

Financial Development and Economic Growth in Southern Africa.

By

Meshach Jesse Aziakpono
Department of Economics
National University of Lesotho
P.O. Roma 180, Lesotho
Tel: +266 22213592
Fax: +266 22 340 000
E-mail: azimesh@yahoo.com

Abstract

The increasing international interest in economic integration and monetary union has spawned new regional initiatives in every continent. As a result, global financial markets are becoming increasingly integrated. A major question that arises from this is whether domestic financial institutions will become irrelevant in promoting economic growth. This paper attempts to examine this question using the experience of the Southern African Customs Union and the (Rand) Common Monetary Area, which are often cited as examples of successful integration in Africa. The empirical evidence shows that domestic financial intermediation is still relevant in such financially integrated markets. However, the evidence also indicates that for the smaller countries of the SACU with less developed financial institutions, to derive the optimal gains from financial intermediation, they would need to take steps to strengthen their weak financial system and resolve the institutional and structural problems in their economies. An obvious lesson for countries contemplating forming or entering economic integration, in particular a monetary union, is that the development of their financial system and addressing other institutional and structural problems will be a necessary precondition for deriving optimal gains from such integration.

1. Introduction

In the last two decades, the link between financial intermediation (FI) and economic growth has generated a great deal of interest among academics, policy makers and economists around the world. Several studies have addressed the potential links between financial development and economic growth (see Levine 1997 for a detailed review). Alternative views on the links between financial intermediation and economic growth focus on the key functions of financial systems in the saving-investment-growth nexus. These include firstly, acting as an effective conduit firstly for channelling funds from surplus to deficit units by mobilizing resources and ensuring an efficient transformation of funds into real productive capital. Secondly, financial intermediation transforms the maturity of the portfolios of savers and investors, while providing sufficient liquidity to the system as the need arises. The third function is risks reduction from the system through diversification and techniques of risk sharing and pooling (Nissanke and Stein 2003: 288). By so doing a modern financial system may spur economic growth. However, despite the rapidly growing literature, the debate concerning the role played by the development of financial intermediaries in economic growth is far from settled.

Moreover, much of the empirical evidence on the links between financial development and economic growth comes from a period when cross-border capital movements were very limited and as such were ignored in most analyses. However, as globalisation and economic integration are becoming increasingly the dominant features of the world economy, international capital mobility has exploded. For instance, private capital flows to emerging market economies have grown from close to nothing in the 1970s, to US\$170 billion in the 1980s, and to US\$1.3 trillion by the late 1990s (Guiso, Sapienza and Zingales 2003: 2).

In the light of these developments, the question of whether national financial markets still matter for growth once domestic agents have access to foreign financial markets has become very important from a policy perspective. Despite the importance of this question for policy purpose, especially since the emergence of the European Monetary and Economic Union (EMU), however, only very few attempts have been made to empirically examine the issue. These include, Jayaratne and Strahan (1996), Dehejia and Lleras-Muney (2003) and Guiso, Sapienza and Zingales (2003). These studies focus on within country differences of the effects of financial

intermediation in an integrated market and they all show that local financial development matters.

Jayaratne and Strahan (1996) used the de-regulation of banking in different states of the United States between 1972 and 1991 as a proxy for financial development. They show that annual growth rates in a state increased by 0.5 to 1.19 percentage points a year after deregulation. Dehejia and Lleras-Muney (2003) study the impact of changes in banking regulation on financial development between 1900 and 1940. Guiso, Sapienza and Zingales (2003) on their part study the effects of financial development within Italy which has been unified from both political and regulatory point of view for some 140 years. They found that in the most financially developed region per capita GDP grows 2% per annum more than in the least financially developed one. Also, they show that the odd of an individual starting a business increases by 5.6 percent if he moves from the least financially developed region to the most financially developed one; and the individual is able to do so at a younger age. As a result, on average entrepreneurs were 5 years younger in the most financially developed region than in the least developed one.

Evidence from developing countries are however very slim. An attempt to examine the role of financial intermediation in an economic union and specifically for the Southern Africa was made by Allen and Ndikumana (1998). Using four indicators of financial intermediation and three different panel techniques-simple OLS regressions, regressions including country-specific fixed effects, and regressions including a high-income dummy, they found a positive correlation between financial development and the growth of real per capita GDP for the Southern Africa Development Community (SADC). However, their study suffers from two major weaknesses as far as the question of the relevance of domestic financial intermediation is concerned. First, it fails to take into consideration the heterogeneous nature of the economies concerned. Second, other studies have shown that the degree of financial and monetary integration among the SADC countries is still very weak (See for instance, Jenkins and Thomas, 1998: 153-156; and ADB, 2000: 152-154). By contrast, it has been shown that the financial sector in the Southern African Customs Union (SACU) countries are highly integrated because of the monetary union among most member countries.

The goal of this paper therefore is to assess the relevance of national financial intermediaries in an increasingly integrated financial market using the case of the Southern African Customs

Union¹ countries. In so doing the paper will attempt to show the benefit and costs of financial integration for the economies concerned and then draw relevant lessons for other countries in the face of the on going efforts toward regional integration.

Following this introduction, the paper presents an overview of the background of the SACU countries, highlighting the implications of official integration arrangements, the banking sector and economic performance of the economies. In section three, the empirical analysis of the paper is carried out using the Zellner seemingly unrelated regression estimation technique. The method enables us to account for the individual country-specific effects of financial development on economic growth and at the same time take into account the integrated nature of the economies of the countries concerned. Finally, the paper concludes with some policy recommendations for possible further steps in the on going regional integration process.

2. Brief Economic Background of the SACU Countries

The two main links among the economies of Botswana, Lesotho, Namibia, South Africa and Swaziland (BLNSS) are: their membership of SACU and except for Botswana, the Common Monetary Area (CMA). They are also members of the Southern African Development Community (SADC)², besides being intimately linked by geographical location. In what follows we briefly discuss the official integration arrangements focusing on the SACU and CMA arrangements. The section also highlights some of the features of the banking sector and economic performance in the SACU

Official Integration Arrangements and Implication for the BLNSS Countries

The Southern African Customs Union

The first formal agreement, which laid the foundations for the SACU, was signed in 1910 when the Union of South Africa was formed. This agreement has been amended and renegotiated in 1911-13, 1969 and 1975. The major objectives of the 1910 agreement required the free flow of goods among the member countries, a common external tariff, with the smaller countries

¹ The memberships of SACU are Botswana, Lesotho, Namibia, South Africa and Swaziland.

² SADC members are SACU countries plus Angola, Congo Democratic Republic, Malawi, Mauritius, Mozambique, Seychelles, Tanzania, Zambia and Zimbabwe.

agreeing to maintain a custom duty structure similar to that in South Africa at all times. Also, there was to be free movement of labour³ among member countries (World Bank, 1996)⁴.

When the agreement was re-negotiated in 1969, South Africa agreed to compensate the partner countries for the loss of fiscal discretion, the price increasing effect of the customs, the implicit protection provided for South African industry, and the industrial polarization of the tariff structure. The compensation agreed upon in 1968 was set at 42 percent of the respective share of customs revenue (Guillaume and Stasavage, 1999). In addition, since 1977, SACU has also included a stabilization factor to counteract variations in payment. As a result, SACU transfers represent an important source of government revenue for the smaller countries, in particular Lesotho and Swaziland (see table 1). The two countries also receive large remