4	3.06[0.08]	0.80[0.37]	14.2[0.00]	No	No	Yes

Note: The variables are as defined in Table A-6.1 of the Appendix. In Model A, LFDC is used as a measure of financial development. In Model B, LFDL is used as a measure of financial development. CV – control variables. Parentheses [ ] are used to denote probability values; k is the VAR Order that produces a white noise residual. A is the deterministic trend assumption: (2) The level data X has no deterministic trend and the cointegrating equations have intercepts; (3) The level data X has linear trends, while the cointegrating equations have intercepts but no trend; (4) Both the level data X and the cointegrating equations have linear trends. Yes – the null hypothesis could not be rejected. No – the null hypothesis is rejected.

Source: Source: Estimates by author.

ii. Lesotho

Table 6.2B reports the weak exogeneity test results for Lesotho. The null hypothesis of weak exogeneity is rejected in all the models for output, thus overwhelmingly confirming that output is endogenous in all the models. In the case of FD, the results are mixed. In model A, in the only model reported, FD is exogenous. In model B, the null hypothesis of weak exogeneity is clearly rejected for FD in five out of the seven models. But overall, the prevailing evidence suggests that FD, using the liquid liabilities ratio, is endogenous in Lesotho.

Regarding the causal relationship between FD and output, the results depend on the measure of FD used. Using the private sector credit ratio, the causality runs from FD to output. However, when the liquid liabilities ratio is used, the evidence leans strongly to a two-way causality between FD and output. But, overall, the weight of evidence suggests a two-way causality relationship between FD and output.

Table 6.2B: Weak exogeneity test results for Lesotho

Variable					Weak Exogeneity test			Causality between LPY and FD		
FD	CV	Obs	K	A	LPY	FD	CV	Null hypothesis		
								LPY↔FD	LPY→FD	LPY←FD
Model A: LFDC										
	INF	28	2	3	17.5[0.00]	1.59[0.21]	2.11[0.17]	No	No	Yes
Model B: LFDL										
	LFIA	28	3	3	17.8[0.00]	0.08[0.78]	8.06[0.01]	No	No	Yes
	LFIL	28	3	3	20.9[0.00]	1.61[0.20]	10.5[0.00]	No	No	Yes
	INV	28	2	3	13.5[0.00]	13.8[0.00]	10.3[0.00]	Yes	Yes	Yes
	INF	28	2	3	17.6[0.00]	5.35[0.02]	0.62[0.43]	Yes	Yes	Yes
	OPN	29	2	3	12.2[0.00]	7.28[0.01]	4.36[0.04]	Yes	Yes	Yes
	OPM#	28	1	3	19.9[0.00]	9.52[0.01]	30.2[0.00]	Yes	Yes	Yes
	OPE	28	2	4	16.5[0.00]	5.38[0.02]	2.25[0.13]	Yes	Yes	Yes

Note: See note to Table 6.2A above for a description of symbols used. # – the test is based on weak exogeneity of the variable to the system since in this instance two cointegrating vectors are found.

Source: Estimates by author.

Of the control variables used, five (LFIA, LFIL, INV, OPN and OPM) in model B are found to be endogenous.

iii. South Africa

Table 6.2C reports the results for the weak exogeneity tests for South Africa. As can be seen from the table, in seven out of the nine models reported, the null of weak exogeneity was rejected for output, while it was rejected for FD in two. In model A, out of the six alternative models reported, in four, the null of weak exogeneity is rejected for output while in the remaining two it cannot be rejected. Similarly, in two of the six models, the null hypothesis is rejected for FD. Thus, in model A, FD is endogenous in two while output is endogenous in four. In model B, the null hypothesis is rejected in all the three models for output, while it is not rejected in any of them for FD. Thus, in Model B, output is endogenous in the three models while FD is exogenous.

Therefore, the finding on the causal relationship between output and FD depend, on the measure of FD and the control variable used. In models A and B, the evidence robustly suggests one-way causality. In model A, where the credit ratio is used in four cases causality runs from FD to output and in another two cases causality runs from output to FD. However, when the liquid liabilities ratio is used, in the three cases reported causality runs from FD to output. Overall, the weight of evidence suggests that causality runs from FD to output in South Africa.

Table 6.2C: Weak exogeneity test results for South Africa

Variable					Weak Exogeneity test			Causality between LPY and FD		
FD	CV	Obs	K	A	LPY	FD	CV	Null hypothesis		
								LPY↔FD	LPY→FD	LPY←FD
Model A: LFDC										
	LFDIL	31	3	3	18.5[0.00]	0.25[0.61]	3.80[0.05]	No	No	Yes
	LFIA	33	1	3	9.36[0.00]	0.68[0.41]	2.84[0.09]	No	No	Yes
	INV	30	3	4	0.37[0.54]	12.7[0.00]	0.41[0.52]	No	Yes	No
	GE	33	1	3	13.6[0.00]	0.01[0.95]	2.84[0.09]	No	No	Yes
	INF	29	4	4	3.05[0.08]	5.77[0.02]	3.76[0.05]	Yes	Yes	No
	IRD	24	2	3	9.12[0.00]	0.03[0.87]	4.43[0.04]	No	No	Yes
Model B: LFDL										
	LFIL	31	3	3	8.70[0.00]	0.15[0.70]	4.26[0.04]	No	No	Yes
	OPN	30	4	4	11.3[0.00]	0.35[0.55]	0.10[0.75]	No	No	Yes
	IRD	25	2	4	2.86[0.09]	1.44[0.23]	0.27[0.61]	No	No	Yes

Note: See note to Table 6.2A above for a description of symbols used. # - the test is based on weak exogeneity of the variable to the system since in this instance two cointegrating vectors were found.

Source: Estimates by author.

Regarding the control variables LFDIL, LFIA, GE and IDR in model A are found to be endogenous, while in model B, LFIL is found to be endogenous.

iv. Swaziland

As shown in Table 6.2D, the weak exogeneity test results for Swaziland suggest that output is endogenous, while FD is exogenous. In model A, of the two models reported, the null hypothesis of weak exogeneity is rejected for output but not for FD. In model B, the null hypothesis is rejected for output in three out of four models, but rejected for FD in only one case. Thus, the weight of evidence strongly suggests a one-way causality running from FD to output.

Regarding the control variables, OPE in model A is found to be endogenous, while in model B, INF is endogenous.

Table 6.2D: Weak exogeneity test results for Swaziland

Variable					Weak Exogeneity test			Causality between LPY and FD		
FD	CV	Obs	K	A	LPY	FD	CV	Null hypothesis		
								LPY↔FD	LPY→FD	LPY←FD
Model A: LFDC										
	LDL	33	1	2	20.9[0.00]	2.16[0.14]	0.50[0.48]	No	No	Yes
	OPE	30	3	3	7.34[0.01]	2.34[0.13]	12.9[0.00]	No	No	Yes
Model B: LFDL										
	LFDIL	28	4	4	17.4[0.00]	0.83[0.36]	0.41[0.52]	No	No	Yes
	INV	31	3	4	9.49[0.00]	1.26[0.26]	0.34[0.56]	No	No	Yes
	INF	33	2	4	0.89[0.35]	13.0[0.00]	14.6[0.00]	No	Yes	No
	OPN	32	3	4	15.3[0.00]	1.91[0.17]	0.54[0.46]	No	No	Yes

Note: See note to Table 6.2A above for a description of symbols used.

Source: Estimates by author.

Since the causality pattern alone does not tell the whole story about the nature of the relationship between FD and output, the study estimates the VECM to address two of the issues raised at the outset of this chapter. First is the issue of whether, how and to what extent FD contributes to the growth process in each of the SACU countries. As a corollary, the section also explores the effect of economic performance on FD. Secondly, the study seeks to determine whether or not the effects of FD and output on each other are robust when including different control variables, one at a time.

6.3.4 VECM results

Tables 6.3A-D present the results of the VECM for Botswana, Lesotho, South Africa and Swaziland. For each country, the results reported are only those for which cointegration is found and a meaningful cointegrating relation is identified, the residual diagnostic tests show no sign of model misspecification, and the explanatory power of the of the model is at least 30%. Also, for each country, the tables report the long-run parameters of FD and output, the coefficient of the error correction term and the adjusted R-square, as well as the residual diagnostic test results. The results are reported for the two sets of models – models A and B, where as noted earlier model A uses the credit ratio (LFDC) as a measure of financial development and model B uses the liquid liabilities ratio (LFDL).

As also noted earlier, the long-run parameters are obtained by normalising on the variable for which the error correction term is significant with a negative sign and where the weak exogeneity test shows that the variable is endogenous. Since the main concern of this chapter is to determine the extent of the effect of FD on the output level or the effect of output on FD, the models are normalised on either output or FD if their error correction terms are well behaved and the test of weak exogeneity shows that either the output or FD are endogenous. In cases where both output and FD are endogenous and their error correction terms are well behaved, each variable is normalised on output and FD separately to obtain the effect of the other variable on it. The results for each country are now discussed in turn.

i. Botswana

Using credit ratio as a measure of FD, seven models are reported based on the quality of the estimated models. The seven models are normalised on output and none is normalised on FD since output is endogenous in all the models, but FD is not. In the case of model B, nine models reported are normalised on output, while none is normalised on FD[31]. Since all the variables except IDR and inflation are in log form, their long-run parameters are elasticities. Overall, the elasticities and the sign of the long-run effect of FD on output vary between models A and B. In model A, out of the seven models normalised on output, six elasticities of the long-run parameters are negative while only one is positive. Among those with a negative sign, three are statistically significant at 1% level of significance, while the only one with a positive sign is not statistically significant. For the negative parameters, the elasticities range from 0.01 to 0.40, while for the model with positive sign the elasticity is 0.63. Thus, overwhelmingly the development of the credit market has a negative effect on the level of output in Botswana.

In model B, of the nine models normalised on output, four of the long-run parameters are positive with elasticities ranging from 0.06 to 3.81, but only one is significant, at 1% level of significance. The five elasticities with a negative sign range from 0.02 to 0.39 and two are statistically significant. Thus, overall, the effect of liquid liabilities of banks on output is ambiguous.

[31] All the models that are normalised on FD (two in model A and four in model B) have very low explanatory power, hence they are not reported.

Table 6.3A: Estimated long-run parameters of financial development and output for Botswana

Variables			Slope Coefficients					
FD	CV	Intercept	LPY	FD	R2	ECM	S.Cor	Het
Model normalised on Log of *per capita* GDP (LPY)								
Model A: LFDC								
	LFDIL	8.86		-0.33(-8.59)[a]	0.66	-0.29(-4.03)[a]	9.59[0.38]	35.6[0.91]
	LFIA	8.93		-0.40(-5.99)[a]	0.44	-0.22(-4.99)[a]	14.2[0.11]	4.24[0.98]
	LFIL	5.49		0.63(1.68)	0.59	-0.03(-3.10)[a]	12.2[0.20]	96.9[0.16]
	GE	-0.17		-0.40(-3.30)[a]	0.51	-0.10(-5.66)[a]	14.5[0.11]	16.2[0.18]
	INF	10.9		-0.34(-1.40)	0.39	-0.05(-4.29)[a]	11.8[0.23]	7.44[0.83]
	OPN	1.99		-0.14(-1.55)	0.67	-0.15(-7.84)[a]	14.8[0.10]	18.1[0.11]
	OPE	5.78		-0.01(-0.10)	0.86	-0.17(-6.10)[a]	3.55[0.94]	85.2[0.44]
Model B: LFDL								
	LDL	8.72		-0.39(-10.5)[a]	0.76	-0.33(-5.90)[a]	2.98[0.97]	34.3[0.93]
	LFDIL	8.38		-0.16(-1.13)	0.34	-0.15(-3.83)[a]	4.49[0.88]	11.7[0.47]
	LFIL	-6.58		3.81(2.98)[a]	0.60	-0.01(-2.47)[b]	10.1[0.34]	92.4[0.25]
	INV	11.2		0.11(1.22)	0.87	-0.12(-6.56)[a]	7.22[0.61]	91.6[0.27]
	GE	-0.93		-0.23(-1.63)[c]	0.40	-0.09(-4.55)[a]	12.1[0.21]	12.3[0.43]
	INF	10.9		-0.26(-0.93)	0.39	-0.05(-4.27)[a]	11.5[0.24]	6.61[0.88]
	OPN	-4.12		0.18(1.11)	0.61	-0.08(-6.98)[a]	6.39[0.70]	13.6[0.32]
	OPM	-2.00		-0.02(-0.10)	0.32	-0.07(-3.89)[a]	9.53[0.39]	17.2[0.14]
	IDR	7.85		0.06(0.87)	0.46	-0.18(-2.05)[b]	7.33[0.60]	51.2[0.35]

Notes: See note to Table 6.2A above for a description of symbols used. a, b and c represent 1%, 5% and 10% significance levels respectively.

Source: Estimates by author.

In sum, based on the credit indicator, the results overwhelmingly show a negative effect of FD on the level of *per capita* income in the long-run, while the liquid liabilities indicator produced ambiguous results. Thus, there is lack of evidence to suggest that FD positively affects the level of *per capita* income in Botswana. One would have expected that given the healthy banking sector in the country, its effects on output should be positive. A possible explanation of this outcome is that given the dependence of the economy on the export of diamonds, which is controlled by the government, it is possible that the economy is mainly driven by the efficiency of government management of these resources rather than the efficiency with which banks finance private sector investments. This seems to be supported by the results of the ratio of government expenditure to GDP, which exerts a positive and highly significant effect on economic performance in the two models (see Table A-6.4 in appendix). This is in sharp contrast to South Africa (see below).

Most likely the weak impact of FD on economic growth could be a reflection of the general shift of resources from productive investment to consumption. This may indicate a lack of local industries and a high level of consumption. A recent study of the financial system of Botswana illustrates the situation as follows: “despite the relatively healthy banking sector, however, the proportion of private sector loans going to businesses (in contrast to households) has declined significantly, decreasing from 70% in 1990 to 45% in 2001” (Genesis Analytics, 2003a:3). Given that most of the consumer goods are imported with limited value added in the country, it is not surprising that credit by banks did not stimulate the growth of the economy, but rather tend to affect negatively its economic performance.

The results of the control variables are reported in Table A-6.4 in the appendix. A look at the parameters of the control variables highlights some important features of the Botswana economy. In model B in the model normalised on *per capita* income, investment has a negative and statistically significant elasticity.

The long-run elasticities of *per capita* income to government expenditure are positive and highly significant in the two models. The effect of government expenditure in Botswana is not surprising given the possible efficiency of the government as noted above.

As expected, inflation exerts a negative and significant effect on the level of output in both models. Openness, measured as the sum of exports and imports to GDP (OPN), has a positive and statistically significant elasticity. Likewise the inclusion of the ratio of exports to GDP (OPE) produces a statistically significant and positive elasticity. However, when the ratio of imports to GDP (OPM) is used, the elasticity becomes negative and remains statistically significant in model B where it featured. Thus, as economic theory suggests, exports are a major catalyst to economic growth in Botswana, but imports are not, rather imports suppress the growth of the economy. This is not surprising given that much of the imports to the country, as noted above, are consumer goods that do not add any value to the economy. Thus, as long as consumption (including imports) is largely and increasingly financed by bank loans, while bank credit to business is decreasing, the growth effect of financial development would remain minimal. This is an aspect that the government may want to pay attention to if it wants to achieve sustainable growth in the future.

The error correction terms associated with each cointegrating vector are well behaved with negative and highly significant coefficients. The magnitude of the error correction term shows the speed of adjustment to disequilibrium from its long-run equilibrium value (Luintel and Khan, 1999:394). On this basis, the models normalised on output exhibit very slow adjustments, ranging from 1% to 29% and 1% to 33% per year for models A and B with the distribution skewed towards the lower end of their ranges.

ii. Lesotho

Table 6.3B reports the results of the VECM for Lesotho. In model A, one model is reported and it is normalised on output. In model B, the six models reported are normalised on output, and two on FD since in the latter cases, both variables (output and FD) are endogenous.

In model A, the income elasticity of FD in the only model reported is negative but not statistically significant. In model B, the income elasticities of FD have mixed signs[32] with all of them being statistically significant at 1% level of significance. Of the six models, three have positive elasticities ranging from 0.39 to 2.34, while the remaining three have negative elasticities ranging from 0.70 to 0.75. On balance, the effect of deposit market development on *per capita* income is ambiguous. This may reflect the problem of the inefficiency of the banking systems, stemming from the low and rigid deposit rates that result from the non-competitive banking market.

Regarding the model normalised on FD, the FD elasticity of income is negative and statistically significant at 1% level of significance. Thus, an increase in the level of *per capita* income leads to underdevelopment of the deposit market.

[32] The sign and significance of the parameters did not change even after controlling for the effect of crises from the mid 1990s. However, the introduction of the control dummy, which was mostly significant, did reduce the value of the parameters in many cases, suggesting that the crisis worsened the negative effect of FD on output growth.

Table 6.3B: Estimated long-run parameters of financial development and output for Lesotho

Variables			Slope Coefficients					
FD	CV	Intercept	LPY	FD	R^2	ECM	S.Cor	Het
Model normalised on Log of *per capita* GDP (LPY)								
Model A: LFDC								
	INF	6.74		-0.04(-0.43)	0.49	-0.57(-4.81)[a]	12.5[0.19]	91.5[0.27]
Model B: LFDL								
	LFIA	10.8		-0.75(-5.77)[a]	0.4	-0.17(-4.30)[a]	11.4[0.25]	78.4[0.65]
	LFIL	9.9		-0.73(-4.99)[a]	0.46	-0.15(-4.72)[a]	9.71[0.38]	77.0[0.69]
	INV	8.16		0.39(4.82)[a]	0.41	-0.18(-3.58)[a]	7.59[0.58]	85.2[0.44]
	INF	10.2		0.79(4.51)[a]	0.38	-0.13(-4.40)[a]	4.22[0.89]	41.5[0.73]
	OPM#	11.7		2.34(7.09)[a]	0.48	-0.52(-6.15)[a]	8.44[0.49]	66.6[0.26]
	OPE	10.2		-0.70(-4.44)[a]	0.47	-0.17(-4.93)[a]	4.18[0.90]	67.9[0.90]
Model normalised on financial development (FD)								
Model B: LFDL								
	INV	-20.8	-2.55(-5.52)[a]		0.34	-0.15(-3.59)[a]	7.59[0.58]	85.2[0.44]
	OPM#	1.62			0.37	-0.48(-4.32)a	8.44[0.49]	66.6[0.26]

Notes: See note to Table 6.2A above for a description of symbols used. a, b and c represent 1%, 5% and 10% significance levels respectively. # - based on two cointegrating vectors.

Source: Estimates by author.

The negative effect of the level of output on FD is not surprising. Despite the gradually increasing level of *per capita* income, the ratio of liquid liabilities is progressively decreasing over time. In addition, the gap between liquid liabilities and private sector credit is also widening. Thus, the country is plagued by two problems. On the one hand, because of the inefficiency of the banking system (as reflected in the low deposit interest rate), both individuals and firms are increasingly bypassing the domestic banking system. This is made easier because of the easy access to off-shore banks, especially in South Africa, which is enabled by the CMA agreement. This access explains why an increase in the level of *per capita* income does not lead to the development of the domestic deposit banking market. As individuals become richer, it appears that they increasingly bypass the domestic banking system as they open foreign bank accounts. This enables them to earn better returns and guarantee the safety of their investment and possibly to facilitate payments for imported goods from South Africa (Central Bank of Lesotho, 1996).

On the other hand, the ambiguous effects of deposit liabilities on the level of output may reflect the behaviour of the banks themselves. A major problem lies with the use of the deposits mobilised in the economy. As shown in Chapter 5, it is apparent that the bulk of the liquid liabilities of the commercial banks are not used for financing private domestic investment in the economy. There may be few or no incentives for the banks to serve the domestic market for several reasons. A key factor is the relative ease with which the banks can invest funds in the other CMA countries (especially South Africa) where they can earn higher returns on investments. The CMA agreement, which permits the free flow of funds among member countries, coupled with the fact that most banks are branches of South African banks, might have made the whole process very easy.

With regard to the control variables, investment has a positive and highly significant effect on the level of output in model B where it featured. The effect of the inflation on the output level is positive in the two models. In model A, the effect of inflation is positive and statistically significant. It may be the case that because of the relative stability of prices, due to the link to South Africa through the CMA agreement, inflation is not a major problem in the credit market and thus through this channel might affect output positively. In model B, which uses the deposit liabilities ratio, the effect of inflation is also positive though not statistically significant. The import ratio (OPM) enters model B with a negative sign, though it is not statistically significant.

The coefficient of adjustment for the output model is 57% in model A, while in model B, it ranges from 13% to 52%. All the error correction terms are statistically significant with the right sign. In the case of the financial development models, the speeds of adjustment are 15% and 48% in model B.

iii. South Africa

Table 6.3C reports the VECM results for South Africa. Of the six models reported, four are normalised on output and two on FD in model A. In the four models normalised on output, the income elasticities of FD are negative and are all statistically significant at a 1% level of significance. The four negative elasticities range from 0.22 to 0.36. In model B, the three models reported are normalised on output and two have positive elasticities, with one being statistically significant at a 1% level of significance. The values of the positive elasticities are 0.03 and 0.49. The only elasticity with negative sign with a value of 0.11 is also statistically significant at a 10% level of significance. Thus, the effect of liquid liabilities of banks on the level of output is ambiguous.

Table 6.3C: Estimated long-run parameters of financial development and output for South Africa

Variable			Slope Coefficients					
FD	CV	Intercept	LPY	FD	R^2	ECM	S.Cor	Het
Model normalised on Log of *per capita* GDP (LPY)								
Model A: LFDC								
	LFDIL	10.8		-0.36(-7.25)[a]	0.51	-0.76(-4.96)[a]	2.45[0.98]	88.0[0.36]
	LFIA	-11.2		-0.36(-4.07)[a]	0.45	-0.69(-4.25)[a]	3.08[0.96]	78.8[0.64]
	GE	12.6		-0.22(-2.81)[a]	0.38	-0.36(-4.57)[a]	13.9[0.13]	13.9[0.30]
	IRD	10.6		-0.31(-3.19)[a]	0.55	-0.23(-2.91)[a]	9.97[0.35]	93.6[0.22]
Model B: LFDL								
	LFIL	9.68		0.03(0.19)	0.39	-0.45(-3.41)[a]	7.60[0.58]	87.7[0.37]
	OPN	8.84		-0.11(-1.96)[c]	0.44	-0.54(-3.99)[a]	7.03[0.63]	119[0.50]
	IRD	7.78		0.49(3.52)[a]	0.54	-0.42(-3.57)[a]	7.34[0.60]	53.8[0.26]
Model normalised on financial development(FD)								
Model A: LFDC								
	INV	-0.24	0.19(0.16)		0.50	-0.35(-4.36)[a]	8.40[0.50]	117[0.53]
	INF	3.23	0.06(0.14)		0.43	-0.53(-3.32)[a]	11.8[0.22]	107[0.78]

Notes: See note to Table 6.2A above for a description of symbols used. a, b and c represent 1%, 5% and 10% significance levels respectively. # - based on two cointegrating vectors.

Source: Estimates by author.

The largely negative effect of FD on the level of *per capita* income in South Africa, might be due to inefficiencies in the financial systems, due to the oligopolistic structure of the market for banking services in South Africa, which may cause them to extract undue rents in the form of high interest rate margins and service charges from investors (Okeahalam, 2001:4). Perhaps an aspect where the banking system may help to stimulate the growth of the economy would be to make access to credit easier for newly emerging entrepreneurs from the formerly disadvantaged groups as well as for small to medium scale enterprises. Hence, any failure on the part of the banks to reach out to these groups will minimise the contribution of the banking sector to the overall performance of the economy.

Furthermore, given that the banking system in South Africa is fairly developed, offering services similar to those of banks based in many advanced countries, the lack of a robust positive effect of FD on output level may partly reflect the limitation of the indicators of FD which may not adequately capture the quality of financial intermediation in the economy (Allen and Ndikumana, 2000:153). Moreover, the bank-based indicators of FD do not capture developments outside the banking system. Given the level of development of the equity and bond markets in South Africa, it might be the case that most of the real corporate financing for investment projects take place through bond or equity issues and not through banks[33]. It is also possible that bank lending like in the other SACU countries now services the consumer market and to a lesser extent the corporate market, in which case the effect of FD on output may be minimal, if at all positive.

Regarding, the control variables, the results are largely consistent with expectations. The interest rate spread has highly significant positive coefficients in the two models. The openness variable (OPN) has the theoretically expected positive sign and is highly significant in model B where it featured. On the other hand, government expenditure has a negative effect on the level of output levels in model B. This may reflect possible inefficiencies or the crowding out effect of government spending (see Table A-6.4 in the appendix).

Lastly, the speed of adjustments is quite high in all the models, which suggests a fairly efficient banking system. In the models normalised on output, the speed of adjustment ranges from 23% to 76% in model A, and from 42% to 54% in model B. This suggests a high feedback to output from other sectors of the economy, especially the banking system (Luintel and Khan, 1999).

iv. Swaziland

Table 6.3D presents the results of the VECM for Swaziland. As shown in the table, the two models estimated with LFDC (model A) are normalised on output. Of the two models, the effect of FD is positive in one with an elasticity of 0.74, and is statistically significant at a 10% level of significance. In the other model, the effect is negative and significant at 1%, with an elasticity of 0.80. Thus, the effect of credit market development on the level of output is ambiguous in Swaziland.

In model B, of the four alternative models reported, three are normalised on output and one is normalised on FD. The three output models produced positive and statistically

[33] I would like to thank one of the external examiners for bringing this point to my attention.

significant (at 1%) effect of FD on output with elasticities ranging from 0.39 to 0.72. Thus, the evidence strongly suggests that the effect of the deposit market development on output is positive in Swaziland.

Table 6.3D: Estimated long-run parameters financial development and output for Swaziland

Variable			Slope Coefficient					
FD	CV	Intercept	LPY	FD	R^2	ECM	S.Cor	Het
Model normalised on Log of per capital GDP (LPY)								
Model A: LFDC								
	LDL	8.35		-0.80(-3.65)[a]	0.41	-0.11(-5.89)[a]	4.93[0.84]	5.60[0.93]
	OPE	-20.1		0.74(1.61)[c]	0.39	-0.05(-2.68)[b]	13.9[0.13]	94.7[0.20]
Model B: LFDL								
	LFDIL	4.74		0.72(4.61)[a]	0.43	-0.57(-5.10)[a]	8.34[0.50]	123[0.40]
	INV	6.23		0.39(4.23)[a]	0.42	-0.53(-4.47)[a]	11.0[0.28]	82.0[0.54]
	OPN	8.35		0.47(5.74)[a]	0.37	-0.57(-4.07)[a]	5.48[0.79]	88.8[0.34]
Model normalised on Financial development(FD)								
Model B: LFDL								
	INF	1.45	0.61(5.06)[a]		0.55	-0.98(-4.15)[a]	4.72[0.86]	88.4[0.35]

Notes: See note to Table 6.2A above for a description of symbols used. a, b and c represent 1%, 5% and 10% significance levels respectively.

Source: Estimates by author.

With regard to the models normalised on FD, the slim evidence suggests a positive effects of the level of *per capita* income on FD. The only model normalised on FD uses the liquid liability indicator, has a positive elasticity and is highly statistically significant.

The effects of control variables in the output models are also plausible in relation to the background information about the Swaziland economy. In the output model, the parameter of the export ratio (OPE) as a measure of openness appeared highly statistically and economically significant with an elasticity of 6.03. Openness (OPN) has negative and significant elasticity. The negative effect of the total trade ratio may reflect the structure of trade which is dominated by imports of consumer goods with little or no value added within the economy.

Lastly, the error correction terms of all the models are well behaved with negative and statistically significant coefficients.

SUMMARY AND CONCLUSION

This chapter sets out to empirically examine the relationship between FD and economic performance of the SACU countries. Specifically, it explores the causal relationship and the nature of effects of FD on the level of *per capita* income in each of the SACU countries. The analysis further uses several control variables to evaluate the robustness of the findings.

Overall, regarding the causality analysis, the results lend some support for *supply-leading* finance as proposed by Patrick (1966) across the SACU countries given that causality mainly runs from FD to output. The only exception is Lesotho where a two-way causality dominates. On the effects of FD, the weight of evidence suggests a strong negative long-run causal effect of FD, using the credit indicator, on the level of output in Botswana and South Africa, while the effect was negative but not strong in Lesotho, and in Swaziland, the results were inconclusive. Thus, overall, the development of the credit market seems not to have any discernible positive effect on the level of output in the entire SACU. The effect of the deposit indicator on the output level was largely inconclusive, with the exception of Swaziland, where a robust positive effect was found. The weak and largely negative effect of FD on output level found in this study is consistent with a host of other studies such as Arestis and Demetriades (1997) for USA, Allen and Ndikumana (2000) for SADC countries, Koivu (2002:10) for transition economies, Hondroyiannis *et al.* (2005) for Greece, Naceur and Ghazouani (2006) for 11 MENA countries and Ang and McKibbin (2007) for Malaysia.

In conclusion, while the causality results seem to suggest a supply-leading finance, the largely negative effect of FD on the level of output in the SACU (which is contrary to the Patrick supply-leading finance thesis) is also, to some extent, consistent with the Berthelemy and Varoudakis (1996) argument of a vicious cycle. Though for most of the SACU countries, a strictly vicious cycle as described by Berthelemy and Varoudakis (1996:19) may not apply, since causality runs mainly in one direction from FD to output (with the exception of Lesotho), part of their argument may still hold, that is, that an underdeveloped financial system would be unable to perform most of the desirable functions of a good financial system effectively, thereby causing an inefficient productive structure if income is too low.

Perhaps, for the SACU countries, the argument may be modified to say that, because of an underdeveloped financial system (with the exception of South Africa), and weak institutional and structural problems, the financial systems are unable to perform most of the desirable functions of a good financial system[34] effectively, thereby causing an inefficient productive structure. In Lesotho, where a negative feedback effect between FD and output is found, the cause may likely be due to factors such as the weak institutional and structural problems, other than just the low income of the country, as would be implied by the Berthelemy and Varoudakis (1996:19) vicious cycle. In the case of South Africa, in addition to any institutional and structural problems in the system, the largely negative effect of FD on output might be due to the role of bond and equity market in financing corporate investments which is not captured in the bank-based indicators of FD. The country-specific situation and the policy implication of these findings will be discussed further in the Chapter 9.

[34] The desirable functions of a good financial system such as efficient allocation of savings are discussed in Chapter 2.

Appendix A-6

Table A.6.1: Definition and coverage of variables used for econometric models

Variable	Definition	Country and periods					Source
		Botswana	Lesotho	Namibia	South Africa	Swaziland	
LRPY	Log of per capita real GDP	1970-2003	1970-2003		1970-2004	1970-2003	IMF- CD-ROM
LFDC	Ratio of private sector credit as a percentage of GDP	1972-2003	1973-2003		1970-2004	1970-2003	IMF- CD-ROM
LFDL	Ratio of commercial banks liquid liabilities as percentage of GDP	1972-2003	1973-2003		1970-2004	1970-2003	IMF- CD-ROM
LTL	Ratio of total external liabilities to GDP	1974-2003	NIL		1970-2004	1970-2003	Mark II
LDL	Ratio of total external debt liabilities to GDP	1974-2003	NIL		1970-2004	1970-2003	Mark II
LFDIL	Ratio of total foreign direct investment liabilities to GDP	1975-2003	NIL		1970-2004	1971-2003	Mark II
LFIA	Ratio of foreign assets to total assets of banking system	1972-2003	1973-2003		1970-2004	1970-2004	IMF- CD-ROM
LFIL	Ratio of foreign liabilities to total liabilities of banking system	1972-2003	1973-2003		1970-2004	1970-2004	IMF- CD-ROM
INV	Investment – Gross fixed capital formation as a percentage of GDP	1970-2003	1970-2003		1970-2004	1970-2003	IMF- CD-ROM
GE	Total government consumption expenditure as a percentage of GDP	1972-2003	NIL		1970-2004	1971-2003	IMF- CD-ROM
INF	Inflation – percentage changes in CPI (based year 2000)	1975-2003	1974-2003		1971-2004	1971-2003	IMF- CD-ROM
OPN	Openness – sum of export and import as percentage of GDP	1970-2003	1970-2003		1970-2004	1970-2002	IMF- CD-ROM
OPM	Openness – import as a percentage of GDP	1970-2003	1970-2003		1970-2004	1970-2002	IMF- CD-ROM
OPE	Openness – export as a percentage of GDP	1970-2003	1970-2003		1970-2004	1970-2002	IMF- CD-ROM
IRD	Spread between lending and deposit rates	1980-2003	1980-2003		1977-2004	1975-2003	IMF- CD-ROM
BR	Central bank rate	1990:1-2005:12	1990:1-2005:12	1991:10-2005:12	1990:1-2005:12	1990:1-2005:12	IMF- CD-ROM
DR	Deposit rate	1990:1-2005:12	1990:1-2005:12	1991:1-2005:12	1990:1-2005:12	1990:1-2005:12	IMF- CD-ROM
LR	Lending rate	1990:1-2005:12	1990:1-2005:12	1991:1-2005:12	1990:1-2005:12	1990:1-2005:12	IMF- CD-ROM
MMR	Money market rate	NIL	NIL	1991:10-2005:6	1990:1-2005:12	1990:1-2005:12	IMF- CD-ROM
TBR	Treasury bill rate	NIL	1990:1-2005:12	1991:10-2005:12	1990:1-2005:12	1990:1-2005:12	IMF- CD-ROM

Source: Compiled by author.

Table A-6.2: Unit Root Test Results

Test method			LRPY	LFDC	LFDL	LTL	LDL	LFDIL	LFIA	LFIL	INV	GE	INF	OPN	OPM	OPE	IRD
Botswana																	
DF-GLS	Level	Intercept	0.61	-1.67[c]	-1.6	-1.16	-2.05[b]	-0.83	-2.25[b]	-2.04[b]	-1.61	-1.87	-2.54[b]	-2.26[b]	-0.76	-2.05[b]	-4.30[a]
		Intercept & Trend	-1.47	-1.75	-1.62	-1.66	-3.35[b]	-1.88	-2.7	-3.87[a]	-3.84[a]	-5.25[a]	-3.02[c]	-2.86	-3.25[b]	-2.61	-4.68[a]
	1st Diff.	Intercept	-1.67[c]	-3.56[a]	-3.88[a]	-2.96	-3.43[a]	-3.74[a]	-7.07[a]	-2.59[b]	-4.11[a]	-7.56[a]	-6.04[a]	-5.86[a]	-5.96[a]	-5.62	-8.56[a]
		Intercept & Trend	-2.63	-4.07[a]	-4.38[a]	-4.13[a]	-3.42[a]	-4.40[a]	-7.31[a]	-3.64[b]	-4.76[a]	-7.75[a]	-6.02[a]	-7.06[a]	-7.08[a]	-6.86	-8.97[a]
NP	Level	Intercept	0.38	-5.07	-4.15	-3.46[a]	-14.1[a]	-1.75	-6.81	-7.12	-4.34	-5.5	-8.69[b]	-7.54[c]	-1.89	-5.46	-11.4
		Intercept & Trend	-4.72	-5.22	-4.61	-6.54	-25.5[a]	-3.25	-8.1	-13	-26.9[a]	-15.8	-10.6	-9.27	-11.1	-8.13	-11.5
	1st Diff.	Intercept	-3.36	-11.1[b]	-16.7[a]	-6.34[c]	-12.7	-12.1[b]	-14.4[a]	-1.18	-14.5[a]	-14.4[a]	-14.5[a]	-13.2[b]	-14.3[a]	-13.2	-13.4[b]
		Intercept & Trend	-7.89	-12.4	-20.4[a]	-10.4	-12.7	-13.7	-14.1	-1.91	-34.4[a]	-14.3[c]	-13.5	-13.9[a]	-14.4[c]	-14.6	-6.75
Lesotho																	
DF-GLS	Level	Intercept	-0.08	-1.38	-0.78				-1.79	-2.77[a]	-1.2		-6.67[a]	-1.33	-1.42	-0.57	-1.83[c]
		Intercept & Trend	-2.24	-1.16	-1.21				-2.35	-4.39[a]	-1.35		-7.54[a]	-2	-1.79	-1.91	-3.16[c]
	1st Diff.	Intercept	-4.79[a]	-4.61[a]	-3.98[a]				-6.50[a]	-1.2	-5.58[a]		-10.4[a]	-4.74[a]	-4.12[a]	-4.34[a]	-3.92[a]
		Intercept & Trend	-5.06[a]	-4.68[a]	-5.03[a]				-6.80[a]	-6.75[a]	-6.61[a]		-9.71[a]	-5.23[a]	-4.88[a]	-4.12[a]	-4.09[a]
NP	Level	Intercept	0.83	-3.45	-1.13				-4.24	-8.63[b]	-1.4		-13.7[a]	-1.42	-1.55	-0.42	-4.1
		Intercept & Trend	-6.15	-4.86	-1.37				-8.47	-11.4	-3.91		-12.8	-3.58	-2.41	-7.78	-94.5[a]
	1st Diff.	Intercept	-16.3[a]	-18.0[a]	-13.4[b]				-14.9[a]	-5.59	-15.7[a]		-9.24[b]	-18.3[a]	-16.7[a]	-11.4[b]	-9.89[b]
		Intercept & Trend	-16.2[c]	-14.1	-14.9[c]				-13.9	-9.98	-14.4[c]		-8.08	-16.2[c]	-16.1[c]	-18.7[b]	-10.6
South Africa																	
DF-GLS	Level	Intercept	-1.52	0.66	-0.92	-1.55	-1.65	-1.31	-1.23	-1.09	-1.09	-1.70[c]	-1.02	-2.82[a]	-2.56[b]	-2.57[b]	-2.62[b]
		Intercept & Trend	-2.18	-1.47	-0.84	-1.6	-2.31	-1.19	-2.15	-2.35	-2.57	-2.59	-1.63	-2.85	-2.66	-2.94[c]	-2.76
	1st Diff.	Intercept	-4.45[a]	-7.20[a]	-5.11[a]	-4.63[a]	-3.24[a]	-5.65[a]	-2.71[b]	-6.00[a]	-4.91[a]	-1.83	-5.09[a]	-4.40[a]	-5.55[a]	-4.23[a]	-5.77[a]
		Intercept & Trend	-4.76[a]	-8.45[a]	-5.52[a]	-5.23[a]	-3.71[b]	-5.99[a]	-2.8	-6.44[a]	-5.58[a]	-5.82[a]	-5.60[a]	-4.43[a]	-5.32[a]	-4.47[a]	-5.78[a]
NP	Level	Intercept	-4.13	1.57	-2.54	-4.65	-3.16	-2.98	-12.1[b]	-1.55	-2.13	-3.78	-2.55	-15.7[a]	-9.44[b]	-11.4[b]	-8.95
		Intercept & Trend	-6.32	-3.91	-2.43	-4.79	-13.5	-3.24	-18.8[b]	-9.43	-9.93	-8.41	-3.76	-15.8[c]	-9.8	-13.2	-9.3
	1st Diff.	Intercept	-14.8[a]	-16.2[a]	-17.5[a]	-14.2[a]	-11.4[b]	-16.5[a]	-5.82[c]	-15.9[a]	-15.6[a]	-12.7[c]	-38.2[a]	-16.1[a]	-62.9[a]	-26.4[a]	-13.5[b]
		Intercept & Trend	-15.4	-14.4c	-27.6a	-16.2c	-13.5	-16.5c	-6.92	-16.5c	-15.9[c]	-13.2	-39.2[a]	-16.0[c]	-16.8[c]	-27.6[a]	-13.2
Swaziland																	
DF-GLS	Level	Intercept	-0.04	-2.3	-1.02	-1.79[c]	-1.65	-2.66[c]	-2.98[a]	-1.78[c]	-2.55[c]	-2.77[c]	-3.53[a]	-2.41	-1.62	-3.12[a]	-1.05
		Intercept & Trend	-1.85	-3.23[b]	-2.36	-2.24	-1.74	-2.96[c]	-3.46[b]	-2.13	-2.92[c]	-3.29[b]	-4.53[a]	-2.97[c]	-1.88	-3.59[b]	-2.07
	1st Diff.	Intercept	-3.41[a]	-4.10[a]	-4.14[a]	-1.32	-3.95[a]	-4.77[a]	-1.86[c]	-4.35[a]	-6.64[a]	-6.32[a]	-9.16[a]	-8.00[a]	-6.51[a]	-6.75[a]	-2.38[b]
		Intercept & Trend	-4.43[a]	-5.66[a]	-6.02[a]	-7.23[a]	-4.61[a]	-6.21[a]	-7.10[a]	-4.39[a]	-6.82[a]	-6.35[a]	-9.43[a]	-7.97[a]	-6.63[a]	-6.83[a]	-5.48[a]
NP	Level	Intercept	0.08	-6.77[c]	-3.15	-3.46	-5.31	-9.52[b]	-11.2	-5.02	-9.47[b]	-9.65[b]	-12.4[b]	-8.37[b]	-3.9	-12.2[b]	-1.18
		Intercept & Trend	-7.92	-111.1[a]	-7.01	-7.59	-5.55	-10.9	-12.5	-5.87	-10.7	-12	-14	-10.9	-5.36	-13.2	-7.13
	1st Diff.	Intercept	-9.37[b]	-9.94[b]	-8.51	-1.37	-13.2[b]	-11.4[b]	-2.03	-16.6[a]	-15.7[a]	-17.4[a]	-16.2[a]	-15.8[a]	-16.7[a]	-16.1[a]	-6.30[c]
		Intercept & Trend	-13.4	-11.4	-12.8	-15.4[c]	-15.0[c]	-12.6	-10.9	-15.3[c]	-15.3[c]	-15.9[c]	-13.1	-13.9	-15.5[c]	-15.1[c]	-11.9

Source: Estimates by author.

Table A-6.3a: Johansen Cointegration tests results: VAR={LPY, FD, CV}: Botswana

Variable		Obs	K	A	Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
FD	CV				$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
Model A: LFDC										
	LFDIL	27	2	4	49.2[0.01]	17.6[0.37]	7.67[0.28]	31.5[0.01]	9.95[0.62]	7.67[0.28]
	LFIA	31	1	4	47.9[0.01]	20.7[0.19]	6.10[0.45]	27.2[0.03]	14.6[0.21]	6.10[0.45]
	LFIL	29	3	4	53.0[0.00]	20.9[0.18]	3.90[0.76]	32.1[0.01]	17.0[0.11]	3.90[0.76]
	GE	31	1	3	52.1[0.00]	15.2[0.06]	2.13[0.15]	36.8[0.00]	13.1[0.07]	2.13[0.15]
	INF	29	1	3	33.1[0.02]	8.73[0.39]	3.11[0.08]	24.4[0.02]	5.62[0.66]	3.11[0.08]
	OPN	31	1	4	63.5[0.00]	20.2[0.22]	2.82[0.89]	43.3[0.00]	17.4[0.10]	2.82[0.89]
	OPE	29	3	4	55.1[0.00]	7.76[0.27]	7.76[0.27]	30.8[0.01]	16.5[0.12]	7.76[0.27]
Model B: LFDL										
	LDL	28	2	4	54.2[0.00]	22.4[0.13]	9.56[0.15]	31.8[0.01]	12.9[0.34]	9.56[0.15]
	LFDIL	28	2	4	42.9[0.04]	22.9[0.10]	9.38[0.16]	19.9[0.25]	13.6[0.28]	9.39[0.16]
	LFIL	29	3	3	35.1[0.01]	5.31[0.78]	0.55[0.46]	29.8[0.00]	4.76[0.77]	0.55[0.46]
	INV	30	3	4	59.6[0.00]	21.2[0.17]	6.73[0.37]	38.4[0.00]	14.5[0.22]	6.73[0.37]
	GE	31	1	3	45.4[0.00]	13.8[0.09]	2.32[0.12]	31.6[0.00]	11.5[0.13]	2.32[0.12]
	INF	28	1	3	36.3[0.01]	12.3[0.14]	2.84[0.09]	24.0[0.02]	9.44[0.25]	2.84[0.09]
	OPN	31	1	4	63.3[0.00]	20.7[0.19]	3.33[0.83]	42.6[0.00]	17.4[0.10]	3.33[0.83]
	OPM	31	1	4	49.7[0.01]	25.0[0.07]	5.21[0.57]	24.8[0.07]	19.7[0.04]	5.21[0.57]
	IDR	22	2	4	57.9[0.00]	23.9[0.09]	3.27[0.84]	34.0[0.00]	20.6[0.03]	3.27[0.84]

Note: The variables are as defined in Table A-6.1 of the Appendix. CV – control variables. Parentheses [ ] are used to denote probability values; k is the VAR Order that produces a white noise residual The table reports those models where cointegration is found and either LYP or FD or both is endogenous, but where only the CV is endogenous the results are not reported.

Source: Estimates by author.

Table A-6.3b: Johansen Cointegration tests results: VAR={LPY, FD, CV}: Lesotho

Variable		Obs	K	A	Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
FD	CV				$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
Model A: LFDC										
	INF	28	2	3	32.2[0.02]	8.07[0.46]	1.44[0.23]	24.1[0.02]	6.63[0.53]	1.44[0.23]
Model B:LFDL										
	LFIA	28	3	3	50.3[0.00]	14.3[0.08]	0.39[0.53]	36.0[0.00]	13.9[0.06]	0.39[0.53]
	LFIL	28	3	3	48.4[0.00]	10.2[0.26]	0.00[0.96]	38.2[0.00]	10.2[0.20]	0.00[0.96]
	INV	28	2	3	49.4[0.00]	8.10[0.46]	0.00[0.98]	41.3[0.00]	8.10[0.37]	0.00[0.98]
	INF	28	2	3	50.2[0.00]	14.2[0.08]	0.19[0.66]	35.9[0.00]	14.0[0.05]	0.19[0.66]
	OPM#	28	1	3	64.5[0.00]	14.4[0.07]	0.07[0.79]	50.1[0.00]	14.3[0.04]	0.07[0.79]
	OPE	28	2	4	56.2[0.00]	20.7[0.19]	3.38[0.82]	35.5[0.00]	17.3[0.10]	3.38[0.82]

Note: See note to Table A-6.1a above for a description of symbols used. # - two cointegrating vectors are found.

Source: Estimates by author.

Table A-6.3c: Johansen Cointegration tests results: VAR={LPY, FD, CV}: South Africa

Variable					Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
FD	CV	Obs	K	A	$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
Model A										
	LFDIL	31	3	3	35.1[0.01]	6.25[0.67]	0.19[0.66]	28.8[0.00]	6.05[0.61]	0.19[0.66]
	LFIA	33	1	3	31.2[0.03]	12.7[0.13]	2.75[0.10]	18.5[0.11]	9.94[0.22]	2.75[0.10]
	INV	30	3	4	43.4[0.04]	18.5[0.31]	6.39[0.41]	24.9[0.06]	12.1[0.40]	6.39[0.41]
	GE	33	1	3	31.4[0.03]	6.49[0.64]	0.95][0.33	24.9[0.01]	5.55[0.67]	0.95[0.33]
	INF	29	4	4	49.9[0.01]	25.3[0.06]	7.90[0.26]	24.6[0.07]	17.4[0.10]	7.90[0.26]
	IRD	24	2	3	26.7[0.11]	4.04[0.90]	0.80[0.37]	22.7[0.03]	3.24[0.93]	0.80[0.37]
Model B										
	LFIL	31	3	3	30.6[0.04]	9.79[0.30]	2.51[0.11]	20.8[0.06]	7.28[0.46]	2.51[0.11]
	OPN	30	4	4	44.8[0.03]	16.4[0.46]	3.16[0.86]	28.4[0.02]	13.3[0.31]	3.16[0.86]
	IRD	25	2	4	43.3[0.04]	23.3[0.10]	7.11[0.33]	20.0[0.24]	16.1[0.13]	7.11[0.33]

Note: See note to Table A-6.1a above for a description of symbols used. # - two cointegrating vectors are found.

Source: Estimates by author.

Table A-6.3d: Johansen cointegration tests: VAR= {LPY, FD, D): Swaziland

Variable				Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
FD	Obs	K	A	$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
Model A:LFDC									
LDL	33	1	2	34.5[0.05]	8.01[0.82]	2.48[0.68]	26.5[0.01]	5.53[0.84]	2.48[0.68]
OPE	30	3	3	32.1[0.03]	7.78[0.49]	2.02[0.15]	24.3[0.01]	5.75[0.65]	2.02[0.15]
Model B									
LFDIL	28	4	4	46.1[0.02]	15.9[0.50]	5.43[0.53]	30.2[0.01]	10.5[0.57]	5.43[0.53]
INV	31	3	4	46.2[0.02]	19.9[0.23]	3.31[0.83]	26.2[0.04]	16.6[0.12]	3.31[0.83]
INF	33	2	4	26.6[0.04]	26.6[0.04]	10.6[0.10]	43.9[0.00]	16.0[0.14]	10.6[0.10]
OPN	32	3	4	48.4[0.01]	16.9[0.42]	3.63[0.75]	31.5[0.01]	13.3[0.30]	3.63[0.75]

Note: See note to Table A-6.1a above for a description of symbols used.

Source: Estimates by author.

Table A-6.4: Estimated long run parameters of control variables for SACU

Variables	Botswana		Lesotho		South Africa		Swaziland	
Model normalised on LPY								
	Model A	Model B	Model A	Model B	Model A	Model B	Model A	Model B
LDL		-0.08(-2.48)^{a}					0.39(2.91)^{a}	
LFDIL	-0.02(-0.73)	0.03(0.28)			0.09(8.07)^{a}			-0.15(-1.66)^{c}
LFIA	-0.02(-1.26)			-0.22(-2.24)^{b}	0.07(5.39)^{a}			
LFIL	0.71(4.08)^{a}	2.39(3.95)^{a}		0.11(0.69)		-0.11(-6.19)^{a}		
INV		-0.97(-6.38)^{a}		0.18(3.09)^{a}				-0.22(-3.95)^{a}
GE	2.68(12.2)^{a}	2.80(11.1)^{a}			-0.65(-6.26)^{a}			
INF	-0.13(-4.64)^{a}	-0.13(-4.79)^{a}	0.23(6.85)^{a}	0.00(0.03)				
OPN	1.28(6.48)^{a}	2.36(7.32)^{a}				-0.35(-12.9)^{a}		-0.64(-7.38)^{a}
OPM		-2.24(-4.72)^{a}						
OPE	0.54(3.37)^{a}			-0.22(-1.33)			6.03(5.70)^{a}	
IDR		-0.08(-8.10)^{a}			0.07(5.00)^{a}	0.01(1.56)^{a}		
Model normalised on FD (LFDC)								
INV				-0.47(-1.61)^{a}	0.45(0.89)			
INF					-0.02(-3.22)^{a}			0.75(9.26)^{a}

Note: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. The ( ) represent t-values; a, b and c represent 1%, 5% and 10% significance levels respectively

Source: Estimates by author.

CHAPTER 7:
FINANCIAL INTEGRATION AND FINANCIAL DEVELOPMENT IN THE SACU COUNTRIES: EMPIRICAL EVIDENCE

7.1 INTRODUCTION

The theoretical literature reviewed in Chapter 3 shows that a strong relationship between financial integration (IFI) and domestic financial development (FD) can be expected. The literature suggests that IFI can be a complement or a substitute to domestic FD. While as a complement, IFI will promote the domestic FD, as a substitute, IFI can further exacerbate the problems of an already weak domestic financial system (Guiso *et al.,* 2004:566).

An important empirical question that emerges is whether or not a high degree of IFI leads to an increasing level of FD in developing countries, in which case IFI serves as a complement. In other words, do developing countries that are more integrated with the external financial markets have deeper financial systems? If it can be shown that IFI leads to greater FD, especially among developing countries, it justifies the opening up of their financial system and a drive toward greater integration with the rest of the world. Moreover, addressing this question is a preliminary step towards assessing the likely effects of IFI on economic growth (Guiso *et al.*, 2004:528; De Gregorio, 1998:16).

Since an economy with a highly developed financial system will likely become much more attractive to foreign investors, IFI is potentially also endogenous. Therefore, this chapter will also examine whether FD influences IFI.

This chapter focuses on the relationship between IFI and FD among the SACU countries. As noted earlier, the SACU countries have a long history of financial openness among themselves, which makes them highly integrated (see Chapter 5). Has this integration resulted in a greater FD for them? The chapter also investigates whether or not SACU countries that are more integrated with South Africa gain more from IFI in general than those that are less integrated with it. Lastly, the chapter explores the role that domestic FD plays in the financial integration process of the SACU countries. This chapter serves as an empirical counterpart to Chapter 3 which reviews the literature. In addressing the questions raised above, the analyses in this chapter take cognisance of the limitations of previous empirical studies as highlighted in Chapter 3. These include:

i. The inability of the cross-sectional and panel data approaches, commonly used to establish the causal effect between the variables (Kose *et al.*, 2006a:16; Collins, 2004:81).
ii. The inability of cross-sectional and panel data approaches to address adequately the potential endogeneity of IFI and other right-hand-side variables. This may potentially bias the results (Kose *et al.,* 2006a:15; Collins, 2004:81).
iii. The fact that cross-sectional and panel data approaches provide estimates that are only average effects for a sample of countries covered and do not represent any particular country in the sample. This makes it difficult to draw country-specific policy conclusions based on such results (Bloch and Tang, 2003:250; Arestis and Demetriades, 1997:784).
iv. The fact that previous studies use few measures of IFI. In particular, most studies analysing the effects of IFI rely mostly on *de jure* measures. However, *de facto* integration measures may be more relevant for capturing the effects of IFI since, as will be shown shortly, it represents actual integration and not integration on paper (Kose *et al.,* 2006a:49),

Thus, together, Chapters 3 and 7 seek to provide new evidence on the financial development-financial integration nexus as highlighted in Figure 7.1 below.

The specific objectives of this chapter are:

i. To examine the nature (whether positive or negative and the magnitude) of the effects of IFI on FD in each of the SACU countries. As a corollary, to explore the effect of FD on their IFI.
ii. To determine among the smaller SACU countries whether or not countries more integrated with South Africa receive greater benefits from their IFI in general than those that are less integrated.
iii. To explore the nature of the causality relationship between FD and IFI in each of the SACU countries.
iv. To determine whether or not the results of the above analysis are robust to controlling for other possible determinants of FD and IFI.

In addressing the above-stated objectives, the chapter adopts a multivariate cointegration and error correction modelling framework, which is applied to each of the SACU countries. The study also explores different measures of IFI. Since different indicators proxy different aspects of the relationship between IFI and FD, exploring different measures helps to determine the kind of capital flow that mostly affects FD.

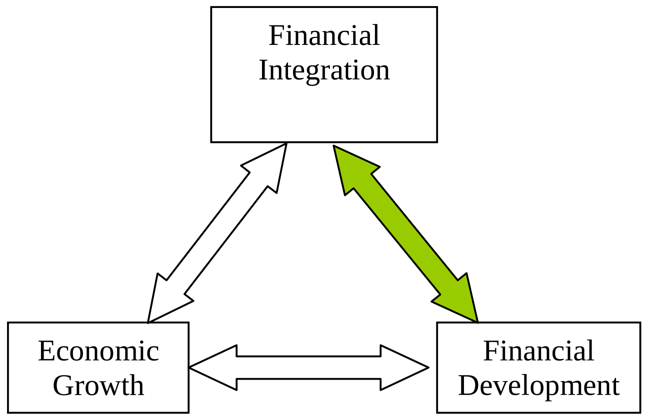


Figure 7.1: Structure of chapters

7.2 VARIABLE DEFINITION AND DISCUSION

7.2.1 Measuring financial development and financial integration

Typically, authors who study the effects of IFI on FD use the ratio of private sector credit by commercial banks to GDP to proxy FD (cf. IMF, 2007:34; Chinn and Ito, 2006:167; Ito, 2006; Bonfiglioli and Mendicino, 2004:26; De Gregorio, 1998:20). However, to be consistent with Chapter 6, this chapter and Chapter 8, use two indicators to proxy FD: the ratio of private credit of commercial banks to nominal GDP and the ratio of liquid liabilities of commercial banks to nominal GDP. It would be recalled, as noted in Chapter 6 (Section 6.2.1), the two FD indicators measure banking system development since the other aspects of the financial system are underdeveloped in the smaller SACU countries.

This chapter uses the *de facto* stock of capital to proxy IFI as defined below. The empirical analyses in this chapter and the subsequent one did not use the *de jure* measures of IFI for two reasons. First, as noted by many authors, most of the *de jure* measures of IFI fail to capture fully the complexity of real-world capital controls (cf. Ito, 2006:307; Kose *et al.*, 2006a:8; Collins, 2004:78). In contrast, the measures based on actual quantity of capital flow have been regarded as “the best available measure of a country’s integration with international financial markets” (Kose *et al.,* 2006a:9). The *de facto* indicators measure the true state of integration in practice and not integration on paper. The second and more compelling reason for using the *de facto* measure is data availability. Whereas there is no available time-series data on *de jure* capital controls, this is not the case with the *de facto* measures, where consistently defined data are available for all the SACU countries (with the exception of Namibia where the number of observations are small).

It is possible to compute *de facto* measures using either capital flows or stocks, where the stocks are the cumulated version of the underlying flows, corrected for valuation effects (Kose *et al.*, 2006a:9). Again, for two reasons, the analyses are based on capital stocks rather than capital flows. First, and very importantly, annual flows tend to be very volatile as they often respond to short-term changes in the political and policy environment, and as a result they may be prone to measurement errors. Second, all the data (the IMF data on foreign assets and liabilities of banks and the dataset on *External Wealth of Nations Mark II* by Lane and Milesi-Ferretti, 2006) are available in the form of stocks. Hence the study uses the available data to avoid any complications that may arise from first computing the flow series from the stock data (such as those relating to the valuation method used and the volatility of flows).

Altogether, this chapter uses four indicators of IFI to gauge its effects on FD. These include: LFDIL, LDL, LFIA and LFIL. The first two indicators are based on the dataset on *External Wealth of Nations Mark II* by Lane and Milesi-Ferretti (2006) and they are broader in scope than the last two. The two are chosen in line with recent trends in the literature on IFI (cf. IMF, 2007:4; Alfaro and Charlton, 2006:12; Kose *et al.*, 2006a:10; Collins, 2004:79; Edison *et al.*, 2002:753-754). The remaining two are bank-based indicators and are chosen in line with Adam *et al.* (2002:20). The need to include Lesotho in the analysis further motivates the choice of the latter two indicators, since as noted earlier the dataset of Lane and Milesi-Ferretti (2006) did not include Lesotho.

The first two measures focus on the components of stocks of external liabilities. Studies have shown that the effects of the *de facto* capital flows were more robust when specific kinds of capital flows or stocks were used instead of total capital flows or stocks (cf. Calderon *et al.*, 2004; Collins, 2004; McLean and Shrestha, 2002; Reisen and Soto, 2001) The external liabilities include portfolio equity, foreign direct investment (FDI), financial derivatives and debt. Following the previous studies, this study uses the FDI and debt components. LFDIL represents the logarithms of the ratio of total FDI liabilities to GDP. FDI includes greenfield investment (construction of new factories), equity capital, reinvested earnings and other capital (Alfaro and Charlton, 2006:12). LDL is the logarithms of the ratio of total debt liabilities to GDP, where debt liabilities include bonds, debentures, money market and negotiable debt instruments, and foreign bank deposits (Lane and Milesi-Ferretti, 2006:10).

The two bank-based indicators (LFIA and LFIL) measure the degree of home biasedness of domestic banks (Adam *et al.*, 2002:20). A high value suggests that the banks are not home biased, implying a high degree of integration. LFIA is the ratio of foreign assets to total assets of the national banking sector. This may take the form of deposits in foreign banks or other money market and negotiable debt instruments held abroad by domestic banks. Since it represents a stock of capital outflows or a substitute for domestic capital outlays of banks, an increase in the ratio may lead to a decrease in the ratio of domestic private sector credit to GDP. The LFIL is the ratio of the foreign liabilities to total liabilities of the national banking sector. This indicator is a component of the LDL described above, but it excludes items such as bond and debentures included in the LDL. Since the LFIL captures the stock of capital inflows, an increase in the ratio will imply an increase in deposit liabilities of domestic banks, hence the liquid liability ratio (LFDL) will rise, and *vice versa*.

7.2.2 Control variables

Following the convention in most of the empirical FD and IFI studies, this chapter uses the following control variables: level of *per capita* income, inflation, trade openness measured as the sum of export plus import over GDP[35], the ratio of domestic investment to GDP and the ratio of government expenditure to GDP (cf. IMF, 2007:34; Chinn and

[35] In this and the next chapter, to simplify the analysis the components of openness, export and import ratios are not used.

Ito, 2006:166; Ito, 2006:308; Bonfiglioli and Mendicino, 2004:26; De Gregorio, 1998:20; Edison *et al.*, 2002; Klein and Olivei, 1999).

Per capita income is included to reflect the effect of economic development. As the literature reviewed in Chapters 2 and 4 show, a rise in level of *per capita* income may lead to a deeper financial system and a higher degree of IFI. Trade openness is included in line with the widely accepted view that trade openness leads to deeper financial systems and is a precondition for financial integration (cf. IMF, 2007:24; Chinn and Ito, 2006:182; Ito, 2006:317; Kose *et al.,* 2006a:46). The inflation rate and government expenditure are added to control for the effects of macroeconomic policies. Sound macroeconomic policies as reflected in stable price levels and prudent government spending may have a positive effect on FD and financial integration. In contrast, high inflation, which may signal macroeconomic instability due to poor macroeconomic policies, may increase vulnerability to financial crises, and hence discourage capital inflow while encouraging outflows (IMF, 2007:24; Kose *et al.*, 2006a:38). If domestic firms raise finance from foreign financial markets the level of investment can also lead to a higher degree of financial integration.

7.2.3 Data and source

The data for FD and IFI models covers the period 1970 to 2004; however, for some of the series, data was not available for the entire period (see Table A-6.1 in Appendix for description and coverage of each series). The series range from 29 to 34 continuous annual observations. As explained in Chapter 6 the choice of annual observations has been made following the trend in many empirical time-series studies of the finance-growth relationship (e.g. Demetriades and Hussein, 1996; Luintel and Khan, 1999). With the exception of the inflation rate, all the variables used for the models are transformed into natural logarithms. Data on financial development, control variables and two measures of IFI (LFIA and LFIL) were obtained from the IMF's IFS September 2007 CD-ROM. The data used for computing other measures of IFI were obtained from the dataset on *External Wealth of Nations Mark II* by Lane and Milesi-Ferretti (2006), as discussed above.

7.3 MODELLING FRAMEWORK

To model the relationship between FD and IFI, this chapter adopts a trivariate model in which both measures of FD and IFI enter along with a control variable. Where the focus is on the effect of IFI on FD the model takes the form:

$$X = f(FD, IFI, CV) \tag{7.1}$$

where FD, IFI and CV represent a measure of financial development, financial integration and the control variable. In a case where the focus is on determining the effect of FD on IFI, the ordering of variables in (7.1) begins with IFI.

The empirical analysis employs a multivariate vector autoregressive (VAR) and error correction model framework based on the Johansen maximum likelihood approach. The modelling framework in this chapter follows the procedure described in Chapter 6. Given the focus of this chapter, the models are normalised on FD or IFI depending on the endogeneity of the variables. If the test of weak exogeneity shows that FD is endogenous but IFI is not, implying that long-run causality runs solely from IFI to FD, the model is normalised on FD. The converse is the case if IFI is endogenous, but FD is not. Hence, to address the first objective of this chapter, i.e. to establish how IFI affects FD, this section focuses attention on the sign and the size of the long-run parameters of IFI in the FD models. A positive and statistically significant coefficient of IFI in the FD model will suggest that IFI helps to stimulate the development of the domestic financial system, which in turn would mean that the complementarity hypothesis is confirmed. However, if the coefficient is negative and statistically significant, then it suggests that IFI is a substitute for domestic FD, in which case, opening financial markets leads to the underdevelopment of the domestic financial system.

In the case of reverse causality (i.e. $FD \rightarrow IFI$), if the parameter of FD in the IFI model is positive and statistically significant, it confirms that domestic FD is a precondition for IFI. Hence countries will need to develop their financial systems before undertaking capital account liberalisation. However, if the reverse causality does not hold (i.e. causality runs only from IFI to FD), countries can develop their financial markets by exogenously deciding to open their financial markets (Chinn and Ito, 2006:181). With regard to a two-way causality (i.e. $FD \leftrightarrow IFI$), if the parameters of the variables are positive and statistically significant, it suggests a mutual reinforcement between FD and IFI.

The second objective focuses on the question of whether or not the smaller SACU countries that are more integrated with South Africa gain more from their IFI than those that are less integrated with South Africa. Swaziland is the most integrated with South Africa amongst the smaller SACU economies, as shown in Section 5.4.2 of Chapter 5, followed by Lesotho and Botswana. The extent of the benefit is measured with the sign and magnitude of the parameter of IFI in the FD models among the smaller SACU countries. The country with the strongest positive effect of IFI on FD is regarded as having the greatest benefit.

The chapter estimates two groups of models (models A and B) based on the two measures of FD. Model A uses the LFDC (private credit ratio) and model B uses the LFDL (liquid liability ratio). For each group of models, a series of regressions is estimated using each of the four measures of IFI. Also, for each model with a measure of IFI, each of the five control variables is added one at a time to explore the robustness of the results. Because of limited degrees of freedom, following Kim *et al.* (2004:630) only one control variable is added at a time. Thus, in total, the chapter estimates 40 models each for Botswana, South Africa and Swaziland. In the case of Lesotho, data limitations restrict the study to 16 models.

Given the focus of this chapter (i.e. to examine the relationship between FD and IFI), it reports the cointegration and the weak exogeneity test results as well as VECM results for models where either the FD or IFI or both are endogenous. The chapter does not report models where both IFI and FD are weakly exogenous. Also, similar to Chapter 6, this chapter does not report the result of models that do not pass the residual diagnostic tests (serial correlation and heteroskedasticity tests) and that have adjusted R^2s below 30%. If the level of *per capita* output as a control variable is endogenous, such models will be reported and analysed in Chapter 8. Consequently, for Botswana, the chapter reports and discusses 19 models out of the 40 models estimated. This comprises 15 cases of model A and four cases of model B. For Lesotho, the chapter reports nine models (five of model A and four of model B) out of the 16 models estimated. For South Africa, of the 40 models estimated, the chapter reports 15 – eight of model A and seven of model B. Lastly, for Swaziland, the chapter reports 12 of the 40 models estimated, comprising eight of model A and four of model B. The next section presents and discusses the results.

7.4 EMPIRICAL RESULTS

7.4.1 Unit root and cointegration results

Table A-6.2 in the Appendix to Chapter 6 reports the results of the unit root test. It reports the tests based on the DF-GLS and the Ng and Perron (2001) tests. The table reports the tests for levels and at first difference with an intercept and intercept and trend. With very few exceptions where they are I(0), both or at least one of the tests suggest that all the series are I(1). The I(0) series are also included in the cointegration test since economic theory suggests they might be important in the cointegrating relation. However, since they may increase the number of cointegrating vectors, the analysis did not include two I(0) variables in a model (Harris, 1995:80).

Based on the results of the unit root tests, it is possible to use the cointegration methods to test for the existence of a stable long-run relationship between an indicator of FD, IFI and a control variable. The number of long-run relationships is determined using the trace and maximal eigenvalue tests. Table 7.1 reports a summary of the cointegration test results, while Tables A-7a-d in the Appendix report the detailed results. As noted earlier, the results are reported for models where evidence of cointegration is found and either FD or IFI or both are endogenous. In addition, as noted above, models in which the residual diagnostic tests (serial correlation and heteroskedasticity tests) show that the residuals are not well behaved and the adjusted R^2 is below 30% are not reported for analysis.

As shown in Table 7.1 for the four countries, in all the models where cointegration is found, both the trace test and maximal eigenvalue test detect only one cointegrating vector. Overall, the trace test consistently obtained more evidence of cointegration than the maximal eigenvalue test in the models.

Table 7.1: Summary of Johansen Cointegration tests results: VAR={FD, IFI, CV}: SACU

Variable		Botswana		Lesotho		South Africa		Swaziland	
IFI	CV	Trace	Max	Trace	Max	Trace	Max	Trace	Max
Model A: LFDC									
LFDIL	LPY	1	0	x	x	0	0	1	1
	INV	1	1	x	x	1	1	1	1
	GE	+	+	x	x	1	0	0	0
	INF	1	1	x	x	0	0	+	+
	OPN	+	+	x	x	0	0	1	1
LDL	LPY	1	1	x	x	1	1	1	1
	INV	1	1	x	x	0	0	+	+
	GE	1	1	x	x	1	1	+	+
	INF	1	1	x	x	+	+	+	+
	OPN	1	1	x	x	1	1	0	0
LFIA	LPY	1	1	+	+	0	0	1	0
	INV	1	1	+	+	1	1	1	1
	GE	1	0	x	x	1	1	+	+
	INF	1	0	1	1	0	0	0	0
	OPN	+	+	0	0	1	0	0	0
LFIL	LPY	1	1	1	1	0	0	1	1
	INV	1	1	1	1	0	0	+	+
	GE	0	0	x	x	0	0	+	+
	INF	1	1	1	0	0	0	0	0
	OPN	+	+	1	1	0	0	1	1
Model B: LFDL									
LFDIL	LPY	+	+	x	x	1	0	0	0
	INV	+	+	x	x	1	1	0	0
	GE	+	+	x	x	1	0	1	1
	INF	0	0	x	x	1	1	+	+
	OPN	+	+	x	x	+	+	+	+
LDL	LPY	0	0	x	x	0	0	+	+
	INV	+	+	x	x	1	1	+	+
	GE	+	+	x	x	1	1	1	1
	INF	1	1	x	x	0	0	1	1
	OPN	1	0	x	x	+	+	0	0
LFIA	LPY	+	+	+	+	0	0	+	+
	INV	+	+	1	1	0	0	+	+
	GE	+	+	x	x	0	0	+	+
	INF	+	+	+	+	1	0	+	+
	OPN	+	+	+	+	0	0	+	+
LFIL	LPY	+	+	1	1	0	0	+	+
	INV	+	+	1	1	0	0	1	1
	GE	+	+	x	x	+	+	0	0
	INF	1	1	0	0	0	0	+	+
	OPN	1	1	1	1	0	0	+	+

Note: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. CV – control variables. In Model A, LFDC is used to as a measure of financial development. In Model B, LFDL is used as a measure of financial development. X denotes where the model could not be estimated because of lack of data. * denotes model where cointegration is found but can only be normalised on the measure of output. The table reports those models where cointegration is found and either FD or IFI or both is endogenous, but where only the CV is endogenous the results are not reported. + Models eliminated due to poor residual diagnostic tests and/or explanatory power below 30%.
Source: Estimates by author.

7.4.2 Weak exogeneity and causality test results

Given the results from the cointegration tests, the chapter reports on tests of weak exogeneity and causality analyses as described in Chapter 6. Tables 7.2A-D report the results for the weak exogeneity tests and the causality analysis for each of the SACU countries. Each table reports the χ^2 (Chi-square) statistics and the probability value of the test and the causality pattern between FD and IFI. In the latter case, the study explores three null hypotheses – the null of two-way causality running between FD and IFI, the null of one-way causality running from FD to IFI, and the null of one-way causality running from IFI to FD. As in the previous chapter, a "Yes" in the tables indicates where the null hypothesis could not be rejected, while a "No" denotes where the null hypothesis is rejected.

Similar to Chapter 6, each table reports two broad groups of models – model A and model B. Model A uses the credit ratio (LFDC) as a measure of FD while model B uses the liquid liabilities ratio (LFDL) as a measure of FD. Moreover, with the exception of Lesotho, in each group of models, four sets of models are estimated with each set having five alternative models. In Lesotho, due to lack of data for government expenditure (GE), in each set four alternative models are estimated. A set of models combines a measure of FD and IFI with each control variable.

Overall, the weak exogeneity test gave inconclusive results. The causality results differ from country to country and depend on the measure of FD and IFI used. Next, the results for each country are discussed in turn.

i. Botswana

As shown in Table 7.2A, of the 19 models reported, the null hypothesis of weak exogeneity is rejected in 13 and 15 models for FD and IFI respectively. In model A, out of the 15 models reported, causality runs solely from IFI to FD in five cases, and from FD to IFI in four cases while in six cases a two-way causality between FD and IFI is found. In model B, out of the four models reported, causality runs from IFI to FD in three cases and from FD to IFI in four cases, out of which in two the causality runs in both directions. Thus, overall, the causality relationship between FD and IFI is mixed.

Table 7.2A: Weak exogeneity test results for Botswana

Variable					Weak Exogeneity test			Causality between LPY and FD		
IFI	CV	Obs	K	A	FD	IFI	CV	Null hypothesis		
								FD↔IFI	FD→IFI	FD←IFI
Model A: LFDC										
LDL	LPY	27	3	3	7.36[0.01]	9.22[0.00]	10.1[0.00]	Yes	Yes	Yes
	INV	28	2	4	10.6[0.00]	0.50[0.48]	8.02[0.00]	No	No	Yes
	GE	27	3	3	8.01[0.01]	9.14[0.00]	0.19[0.66]	Yes	Yes	Yes
	INF	26	3	3	9.18[0.00]	12.0[0.00]	1.06[0.30]	Yes	Yes	Yes
	OPN	27	3	3	5.98[0.01]	4.79[0.03]	6.41[0.01]	Yes	Yes	Yes
LFDIL	LPY	28	1	3	1.58[0.21]	8.09[0.00]	4.98[0.03]	No	Yes	No
	INV	25	4	2	6.43[0.01]	0.33[0.56]	6.41[0.01]	No	No	Yes
	INF	25	4	3	1.09[0.30]	10.4[0.00]	7.15[0.01]	No	Yes	No
LFIA	LPY	29	3	3	0.32[0.57]	17.2[0.00]	8.71[0.00]	No	Yes	No
	INV	31	1	3	11.2[0.00]	3.65[0.06]	2.02[0.16]	Yes	Yes	Yes
	GE	30	2	4	6.95[0.01]	1.51[0.22]	12.2[0.00]	No	No	Yes
	INF	28	1	4	39.8[0.00]	0.09[0.77]	0.21[0.65]	No	No	Yes
LFIL	LPY	29	3	3	2.48[0.12]	14.0[0.00]	9.85[0.00]	No	Yes	No
	INV	31	1	4	10.0[0.00]	4.22[0.04]	2.71[0.10]	Yes	Yes	Yes
	INF	28	1	3	0.89[0.35]	31.5[0.00]	2.61[0.11]	No	Yes	No
Model B: LFDL										
LDL	INF	26	3	3	22.4[0.00]	15.1[0.00]	1.07[0.30]	Yes	Yes	Yes
	OPN	27	3	3	5.20[0.02]	10.6[0.00]	1.12[0.29]	Yes	Yes	Yes
LFIL	INF	28	1	2	1.23[0.27]	35.9[0.00]	2.66[10.0]	No	Yes	No
	OPN	28	4	4	3.43[0.06]	32.8[0.00]	0.05[0.82]	Yes	Yes	Yes

Note: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. In Model A, LFDC is used to as a measure of financial development. In Model B, LFDL is used as a measure of financial development. CV – control variables. Parentheses [ ] are used to denote probability values; k is the VAR Order that produces a white noise residual. A is the deterministic trend assumption: (2) The level data X has no deterministic trend and the cointegrating equations have intercepts; (3) The level data X has linear trends, while the cointegrating equations have intercepts but no trend; (4) Both the level data X and the cointegrating equations have linear trends. Yes – the null hypothesis could not be rejected. No – the null hypothesis is rejected.

Source: Estimates by author.

ii. Lesotho

Table 7.2B reports the weak exogeneity tests and causality results for Lesotho. Altogether, nine models are reported, out of which the null hypothesis of weak exogeneity is rejected in two cases for FD and eight cases for IFI. Thus, predominantly, IFI is endogenous in Lesotho. An analysis of the results according to the measure of FD reveals that IFI is endogenous in one case each for models A and B.

The weak exogeneity test results suggest that causality runs mainly from FD to IFI in both models A and B. Thus, overall the weight of evidence suggests that long-run causality runs from FD to IFI in Lesotho.

Table 7.2B: Weak exogeneity test results for Lesotho

Variable					Weak Exogeneity test			Causality between LPY and FD		
IFI	CV	Obs	K	A	FD	IFI	CV	Null hypothesis		
								FD↔IFI	FD→IFI	FD←IFI
Model A: LFDC										
LFIA	INF	27	3	2	0.00[0.96]	10.3[0.00]	0.62[0.43]	No	Yes	No
LFIL	LPY	30	3	3	1.08[0.30]	24.5[0.00]	1.64[0.20]	No	Yes	No
	INV	30	1	3	0.38[0.54]	17.3[0.00]	0.96[0.33]	No	Yes	No
	INF	28	2	4	6.85[0.01]	0.41[0.52]	3.65[0.06]	No	No	Yes
	OPN	30	1	4	2.17[0.14]	15.5[0.00]	1.64[0.20]	No	Yes	No
Model B: LFDL										
LFIA	INV	30	1	3	5.35[0.02]	11.4[0.00]	0.02[0.89]	Yes	Yes	Yes
LFIL	LPY	30	1	3	0.08[0.78]	18.4[0.00]	1.21[0.27]	No	Yes	No
	INV	30	1	3	0.74[0.39]	15.1[0.00]	0.46[0.50]	No	Yes	No
	OPN	30	1	3	0.76[0.38]	14.2[0.00]	1.67[0.20]	No	Yes	No

Note: See note to Table 7.2A above for a description of symbols used.

Source: Estimates by author.

iii. South Africa

Table 7.2C reports the weak exogeneity test results for South Africa. Of the 15 models reported, the null hypothesis of weak exogeneity is rejected in ten cases for FD and seven for IFI. In the case of FD, where the null hypothesis is rejected, five of them occur in model A, and another five occur in model B. Financial integration is found to be endogenous in four cases in model A and three in model B.

With regard to the causality analysis, in model A, of the eight different models reported, one-way causality dominates. Out of the eight models, causality runs from FD to IFI in four, while in five, causality runs from IFI to FD, with a two-way causality found in one model. Seven models are reported in model B. The results show that causality predominantly runs from IFI to FD. In five out of seven models, causality runs from IFI to FD, while in three models causality runs from FD to IFI. Overall, the direction causality between FD and IFI in South Africa remains ambiguous.

Table 7.2C: Weak exogeneity test results for South Africa

Variable					Weak Exogeneity test			Causality between LPY and FD		
IFI	CV	Obs	K	A	FD	IFI	CV	Null hypothesis		
								FD↔IFI	FD→IFI	FD←IFI
Model A: LFDC										
LFDIL	INV	33	1	3	0.25[0.62]	13.2[0.00]	10.9[0.00]	No	Yes	No
	GE	31	3	4	9.07[0.00]	0.76[0.38]	0.66[0.42]	No	No	Yes
LDL	LPY	31	3	4	10.1[0.00]	6.37[0.01]	0.35[0.55]	Yes	Yes	Yes
	GE	31	3	4	17.6[0.00]	1.25[0.26]	0.01[0.91]	No	No	Yes
	OPN	32	2	4	11.7[0.00]	0.06[0.81]	9.37[0.00]	No	No	Yes
LFIA	INV	31	4	4	1.38[0.24]	14.4[0.00]	2.57[0.11]	No	Yes	No
	GE	32	3	4	24.1[0.00]	2.33[0.13]	1.09[0.30]	No	No	Yes
	OPN	32	3	3	0.46[0.50]	12.8[0.00]	0.35[0.55]	No	Yes	No
Model B: LFDL										
LFDIL	LPY	31	3	3	10.4[0.00]	0.11[0.74]	0.40[0.53]	No	No	Yes
	INV	31	3	3	20.4[0.00]	0.34[0.56]	0.97[0.32]	No	No	Yes
	GE	31	3	3	13.2[0.00]	0.17[0.68]	0.10[0.75]	No	No	Yes
	INF	32	1	3	0.67[0.41]	11.0[0.00]	2.63[0.11]	No	Yes	No
LDL	INV	30	4	3	3.79[0.05]	14.0[0.00]	0.69[0.41]	Yes	Yes	Yes
	GE	30	4	3	0.01[0.92]	19.3[0.00]	5.43[0.02]	No	Yes	No
LFIA	INF	31	3	3	6.71[0.01]	0.25[0.62]	1.23[0.27]	No	No	Yes

Note: See note to Table 7.2A above for a description of symbols used.

Source: Estimates by author.

iv. Swaziland

Table 7.2D reports the weak exogeneity test results for Swaziland. Overall, the evidence seems to suggest that in Swaziland, FD is predominantly endogenous compared to IFI – 10 out of 12 cases for FD as opposed to five cases for IFI. Financial integration is mostly exogenous in model B, where out of four models the null hypothesis of weak exogeneity was rejected in only one, while in model A, it was rejected in four out of eight cases. In the case of FD, it is highly endogenous in the two groups of models – seven out of eight cases in model A and three out of four in model B.

Overall, the weak exogeneity test suggests that causality runs mainly from IFI to FD in Swaziland, though the evidence is more mixed in model A than in model B.

The analyses so far highlight that there is a long-run causal relationship between FD and IFI across the SACU countries. However, the nature of the causal effect (whether positive or negative and the size) needs further exploration. This is considered next under the VECM results.

Table 7.2D: Weak exogeneity test results for Swaziland

Variable					Weak Exogeneity test			Causality between LPY and FD		
IFI	CV	Obs	K	A	FD	IFI	CV	Null hypothesis		
								FD↔IFI	FD→IFI	FD←IFI
Model A: LFDC										
LFDIL	LPY	29	3	4	15.4[0.00]	0.96[0.33]	1.29[0.26]	No	No	Yes
	INV	29	4	4	9.45[0.00]	0.35[0.55]	1.60[0.21]	No	No	Yes
	OPN	29	2	4	12.5[0.00]	0.62[0.43]	8.26[0.00]	No	No	Yes
LDL	LPY	31	3	3	22.6[0.00]	0.37[0.54]	2.48[0.12]	No	No	Yes
LFIA	LPY	33	1	3	2.84[0.09]	9.36[0.00]	0.68[0.41]	Yes	Yes	Yes
	INV	32	2	3	4.42[0.04]	8.90[0.00]	5.51[0.02]	Yes	Yes	Yes
LFIL	LPY	32	2	4	2.32[0.13]	15.9[0.00]	1.46[0.23]	No	Yes	No
	OPN	31	2	4	10.2[0.00]	19.9[0.00]	2.24[0.14]	Yes	Yes	Yes
Model B: LFDL										
LFDIL	GE	29	3	4	14.2[0.00]	1.58[0.21]	8.65[0.00]	No	No	Yes
LDL	GE	30	3	4	16.6[0.00]	0.02[0.88]	1.36[0.24]	No	No	Yes
	INF	32	1	3	10.3[0.00]	0.37[0.54]	20.9[0.00]	No	No	Yes
LFIL	INV	32	2	4	0.08[0.78]	16.6[0.00]	0.74[0.39]	No	Yes	No

Note: See note to Table 7.2A above for a description of symbols used.

Source: Estimates by author.

7.4.3 VECM result

Tables 7.3A-7.6B report the results of the VECM. Each of the tables reports the results of the normalised models. These include the long-run elasticities, the adjusted R^2, the error correction terms and the residual diagnostic results. Moreover, each table reports the results in two panels according to the measure of FD, models A and B as described earlier. The first two columns of the tables contain the measure of IFI and the control variables (CV). The next section discusses the results of each country in turn.

i. Botswana

Tables 7.3A and 7.3B report the VECM results for Botswana. Table 7.3A reports the results of the model normalised as an FD model. Altogether, five models are normalised as LFDC (model A) relationship and one as LFDL (model B) relationship. Of the five models using LFDC, FD is a positive function of IFI in four, with elasticities ranging from 0.02 to 1.83, with values skewed toward the upper part of the range. Of the four positive long-run elasticities, three are statistically significant at a 1% level of significance, while only one is not statistically significant. In the remaining one model, the long-run elasticity of FD is negative and statistically significant at a 1% level of significance with a value of 0.54. On balance, the evidence suggests a positive effect of IFI on credit market development in Botswana. Strikingly, the only model with negative elasticity is where the indicator of FDI liabilities is used. Thus, while accumulation of FDI liabilities causes underdevelopment of the credit market, the accumulation of external debts and foreign assets and liabilities of banks yield an opposite effect.

In model B, the only model normalised as a LFDL relationship has a negative elasticity of IFI, with the parameter being statistically significant at a 1% level of significance. Given that the model uses the ratio of the external debt liabilities indicator, it suggests that an accumulation of external debt has a negative effect on the deposit market in Botswana. Thus, while accumulation of external debt liabilities positively affects the credit market, it has a negative effect on the deposit market.

Table 7.3A: Estimated long run parameters of financial integration for Botswana

Variable			Slope Coefficient				
IFI	CV	Intercept	IFI	R2	ECM	S.Cor	Het
Model A: LFDC							
LFDIL	INV	5.73	-0.54(-4.11)[a]	0.4	-0.38(-2.81)[a]	2.65[0.98]	124[0.38]
LDL	INV	-11.1	0.94(3.78)[a]	0.37	-0.31(-3.99)[a]	9.89[0.36]	33.7[0.94]
LFIA	INV	-7.91	0.68(4.09)[a]	0.35	-0.10(-4.11)[a]	5.11[0.83]	14.7[0.26]
	GE	32.4	0.02(0.20)	0.3	-0.15(-3.16)[a]	10.8[0.29]	47.2[0.51]
LFIL	INV	-24.7	1.83(4.48)[a]	0.34	-0.06(-4.04)[a]	5.28[0.81]	10.1[0.61]
Model B: LFDL							
LDL	INF	7.45	-1.16(-6.69)[a]	0.52	-0.36(-4.97)[a]	4.88[0.84]	83.4[0.50]

Notes: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. Models reported in this table are normalised on financial development. Parentheses [ ] are used to denote probability values and ( ) represent t-values; a, b and c represent 1%, 5% and 10% significance levels respectively

Source: Estimates by author.

The degree of adjustment when FD is displaced from its long-run equilibrium value, as shown by the error correction terms, is moderate. In model A, the speed of adjustment ranges from 6% to 38% per year and is skewed toward the upper side of the range. In model B, the speed of adjustment is 36% per year. Thus, it would appear that both the markets seem to adjust moderately in Botswana.

The weak exogeneity results presented earlier show that there is strong evidence of reverse causality between FD and IFI. Table 7.3B reports the results of the reverse causal effects. These are models where IFI is found to be endogenous and the models are normalised on it. Again, the models are grouped into models A and B, depending on the measure of FD used. Overall, the results strongly suggest that the long-run effect of FD on IFI is negative in Botswana. In model A, of the 10 models normalised on measures of IFI, in seven, the long-run elasticities are negative and highly statistically significant – with the majority at a 5% level of significance or less. The negative long-run elasticities range from 0.54 to 1.25. Of the three with positive elasticities, only one is statistically significant, at a 1% levels of significance. The negative effect is manifest irrespective of the IFI measures used. The only exception is LFIL, where the evidence is ambiguous.

In model B, four models are normalised on measures of IFI and these have negative long-run elasticities with three being highly statistically significant (at a 1% level of significance). Thus, as noted earlier, the evidence seems robust in suggesting a negative and significant long-run effect of FD on IFI. The strong negative effect of FD on IFI suggests that domestic FD is a substitute to IFI in Botswana.

All the error correction parameters associated with the IFI models are negative and statistically significant. The speeds of adjustment to long-run equilibrium range from 5% to 59% per year in model A, and from 35% to 99% in model B, with the parameters skewed to the centre of each range. Thus, compared to the FD models, the IFI models have a higher speed of adjustment to long-run equilibrium. In addition, of the two groups of IFI models, the speed of adjustment in model B is faster than in model A.

In sum, the results show that accumulation of FDI liabilities leads to underdevelopment of the domestic financial system, especially the credit market, while the effect of the accumulation of external debt liabilities depend on the market it impacts. Whereas the accumulation of external debt liabilities leads to the underdevelopment of the domestic deposit market, it promotes the development of the credit market. In addition, the results suggest that accumulation of bank foreign assets and liabilities exerts a positive effect on the domestic financial system. Lastly, the effect of FD on IFI is mainly negative irrespective of the measure of FD used.

Table 7.3B: Estimated long run parameters of financial development for Botswana

Variable			Slope Coefficients				
IFI	CV	Intercept	FD	R2	ECM	S.Cor	Het
Model A: LFDC							
LFDIL	LPY	25.9	-1.24(-2.37)[b]	0.32	-0.16(-3.69)[a]	13.7[0.13]	12.9[0.38]
	INF	5.97	0.17(0.68)	0.34	-0.45(-3.00)[a]	3.90[0.92]	107[0.79]
LDL	LPY	6.56	-0.60(-2.39)[b]	0.33	-0.46(-3.29)[a]	4.92[0.84]	85.1[0.45]
	GE	9.34	-0.79(-3.08)[a]	0.31	-0.39(-3.10)[a]	7.38[0.60]	75.2[0.74]
	INF	4.62	-0.54(-2.82)[a]	0.33	-0.51(-3.44)[a]	2.81[0.97]	74.0[0.77]
	OPN	-0.89	-0.67(-2.72)[b]	0.32	-0.29(-2.37)[b]	6.05[0.74]	88.9[0.34]
LFIA	LPY	-23.1	0.18(0.19)	0.41	-0.56(-4.25)[a]	12.3[0.20]	86.1[0.42]
	INF	4.02	-0.78(-3.60)[a]	0.80	-0.12(-10.3)[a]	10.3[0.33]	6.76[0.87]
LFIL	LPY	-0.83	-1.25(-2.37)[b]	0.51	-0.59(-3.77)[a]	12.2[0.21]	96.8[0.16]
	INF	4.77	1.15(4.80)[a]	0.70	-0.05(-7.98)[a]	9.20[0.42]	5.50[0.94]
Model B: LFDL							
LDL	INF	6.43	-0.86(-5.02)[a]	0.34	-0.55(-3.91)[a]	4.88[0.84]	83.4[0.50]
	OPN	0.15	-0.44(-1.49)	0.37	-0.45(-3.43)[a]	6.60[0.68]	70.9[0.84]
LFIL	INF	7.34	-1.63(-6.86)[a]	0.75	-0.99(-9.10)[a]	7.84[0.55]	4.72[0.97]
	OPN	-3.2	-1.56(-4.76)[a]	0.74	-0.89(-6.55)[a]	7.52[0.58]	113[0.65]

Notes: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. Models reported in this table are normalised on financial integration. Parentheses [ ] are used to denote probability values and ( ) represent t-values; a, b and c represent 1%, 5% and 10% significance levels respectively

Source: Estimates by author.

ii. Lesotho

Table 7.4 reports the VECM results for Lesotho. As noted earlier, in Lesotho the aggregate capital stock data is not available, hence all the models are based on stocks of foreign assets and liabilities of banks (i.e. LFIA and LFIL). The results of Table 7.4 are presented in two panels, where the first panel reports the results of FD models and the second panel reports the IFI models. Again, each panel contains two groups of results – model A and B as described earlier.

In model A of the first panel, only one model is normalised on FD and the results show that FD is a positive function of IFI, though the elasticity is not statistically significant. Regarding the models normalised on IFI, the evidence suggests that IFI is a negative function of FD in the long-run. In model A and B, all the elasticities (eight altogether) possess negative signs and three of them are statistically significant. In model A, the elasticities ranges from 0.04 to 1.25, while in model B, the elasticities range from 0.27 to 0.67. Thus the results show that the domestic FD is a substitute to IFI. Consequently, the development of domestic deposit and loan markets will prevent both individuals and firms from bypassing domestic banks, and the banks from bypassing the domestic economy in their lending.

Table 7.4: Estimated long-run parameters of financial integration and financial development – Lesotho

Variable			Slope Coefficients					
IFI	CV	Intercept	IFI	FD	R2	ECM	S.Cor	Het
Model normalised on Financial development(FD)								
Model A: LFDC								
LFIL	INF	-1.61	0.32(0.80)		0.73	-0.20(-5.21)[a]	10.3[0.33]	50.8[0.36]
Model normalised on Financial integration (IFI)								
Model A: LFDC								
LFIA	INF	7.17		-1.25(-6.91)[a]	0.41	-0.86(-4.26)[a]	8.43[0.49]	84.5[0.47]
LFIL	LPY	-3.79		-0.28(-0.69)	0.55	-0.95(-6.09)[a]	3.66[0.93]	7.38[0.83]
	INV	0.67		-0.04(-0.08)	0.52	-0.89(-5.67)[a]	4.29[0.89]	9.28[0.68]
	OPN	-2.3		-0.38(-0.88)	0.57	-0.88(-6.33)[a]	5.21[0.82]	14.0[0.30]
Model B: LFDL								
LFIA	INV	6.87		-0.53(-2.32)[b]	0.35	-0.55(-4.08)[a]	1.38[0.99]	8.37[0.76]
LFIL	LPY	-0.41		-0.27(-0.85)	0.55	-0.97(-6.07)[a]	8.56[0.48]	9.58[0.65]
	INV	2.92		-0.40(-1.28)	0.50	-0.97(-5.51)[a]	9.04[0.43]	10.7[0.55]
	OPN	-4.49		-0.67(-1.63)[c]	0.48	-0.79(-5.30)[a]	10.3[0.33]	13.6[0.33]

Notes: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. Models reported in first panel of this table are normalised on financial development, while those in the second panel are normalised on financial integration. Parentheses [ ] are used to denote probability values and ( ) represent t-values; a, b and c represent 1%, 5% and 10% significance levels respectively

Source: Estimates by author.

The control variables largely appear with the expected signs (see Table A-7.3b in the appendix). In model A and B, the results show that trade openness in Lesotho leads to greater IFI as found in several empirical studies (cf. Chinn and Ito, 2006:183; Ito 2006:318). Moreover, consistent with economic theory, the results show that IFI is a negative and statistically significant function of inflation in the long-run. Thus, an increase in the inflation rate, implying increase in domestic macroeconomic instability, results in a lower level of IFI in Lesotho. Only investment appeared with mixed signs in the models.

Consistently, the error correction terms appeared with negative and statistically significant coefficients. The speed of adjustment is quite fast in both models A and B. In model A, it ranges from 86% to 95% a year and in model B, it ranges from 55% to 97% a year.

In sum, the results presented in this section suggest that overall the long-run effect of IFI on FD is not very strong in Lesotho. In contrast, the evidence robustly suggests that IFI is a negative function of FD, thus confirming that domestic FD is a substitute to IFI.

iii. South Africa

Tables 7.5A-B report the VECM results for South Africa. As shown in Table 7.5A, the effect of IFI on the credit market is the exact opposite of its effect on the deposit market. The results robustly show that IFI has a negative effect on the credit market while its effect on the deposit market is positive. In model A, the long-run elasticities of IFI in the FD models are all negative and statistically significant at a 1% level of significance. Thus the results suggest that FD measured as the credit ratio is a negative function of IFI. The elasticities range from 0.21 to 1.44, thus an increase in IFI will lead to a reduction in the level of domestic private credit of banks. Overall, the evidence suggests that, compared to other stocks of capital, the stock of debt liabilities appear to have the strongest negative effect on domestic credit market development.

Table 7.5A: Estimated long-run parameters of financial integration for South Africa

Variable		Intercept	IFI	R^2	ECM	S.Cor	Het
IFI	CV						
Model A: LFDC							
LFDIL	GE	16.5	-0.34(-2.82)[a]	0.47	-0.25(-4.77)[a]	8.37[0.50]	71.6[0.83]
LDL	LPY	48.2	-1.44(-5.29)[a]	0.38	-0.13(-3.99)[a]	7.47[0.59]	97.4[0.15]
	GE	7.67	-0.21(-3.35)[a]	0.58	-0.51(-5.85)[a]	4.40[0.88]	80.5[0.59]
	OPN	1.21	-0.46(-3.59)[a]	0.36	-0.21(-4.19)[a]	10.9[0.28]	56.8[0.18]
LFIA	GE	15.9	-0.35(-4.45)[a]	0.63	-0.26(-6.51)[a]	7.25[0.61]	71.7[0.83]
Model B: LFDL							
LFDIL	LPY	-0.31	0.21(5.95)[a]	0.41	-0.60(-4.36)[a]	5.52[0.79]	93.8[0.22]
	INV	2.84	0.20(8.73)[a]	0.5	-0.79(-5.18)[a]	5.17[0.82]	79.5[0.62]
	GE	3.92	0.20(5.24)[a]	0.41	-0.62(-4.65)[a]	9.53[0.39]	65.9[0.93]
LFIA	INF	4.28	0.14(5.48)[a]	0.4	-0.48(-4.17)[a]	2.49[0.98]	92.3[0.25]

Notes: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. Models reported in this table are normalised on financial development. Parentheses [ ] are used to denote probability values and ( ) represent t-values; a, b and c represent 1%, 5% and 10% significance levels respectively
Source: Estimates by author.

In contrast, in model B, where the liquid liability ratio is used to measure FD, the elasticities of FD are positive and highly statistically significant in all the four models normalised on FD. Thus, overwhelmingly, the results show that FD (LFDL) is a positive function of IFI in the long-run. The elasticities range from 0.14 to 0.21. Moreover, unlike the credit market where the stock of debt liabilities has the most negative effect, in the deposit market, the stock of debt liabilities did not appear in any of the models. Instead, the stock of FDI liabilities has the most positive impact on the deposit market development.

These results may reflect two possibilities. First, a negative effect of debt stocks on credit market development might reflect the declining debt flows to South Africa as shown in Chapter 5 and the volatility and pro-cyclicality of debt flows. In contrast, the positive effect of stock of FDI on deposit market development in South Africa might reflect an efficiency seeking FDI flows. Given the relatively developed and stable banking system, such FDI will be attracted as the results of the reverse causality show. Such inflow of FDI brings along improved technology and infuses new management skill that might have helped to enhance the deposit mobilising ability of domestic banks (Bailliu, 2000:7). This is a positive development that needs to be encouraged through strengthening of the domestic banking system.

Nevertheless, a worrying aspect of the results relates to the negative (though not very strong) effect of FDI flows on credit market development. This may reflect possible discrimination against small and medium scale businesses and emerging entrepreneur from the formerly disadvantaged group since they might be perceived as more risky. If this is true, it calls for an urgent intervention by government in form of incentive and regulations to sway banks to lend to these groups, since they hold a lot of capacity to contribute to growth and employment generation in the economy (Okeahalam, 2001:16).

Table 7.5B reports the results of the IFI models. The evidence in model A largely suggests that IFI is a positive function of FD. Of the four models normalised on IFI, three have positive elasticities and are all statistically significant at a 1% level of significance. In the only instance where the elasticity is negative, it is not statistically significant. In model B, of the three models normalised on IFI, one has a positive elasticity and is statistically significant at a 5% level of significance, while of the other two with negative elasticities, one is also statistically significant. Notably, in all the instances where the elasticities of IFI are negative in model A and B, they correspond to where the stocks of foreign debt liabilities are used. Thus, the accumulation of debt liabilities is a substitute to domestic FD while accumulation of FDI liabilities is a complement.

Table 7.5B: Estimated long-run parameters of financial development for South Africa

Variable		Intercept	FD	R^2	ECM	S.Cor	Het
IFI	CV						
Model A: LFDC							
LFDIL	INV	-27.3	5.58(8.42)[a]	0.36	-0.34(-4.34)[a]	12.2[0.20]	9.01[0.70]
LDL	LPY	-33.5	-0.69(-1.25)	0.64	-0.32(-2.93)[a]	7.47[0.59]	97.4[0.15]
LFIA	INV	-32.9	3.99(5.44)[a]	0.56	-0.71(-5.45)[a]	8.83[0.45]	115[0.60]
	OPN	-31.5	4.87(11.5)[a]	0.5	-0.75(-4.40)[a]	4.89[0.84]	72.1[0.82]
Model B: LFDL							
LFDIL	INF	-8.26	3.27(2.65)[b]	0.36	-0.31(-4.29)[a]	7.26[0.61]	11.4[0.49]
LDL	INV	5.31	-0.93(-1.22)	0.5	-0.47(-3.69)[a]	5.65[0.77]	126[0.32]
	GE	38.2	-5.14(-3.31)[a]	0.55	-0.36(-4.79)[a]	7.81[0.55]	133[0.19]

Notes: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. Models reported in this table are normalised on financial integration. Parentheses [ ] are used to denote probability values and ( ) represent t-values; a, b and c represent 1%, 5% and 10% significance levels respectively.

Source: Estimates by author.

Another aspect of the results of the IFI models when compared to the FD models is the relatively stronger effects of FD on IFI as opposed to the effect of IFI on FD. In the FD models, the elasticities in absolute terms range from 0.21 to 1.44 in model A and 0.14 to 0.21 in model B. In contrast, in the IFI models the coefficients of FD in absolute terms range from 0.69 to 5.58 in model A and 0.93 to 5.14 in model B. Thus, an increase in FD will result in a larger proportionate increase in the level of IFI than the effect of a similar increase in IFI on FD.

Regarding the control variables, the results are largely consistent with expectation (Table A-7.2b in the appendix). As expected, IFI is a positive and significant function of investment and openness in the long-run. Thus, an increase in domestic investment or openness will lead to an increase in degree of IFI in South Africa. The evidence is robust to the measure of IFI used. In contrast, as expected, IFI is a negative function of inflation rate. This suggests that an increase in the inflation rate will lead to a lower level of IFI in South Africa.

The coefficients of the error correction term associated with each of the models are well behaved with negative signs and they are statistically significant. Again, the coefficients of the error correction term show that the speed of adjustment of the IFI models is faster than those of the FD models.

In summary, while IFI may cause the development of the deposit market in South Africa, the evidence suggests the opposite in the case of the credit market. In addition, the development of the domestic financial system leads to accumulation of FDI liabilities and bank foreign assets, but not the debt liabilities.

iv. Swaziland

Tables 7.6A-B report the VECM results for Swaziland, where Table 7.6A reports the results of FD models and Table 7.6B reports the results of IFI models. As evident from the results of Table 7.6A, in model A, the long-run effects of IFI on FD are all positive and highly statistically significant (at a 1% level of significance) irrespective of whether debt or FDI liability indicator is used. However, the weight of evidence suggests that FDI liability has a stronger positive effect on FD using the credit ratio, than debt liability. More specifically, the LFDIL enters the FD models three times with elasticities ranging from 0.81 to 1.09, while LDL enters the model just once with an elasticity of 0.41. This suggests that though both have positive effects, an accumulation of FDI liabilities will help to improve the quality of private sector credit more than accumulation debt liabilities.

In model B, the evidence suggests a positive effect of IFI on deposit market development. Altogether, three models are normalised on FD based on the liquid liability measure and all IFI has a positive effect on FD, but only one is statistically significant at a 5% level of significance. The elasticities range from 0.02 to 0.48. Both the FDI and debt liabilities enter the model with positive signs, but only one out of two parameters of the debt liability is statistically significant, while the FDI parameter is not. Thus debt liability appears to have a stronger positive effect on the deposit market than FDI liability in Swaziland.

The coefficients of the error correction term are all well behaved with negative and statistically significant coefficients in models A and B. The speed of adjustment in model

A ranges from 43% to 94% while in model B it ranges from 8% to 19%, with the parameters in both models skewed toward the upper end of their ranges.

Table 7.6A: Estimated long-run parameters of financial integration -Swaziland

Variable			Slope Coefficients				
IFI	CV	Intercept	IFI	R^2	ECM	S.Cor	Het
Model A: LFDC							
LFDIL	LPY	-5.16	0.81(10.9)[a]	0.48	-0.91(-4.98)[a]	12.6[0.18]	99.9[0.11]
	INV	0.11	0.94(8.13)[a]	0.34	-0.91(-3.54)[a]	124[0.37]	124[0.37]
	OPN	4.08	1.09(6.51)[a]	0.31	-0.43(-3.96)[a]	51.4[0.34]	51.4[0.34]
LDL	LPY	-10.5	0.41(8.05)[a]	0.48	-0.94(-5.37)[a]	5.98[0.74]	69.2[0.88]
Model B: LFDL							
LFDIL	GE	26.3	0.13(0.16)	0.48	-0.08(-4.92)[a]	5.90[0.75]	74.4[0.76]
LDL	GE	11.7	0.48(2.32)[b]	0.56	-0.18(-5.03)[a]	6.92[0.65]	82.6[0.52]
	INF	2.45	0.02(0.65)	0.35	-0.19(-3.29)[a]	13.4[0.15]	43.2[0.67]

Notes: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. Models reported in this table are normalised on financial development. Parentheses [ ] are used to denote probability values and ( ) represent t-values; a, b and c represent 1%, 5% and 10% significance levels respectively

Source: Estimates by author.

Table 7.6B reports the results of the IFI models. In model A, the results seem to suggest that IFI is a positive function of FD. As can be seen from the table, of the four IFI models, two have positive coefficients and are statistically significant, while the two with negative coefficients are not statistically significant. The elasticities of the positive coefficients are 2.45 and 6.99, while the negative ones are 0.02 and 1.14. Thus, on balance, the weight of evidence suggests that IFI is a complement of the domestic credit market. Notably, FD (both credit and liquid liability ratios) did not enter in both the LFDIL and the LDL models. The development of the credit market seems to have a similar effect on the two bank-based measures of IFI.

In Model B, only one model is normalised on IFI. The model has a positive and statistically significant coefficient. Since the model is normalised on the LFIL, i.e. foreign liabilities of banks, it suggest that the development of deposit markets will lead to an accumulation of foreign liabilities of banks in Swaziland.

Overall, the results suggest that FD has a stronger effect on IFI than IFI has on FD. This is also consistent with the other SACU countries. Thus, a change in the level of FD would have a greater proportionate effect on IFI than a change in the level of IFI would have on FD.

Table 7.6B: Estimated long-run parameters of financial development - Swaziland

Variable							
IFI	CV	Intercept	FD	R2	ECM	S.Cor	Het
Model A: LFDC							
LFIA	LPY	-11.5	-1.14(-1.58)	0.40	-0.78(-4.70)[a]	10.5[0.31]	12.8[0.38]
	INV	11.9	2.45(2.18)[b]	0.49	-0.35(-3.60)[a]	5.31[0.81]	47.2[0.51]
LFIL	LPY	1.55	6.69(5.44)[a]	0.56	-0.69(-5.32)[a]	1.92[0.99]	57.4[0.17]
	OPN	-51.1	-0.02(-0.01)	0.59	-0.51(-5.56)[a]	3.47[0.94]	42.0[0.72]
Model B: LFDL							
LFIL	INV	-45.9	6.74(2.10)[b]	0.45	-0.39(-5.09)[a]	7.73[0.56]	46.1[0.55]

Notes: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. Models reported in this table are normalised on financial integration. Parentheses [ ] are used to denote probability values and ( ) represent t-values; a, b and c represent 1%, 5% and 10% significance levels respectively.

Source: Estimates by author.

Regarding the control variables, the results are largely consistent with *a priori* expectations (see Table A-7.2b in the appendix). Consistent with economic theory, IFI based on the foreign asset of banks is a negative function of domestic investment. Thus, as one would expect, an increase in domestic investment financed by banks should reduce the foreign assets of banks relative to their total assets. Notably, in the instance where investment entered in the model using the ratio of foreign liabilities to total liabilities of banks (LFIL), investment has a positive and statistically significant coefficient. This is also not surprising as an increase in domestic investment opportunity will encourage inflow of capital. Government expenditure has negative effect on IFI and the effect is statistically significant in the only model where it occurred. Consistent with economic theory, an increase in trade openness leads to a significant increase in the level of IFI.

The coefficients of the error correction term have the right signs and are statistically significant. In model A, the speeds of adjustment ranges from 35% to 78%, while it is 39% in model B.

7.5 SUMMARY AND CONCLUSION

This chapter sets out to investigate the relationship between FD and IFI. Specifically, it explores the causality and the long-run relationships between FD and IFI. To ascertain the robustness of the results, the analysis controls for other variables that might affect FD and IFI. Moreover, the analysis uses different measures of IFI to determine the kind of capital stock that mostly affects FD and *vice versa*.

The results presented in this chapter can be summarised under three headings – cointegration results, causality results and the VECM results. Overall, the cointegration analysis found evidence of a long-run relationship between FD and IFI across the SACU countries.

The weak exogeneity and causality results lead to two main conclusions. First, the weak exogeneity analyses overwhelmingly confirm that the measures of IFI can be endogenous. The endogeneity of IFI in many of the models confirms, as the literature suggests, that domestic FD is a prerequisite for IFI among the SACU countries (von Furstenberg, 1998:56). Indeed, in Lesotho IFI is endogenous in more cases than FD. A major implication of this finding for the empirical modelling of the relationship between FD and IFI is that any analysis that treats IFI as exogenous without first testing for it, such as is often done in cross-country and panel data analyses, might produce a biased result.

Second, the results of the causality analysis depend on the measure of FD and IFI as well as the country involved. For instance, while the causality results largely confirmed a one-way causality between FD and IFI in all the SACU countries (excluding Namibia of course), but the direction of causality vary from country to country. In Botswana and South Africa, the direction of causality is almost evenly distributed between those running from FD to IFI and those running in the opposite direction. In Lesotho, causality runs mainly from FD to IFI, while in Swaziland causality runs mainly from IFI to FD. This confirms, as Kose *et al.* (2006a:14) noted, that specific country characteristics matter for the outcomes of financial openness. Such country specific characteristics include institutional quality and development (cf. Klein, 2005, Edison *et al.* 2004; Edison *et al.* 2002), level of financial development (Bailliu, 2000); level of human capital development (Khoury and Savvides, 2006); level of *per capita* income (cf. Edison *et al.* 2004; Edison *et al.* 2002; Klein, 2003; 2007); political environment (cf. Chanda, 2005); and macroeconomic and financial policies and the regulatory environment (Mauro and

Ostry 2007). Consequently, any robust analysis of the relationship between FD and IFI must take into consideration the differences across countries and measures of FD and IFI.

Regarding the effects of IFI on FD and *vice versa*, the evidence varies across the countries and depends on the kinds of stock of capital and measure of FD used. In Botswana, the weight of evidence suggests a positive effect of IFI on credit market development, though the effects differ between FDI and debt liabilities. Specifically, accumulation of debt liability has a positive effect, while accumulation of FDI liabilities exerts a negative effect on the credit market development. Whereas accumulation of external debt liabilities leads to underdevelopment of the domestic deposit market, it promotes the development of the credit market. In addition, the results suggest that accumulation of bank foreign assets and liabilities exerts a positive effect on domestic financial system. Lastly, the effect of FD on IFI is mainly negative irrespective of the measure of FD used.

In Lesotho, the effect of IFI on FD is statistically generally very weak. On the reverse causality, the evidence robustly suggests a negative effect of domestic FD on IFI, thus confirming that domestic FD is a substitute to IFI in Lesotho.

The effect of IFI on FD in South Africa depends on the measures of FD. The results robustly show that IFI has a negative effect on the credit market while its effect on the deposit market is positive. Overall, the evidence suggests that, compared to other stocks of capital, the stock of debt liabilities appears to have the strongest negative effect on domestic credit market development while the stock of FDI liabilities has the most positive impact on the deposit market development. In addition, the development of the domestic financial system leads to accumulation of FDI liabilities and bank foreign assets, but not the debt liabilities.

In Swaziland, the evidence suggests a positive feedback relationship between FD and IFI. But while debt and FDI liabilities both have positive effects on FD, the results suggest that an accumulation of FDI liabilities will help to improve the quality of private sector credit more than accumulation debt liabilities, but the reverse appears to be the case with deposit market development.

In summary, the results discussed in this chapter suggest that the effect of IFI on FD varies from country to country and depend on the kind of capital stock as well as the aspects of the financial system. This suggests that there is no one-size-fits-all policy approach to stimulating FD or harnessing the benefits of IFI. Instead, different approaches will be required by different countries. Chapter 9 will examine the implications of these findings for policy purposes for each of the SACU countries.

Appendix: A-7

Table A-7.1a: Johansen Cointegration tests results: VAR={FD, IFI, D}: Botswana

Variable					Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
IFI	CV	Obs	K	A	$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
Model A: LFDC										
LFDIL	LPY	28	1	3	31.7[0.03]	11.7[0.17]	4.27[0.04]	20.1[0.07]	7.47[0.44]	4.27[0.04]
	INV	25	4	2	44.8[0.00]	19.5[0.06]	4.75[0.31]	25.3[0.02]	14.7[0.08]	4.75[0.31]
	INF	25	4	3	51.6[0.01]	19.7[0.24]	7.02[0.34]	31.9[0.01]	12.7[0.35]	7.02[0.34]
LDL	LPY	27	3	3	33.9[0.02]	8.71[0.39]	0.83[0.36]	25.1[0.01]	7.89[0.39]	0.83[0.36]
	INV	28	2	4	51.3[0.01]	20.8[0.19]	5.76[0.49]	30.5[0.01]	15.0[0.19]	5.76[0.49]
	GE	27	3	3	30.8[0.04]	7.96[0.47]	0.43[0.51]	22.9[0.03]	7.53[0.43]	0.43[0.51]
	INF	26	3	3	38.5[0.00]	10.6[0.24]	0.00[0.97]	27.9[0.01]	10.6[0.18]	0.00[0.97]
	OPN	27	3	3	39.3[0.00]	14.4[0.07]	2.47[0.12]	24.9[0.01]	11.9[0.11]	2.47[0.12]
LFIA	LPY	29	3	3	38.4[0.00]	8.15[0.45]	0.89[0.34]	30.3[0.00]	7.25[0.46]	0.89[0.34]
	INV	31	1	3	35.7[0.01]	12.0[0.16]	3.97[0.05]	23.7[0.02]	8.07[0.37]	3.97[0.05]
	GE	30	2	4	44.2[0.04]	19.5[0.25]	8.02[0.25]	24.7[0.07]	11.5[0.47]	8.02[0.25]
	INF	28	1	4	75.6[0.00]	17.4[0.39]	5.40[0.54]	58.3[0.00]	11.9[0.42]	5.40[0.54]
LFIL	LPY	29	3	3	39.2[0.00]	6.13[0.68]	1.42[0.23]	33.1[0.00]	4.71[0.78]	1.42[0.23]
	INV	31	1	4	46.7[0.02]	18.2[0.33]	5.33[0.55]	28.5[0.02]	12.8[0.34]	5.33[0.55]
	INF	28	1	3	51.8[0.00]	9.41[0.33]	3.50[0.06]	42.4[0.00]	5.91[0.62]	3.50[0.06]
Model B: LFDL										
LDL	INF	26	3	3	48.2[0.00]	8.95[0.37]	0.02[0.88]	39.3[0.00]	8.93[0.29]	0.02[0.88]
	OPN	27	3	3	32.1[0.03]	11.8[0.17]	3.17[0.08]	20.2[0.07]	8.66[0.32]	3.17[0.08]
LFIL	INF	28	1	2	63.0[0.00]	11.3[0.51]	5.55[0.23]	51.7[0.00]	5.77[0.81]	5.55[0.23]
	OPN	28	4	4	69.8[0.00]	12.8[0.75]	5.79[0.49]	56.9[0.00]	7.05[0.89]	5.79[0.49]

Note: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. CV – control variables. In Model A - LFDC is used to as a measure of financial development. In Model B, LFDL is used as a measure of financial development. CV – control variables. Parentheses [ ] are used to denote probability values k is the VAR Order that produces a white noise residual. The table reports those models where cointegration is found and either FD or IFI or both is endogenous, but where only the CV is endogenous the results were not reported.

Source: Estimates by author.

Table A-7.1b: Johansen Cointegration tests results: VAR={FD, IFI, D}: Lesotho

Variable					Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
IFI	CV	Obs	K	A	$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
Model A: LFDC										
LFIA	INF	27	3	2	40.3[0.01]	17.9[0.10]	6.49[0.16]	22.4[0.04]	11.4[0.22]	6.49[0.16]
LFIL	LPY	30	3	3	30.9[0.04]	3.34[0.95]	0.26[0.61]	27.6[0.01]	3.08[0.94]	0.26[0.61]
	INV	30	1	3	34.6[0.01]	10.3[0.26]	3.59[0.06]	24.3[0.02]	6.72[0.52]	3.59[0.06]
	INF	28	2	4	48.5[0.01]	22.7[0.12]	4.08[0.73]	25.8[0.05]	18.6[0.06]	4.08[0.73]
	OPN	30	1	4	46.0[0.02]	15.8[0.50]	2.46[0.93]	30.2[0.01]	13.4[0.30]	2.46[0.93]
Model B: LFDL										
LFIA	INV	30	1	3	32.5[0.02]	9.53[0.31]	1.74[0.19]	23.0[0.03]	7.79[0.40]	1.74[0.18]
LFIL	LPY	30	1	3	37.0[0.01]	9.11[0.35]	0.01[0.95]	27.9[0.00]	9.11[0.28]	0.01[0.95]
	INV	30	1	3	36.2[0.01]	9.89[0.29]	0.96[0.33]	26.3[0.01]	8.94[0.29]	0.96[0.33]
	OPN	30	1	3	41.7[0.00]	12.9[0.12]	0.92[0.34]	28.8[0.00]	12.0[0.11]	0.92[0.34]

Note: See note to Table A-7.1a above for a description of symbols used.
Source: Estimates by author.

Table A-7.1c: Johansen Cointegration tests results: VAR={FD, IFI, D}: South Africa

Variable					Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
IFI	CV	Obs	K	A	$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
Model A: LFDC										
LFDIL	INV	33	1	3	37.2[0.01]	7.89[0.48]	0.02[0.88]	29.3[0.00]	7.87[0.39]	0.02[0.88]
	GE	31	3	4	44.6[0.03]	21.0[0.18]	6.52[0.40]	23.6[0.09]	14.5[0.22]	6.52[0.40]
LDL	LPY	31	3	4	49.8[0.01]	21.0[0.18]	7.12[0.33]	28.8[0.02]	13.9[0.26]	7.12[0.33]
	GE	31	3	4	44.8[0.03]	15.3[0.55]	3.60[0.80]	29.5[0.02]	11.7[0.44]	3.60[0.80]
	OPN	32	2	4	49.7[0.01]	21.4[0.16]	5.28[0.56]	28.3[0.02]	16.1[0.14]	5.28[0.56]
LFIA	INV	31	4	4	55.7[0.00]	22.7[0.12]	5.31[0.55]	33.0[0.01]	17.4[0.09]	5.31[0.55]
	GE	32	3	4	52.1[0.00]	16.2[0.48]	4.91[0.61]	35.9[0.00]	11.3[0.49]	4.91[0.61]
	OPN	32	3	3	32.3[0.02]	11.3[0.20]	4.11[0.04]	21.1[0.05]	7.15[0.47]	4.11[0.04]
Model B: LFDL										
LFDIL	LPY	31	3	3	32.8[0.02]	13.5[0.10]	4.70[0.03]	19.4[0.09]	8.76[0.31]	4.71[0.03]
	INV	31	3	3	31.2[0.03]	6.00[0.70]	1.87[0.17]	25.2[0.01]	4.13[0.85]	1.87[0.17]
	GE	31	3	3	32.5[0.02]	11.6[0.18]	3.75[0.05]	21.0[0.05]	7.80[0.40]	3.75[0.05]
	INF	32	1	3	32.5[0.02]	11.2[0.20]	2.46[0.12]	21.2[0.04]	8.78[0.31]	2.46[0.12]
LDL	INV	30	4	3	40.8[0.00]	13.3[0.10]	4.38[0.04]	27.5[0.00]	8.96[0.29]	4.38[0.04]
	GE	30	4	3	36.8[0.01]	8.31[0.43]	2.23[0.14]	28.5[0.00]	6.08[0.60]	2.23[0.14]
LFIA	INF	31	3	3	31.8[0.03]	11.8[0.17]	3.19[0.07]	20.1[0.07]	8.58[0.32]	3.19[0.07]

Note: See note to Table A-7.1a above for a description of symbols used.
Source: Estimates by author.

Table A-7.1d: Johansen Cointegration tests results: VAR={FD, IFI, D}: Swaziland

Variable					Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
IFI	CV	Obs	K	A	$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
Model A: LFDC										
LFDIL	LPY	29	3	4	53.6[0.00]	17.3[0.39]	4.23[0.71]	36.3[0.00]	13.0[0.32]	4.23[0.71]
	INV	29	4	4	55.6[0.00]	20.9[0.18]	4.35[0.69]	34.7[0.00]	16.6[0.12]	4.35[0.69]
	OPN	29	2	4	45.7[0.03]	14.6[0.61]	5.37[0.54]	31.1[0.01]	9.18[0.71]	5.37[0.54]
LDL	LPY	31	3	3	43.9[0.04]	8.61[0.97]	2.83[0.89]	35.2[0.00]	5.78[0.96]	2.83[0.89]
LFIA	LPY	33	1	3	31.2[0.03]	12.7[0.13]	2.75[0.10]	18.5[0.11]	9.94[0.22]	2.75[0.10]
	INV	32	2	3	34.9[0.01]	11.8[0.17]	2.15[0.14]	23.2[0.03]	9.60[0.24]	2.15[0.14]
LFIL	LPY	32	2	4	44.5[0.03]	15.8[0.51]	3.09[0.87]	28.7[0.02]	12.7[0.35]	3.09[0.87]
	OPN	31	2	4	43.8[0.04]	14.1[0.65]	4.87[0.61]	29.8[0.01]	9.18[0.71]	4.87[0.61]
Model B: LFDL										
LFDIL	GE	29	3	4	47.3[0.02]	19.5[0.25]	3.23[0.85]	27.8[0.03]	16.2[0.14]	3.23[0.85]
LDL	GE	30	3	4	44.3[0.04]	17.7[0.36]	6.07[0.45]	26.6[0.04]	11.6[0.45]	6.07[0.45]
	INF	32	1	3	32.2[0.03]	5.90[0.71]	0.15[0.70]	26.3[0.01]	5.75[0.65]	0.15[0.70]
LFIL	INV	32	2	4	45.7[0.02]	13.7[0.68]	3.66[0.79]	32.0[0.01]	10.1[0.61]	3.66[0.79]

Note: See note to Table A-7.1a above for a description of symbols used.
Source: Estimates by author.

Table A-7.2a: Estimated long-run parameters of control variables for financial development model for SACU

Variables		Botswana		Lesotho		South Africa		Swaziland	
IFI	CV	Model A	Model B	Model A	Model B	Model A	Model B	Model A	Model B
LFDIL	LPY		1.86(4.08)[a]				0.36(1.87)[c]	0.82(3.42)[a]	
	INV	-0.36(-1.26)	2.56(4.25)[a]				0.12(3.73)[a]	-0.03(-0.34)	
	GE					-3.76(-4.45)[a]	-0.21(-1.66)		-6.67(-4.71)[a]
	INF								
	OPN							-0.92(-2.70)[a]	
LDL	LPY					5.78(4.18)[a]		1.78(6.22)[a]	
	INV	2.80(7.35)[a]							
	GE					-1.08(-5.00)[a]			-2.85(-3.96)[a]
	INF		-0.07(-3.38)a						0.12(6.04)[a]
	OPN					0.99(4.07)[a]			
LFIA	LPY								
	INV	2.64(3.91)[a]							
	GE	-8.68(-5.29)[a]				-4.04(-6.56)[a]			
	INF						-0.02(-4.35)[a]		
	OPN								
LFIL	LPY								
	INV	6.43(4.99)[a]						3.17(4.17)[a]	
	GE								
	INF			0.21(5.33)[a]					
	OPN								

Note: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. The ( ) represent t-values; a, b and c represent 1%, 5% and 10% significance levels respectively. The models reported in this table are normalised on financial development.

Source: Estimates by author.

Table A-7. 3b: Estimated long-run parameters of control variables for financial integration model for SACU

Variables		Botswana		Lesotho		South Africa		Swaziland	
IFI	CV	Model A	Model B	Model A	Model B	Model A	Model B	Model A	Model B
LFDIL	LPY	-2.19(-6.30)^{a}							
	INV					2.67(7.48)^{a}			
	GE								
	INF	-0.11(-3.82)^{a}					-0.14(-5.98)^{a}		
	OPN								
LDL	LPY	-0.21(-1.12)				4.01(4.96)^{a}			
	INV						0.52(2.48)^{b}		
	GE	1.10(1.86)c					-4.49(-3.90)^{a}		
	INF	0.01(0.21)	0.06(3.40)^{a}						
	OPN	-1.24(-3.00)^{a}	-0.93(-2.08)^{b}						
LFIA	LPY	2.84(4.69)^{a}						2.41(3.02)^{a}	
	INV				-0.47(-3.63)^{a}	4.84(6.75)^{a}		-5.25(-5.66)^{a}	
	GE								
	INF	0.14(5.27)^{a}		-0.06(-3.18)^{a}					
	OPN					3.28(7.04)^{a}			
LFIL	LPY	0.63(1.90)^{c}		0.80(1.75)^{c}	0.37(1.37)			-3.58(-1.18)	
	INV			0.22(0.70)	-0.03(-0.17)				5.64(3.32)^{a}
	GE								
	INF	0.04(1.56)	0.10(4.22)^{a}						
	OPN		1.85(2.72)^{b}	0.83(1.39)	1.71(2.38)^{b}			10.0(2.98)^{a}	

Note: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. The ( ) represent t-values; a, b and c represent 1%, 5% and 10% significance levels respectively. The models reported in this table are normalised on financial integration.

Source: Estimates by author.

CHAPTER 8:
FINANCIAL INTEGRATION AND ECONOMIC PERFORMANCE OF THE SACU COUNTRIES: EMPIRICAL EVIDENCE

8.1 INTRODUCTION

The literature reviewed in Chapter 4 suggests a potentially ambiguous effect of financial integration (IFI) on economic growth. In addition, the influence of IFI on growth could be direct or indirect. The direct effects arise because IFI can increase domestic investment by relaxing the constraints imposed by low levels of domestic saving and by reducing the cost of capital (Kose *et al.,* 2006a:5). Indirectly, IFI can promote economic growth by stimulating domestic financial and institutional development, macroeconomic discipline, and through signalling effects. Further, IFI can improve the quality of investment *per capita* by promoting international risk sharing and diversification, thereby stimulating economic growth (Obstfeld, 1994). But IFI also brings costs and risks in terms of potentially lower economic growth. These risks include the volatility and pro-cyclicality of short-term capital flows, deterioration of macroeconomic stability, geographical concentration of capital flows, and a lack of access by small countries, as well as a domestic misallocation of the capital flow that may result from integration (Agénor, 2003:1097-1098).

The financial integration-growth nexus has attracted a large and growing empirical literature. But, despite the rich body of contributions, the empirical literature remains inconclusive. As Table 4.1 of Chapter 4 shows, several empirical studies have failed to find any robust long-term impact of IFI on economic growth. Others, such as Quinn (1997), and Quinn and Toyoda (2007), found a strong positive effects of IFI on growth. Some recent studies suggest that the growth effect of IFI depends on other factors such as a sound institutional environment or income levels (cf. Klein, 2005; Edwards, 2001). An analysis of the various empirical studies further highlights a number of reasons that may account for differences across the studies. These include the measures of IFI used, the country sample, time period, econometric methodology and the set of control variables used.

Chapter 6 looked at the effect of FD on economic performance while Chapter 7 investigated the relationship between IFI and financial development (FD) among the

SACU countries. The evidence, though mixed, confirms that IFI does affect the level of domestic FD either positively or negatively and by implication may through this channel affect the level of economic performance of the SACU countries. This chapter extends the analysis of Chapters 6 and 7, to investigate the effect of IFI on the level of economic performance of the SACU countries. The concern in this chapter is whether or not countries with more IFI have experienced higher economic growth. Besides analysing the effect of integration on economic performance among the SACU countries in general, the chapter also investigates whether or not countries that are more integrated with South Africa gain more from IFI in general than those that are less integrated with it.

A further issue considered here is whether different types of financial flows have different effects on the economic performance of a country (IMF, 2007; Kose *et al.,* 2006a; Collins, 2004; Levine and Zervos, 1998a). To a large extent the debate centres on the relative effects of FDI and debt flows. Because of the spillover effect that may arise from FDI, it should have a greater potential to stimulate economic growth than debt flows. However, the empirical literature has remained largely inconclusive on the matter (see a survey of the literature by Kose *et al.*, 2006a). This chapter investigates the issue by examining the relative effects on economic performance of the different types of financial flows in the SACU countries.

This chapter provides new evidence on the financial integration-growth nexus based on the experiences of the SACU countries. The specific objectives of this chapter are:

i. To examine the nature (i.e. the sign and size) of the effects of IFI on the level of *per capita* income in each of the SACU countries. As a corollary, to explore the effect of economic performance on IFI in SACU.
ii. To determine among the smaller SACU countries whether or not countries more integrated with South Africa have greater growth benefits from their IFI in general than those that are less integrated with South Africa.
iii. To explore the direction of the causal relationship between the level of income *per capita* and IFI in each of the SACU countries.
iv. To investigate the relative effects of the different types of capital stock on economic performance in the SACU countries.
v. To explore the channels through which IFI affects the economic performance of each of the economies.

vi. Lastly, to determine whether or not the results of the above analysis are robust to controlling for other possible determinants of economic performance and IFI.

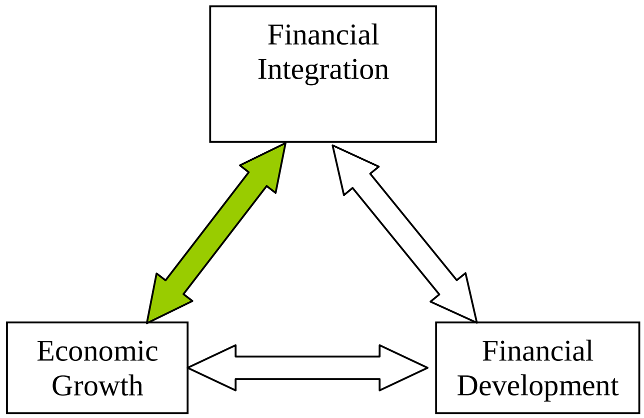


Figure 8.1: Structure of chapters

To achieve the above objectives, the analysis in this chapter draws on previous studies in a number of ways. First, following the trend in recent literature (IMF, 2007; Collins, 2004; O'Donnell, 2001; Reisen and Soto, 2001; Kraay, 1998), the current analysis employs different *de facto* measures of IFI as opposed to the *de jure* measures. Secondly, it uses the standard control variables used in growth literature. However, it departs from most of the previous studies that use cross-sectional and panel data approaches by adopting a time-series country-specific approach. Hence, it is similar to Kim *et al.* (2004) and Jin (2006). But, unlike the Kim *et al.* (2004) and Jin (2006) studies, the current study explicitly explores the endogeneity of each of the variables used and also models the long-run causality between IFI and *per capita* income. Moreover, it focuses on SACU countries. The modelling framework used in this chapter is briefly discussed below.

8.2 MODELLING FRAMEWORK

The modelling strategy of this chapter follows the procedure described in Chapters 6 and 7. However, unlike the previous chapters, this chapter focuses on the financial integration-growth nexus as highlighted in Figure 8.1 above. Thus, following Chapters 6 and 7, the analysis of this chapter adopts a trivariate cointegration and error correction modelling technique based on the Johansen maximum likelihood approach.

As usual the Johansen maximum likelihood approach employs tests of cointegration based on the trace statistics and maximal eigenvalue tests. Where a long-run relationship is found, a weak exogeneity test is carried out to explore whether or not a variable is endogenous, and, depending on the endogeneity of the variables, to determine the causal relations among the variables. Given the focus of this chapter, each long-run model is either normalised as an output model or a IFI model.

In case the model is normalised on output, the ordering of the variables of model takes the form:

$$X = f(LPY, IFI, CV) \tag{8.1}$$

where LPY, IFI and CV represent the level of *per capita* income, IFI and a control variable. Where the model is normalised on IFI to determine the effect of economic performance on IFI, the ordering begins with IFI.

To evaluate the effects of the different types of the stock of capital flows on the economic performance of the SACU countries, the analysis in this chapter, similar to Chapter 7, considers four measures of IFI. These are: LFDIL, LDL, LFIA and LFIL, and are as defined in Chapter 7. In particular, in view of the debate in the literature as noted above, emphasis is placed on the LDL and LFDIL, to analyse the relative effects on economic performance of stock of debt and FDI liabilities. The theoretical literature suggests that in developing countries, FDI inflows will have a positive effect on economic growth due to spillover effects, but debt inflows may have a negative effect due to volatility of such debt flows (IMF, 2007:3; Kose *et al.,* 2006a:23-26).

As in the two preceding chapters, this chapter uses two indicators to proxy financial development: the ratio of commercial banks private sector credit to nominal GDP (LFDC) and liquid liabilities of commercial banks to nominal GDP (LFDL). This chapter uses these proxies of FD, in turn, as control variables. Other control variables are: the ratio of domestic investment to GDP (INV), the ratio of government expenditure to GDP (GE), inflation rate (INF), and trade openness measured as the ratio of sum of export plus import to GDP (OPN). As discussed in previous chapters, all things being equal, investment should have a positive effect on economic growth. However, according to the theoretical and empirical literature, the effects of the other variables are uncertain on *a priori* grounds.

In addition to looking at how each of the control variables affects the level of *per capita* income, this chapter uses them to analyse the channels through which IFI affects economic performance of each economy. This is done by examining the parameters of IFI vis-à-vis that of a control variable that enters the model, especially investment and FD. For instance, if IFI affects the output level mainly through the investment channel, there is little reason to expect it to be significant in a model where it enters alongside the investment ratio (Schularick and Steger, 2007:13). But if both variables are statistically significant in the same model, it suggests that IFI affects the output level through channels other than the investment channel.

The sources of data and scope are as discussed in Chapters 6 (see Table A-6.1) and Section 7.2.3 of Chapter 7. The next section presents and discusses the results.

8.3 EMPIRICAL RESULTS

8.3.1 Unit root and cointegration results

Table A-6.2 of appendix in Chapter 6 reports the unit root results based on the DF-GLS and Ng and Perron (2001) tests. The discussion in the preceding two chapters show that in most of the variables the hypothesis of a unit root in level cannot be rejected, whereas it was strongly rejected for first difference in most of the series. Thus, most of the series are first difference stationary, i.e. I(1).

Given the results of the unit root tests, it is possible to carry out cointegration tests. Table 8.1 reports the summary of the cointegration results based on the trace test and the maximal eigenvalue statistics, while Tables A-8.1a-d in the appendix report more detailed results. Considering the focus of this chapter, any model where *per capita* income or IFI is not endogenous is not reported in the tables. Moreover, as in the preceding two chapters, this chapter reports and discusses the results of models that pass the residual diagnostic tests and have at least 30% explanatory power. Altogether, the chapter estimates 25 models for Botswana, South Africa and Swaziland individually. Due to data limitation noted earlier, the chapter estimates only 10 models for Lesotho. Of the

25 models estimated, a stable long-run relationship is found in 18 in Botswana, 13 in South Africa and five in Swaziland. In Lesotho, seven of the 10 models estimated produce a stable long-run relationship.

In all the models across the countries, the two tests suggest one cointegrating vector. Overall, the trace test produces more evidence of cointegration than the maximal eigenvalue method.

Table 8.1: Summary of Johansen Cointegration tests results: VAR={LPY, IFI, CV} for SACU

Variable		Botswana		Lesotho		South Africa		Swaziland	
IFI	CV	Trace	Max	Trace	Max	Trace	Max	Trace	Max
LFDIL	LFDC	1	1	x	x	1	1	0	0
	LFDL	1	0	x	x	+	+	1	1
	INV	1	1	x	x	1	1	0	0
	GE	1	1	x	x	+	+	0	0
	INF	1	1	x	x	1	0	0	0
	OPN	1	1	x	x	+	+	+	+
LDL	LFDC	1	1	x	x	0	0	1	1
	LFDL	1	1	x	x	0	0	0	0
	INV	1	1	x	x	0	0	1	1
	GE	+	+	x	x	+	+	0	0
	INF	1	1	x	x	1	1	0	0
	OPN	+	+	x	x	+	+	+	+
LFIA	LFDC	1	1	+	+	1	0	1	1
	LFDL	+	+	1	1	0	0	0	0
	INV	+	+	1	1	1	1	+	+
	GE	1	1	x	x	+	+	+	+
	INF	1	0	1	1	1	1	+	+
	OPN	1	1	+	+	1	0	+	+
LFIL	LFDC	1	1	1	1	0	0	+	+
	LFDL	1	1	1	1	1	0	0	0
	INV	1	1	1	1	1	1	+	+
	GE	+	+	x	x	1	1	+	+
	INF	0	1	0	0	1	1	+	+
	OPN	1	1	1	1	1	1	1	1

Note: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. CV – control variables. X denotes where the model could not be estimated because of lack of data. The table reports those models where cointegration is found and either LYP or IFI or both is endogenous, but where only the CV is endogenous the results are not reported. + Models eliminated due to poor residual diagnostic tests and/or explanatory power below 30%.

Source: Estimates by author.

8.3.2 Weak exogeneity and causality test results

Tables 8.2A-D report the weak exogeneity and causality tests results for Botswana, Lesotho, South Africa and Swaziland. The existence of a long-run cointegrating relationship between IFI and *per capita* income suggests that causality must at least run from one of the variables to the other. Considering that some of the factors that affect the level of economic performance can also affect capital flows, it is possible that IFI will be endogenous in the model. The test of weak exogeneity is used to establish whether IFI is endogenous in each model.

Overall, the weak exogeneity tests results predominantly show that the level of *per capita* income is endogenous in nearly all the models across the countries. In contrast, IFI is predominantly exogenous. Thus, causality runs mainly from IFI to output. The results appear to be very robust to variations in IFI measures and control variables. Specifically, in Botswana, of the 18 models reported, *per capita* income is found to be endogenous in all the cases while IFI is endogenous in nine cases. In Lesotho, *per capita* income is found to be endogenous in all the seven models reported, while IFI is endogenous in three. Of the 13 models reported for South Africa, *per capita* income is endogenous in 11, while IFI is endogenous in two of them. Regarding Swaziland, the results show that out of five models reported, the *per capita* income is endogenous in all five, while IFI is endogenous in one.

While the results of Chapter 7 strongly suggest that the level of FD influenced the degree of IFI, this chapter reports evidence that IFI influences output and is not, in turn, much influenced by output.

Table 8.2A: Weak exogeneity test results for Botswana

Variable					Weak Exogeneity test			Causality between LPY and FD		
IFI	CV	Obs	K	A	LPY	IFI	CV	Null hypothesis		
								LPY↔IFI	LPY→IFI	LPY←IFI
LDL	LFDC	27	3	3	9.22[0.00]	10.1[0.00]	7.36[0.01]	Yes	Yes	Yes
	LFDL	28	2	4	16.2[0.00]	0.00[0.99]	0.12[0.73]	No	No	Yes
	INV	29	1	2	42.6[0.00]	1.93[0.16]	0.14[0.71]	No	No	Yes
	INF	28	1	3	6.67[0.01]	0.43[0.51]	3.30[0.07]	No	No	Yes
LFDIL	LFDC	27	2	4	12.1[0.00]	4.55[0.03]	0.12[0.73]	Yes	Yes	Yes
	LFDL	28	2	4	6.87[0.01]	3.75[0.05]	0.90[0.34]	Yes	Yes	Yes
	INV	26	3	4	18.9[0.00]	2.92[0.09]	0.55[0.46]	Yes	Yes	Yes
	GE	27	2	3	7.28[0.01]	0.00[0.99]	5.85[0.02]	No	No	Yes
	INF	28	1	3	14.2[0.00]	5.33[0.02]	2.15[0.14]	Yes	Yes	Yes
	OPN	28	1	4	27.3[0.00]	2.79[0.09]	3.64[0.06]	Yes	Yes	Yes
LFIA	LFDC	31	1	4	12.5[0.00]	0.04[0.84]	1.87[0.17]	No	No	Yes
	GE	31	1	4	10.4[0.00]	5.19[0.02]	8.11[0.00]	Yes	Yes	Yes
	INF	26	3	2	8.59[0.00]	0.73[0.39]	0.07[0.79]	No	No	Yes
	OPN	31	1	4	27.3[0.00]	0.43[0.51]	2.63[0.11]	No	No	Yes
LFIL	LFDC	29	3	4	9.54[0.00]	11.4[0.00]	1.53[0.22]	Yes	Yes	Yes
	LFDL	29	3	3	7.26[0.01]	13.2[0.00]	1.29[0.26]	Yes	Yes	Yes
	INV	30	2	3	6.59[0.01]	0.09[0.77]	11.0[0.00]	No	No	Yes
	INF	26	3	2	13.0[0.00]	0.21[0.64]	0.06[0.81]	No	No	Yes
	OPN	31	1	4	25.2[0.00]	0.07[0.79]	2.97[0.08]	No	No	Yes

Note: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. CV – represent control variables. Parentheses [ ] are used to denote probability values; k is the VAR order that produces a white noise residual. A is the deterministic trend assumption: (2) The level data X has no deterministic trend and the cointegrating equations have intercepts; (3) The level data X has linear trends, but the cointegrating equations have only intercepts; (4) Both the level data X and the cointegrating equations have linear trends. Yes – the null hypothesis could not be rejected. No – the null hypothesis is rejected.

Source: Estimates by author.

Table 8.2B: Weak exogeneity test results for Lesotho

Variable					Weak Exogeneity test			Causality between LPY and FD		
IFI	CV	Obs	K	A	LPY	IFI	CV	Null hypothesis		
								LPY↔IFI	LPY→IFI	LPY←IFI
LFIA	LFDL	28	3	3	17.8[0.00]	0.08[0.78]	8.06[0.01]	No	No	Yes
	INV	27	4	4	4.71[0.03]	6.27[0.01]	1.69[0.19]	Yes	Yes	Yes
	INF	28	2	4	8.24[0.00]	0.11[0.74]	1.44[0.22]	No	No	Yes
LFIL	LFDC	28	3	3	9.90[0.00]	4.89[0.03]	1.66[0.19]	Yes	Yes	Yes
	LFDL	28	3	3	20.9[0.00]	1.61[0.20]	10.5[0.00]	No	No	Yes
	INV	30	1	2	5.40[0.02]	13.7[0.00]	0.92[0.34]	Yes	Yes	Yes
	OPN	28	3	4	12.4[0.00]	0.31[0.58]	10.0[0.00]	No	No	Yes

Note: See note to Table 8.2A above for a description of symbols used.

Source: Estimates by author.

Table 8.2C: Weak exogeneity test results for South Africa

Variable					Weak Exogeneity test			Causality between LPY and FD		
IFI	CV	Obs	K	A	LPY	IFI	CV	Null hypothesis		
								LPY↔IFI	LPY→IFI	LPY←IFI
LDL	INF	31	2	4	14.7[0.00]	0.24[0.63]	7.95[0.01]	No	No	Yes
LFDIL	LFDC	31	3	3	18.5[0.00]	0.25[0.61]	3.80[0.05]	No	No	Yes
	INV	31	3	3	18.9[0.00]	0.44[0.51]	6.85[0.01]	No	No	Yes
	INF	31	2	4	4.84[0.03]	0.36[0.55]	0.39[0.53]	No	No	Yes
LFIA	LFDC	33	1	3	0.68[0.41]	9.36[0.00]	2.84[0.09]	No	Yes	No
	INV	31	3	3	20.8[0.00]	0.04[0.84]	2.44[0.12]	No	No	Yes
	INF	30	3	4	1.34[0.25]	15.6[0.00]	0.00[0.96]	No	Yes	No
	OPN	30	4	4	8.90[0.00]	0.35[0.55]	1.27[0.26]	No	No	Yes
LFIL	LFDL	31	3	3	8.70[0.00]	0.15[0.70]	4.26[0.04]	No	No	Yes
	INV	31	3	2	16.7[0.00]	0.01[0.94]	2.49[0.12]	No	No	Yes
	GE	31	3	3	18.0[0.00]	0.46[0.50]	0.18[0.67]	No	No	Yes
	INF	31	2	3	13.2[0.00]	0.06[0.80]	5.48[0.02]	No	No	Yes
	OPN	33	1	3	14.8[0.00]	0.11[0.74]	0.13[0.72]	No	No	Yes

Note: See note to Table 8.2A above for a description of symbols used.

Source: Estimates by author.

Table 8.2D: Weak exogeneity test results for Swaziland

Variable					Weak Exogeneity test			Causality between LPY and FD		
IFI	CV	Obs	K	A	LPY	IFI	CV	Null hypothesis		
								LPY↔IFI	LPY→IFI	LPY←IFI
LDL	LFDC	33	1	2	20.9[0.00]	2.16[0.14]	0.50[0.48]	No	No	Yes
	INV	31	3	3	9.35[0.00]	0.17[0.68]	0.63[0.43]	No	No	Yes
LFDIL	LFDL	28	4	4	17.4[0.00]	0.83[0.36]	0.41[0.52]	No	No	Yes
LFIA	LFDC	33	1	3	9.36[0.00]	0.68[0.41]	2.84[0.09]	No	No	Yes
LFIL	OPN	30	3	4	13.8[0.00]	17.9[0.00]	0.11[0.75]	Yes	Yes	Yes

Note: See note to Table 8.2A above for a description of symbols used.

Source: Estimates by author.

8.3.3 VECM result

To determine the nature and the strength of the causal effects of IFI on economic performance of the SACU countries, a normalisation restriction is placed on each of the models based on the endogeneity of the variables. As usual, a model is normalised on output, if output is found to be endogenous, and conversely, it is normalised on IFI if it is endogenous. Tables 8.3A-D report the VECM results for Botswana, Lesotho, South Africa and Swaziland. Each table contains two panels. The first panel reports the results of the models normalised as output models, while the second panel reports the results of the few models normalised as IFI models. In addition to reporting the long-run parameters of the IFI and output, the tables also report the adjusted R^2, the error correction terms and diagnostic tests based on the residuals.

Table A-8.2 in the appendix reports the results of the control variables for the four countries. Overall, the results are consistent with the earlier results reported in Chapter 6. Hence, they will not receive attention in this section. The only exception occurs in Lesotho and South Africa with inflation. In Lesotho the inflation rate enters the output models with the expected negative sign and is statistically significant at 10% level of significance, unlike the results of Chapter 6 where it has a positive sign. In South Africa, the inflation rate also enters the output models with the expected negative sign and statistically significant coefficients. This is unlike the results shown in Chapter 6, where inflation did not enter any of the output models.

The analysis in the rest of this section seeks to address, among others, three main concerns regarding the effects of IFI on economic performance. First, by examining the sign and size of the long-run parameters of IFI in the output model, one can establish the nature and extent of the effects of IFI on the economic performance of the SACU countries. As a corollary, the effect of income level on IFI is analysed using the parameters of income *per capita* in the few IFI models. Second, by unbundling IFI into different types of stock of capital, one can determine the kinds of capital flows that help to stimulate economic growth. Lastly, the results are compared among the SACU countries to determine the relative benefit of integration in general to each country, especially the smaller SACU countries. The following discusses the results of each country in turn.

i. Botswana

Table 8.3A reports the VECM results for Botswana. In general, the analysis of the effects of IFI on output performance produced ambiguous results. Of the 18 output models reported in the table, IFI had a positive coefficient in nine while in the other nine it is negative. Of the nine models with positive coefficients, three are statistically significant while out of the nine coefficients with a negative sign, two are statistically significant. A close examination of the results shows the type of capital stock that yield the most growth outcome in Botswana.

First, regarding the stock of external debt liabilities (LDL), the effect on output is negative. Out of three models reported, two had negative parameters and one is statistically significant at a 1% level of significance. The only parameter with a positive sign is not statistically significant. Thus, overall the slim weight of evidence suggests a negative effect of the debt stocks on output in Botswana.

In the case of the stock of FDI liabilities (LFDI), the six models have a 50-50 split between those with positive and negative parameters. Again, the slim weight of evidence suggests that the effect of LFDI on growth is negative since the only statistically significant (at 1%) parameter has a negative sign. But, by and large, the effects of the stocks of both debt and FDI liability on the level of income in Botswana are not robust. Thus, the evidence in Botswana does not support the contention that FDI inflows may have a stronger positive effect on growth (due to transfer of management and technological expertise) than debt flows (Kose *et al*., 2006a:19).

The negative effect of inward FDI on the level of *per capita* income in Botswana is inconsistent with theoretical expectation. Nevertheless, the negative effect in Botswana is consistent with the findings of Jin (2006) for Korea and Japan, and Laureti and Postiglione (2005) who find a weak effect of FDI in a sample of 11 Mediterranean countries. In particular, Jin (2006) finds the negative effect of FDI in Korea to be statistically significant. The author attributes the negative effect in Korea to a weak domestic banking sector that could not compete favourably with foreign investors (Jin, 2006:238). A negative effect of inward FDI could also reflect the quality of domestic institutions especially institutions that assign and enforce property rights (Schularick and Steger, 2006:12). Also, Alfaro *et al*. (2004:101) suggest that insufficiently developed domestic institutions can "choke the positive effect of FDI". Similarly, Bailliu (2000:17) suggests that the presence of distortions in domestic economy, especially in the financial sector, could lead to unfavourable outcome of capital inflows.

In the case of Botswana, it is noteworthy that the negative effect of FDI is consistent with the results of FD and investment that also show a negative effect on the level of *per capita* income. Similarly, FDI has a negative effect on FD (using the credit indicator). Combining these results suggest the negative effects stem from the same sources, namely the low investment capacity in the economy due to the small size of the domestic market, poor entrepreneurial capacity and the strong exchange rate of the pula vis-à-vis the currencies of neighbouring countries such as South Africa. Consequently, while liberalisation of inward FDI will be necessary, such liberalisation must be accompanied by policies to address the low productive capacities within the economy. One such policy will be to, at least, peg the Botswana pula at par with the South African rand or allow the pula to freely float in the market to determine its level. This will encourage competitive domestic production of goods that could also be exported to the other SACU countries, hence reducing the constraint imposed by the small domestic market. Similarly the negative effect of debt inflows on the level of output may be associated with the same reasons as just outlined in the case of FDI. Hence, the same recommendations would be applicable.

Table 8.3A: Estimated long run parameters of financial integration and output in Botswana

Variable			Slope Coefficients					
IFI	CV	Intercept	IFI	LPY	R2	ECM	S.Cor	Het
Model normalised on Output (LPY)								
LDL	LFDL	8.72	-0.08(-2.48)[a]		0.76	-0.33(-5.90)[a]	2.98[0.97]	34.3[0.93]
	INV	12.4	0.12(0.46)		0.45	-0.05(-12.2)[a]	14.7[10.0]	9.65[0.65]
	INF	11.1	-0.30(-1.30)		0.30	-0.05(-3.56)[a]	14.0[0.12]	4.47[0.97]
LFDIL	LFDC	8.86	-0.02(-0.73)		0.66	-0.29(-4.03)[a]	9.59[0.38]	35.6[0.91]
	LFDL	8.38	0.03(0.28)		0.34	-0.15(-3.83)[a]	4.49[0.88]	11.7[0.47]
	INV	11.4	-0.09(-1.31)		0.77	-0.13(-5.16)[a]	6.34[0.71]	73.2[0.79]
	GE	-3.83	0.04(0.43)		0.68	-0.06(-2.75)[a]	7.71[0.56]	52.0[0.32]
	INF	9.5	0.14(0.86)		0.42	-0.05(-4.53)[a]	7.36[0.60]	3.10[0.99]
	OPN	-9.23	-0.64(-3.61)[a]		0.65	-0.05(-7.19)[a]	7.94[0.54]	25.9[0.01]
LFIA	LFDC	8.93	-0.02(-1.26)		0.44	-0.22(-4.99)[a]	14.2[0.11]	4.24[0.98]
	GE	-9.89	-0.05(-0.79)		0.34	-0.04(-4.04)[a]	10.9[0.28]	17.6[0.13]
	INF	10.8	0.05(0.28)		0.62	-0.05(-3.95)[a]	10.6[0.30]	96.9[0.16]
	OPN	-0.35	0.00(0.08)		0.64	-0.12(-7.34)[a]	8.20[0.51]	13.9[0.30]
LFIL	LFDC	5.49	0.71(4.08)[a]		0.59	-0.03(-3.10)[a]	12.2[0.20]	96.9[0.16]
	LFDL	-6.58	2.39(3.95)[a]		0.60	-0.01(-2.47)[b]	10.1[0.34]	92.4[0.25]
	INV	17.9	-0.35(-2.29)[b]		0.46	-0.03(-2.94)[a]	4.54[0.87]	49.9[0.39]
	INF	10.6	0.15(0.90)		0.60	-0.06(-4.95)[a]	7.44[0.59]	80.5[0.59]
	OPN	-0.63	-0.05(-1.06)		0.63	-0.11(-6.99)[a]	10.1[0.34]	10.7[0.55]
Model normalised on Financial integration (IFI)								
LDL	LFDC	6.57		-0.21(-1.12)	0.33	-0.46(-3.29)[a]	4.92[0.84]	85.1[0.45]

Notes: See note to Table 8.2A above for a description of symbols used. a, b and c represent 1%, 5% and 10% significance levels respectively.

Source: Estimates by author.

The remaining two measures of IFI similarly produced mixed results. In both the LFIA (the ratio of foreign assets to total assets of banks) and the LFIL (the ratio of foreign liabilities to total liabilities of banks), the parameters is equally split between those with positive and negative signs. In the case of LFIA, none of the parameters is statistically significant. In the case of LFIL, two of the positive parameters are statistically significant, while one of the negative parameters is statistically significant. But, by and large, the evidence shows that the effects of foreign assets or liabilities of banks on income level are inconclusive in Botswana.

An analysis of the effect of FD vis-à-vis that of IFI in the output models helps to address an important empirical concern. That is, whether or not IFI has any direct effect on economic performance other than any indirect effect that it may have through FD. A direct effect, as noted earlier, may arise because IFI can help to promote domestic investment through capital inflows and improve the quality of investment through risk diversification and sharing (Obstfeld, 1994).

As evidenced from the results, when the private credit ratio (LFDC) enters as control variable, IFI measures have mixed results. In two out of three models where LFDC featured as control variable, IFI had a negative sign, but none of them is statistically significant, while the only positive parameter is statistically significant at 1% level of significance (see Table A-8.2 in the appendix). When the liquid liability ratio (LFDL) enters as control variable, in two out of three cases, the measures of IFI enter with positive coefficients with one out of the two being highly statistically significant. Also, the only case where IFI enters with a negative sign, its coefficient is also statistically significant at 1% level of significance. Therefore, the evidence suggests that when LFDC and LFDL are controlled for, the effect of IFI on economic performance in Botswana is not conclusive.

Moreover, consider the parameters of investment vis-à-vis that of IFI in the output models. This helps to establish whether or not IFI has a direct effect on the level of output through the investment channel. As noted earlier, a joint statistically significant coefficient of IFI and the investment will suggest that IFI affects the output level through channels other than the investment channel. In the three models where investment featured as a control variable, its long-run elasticities are negative and statistically significant at 1% level of significance. Furthermore, in two out of the three models, IFI measures produce negative coefficients and one of them is statistically significant at 5% level of significance (see Table A-8.2 in the appendix).

Put together, the results of the models where FD and investment enter as control variables suggest that IFI affect the level of output through both the direct channel (investment channel) and indirect channels such as through domestic financial system development. However, such direct and indirect effects of IFI on output level appear to be negative in Botswana.

Regarding the models normalised on IFI, most of them have weak explanatory power (far below 30%) and as such are not reported. In the only model reported, the parameter is not statistically significant. This further confirms that income level does not constrain IFI in Botswana.

Consistent with the normalisation requirement, all the coefficients of the error correction term are negative and statistically significant. The speed of adjustment to equilibrium is slow, ranging from 1% to 33%. This is quite consistent with expectations, since the output level is a low frequency variable. That is, it takes some time before output will respond to changes in any of the variables used in the models (Adams, 2007; Collier, 2007). A closer examination of the coefficients of adjustments shows that in models where the measures of FD enter as control variables, the speed of adjustment tends to be faster compared to the other models. This may underscore an important role of the financial system in the transmission mechanism.

To summarise the results of the analysis for Botswana, overall the results do not produce robust evidence on the effect of IFI on output. The effect depends on the measure of IFI and the control variables used. In this regard, some patterns do emerge in Botswana:

i. The evidence could not lead to a robust conclusion about the effect of IFI on the level of *per capita* GDP.
ii. The evidence does not support the contention that the stock of FDI has a stronger positive effect on economic growth than the stock of debt.
iii. The results suggest that IFI affects the level of output through both the direct channel (investment channel) and indirect channels such as through domestic financial system development. But such direct and indirect effects of IFI on the level of output appear to be negative in Botswana.

ii. Lesotho

Table 8.3B reports the VECM results for Lesotho. The table reports five output models and two IFI models. As noted earlier, due to data limitation, the analysis uses two measures of financial integration (LFIA and LFIL) in Lesotho.

Overall, the results suggest an ambiguous effect of IFI on economic performance in Lesotho. Of the five models reported, IFI enters with a positive sign in three and negative sign in two. Of the three models where IFI enters with a positive sign, only one of the coefficients is statistically significant. Similarly, of the two models where IFI enters with a negative sign, the coefficient is statistically significant at a 5% level of significance in the case of one, while the other coefficient is not statistically significant. Thus, on balance, the effect of IFI on the level of output in Lesotho is inconclusive.

Table 8.3B: Estimated long run parameters of financial integration and output in Lesotho

Variable			Slope Coefficients					
IFI	CV	Intercept	IFI	LPY	R2	ECM	S.Cor	Het
Model normalised on Output (LPY)								
LFIA	LFDL	10.8	-0.22(-2.24)[b]		0.40	-0.17(-4.30)[a]	11.4[0.25]	78.4[0.65]
	INV	5.21	0.24(4.18)[a]		0.33	-0.35(-2.38)[b]	4.89[0.84]	111[0.70]
	INF	7.09	-0.02(-0.45)		0.40	-0.47(-4.54)[a]	5.27[0.81]	48.2[0.47]
LFIL	LFDL	9.9	0.11(0.69)		0.46	-0.15(-4.72)[a]	9.71[0.38]	77.0[0.69]
	OPN	11.8	0.10(1.37)		0.48	-0.26(-3.92)[a]	10.5[0.31]	79.5[0.62]
Model normalised on Financial integration (IFI)								
LFIL	LFDC	-15.9		2.65(3.72)[a]	0.37	-0.49(-2.45)[b]	8.15[0.52]	79.0[0.63]
	INV	-7.35		1.53(3.68)[a]	0.49	-0.86(-5.30)[a]	11.6[0.24]	10.9[0.54]

Notes: See note to Table 8.2A above for a description of symbols used. a, b and c represent 1%, 5% and 10% significance levels respectively.

Source: Estimates by author.

A closer examination of the results shows some differences between the two measures of IFI. Using the LFIA, the models have inconclusive results. Of the three models with LFIA, two have negative coefficients of which one is statistically significant. However, the one with positive coefficient is statistically significant. Thus, using the LFIA, the results do not lead to a decisive conclusion. Intuitively, one would expect the accumulation of bank foreign assets, which represent capital outflows, to have a negative effect on economic growth, since such outflows of capital reduce the amount of capital available for domestic investment.

When the LFIL is used, the results show a positive effect of IFI on the level of output. In the two models where LFIL features, it enters with positive parameters, but none of them is statistically significant.

Overall, the conclusion that emerges is that an increase in capital outflows through the accumulation of bank foreign assets has the potential to slow down the level of *per capita* income.

Next, consider the question of the channel of effect of IFI on the level of output. If as noted earlier indicators of FD and IFI are individually statistically significant in the same model, it suggests that IFI operates through channels other than through FD. The credit ratio (LFDC) did not enter any of the IFI models. When the second indicator of financial development (LFDL) is used, the results indicate a statistically significant negative effect of FD on output level (see Table A-8.2 in the appendix). In the two models where LFDL is used as control variable, IFI enters with opposite signs, with the one with a negative sign being statistically significant. Thus, on balance, the results suggest that the effect of IFI on output after controlling for the effect of deposit market development is negative.

Next, consider the question of whether or not IFI has a direct effect on output level through investment channel. In the only case where the investment ratio enters the output model it has a positive and highly statistically significant coefficient (see Table A-8.2 in the appendix). In the same model, IFI enters with positive and highly statistically significant coefficients. Thus, after controlling explicitly for the effect of the investment, IFI still causes the output level to increase. Therefore, in addition to the investment channel, IFI also affects the output level through other indirect channels in Lesotho.

Two models are normalised on IFI, and in both output enters with a positive and statistically significant coefficient. The results are consistent with the findings of Chapter 7 (Table 7.4). Overwhelmingly, the results show that, other things being equal, an increase in the level of output will cause an increase in the degree of IFI. Note that while an increase in the output level fails to promote the development of the domestic financial system, it increases the degree of integration of the financial system.

The speed of adjustment of both the output and IFI models are well behaved with and statistically significant coefficients. The speed of adjustment in the output model ranges from 10% to 47% per year with the values lying predominantly in the middle of the range, while it ranges from 45% to 86% (with the values falling mainly in the lower part of the range) in the IFI model.

In summary, the results highlight a number of key findings for Lesotho.

i. Overall, the results suggest that an accumulation of foreign liability of banks causes an increase in the level of *per capita* income. But the effect is not conclusive if banks accumulate foreign assets.
ii. The evidence suggests that IFI affects the level of income through both the direct channel (investment channel) and the indirect channels, but while the direct channel appears to have a positive effect, the indirect channel through deposit market development has a negative effect.

iii. South Africa

Table 8.3C reports the VECM results for South Africa. The table reports 12 output models and one IFI model. Of the 12 output models, IFI enters in five with a positive sign and all are statistically significant. In the remaining seven models, IFI enters with a negative sign, with five of them being statistically significant (four at 1% and one at 10% levels of significance). The positive coefficients range from 0.02 to 0.09 while the negative coefficients range from 0.01 to 0.21. In summary, the overall effect of IFI on output is ambiguous.

Next, consider the different types of capital stock. With regard to LFDIL (the ratio of the stock of FDI liabilities), it enters the output models with a positive sign in three of the times it features and these are all statistically significant. Thus, the evidence strongly suggests that LFDIL has a positive effect on the level of output level in South Africa.

The stock of debt liabilities (LDL) enters with a negative sign in the only output models where it featured and is statistically significant with a coefficient of 0.21. This is in sharp contrast with the results of the stock of FDI liabilities just discussed. Therefore, in South Africa, the results show that the stock of FDI and debt liabilities have opposite effects on the output level, thereby supporting the view that FDI inflows are better than debt inflows in promoting economic growth.

The two measures of IFI based on foreign assets and liabilities of banks suggest opposite effects of IFI on output. LFIA enters the output model three times. Of the three, its coefficients are positive in two and are statistically significant. But in the only instance where it enters with a negative coefficient, it is not statistically significant. Thus, on balance, the evidence suggests a positive effect of LFIA on the output level. The evidence is very robust when the LFIL enters the output models. In all five cases it enters with a negative sign and four of them are statistically significant. This may further highlight the negative effect of debt liabilities, since the stock of foreign liabilities of banks is also a component of debt liabilities.

Table 8.3C: Estimated long-run parameters of financial integration and output in South Africa

Variable			Slope Coefficients					
IFI	CV	Intercept	IFI	LPY	R2	ECM	S.Cor	Het
Model was normalised on Output (LPY)								
LDL	INF	9.75	-0.21(-1.78)[c]		0.52	-0.13(-4.44)[a]	4.04[0.91]	43.6[0.65]
LFDIL	LFDC	10.8	0.09(8.07)[a]		0.51	-0.76(-4.96)[a]	2.45[0.98]	88.0[0.36]
	INV	8.96	0.02(1.69)[c]		0.50	-0.90(-5.07)[a]	3.07[0.96]	74.1[0.77]
	INF	9.46	0.07(3.12)[a]		0.44	-0.59(-5.07)[a]	5.64[0.78]	40.3[0.78]
LFIA	LFDC	-11.2	0.07(5.39)[a]		0.45	-0.69(-4.25)[a]	3.08[0.96]	78.8[0.64]
	INV	8.76	0.02(2.53)[b]		0.50	-0.98(-5.19)[a]	10.7[0.29]	75.1[0.75]
	OPN	8.43	-0.01(-1.43)		0.53	-0.61(-4.60)[a]	8.71[0.47]	122[0.43]
LFIL	LFDL	9.68	-0.11(-6.19)[a]		0.39	-0.45(-3.41)[a]	7.60[0.58]	87.7[0.37]
	INV	9.15	-0.03(-1.40)		0.60	-0.75(-5.07)[a]	8.12[0.52]	86.8[0.40]
	GE	10.9	-0.07(-4.07)[a]		0.62	-0.56(-4.94)[a]	4.92[0.84]	80.8[0.58]
	INF	9.94	-0.14(-7.95)[a]		0.47	-0.38(-4.18)[a]	2.58[0.98]	51.9[0.32]
	OPN	8.65	-0.08(-7.70)[a]		0.40	-0.60(-4.76)[a]	6.76[0.66]	5.95[0.92]
Model was normalised on Financial integration (IFI)								
LFIA	INF	-100.6		10.4(4.18)[a]	0.51	-0.48(-5.28)[a]	8.55[0.48]	91.3[0.28]

Notes: See note to Table 8.2A above for a description of symbols used. a, b and c represent 1%, 5% and 10% significance levels respectively.

Source: Estimates by author.

Next, consider the channels of effect of IFI on economic performance. Consistent with the results of Chapter 6, the LFDC of FD enters the output models twice with a negative sign and they are statistically significant (see Table A-8.2 in the appendix). In the models where LFDC enters as control variable, IFI has positive coefficients and they are all statistically significant (at 1% level of significance). Thus, IFI has a significant positive effect on the level of output after controlling for the effect of credit market development. In the case of the deposit liability ratio (LFDL) as control variable, it enters the output model once with a positive sign but the coefficient is not statistically significant. In the same model (with LFDL), IFI enters with a negative sign and is statistically significant at a 1% level of significance. The evidence suggests a negative effect of IFI after controlling for the effect of the deposit market development. Therefore, the results suggest that IFI has an independent effect on output outside any effect that it may have through FD.

Next, consider the question of whether or not IFI has a direct effect on the output level through the investment channel. Consistent with the results of Chapter 6, investment enters the output models with a positive sign and it is statistically significant in the three models where it features (see Table A-8.2 in the appendix). In two out of three models where investment is used as control variable, IFI enters with positive and statistically significant coefficients. In the only instance, where IFI enters with a negative sign, its coefficient is not statistically significant. Thus, the weight of evidence suggests that after controlling for the effect of investment, an increase in IFI will cause an increase in the level of output. Therefore, the results (models with FD and investment as control variables) suggest that IFI operates through both the direct and indirect channels in South Africa.

Consistent with the normalisation requirement, all the models possess negative and statistically significant error correction terms, but the speeds of adjustment vary depending on the control variable. Notably, the models with investment have the highest speed of adjustment, ranging from 75% to 98% a year. The relatively high speed of adjustment in the models with investment compared to other models may underscore the dominant role of the direct channel (investment channel) in South Africa.
In summary, the following are the key findings for South Africa.

i. Overall, the effect of IFI on output depends on the types of stock of capital. Whereas the FDI causes output to increase, the debt related flows have a negative effect on output, thereby supporting the view that FDI inflows are better than debt inflows in promoting economic growth in South Africa.
ii. The results suggest that IFI operates through both the direct and indirect channels, with the investment channel having a strong positive effect on the level of output in South Africa.
iii. The results also suggest that IFI operates through other indirect channels, such as domestic institutional development signalling effect, with such channels appearing to have positive effect on output in South Africa.

iv. Swaziland

Table 8.3D reports the VECM results for Swaziland. The table reports four output models and one IFI model. In three of the four output models, IFI enters with a positive sign and they are statistically significant. In the remaining output model, IFI enters with a negative sign and is statistically significant at a 10% level of significance. The parameters with positive sign range from 0.09 to 0.43, while the negative parameter is 0.15. Overall, the weight of evidence suggests that IFI has a positive effect on the output level in Swaziland. An examination of the different measures shows that the effect of IFI depends on the type of capital stock. These are examined in turn.

The stock of FDI liabilities (LFDIL) featured once in the output models with a negative sign and is statistically significant at a 10% level of significance. Thus the slim evidence suggests that the accumulation of FDI liabilities exert a negative effect on output level. The negative effect of FDI on the level of income could be related to weak domestic institutions and political uncertainty in the country.

Table 8.3D: Estimated long run parameters of financial integration and output in Swaziland

Variable			Slope Coefficients					
IFI	CV	Intercept	IFI	LPY	R2	ECM	S.Cor	Het
Model normalised on Output (LPY)								
LDL	LFDC	8.35	0.39(2.91)[a]		0.41	-0.11(-5.89)[a]	4.93[0.84]	5.60[0.93]
	INV	9.15	0.43(3.25)[a]		0.36	-0.12(-3.42)[a]	7.68[0.57]	72.2[0.82]
LFDIL	LFDL	4.74	-0.15(-1.66)[c]		0.43	-0.57(-5.10)[a]	8.34[0.50]	123[0.40]
LFIL	OPN	13.7	0.09(6.55)[a]		0.33	-0.20(-3.69)[a]	10.4[0.32]	99.7[0.12]
Model normalised on Financial integration (IFI)								
LFIA	LFDC	11.5		2.41(3.01)[a]	0.4	-0.79(-4.70)[a]	10.5[0.31]	12.8[0.38]

Notes: See note to Table 8.2A above for a description of symbols used. a, b and c represent 1%, 5% and 10% significance levels respectively.

Source: Estimates by author.

The stock of debt liabilities (LDL) enters with a positive sign in the two output models where it featured and its parameters are statistically highly significant (at 1%). With parameters of 0.39 and 0.43 it shows that an increase in debt ratio causes an increase in output level. The positive effect of the LDL in Swaziland is in sharp contrast to Botswana and South Africa where it has a negative effect on output. The positive effect of debt-based capital in Swaziland is consistent with findings of Laureti and Postiglione

(2005:849) for the Med countries. However, it is important to note as Laureti and Postiglione (2005:849) cautioned that in countries with poorly developed financial system, as in Swaziland, the debt flows can have a negative effect on growth if such inflows are not properly invested. Hence, the country will do well to ensure that debt inflows are properly invested.

Regarding the bank-based measures of IFI, only the LFIL features in the output models, while the LFIA did not. In the one model where the LFIL features, it enters with a positive sign and is statistically significant at a 1% level of significance. This further confirms the positive effects of stock of debt liabilities in Swaziland since the LFIL is a component of the debt stock. Thus, an increase in the ratio of foreign liabilities of banks causes an increase in the level of *per capita* output. A comparison of the effect of LFIL among the SACU countries suggests a contrast between Botswana and South Africa on one hand and Lesotho and Swaziland on the other. In Botswana the effect of LFIL is ambiguous and in South Africa, the LFIL exerts a negative effect on output level. However, in Lesotho and Swaziland its effect is positive with coefficients of 0.10 & 0.11 and 0.09 respectively.

Next, consider the channels of effect of IFI on economic performance in Swaziland. First, consider the indirect channel through FD. The LFDC enters the output models once with a negative parameters of 0.80 and is highly statistically significant. In the same model, IFI enters with a positive and statistically significant coefficient with a value of 0.39.

The second measure of financial development (LFDL) enters the output model with a positive and statistically significant coefficient. In the only output model with LFDL as control variable, IFI enters with statistically significant (at 10%) negative coefficient. Thus, overall, IFI has a statistically significant effect on output after controlling for the effect of domestic FD. However, the effect depends on the FD indicators used – the effect is positive after controlling for credit market development, but negative in the case of deposit market development.

Next, regarding the direct channel, investment enters the output model with a negative and statistically significant coefficient with a value of 1.08. In the same model where investment is used as control variable, IFI enters with a positive and statistically significant coefficient with a value of 0.43. Thus, an increase in IFI causes output to increase after controlling for the effect of investment. This suggests that IFI affects output through both the direct and indirect channels, but the direct channel appears to exert a negative effect, while the indirect channel, especially through deposit market development, has a positive effect.

Consistent with normalisation restriction, all the coefficients of error correction terms are well behaved. The speed of adjustment to disequilibria ranges from 11% to 43% per year.

Finally, consider the model normalised on IFI. Only one model is normalised as an IFI model. In the model, output enters with a positive sign and the coefficient of 2.41 is statistically significant at a 1% level of significance. Thus, the result shows that IFI is a positive function of *per capita* income. This suggests that an increase in the level of income causes a higher degree of IFI. In particular, an increase in the income level causes the banks to increase the stock of their foreign assets.

In summary, the weight of evidence strongly suggests a positive effect of IFI on output levels in Swaziland. Notably, the positive effect stems from the accumulation of debt-based capital stocks, while FDI inflows has a negative effect in Swaziland. Financial integration seems to operate through both the direct and the indirect channels. Also the result suggests that an increase in the level of income leads to an increase in the degree of IFI, specifically accumulation of bank foreign assets.

8.4. SUMMARY AND CONCLUSION

This chapter examines the effect of IFI on the level of *per capita* output in the SACU countries. It further explores the channels through which the effect of IFI on output is brought about, as well as the role of the different types of stock of capital. Overall, the results show that in the four countries, output is predominantly endogenous while IFI is mainly exogenous. Therefore, causality runs mainly from IFI to the level of output. Regarding the effects of IFI on output level, the results are mixed; the effects vary from country to country and depend on the types of capital stock.

In Botswana, both the stocks of FDI and debt liabilities consistently have a negative effect on output, thus refuting the claim that FDI inflows are more advantageous than debt inflows with reference to economic growth. The results suggest that IFI affects the level of output through both the direct channel (investment channel) and indirect channels such as domestic financial system development. Such direct and indirect effects of IFI on the output level appear to be negative.

Overall, the effect of IFI on economic performance in Lesotho is ambiguous. However, the results suggest that an accumulation of the foreign liabilities of banks causes an increase in the level of *per capita* income while the effect is not conclusive if banks accumulate foreign assets. The evidence suggests that IFI affects the level of income through both the direct channel (investment channel) and indirect channels, but while the direct channel appears to have a positive effect, the indirect channel through deposit market development has a negative effect.

In South Africa, the overall results provide mixed evidence on the effects of IFI on the output level and are largely dependent on the type of capital stock. Specifically, the results consistently show that the stock of debt and FDI liabilities have opposite effects on the output level, with the latter having a significant positive effect. Thus, in South Africa, the evidence favours accumulation of FDI liabilities as opposed to debt liabilities. Regarding the channel of effect, the evidence suggests that IFI operates through both the direct (investment channel) and indirect channels. However, while the direct channel seems to have a strong positive effect, the indirect channel through credit market development has a negative effect.

Overall, the evidence suggests a positive effect of IFI on the level of output in Swaziland. However, the evidence suggests that the positive effect stems from the accumulation of debt-based capital stocks, while FDI inflows have a negative effect in Swaziland. Moreover, financial integration seems to operate through both direct and indirect channels. In addition, while the direct channel appears to exert a negative effect, the indirect channel, especially through the deposit market development, has a positive effect. Lastly, the slim evidence suggests that an increase in the level of income leads to an increase in the degree of IFI, specifically the accumulation of bank foreign assets.

Finally, regarding the benefit of IFI among the smaller SACU countries, the evidence suggests that overall Swaziland has the strongest discernible positive effect of integration.

In all the corresponding stocks of capital where both Botswana and Swaziland have data, the evidence suggests that IFI has a more positive effect on the level of output in Swaziland than in Botswana. Using the bank-based measures where the three smaller SACU countries have data, the evidence is mixed. Using the stock of foreign liabilities of banks, Lesotho and Swaziland record positive effects (though in Lesotho the effect is not statistically significant), while in Botswana the results produced an ambiguous effect.

Based on the stock of foreign assets of banks, none of the models in Swaziland are normalised as output model. In Botswana and Lesotho, the effect of the stock of foreign assets of banks on output is examined. The evidence shows that in both countries the effect is ambiguous.

Therefore, by and large, it is difficult to rank the three countries in terms of their gains from integration. Hence, the evidence does not support a strong conclusion on the question of whether or not countries that are more integrated to South Africa gain more from their IFI in general. Nevertheless, looking at the components of the aggregate stock of capital (FDI and LDL), the evidence suggests that Swaziland has a higher benefit from its IFI compared to Botswana. Given that Swaziland is more integrated to South Africa than Botswana, the results may provide some indication that as a country becomes financially more integrated with the external financial markets its gains in terms of output may increase.

Appendix A-8:

Table A-8.1a: Johansen Cointegration tests results: VAR={LPY, IFI, D}: Botswana

Variable		Obs	K	A	Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
IFI	CV				$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
LDL	LFDC	27	3	3	33.9[0.02]	8.71[0.39]	0.83[0.36]	25.1[0.01]	7.89[0.39]	0.83[0.36]
	LFDL	28	2	4	54.2[0.00]	22.4[0.13]	9.56[0.15]	31.8[0.01]	12.9[0.34]	9.56[0.15]
	INV	29	1	2	75.8[0.00]	19.2[0.07]	4.54[0.34]	56.6[0.00]	14.7[0.08]	4.54[0.34]
	INF	28	1	3	34.1[0.02]	12.9[0.12]	3.44[0.06]	21.2[0.04]	9.45[0.25]	3.44[0.06]
LFDIL	LFDC	27	2	4	49.2[0.01]	17.6[0.37]	7.67[0.28]	31.5[0.01]	9.95[0.62]	7.67[0.28]
	LFDL	28	2	4	42.9[0.04]	22.9[0.10]	9.38[0.16]	19.9[0.25]	13.6[0.28]	9.39[0.16]
	INV	26	3	4	70.8[0.00]	24.8[0.07]	11.6[0.07]	46.0[0.00]	13.2[0.32]	11.6[0.07]
	GE	27	2	3	35.6[0.01]	12.0[0.16]	1.77[0.18]	23.6[0.02]	10.3[0.20]	1.77[0.18]
	INF	28	1	3	40.5[0.00]	12.5[0.14]	3.85[0.05]	28.1[0.01]	8.62[0.32]	3.85[0.05]
	OPN	28	1	4	68.3[0.00]	18.3[0.32]	7.78[0.27]	49.9[0.00]	10.6[0.56]	7.78[0.27]
LFIA	LFDC	31	1	4	47.9[0.01]	20.7[0.19]	6.10[0.45]	27.2[0.03]	14.6[0.21]	6.10[0.45]
	GE	31	1	4	54.5[0.00]	20.1[0.22]	6.30[0.42]	34.2[0.00]	13.8[0.27]	6.30[0.42]
	INF	26	3	2	35.3[0.04]	15.2[0.21]	5.77[0.21]	20.1[0.10]	9.45[0.39]	5.77[0.21]
	OPN	31	1	4	57.0[0.00]	15.7[0.52]	7.56[0.29]	41.3[0.00]	8.15[0.81]	7.56[0.29]
LFIL	LFDC	29	3	4	53.0[0.00]	20.9[0.18]	3.90[0.76]	32.1[0.01]	17.0[0.11]	3.90[0.76]
	LFDL	29	3	3	35.1[0.01]	5.31[0.78]	0.55[0.46]	29.8[0.00]	4.76[0.77]	0.55[0.46]
	INV	30	2	3	39.9[0.00]	14.4[0.07]	4.91[0.03]	25.6[0.01]	9.49[0.25]	4.91[0.03]
	INF	26	3	2	32.0[0.11]	9.53[0.68]	3.29[0.53]	22.5[0.04]	6.25[0.76]	3.29[0.53]
	OPN	31	1	4	61.3[0.00]	16.9[0.42]	4.86[0.62]	44.4[0.00]	12.1[0.41]	4.86[0.61]

Note: The variables are as defined in Table A-6.1 of the Appendix. CV – control variables. Parentheses [ ] are used to denote probability values; k is the VAR Order that produces a white noise residual The table reports those models where cointegration is found and either LYP or IFI or both is endogenous, but where only the CV is endogenous the results are not reported.

Source: Estimates by author.

Table A-8.1b: Johansen Cointegration tests results: VAR={LPY, IFI, D}: Lesotho

Variable		Obs	K	A	Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
IFI	CV				$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
LFIA	LFDL	28	3	3	50.3[0.00]	14.3[0.08]	0.39[0.53]	36.0[0.00]	13.9[0.06]	0.39[0.53]
	INV	27	4	4	48.9[0.01]	20.2[0.22]	3.81[0.77]	28.7[0.02]	16.4[0.13]	3.81[0.77]
	INF	28	2	4	49.2[0.01]	23.4[0.09]	8.50[0.21]	25.8[0.05]	14.9[0.19]	8.50[0.21]
LFIL	LFDC	28	3	3	31.7[0.03]	10.3[0.26]	0.04[0.84]	21.4[0.04]	10.3[0.19]	0.04[0.84]
	LFDL	28	3	3	48.4[0.00]	10.2[0.26]	0.00[0.96]	38.2[0.00]	10.2[0.20]	0.00[0.96]
	INV	30	1	2	48.9[0.00]	17.0[0.13]	5.10[0.27]	31.9[0.00]	11.9[0.19]	5.10[0.27]
	OPN	28	3	4	56.4[0.00]	18.5[0.31]	4.78[0.63]	37.9[0.00]	13.8[0.28]	4.78[0.63]

Note: See note to Table A-8.1a above for a description of symbols used.

Source: Estimates by author.

Table A-8.1c: Johansen Cointegration tests results: VAR={LPY, IFI, D}: South Africa

Variable		Obs	K	A	Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
IFI	CV				$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
LDL	INF	31	2	4	46.4[0.02]	15.9[0.49]	4.23[0.71]	30.4[0.01]	11.8[0.44]	4.23[0.71]
LFDIL	LFDC	31	3	3	35.1[0.01]	6.25[0.67]	0.19[0.66]	28.8[0.00]	6.05[0.61]	0.19[0.66]
	INV	31	3	3	31.7[0.03]	6.59[0.63]	0.90[0.34]	25.1[0.01]	5.69[0.65]	0.90[0.34]
	INF	31	2	4	45.2[0.03]	22.6[0.12]	4.81[0.62]	22.6[0.13]	17.8[0.08]	4.81[0.62]
LFIA	LFDC	33	1	3	31.2[0.03]	12.7[0.13]	2.75[0.10]	18.5[0.11]	9.94[0.22]	2.75[0.10]
	INV	31	3	3	37.5[0.01]	8.23[0.44]	0.36[0.55]	29.2[0.00]	7.87[0.39]	0.36[0.55]
	OPN	30	4	4	43.5[0.04]	19.7[0.24]	4.88[0.61]	23.9[0.09]	14.8[0.21]	4.88[0.61]
LFIL	LFDL	31	3	3	30.6[0.04]	9.79[0.30]	2.51[0.11]	20.8[0.06]	7.28[0.46]	2.51[0.11]
	INV	31	3	2	36.5[0.04]	11.6[0.48]	4.69[0.32]	24.9[0.02]	6.93[0.68]	4.69[0.32]
	GE	31	3	3	31.9[0.03]	8.46[0.42]	2.82[0.09]	23.5[0.02]	5.63[0.66]	2.82[0.09]
	INF	31	2	3	32.9[0.02]	8.33[0.43]	2.75[0.10]	24.5[0.02]	5.58[0.67]	2.75[0.10]
	OPN	33	1	3	35.7[0.01]	10.1[0.27]	3.84[0.05]	25.6[0.01]	6.28[0.58]	3.84[0.05]

Note: See note to Table A-8.1a above for a description of symbols used

Source: Estimates by author.

Table A-8.1d:Johansen Cointegration tests results: VAR={LPY, IFI, D}: Swaziland

Variable		Obs	K	A	Trace statistics under the H0: rank=r			Trace statistics under the H0: rank=r		
IFI	CV				$r = 0$	$r \leq 1$	$r \leq 2$	$r = 0$	$r = 1$	$r = 2$
LDL	LFDC	33	1	2	34.5[0.05]	8.01[0.82]	2.48[0.68]	26.5[0.01]	5.53[0.84]	2.48[0.68]
	INV	31	3	3	32.4[0.02]	10.1[0.28]	3.38[0.07]	22.4[0.03]	6.69[0.53]	3.38[0.07]
LFDIL	LFDL	28	4	4	46.1[0.02]	15.9[0.50]	5.43[0.53]	30.2[0.01]	10.5[0.57]	5.43[0.53]
LFIA	LFDC	33	1	3	31.2[0.03]	12.7[0.13]	2.75[0.10]	18.5[0.11]	9.94[0.22]	2.75[0.10]
LFIL	LFDC	33	1	3	32.9[0.02]	7.75[0.49]	1.10[0.29]	25.1[0.01]	6.65[0.53]	1.10[0.29]
LFIL	OPN	30	3	4	53.7[0.00]	12.0[0.81]	2.28[0.95]	41.7[0.00]	9.76[0.64]	2.28[0.95]

Note: See note to Table A-8.1a above for a description of symbols used.
Source: Estimates by author.

Table A-8.2: Estimated long run parameters of control variables of output and financial integration models

CV	Model normalised on Output (LPY)				Model normalised on Financial integration (IFI)			
	LDL	LFDIL	LFIA	LFIL	LDL	LFDIL	LFIA	LFIL
Botswana								
LFDC		-0.33(-8.59)^{a}	-0.40(-5.99)^{a}	0.63(1.68)	-0.60(-2.39)^{b}			
LFDL	-0.39(-10.5)^{a}	-0.16(-1.13)		3.81(2.98)^{a}				
INV	-0.92(-2.86)^{a}	-0.82(-7.45)^{a}		-2.56(-7.82)^{a}				
GE		3.36(9.96)^{a}	5.24(6.60)^{a}					
INF	-0.14(-4.91)^{a}	-0.12(-4.65)^{a}	-0.13(-1.86)^{c}	-0.13(-4.47)^{a}				
OPN		4.10(8.76)^{a}	-1.69(-7.42)^{a}	1.76(8.22)^{a}				
Lesotho								
LFDC								-0.90(-1.45)
LFDL			-0.75(-5.77)^{a}	-0.73(-4.99)^{a}				
INV			0.24(3.55)^{a}					-0.77(-2.77)^{a}
GE								
INF			-0.01(-1.72)^{c}					
OPN				-1.01(-5.24)^{a}				
South Africa								
LFDC		-0.36(-7.25)^{a}	-0.36(-4.07)^{a}					
LFDL				0.03(0.19)				
INV		0.20(7.49)^{a}	0.28(13.01)^{a}	0.18(3.01)^{a}				
GE								
INF	-0.04(-5.36)^{a}	0.004(1.13)		-0.01(-2.49)^{b}			-0.14(-4.11)^{a}	
OPN			-0.34(-8.09)^{a}	0.29(5.66)^{a}				
Swaziland								
LFDC	-0.80(-3.65)^{a}						-1.14(-1.58)	
LFDL		0.72(4.61)^{a}						
INV	-1.08(-5.85)^{a}							
GE								
INF								
OPN				-1.33(-6.15)^{a}			-	

Note: The variables are as defined in Table A-6.1 of the Appendix of Chapter 6. The ( ) represent t-values; a, b and c represent 1%, 5% and 10% significance levels respectively

Source: Estimates by author.

CHAPTER 9:
CONCLUSION

9.5 INTRODUCTION

Internationally, there is a growing interest in regional and global financial integration, which extends to countries in Sub-Saharan Africa. Economic theory suggests that financial integration (IFI) can promote economic growth and enhance welfare by providing opportunities for the more efficient allocation of resources, portfolio and risk diversification. Financial integration could also allow higher profitability of investment, and help to promote domestic financial development (FD), especially in developing countries (IMF, 2007:35). However, the question of whether IFI truly benefits developing countries and if it does, under what conditions, has been hotly debated without any consensus yet emerging. Most previous studies on the subject employ cross-sectional and panel data approaches in which developed and developing countries are often grouped together in the analysis. Besides having inconclusive results, it is difficult to apply their results to any one of the countries included in the sample. Consequently, it is problematic to draw country-specific policy conclusions from these studies given the differences in the level of institutional development, economic performance, and political environment among countries.

Against this backdrop, this study explores the degree of financial integration and its effects on financial development and economic performance of the five SACU countries, namely, Botswana, Lesotho, Namibia, South Africa and Swaziland. Specifically, it investigates whether IFI has stimulated domestic FD and economic growth among the SACU countries and whether countries that are more integrated with South Africa benefit more from the integration in general than those that are not.

The empirical analyses in this study use both descriptive statistics, such as simple ratios and averages, as well as graphs and econometric models to explore the depth and effects of IFI. The empirical analyses commence with an examination of the depth of IFI among the SACU countries using three outcome-based indicators of IFI, the first two of which derive information from market outcomes, i.e. prices and quantities. The third category draws on behavioural information from households. To explore the relationship between IFI, FD and economic performance, the study uses multivariate cointegration and error correction modelling techniques based on the Johansen approach in a country-specific framework. Bearing in mind the limitations of previous studies that employ cross-country and panel data approaches, the method is used to explore the potential endogeneity of all the variables entering the models estimated. The method is further used to explore the causal relationship between FD, IFI and output and, at the same time, to overcome the problem of spurious regression that may arise when time-series are not stationary.

The purpose of this chapter is threefold. First to provide a general summary of the key finding of this study focusing on the evidence presented in Chapters 5 to 8, secondly to highlight the policy implication of the findings and lastly, to offer some policy recommendations.

9.6 SUMMARY OF KEY FINDINGS AND POLICY IMPLICATIONS

This section summarises the findings regarding financial integration, as well as its relationship with financial development and economic performance. The section also discusses the policy implications that these relationships entail.

9.2.1 Nature and degree of financial integration and its policy implications

The analysis of the depth of IFI relies on three sets of *de facto* measures: capital stock measures, price (return)-based indicators and the investment-saving correlation. Overall, the evidence suggests that the financial systems of the SACU countries are highly integrated and are becoming more so.

First, the analysis based on the stocks of foreign assets and liabilities of domestic banks in the countries not only shows that the banking sectors have become more integrated, but also highlights a clear asymmetry in the capital flows among banks in the SACU countries. Even though the indicators did not specifically capture the actual capital flows across banks in the SACU countries, combining them with the pattern of FD indicators as well as an analysis of interest rate spreads, suggests that the flows favour South Africa and Namibia more than the other countries.

In addition, in Botswana, Namibia, and Swaziland, the ratio of aggregate stocks of assets are significantly higher than those of liabilities, and the liability ratios are experiencing a decline, except in Namibia, where it is growing. In contrast, in South Africa the ratio of total liabilities is higher than the ratio of total assets and both ratios are increasing. Thus, among the SACU countries, it is only in South Africa that capital inflow from the rest of the world is higher than capital outflow to the rest of the world. Consequently, the experience of the smaller SACU countries represents an example of capital moving from poor countries to richer countries (Mishkin, 2007:260).

Moreover, the analysis of the composition of the aggregate stock of liabilities shows that the share of equity liabilities represents a significant part of total liabilities and has increased over time. Meanwhile, the share of debt liabilities has continued to fall, though it remains high in all the countries in comparison with other emerging markets and developing countries. The growing share of equity liabilities, particularly FDI, is a welcome development and should be encouraged, given that FDI has the potential to stimulate economic growth due to a possible positive growth spin off that may result from it (cf. Prasad *et al*. 2004; Agénor, 2003; Bailliu, 2000; World Bank, 2000; Borensztein, De Gregorio and Lee, 1998; Blomstrom, 1991; Grossman and Helpman, 1991).

The results based on the interest rate analysis confirm the dominant role of South Africa among the SACU countries. Furthermore, the interest rates analysis unambiguously indicates a hierarchy of integration of the financial systems of each member state with that of South Africa, with Namibia at the top, followed by Swaziland, Lesotho and Botswana in that order.

More specifically, the results based on the interest rate analysis suggest that the prevailing integration between the financial systems stems from both policy convergence and market convergence. Policy convergence refers to the response of interest rates (BR, DR, LR, MMR and TBR) in the other SACU countries to changes in the official rate in South Africa, while the response of market rates (DR, LR, MMR and TBR) to their corresponding counterpart rates in South Africa is referred to as market convergence. However, the evidence on market convergence suggests limited arbitrage activities between the countries, which might result from both weak institutional development and limited investment opportunities and an inability of investors to explore such opportunities in the smaller countries. This may cause the financial flows within SACU to be asymmetric, with most of the funds likely flowing to South Africa, given its more developed institutions and better investment opportunities.

9.2.2 The relationship between financial integration, financial development and economic performance and its policy implications

Three empirical chapters (6, 7 and 8) have been devoted to examining the interactions between financial integration, financial development and economic performance of SACU. The thesis organises and studies the interactions among the variables in the three blocks as highlighted in Figure 9.1. The first block explores the relationship between financial development and economic growth, the second block focuses on the link between financial integration and financial development, while the third block explores the relationship between financial integration and economic growth.

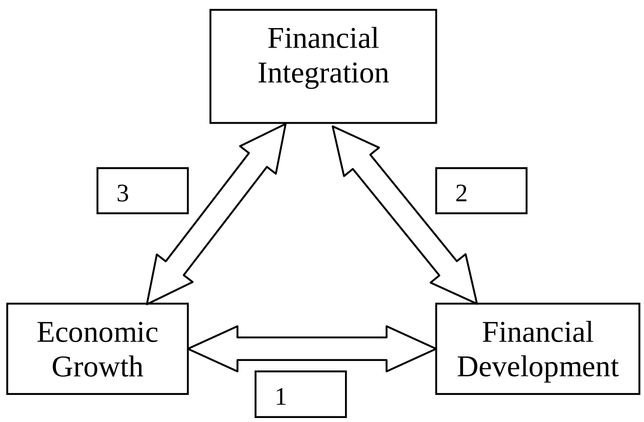


Figure 9.1: Financial integration, development and economic performance nexus

To analyse these relationships, the study employs a multivariate cointegration and error correction modelling framework, which is applied to each of the SACU countries. The empirical framework is used to explore the causal and the long-run relationships between the variables. To ascertain the robustness of the results, the analysis controls for other variables that might affect the level of output, FD and IFI. Moreover, the study uses four measures of IFI and two measures of FD for the estimations. The study uses different measures of IFI to establish which kind of capital flows affect FD and the level of output the most. The study also investigates the impact of FD and output on IFI.

In the three relationships studied, the results confirm the existence of long-run relationships between FD and output level, FD and IFI, as well as between IFI and the level of the output. The causality and VECM results exhibit variation across the SACU countries in each of the relationships (excluding Namibia which was not analysed due to data limitation). This section summarises and synthesises the main findings of the three blocks, and highlights the policy implications of the findings. The results for each block are presented in turn, followed by a synthesis of the findings.

i. *The financial development-growth nexus*

Overall, the results of the causality analysis suggest that causality runs mainly from FD to output across the SACU countries. The only exception is Lesotho where a two-way causality dominates. The one-way causality running from FD to the level of output in most SACU countries lend some support for *supply-leading* finance as proposed by Patrick (1966).

On the effects of FD, the weight of evidence suggests a strong negative long-run causal effect of FD, using the credit indicator, on the level of output in Botswana and South Africa, while the effect was negative but not strong in Lesotho. In Swaziland the results were inconclusive. Thus, overall and unlike the suggestion by Patrick of supply-leading finance, the development of the credit market seems not to have any discernible positive effect on the level of output in the entire SACU. The effect of the deposit indicator on the output level was largely inconclusive, with the exception of Swaziland, where a robust positive effect was found. The weak and largely negative effect of FD on output level found in this study is consistent with a host of other studies such as Arestis and Demetriades (1997) for USA, Allen and Ndikumana (2000) for SADC countries, Koivu (2002:10) for transition economies, Hondroyiannis *et al.* (2005) for Greece, Naceur and Ghazouani (2006) for 11 MENA countries and Ang and McKibbin (2007) for Malaysia.

A negative and weak effect of FD on economic growth, especially using the credit indicator, could stem from a number of reasons. Ang and McKibbin (2007) contends that the weak effect of FD on *per capita* income in Malaysia may be an indication of inefficiencies of the banking sector to ameliorate information asymmetries, reduce transaction costs and allocate resources efficiently. Based on their study of the 11 MENA countries, Naceur and Ghazouani (2006) suggest that the negative and statistically significant effect of FD on growth was due to a high degree of financial repression and underdevelopment of the financial system. In his study of the transition economies, Koivu (2002:10) argued that the negative effect of FD on growth was because of the numerous banking crises in the transition countries in the 1990s that resulted from a lack of capable banking supervision. Similarly, Allen and Ndikumana (2000:153) suggest that the negative effect found in the SADC countries might reflect "pervasive inefficiencies in the credit allocation mechanism". Therefore, Allen and Ndikumana propose the strengthening of financial sector legislation and banking system supervision as one way of enhancing financial sector efficiency. Moreover, Allen and Ndikumana (2000:153) suggest that the credit indicator may not be a good indicator of the efficiency of the financial system. For example, it might be true that long-term capital may be more important for investment and output growth than short-term capital. Unfortunately, whether or not long-term capital is more important in SACU countries than short-term capital cannot be established due to a lack of private sector credit data disaggregated on a maturity basis.

In conclusion, while the causality results seem to suggest a *supply-leading* finance, the largely negative effect of FD on the level of output in SACU (which is contrary to Patrick's supply-leading finance thesis) is also, to some extent, consistent with Berthelemy and Varoudakis' (1996) argument of a vicious cycle. However, since causality runs mainly in one direction from FD to output (with the exception of Lesotho), a strictly vicious cycle as described by Berthelemy and Varoudakis (1996:19) may not apply, Nevertheless, some of their argument – that an underdeveloped financial system would be unable to perform most of the desirable functions of a good financial system effectively, thereby causing an inefficient productive structure if income is too low – may still hold. Perhaps, for the SACU countries, the argument may be modified to say that, because of underdeveloped financial systems (in some countries), inefficiencies in the credit allocation mechanism, weak regulations and banking supervision, and weak institutional and structural problems as well as an unstable political environment (in some of the countries), the financial systems are unable to perform most of the desirable functions of a good financial system effectively. This inability of the financial systems may cause an inefficient productive structure. In Lesotho, where a negative feedback effect between FD and output is found, the cause may likely be due to factors such as the weak institutional and structural problems, other than just the low income of the country, as would be implied by the Berthelemy and Varoudakis vicious cycle. A more detailed consideration of country-specific situation and the policy implications of these findings will be discussed further shortly, but first attention is now turned to highlighting the key results of the second block, that is the relationship between IFI and FD.

ii. The financial development and financial integration nexus

The results produce strong evidence of a causality relationship that runs in either direction between FD and IFI across the SACU countries with the exception of Lesotho where the causality runs mainly from IFI to FD. Regarding the effect of IFI on FD and *vice versa,* the results vary across the SACU countries. In addition to the variation across the countries, the evidence depends on the kinds of stock of capital and measure of FD used. Hence, it is difficult to conclude in general whether IFI is a *complement* or *substitute* to domestic FD across the SACU. The inconclusive and fragile nature of the results is largely consistent with evidence in previous studies that are based on cross-country analysis (cf. Chinn and Ito, 2002; Chinn, 2001; Klein and Olivei, 1999; De Gregorio, 1998). Though, much of these earlier studies found some evidence of a positive and sometimes statistically significance effect of IFI on FD in cross-country analysis, such effect becomes insignificant and sometimes negative when the sample is reduced to developing countries only. A more recent study by the IMF (2007), which did not differentiate between developed and developing countries, finds a statistically significant positive effect of IFI on FD. Unfortunately, it is difficult to compare the results of the previous studies with the current study in *absolute sense*, since they used the rule-based measure of IFI in cross-country regressions. Moreover, the results of such studies do not represent any of the countries included in the sample; instead they simply represent an average effect for the countries (Block and Tang, 2003). It is at this point that the major advantage of country-by-country analysis in this thesis manifests.

The results show that in Botswana and South Africa the accumulation of FDI liabilities has a negative effect on credit market development, while the effect is positive in Swaziland. In contrast, the accumulation of external debt liabilities has a positive effect on credit market development in Botswana and Swaziland, while it has a strong negative effect in South Africa. In the case of the deposit market development, in Botswana, the accumulation of debt liabilities has a negative effect, but no discernible effect is found for

FDI liabilities. Meanwhile in South Africa and Swaziland, accumulation of debt and FDI liabilities has a positive effect on the deposit market development. But while the effect of FDI liabilities is stronger than debt liabilities in South Africa, the opposite is the case in Swaziland. The policy implication of these findings will be addressed shortly.

iii. Financial integration and economic growth nexus

The results show that in Botswana, Lesotho, South Africa and Swaziland, output is predominantly endogenous while IFI is mainly exogenous. This suggests a limited feedback relation from output to IFI. Regarding the effects of IFI on the output level, the results are mixed; the effects vary from country to country and depend on the types of capital. The effect of FDI was negative in Botswana, positive in South Africa but ambiguous in Swaziland. The stock of debt liabilities has a negative effect in Botswana and South Africa while the effect was positive if Swaziland. The ratio of foreign assets of banks has an ambiguous effect in Botswana, Lesotho and South Africa while no effect was detected in Swaziland. Lastly, the ratio of foreign liabilities of banks has a positive effect in Lesotho and Swaziland and a negative effect in South Africa, while the effect is ambiguous in Botswana. In what follows attention is focused on highlighting the key implication of these findings for each country.

iv. Synthesis of results and policy implication

The results of this study as highlighted above show some consistency across the SACU countries, and some country-specific features. They also highlight some areas that the authorities would need to focus attention on, to stimulate the development of the financial systems as well as enhance its contribution to economic growth. Similarly, the results further highlight some aspects where IFI in the SACU countries seems to present a challenge that the authorities would have to address to prevent further negative effects in their integration process.

One aspect in which the results stand out in being consistent across the SACU countries is that FD does not exert a positive effect on the level of output. Indeed, FD measured by the credit indicator shows a strong negative effect on the level of output. This may be a manifestation of some underlying problems within the financial systems of these countries. As noted earlier, such problems within the financial system may include underdevelopment of the financial system (in some countries) and inefficiencies in the credit allocation mechanism that may be due to weak regulations and banking supervision.

Thus, it would be necessary for the authorities to look into their current banking regulatory and banking supervision to ensure better regulation practices. Better supervision and monitoring of the banks will also require a well-structured information and data reporting system to which the banks must conform in their regular reports to the regulatory authorities. A regional approach to banking and financial institution regulation and supervision could help to raise and harmonise regulatory standards among members. This will help the smaller SACU countries to catch up with South Africa since South Africa is more advanced in its banking regulatory framework.

The predominantly negative effect of FD in these countries may also have some close link with the fact that the FDI liabilities ratio as a measure of IFI also predominantly has a negative effect on the credit market development in SACU. This negative effect might be ascribed to the lack of appropriate regulations and banks that are not properly supervised, which may, in turn, cause foreign dominated banks to discriminate against small and medium scale businesses and emerging entrepreneurs. In countries with a large poor population, such as in the SACU, such small to medium scale businesses may hold a large capacity to contribute to economic growth and employment generation. Hence discriminating against them may cause banks to have a minimal positive and possibly a negative effect on the economy. Since the current study uses aggregate data, there is no way of knowing whether the negative effect of FD in the SACU is partly due to banks' discrimination against small to medium scale businesses. This is an area for further research: specifically, micro level studies of bank activities would be required to uncover this. If such studies were to confirm this claim in SACU, it would call for an urgent intervention by government in the form of incentives and regulations to sway banks to lend to such businesses given their potential capacity to contribute to economic growth and employment generation in the economy.

The negative effect of FD on the level of income could also be a manifestation of other institutional and structural problems, such as weak legal systems that may be slow or inefficient in enforcing contracts and debt repayment and guarantee property rights.

There could also be problems of weak domestic entrepreneurial capacity, which might cause excess liquidity in banks because of a lack of viable investment opportunities to finance with their deposit liabilities. The potential presence of poor entrepreneurial capacity problem has been documented for the smaller SACU countries by Genesis Analytics (2003a, 2003b, 2003c, 2003d). However, the analysis of the effect that such institutional and structural problems may have on the performance of banking systems in the SACU countries is beyond the scope of the current study. Hence, further studies are called for to examine this issue. If it could be found that such institutional problems have a significant effect on performance of the financial systems of these countries, it would raise the urgency for the authorities to address them.

The variation in the results across the SACU countries may require other country-specific interventions to enhance the contributions of their financial system to economic growth as well as the effect of their financial integration. Hence what follows focuses on key results for each of the SACU countries to highlight probable country-specific interventions.

One of the problem areas highlighted in the study of Botswana is that FD, as measured by the credit indicator, has a strong negative effect on the level of *per capita* income in the long-run. Similarly, the accumulation of FDI has a negative effect on FD and the level of output. Noteworthy too, is that investment has a negative effect on the level of output and both the direct and indirect channels of IFI exert a negative effect on the level of output. These negative findings may result from the same sources, namely the low investment capacity in the economy due to the small size of the domestic market and distortions induced by government policies such as the over valued exchange rate of the pula vis-à-vis other currencies, most notably the South African rand (Iimi, 2006:20).

Because of the small size of the economy, large-scale production focusing on the domestic market is largely ruled out. Large-scale production would only be possible if goods can be produced for export, which would have been easy because of the SACU arrangement with South Africa, which is a large market relative to Botswana. However, because of the stronger pula relative to the South African rand, and the high wages relative to neighbouring countries including South Africa, domestic production of goods is rendered less competitive. In contrast, the stronger pula makes import relatively cheaper and more attractive. Genesis Analytics (2003a) also suggests poor entrepreneurial capacity as another problem of the economy. Specifically, Genesis Analytics (2003a:4) suggests that the high incidence of government handouts such as material, medical benefits, education, and subsidised credit makes the citizenry depend on the government and does not promote entrepreneurial spirit in the country.

Therefore, with high incomes and the relatively stronger pula as well as the favourable trade policy, which allows free movement of goods across the SACU countries, the Botswana economy has become increasingly import dependent. Moreover, because of low investment opportunities due to the small size of the economy, low entrepreneurial capacity and the stronger pula, banks resort to financing household consumption instead of business investment. Consequently, banking sector credit allocation has increasingly shifted from productive investment to consumption finance. This is consistent with the observation of Genesis Analytics (2003a:3) that "despite the relatively healthy banking sector, however, the proportion of private sector loans going to businesses (in contrast to households) has declined significantly, decreasing from 70% in 1990 to 45% in 2001". Given that most of the consumer goods are imported, especially from South Africa, with limited value added in the country, it is not surprising that credit by banks does not stimulate the growth of the economy, but rather tends to slow down its economic performance.

An important policy intervention to stem the trend will be to, at least, peg the Botswana pula at par with the South African rand or allow the pula to freely float in the market to determine its level. This will encourage competitive domestic production of goods that could also be exported to the other SACU countries, thereby reducing the constraint imposed by the small domestic market. With an increase in domestic production, more investment opportunities will become available for both foreign and domestic investors, which, in turn, will encourage the banks to lend to businesses with a possible positive feedback effect on the economy.

With an enabling environment in place, the regulatory authority may further use incentives, such as credit guarantee schemes, to adjust the lending behaviour of the banks towards lending to small and medium scale businesses. This will not only help to stimulate the development of the financial system, but also have a positive effect on the economy at large. Moreover, it may encourage the development of domestic entrepreneurial capacity.

The key finding for Lesotho relates to the weak and generally negative feedback effect in the three relationships studied – i.e. between FD and the level of output, between FD and IFI and between IFI and level of output.

The weak effect of FD on economic performance in Lesotho is likely due to the declining level of commercial bank credit to the private sector and the general shift of credit allocation from business finance to consumption finance. The decline in the credit to private sector may reflect political, institutional and structural problems in the economy. The 1998 political crisis, which created a sense of insecurity of life, property and investments, and as a precaution against losses in the event of a similar crisis, caused many individuals, companies and the banks to invest offshore.

As is generally applicable to most developing countries, strengthening the domestic institutions and ensuring a stable political environment will help to enhance the contributions of the domestic financial system in Lesotho. Specifically, the recently established commercial court and postal bank and the proposed credit bureau, if properly managed and implemented, may constitute some solutions to the poor FD in Lesotho.

To the extent that the new commercial court is able to help expedite the adjudication of commercial cases and enforce legal contracts, it will help to promote the development of the financial system. The court will have to be adequately empowered (in terms of trained personnel and necessary logistics) to perform its duties. Moreover, the establishment of the proposed credit bureau may enhance the intermediation process in the country. The credit bureau can provide valuable information on the creditworthiness of customers, which, in turn, will lead to a reduction in the costs of gathering information about a potential borrower by banks and thus enhance access to credit at possibly reduced cost to an individual or firm. In addition, the activities of the bureau may help promote a culture of loan repayment (since individuals may not want to be exposed as ‘bad’ debtors, they may be more careful with the use of borrowed funds), which may help reduce the relative risk of investment in Lesotho. This, ultimately, may help boost investor confidence (particularly of the banks) in the economy and help increase the volume of credit and the proportion of the population that may have access to such credit.

The recent effort of the government to establish a postal bank, to encourage greater financial intermediation, especially in the rural areas that presently have almost no access to banking facilities, is a step in the right direction. However, it is important to ensure that there is no political interference in its operations and it is properly monitored and regulated to prevent it from running into problems that could eventually lead to its collapse. A stable domestic financial system will also help to prevent the negative feedback from the level of income to FD in the country.

In South Africa, among the key findings of this study are: the lack of a positive effect of FD on the level of *per capita* income, the negative effect of debt liabilities on credit market development and the level of output and the positive effect of FDI inflows on FD and the level of output. Given that the banking system in South Africa is fairly developed, offering services similar to those of banks based in many advanced countries, the lack of a robust positive effect of FD on output level may partly reflect the limitation of the aggregate measures of FD which may not adequately capture the quality of financial intermediation in the economy (Allen and Ndikumana, 2000:153).

It might also be due to inefficiencies in the financial systems, due to the oligopolistic structure of the market for banking services in South Africa, which may cause them to extract undue rents in the form of high interest rate margins and service charges from investors (Okeahalam, 2001:4). Thus regulatory and supervisory measures that help to ensure adequate competition in the banking system may improve its efficiency and as such enhance the contribution of the financial system to economic performance in South Africa. Perhaps an aspect where the banking system may help to stimulate the growth of the economy would be to make access to credit easier for newly emerging entrepreneurs from the formerly disadvantaged groups as well as for small to medium scale enterprises. Consequently, it would be a step in the right direction for government to provide incentives to encourage banks to extend credit to such businesses.

The weak effect of the level of income on FD in South Africa is likely due to the absence of a habit of saving, and the availability of an alternative savings avenue such as the stock market and mortgage investments which might have gained popularity among the population and that are often not reflected in the traditional measures of FD. It might also reflect the inability of the banking system to reach the formerly unbanked population to mobilise their savings.

The positive effect of FDI inflow in South Africa is consistent with theoretical expectation and some earlier studies such as Reisen and Soto (2001), McLean and Shrestha (2002), Collins (2004), Mody and Murshid (2005) and IMF (2007). The positive effect of FDI on economic performance in South Africa suggests that FDI possibly directly augments domestic investment and indirectly boosts economic growth through the facilitation of transfer of managerial skills and technological know-how from more developed home countries. This suggests that further liberalisation of inward FDI would be beneficial. Further liberalisation of inward FDI may be combined with appropriate labour laws and fiscal incentives as well as ensuring an enabling political environment that will help to attract FDI.

The negative effect of the debt-based stock of capital in South Africa may be associated with the volatility and pro-cyclicality of debt flows as suggested in the literature (Symmonds, 2004:17 and Agénor, 2003:1099). Given the history of South Africa, especially the political instability during the apartheid regime, this conjecture would not be implausible. Hence, if the country were to further liberalise the inflow of debt-based capital, it would require the strengthening of domestic institutions, the continued pursuit of sound macroeconomic polices and a stable political environment.

Finally, in Swaziland, the weight of evidence suggests that the development of the credit market has an ambiguous effect on the output level, while the development of the deposit market has a positive effect on the output level. The problems of the banking system in Swaziland may be similar to that of Lesotho and as such the recommendations for the Lesotho may also be applicable in the case of Swaziland.

Lastly, for Swaziland the evidence suggests that the effects of IFI on FD depend on the kind of stock of capital. The evidence suggests that the accumulation of FDI liabilities has a robustly positive effect on credit market development, while the accumulation of debt-based liabilities has a negative effect on the credit market development. The positive effect of FDI flows on the credit market is very encouraging.

In the case of Swaziland, the negative effect of FDI on the level of income could be related to weak domestic institutions and political uncertainty. Thus, liberalisation of inward FDI should be accompanied by a strengthening of domestic institutions and the creation of a stable political atmosphere. Regarding, the positive effect of debt-based capital in Swaziland, this is consistent with the findings of Laureti and Postiglione (2005:849) for the Mediterranean countries. However, it is important to note, as Laureti and Postiglione (2005:849) cautioned, that in countries with poorly developed financial system, such as Swaziland, the debt flows can have a negative effect on growth if such inflows are not properly invested. Hence, the country will do well to ensure that debt inflows are properly invested. Also, the fact that debt flows are very volatile and could be pro-cyclical, requires that the country should pursue sound macroeconomic polices and ensure a stable political environment in order to sustain the positive results from such inflows.

9.3 CONTRIBUTION OF THE CURRENT STUDY

Overall, this study contributes to the existing literature in a number of ways. Firstly, it represents the most comprehensive time-series study of the relationship between FD, IFI and economic performance in the SACU countries. Whereas, previous studies often include some of the SACU countries in cross-country or panel data analyses, there has never been a time-series country-specific analysis for the SACU countries of most of the issues analysed in the current study. The analysis of the relationships between FD, IFI and economic performance in the SACU countries is of particular interest given that the official integration arrangement among these countries represents one of the oldest integration arrangements in the world. Thus, this study fills a major gap in the literature.

Secondly, the time-series framework used in the study represents another contribution of the study. Unlike cross-country/panel data studies, the current framework has the advantage that it provides country-specific estimates, thereby fully accounting for possible heterogeneity across the countries. It also fully accounts for the endogeneity of each variable in the model, thereby avoiding the risk of reporting an incorrect model where the modelled variable is actually not endogenous. Thus, instead of a mere degree of association often obtained in cross-country/panel studies, where such degree of association could not be given causal interpretation, both the effect of FD, IFI on output and the causality relationship between them can be estimated more reliably with the time-series approach.

Moreover, the fact that this analysis uses several control variables represents a major improvement on previous time-series studies. The use of several relevant control variables, employed one at a time in the current framework, makes it possible to explore the robustness of the results obtained in the analysis. This is necessary since it is possible that the effects and causal relationship(s) between the variables of interest (FD, IFI and output) may be sensitive to the control variables used (Quinn, 1997:536).

Lastly, the current study explores different measures of IFI, benefiting from one of the most recent and comprehensive data sources on IFI (*External Wealth of Nations Mark II* by Lane and Milesi-Ferretti, 2006). The use of several measures of IFI in this study makes it possible to address an important policy question i.e. what kinds of external capital stock is more important for economic growth.

While the current study has filled some gaps in the literature, it also has its limitations. One such limitations relates to the measures of FD used in the study that focus on developments in the banking sector without taking into account developments in the bond and stock markets as well as other non-bank financial institutions. In the smaller SACU countries where the bond and stock markets and other non-bank financial institutions are highly underdeveloped or non-existence, the results may not be adversely affected by the use of the bank-based measures. However, in South Africa, where the bond and stock markets as well as other non-bank financial institutions are highly developed, the bank-based measures of FD may underestimate the effect of financial system development in the economy. This is an area where further research is needed to uncover the effects of the other aspects of the financial system in the economy. In doing this, besides using separate indicators that measure each aspects of the financial system, it may be necessary to develop a composite index of the entire financial system in such analysis.

Another limitation of the current study stems from the limited sample of time-series observations used in the econometric models. As the literature suggests, while the number of observations are enough to carry out the time-series analysis in the study, the degrees of freedom are nevertheless limited. This limited degrees of freedom makes it difficult to explore more than one control variables at a time. Therefore, it is recommended that the analysis is repeated as more data becomes available in time. With more data and hence more degrees of freedom, it would also be possible to include more control variables. Moreover, as more data becomes available it will be possible to explore other econometric methods such a Kalman Filter technique to determine the time-varying nature of the effects of the relationships addressed in this study.

9.4 CONCLUDING REMARKS

In summary, though FD and IFI have great potential to stimulate economic growth significantly in developing countries, their benefits across the SACU in terms of growth effects remain very weak. This may be due to a number of factors such as inefficiencies in the credit allocation mechanism, the underdevelopment of the financial systems, weak regulations and banking supervision, lack of competition among banks, as well as weak and inefficient legal systems. There are also structural problems such as low entrepreneurial capacity and over-dependence on imports (especially in the smaller SACU countries). Addressing these problems will call for regional and country-specific strategies.

At the country level, government should make concerted efforts to create enabling environments through ensuring strong domestic institutions (financial, legal, etc.), strong economic performance with alternative investment opportunities, and a stable political environment. In countries such as Lesotho and Swaziland, governments also need to strengthen property rights. In addition, given that South Africa is the main economy with the most developed financial system, South Africa needs to take the leading role to ensure sustained financial stability. Any major financial disruption in South Africa could undermine its central role, which, in turn, could make member states push for more independent national policies.

A regional approach will call for the establishment of regional organs (institutions) to coordinate monetary and financial integration efforts. Such efforts will include policies toward macroeconomic convergence, regional surveillance mechanisms (macroeconomic surveillance systems that would encourage member countries to pursue sound policies) and regional payment systems (payments and clearing systems for banks, securities and insurance). In addition, efforts need to be coordinated in the areas of legal frameworks (rules and regulations governing the conducts of banks, foreign exchange operators and payment system to support the development of strong financial systems) and financial infrastructural development for the harmonisation of regulations and the supervision of the financial sector as well as the harmonisation of national, monetary and financial statistics – common data dissemination systems and common statistical database.

To create and sustain such regional institutions that will oversee and regulate the process, will call for a considerable political will among member states to ensure that domestic interest does not override the regional goals.

A combination of both the country level and regional efforts will help to ensure that the benefits of FD and IFI are realised in a more equitable manner across the countries. This will further strengthen their integration effects.

Finally, as developing countries become more financially integrated, it is important that the dynamics of the process are continuously studied. This will enable countries to avoid the mistakes of the past and to help them harness the benefits that integration brings.

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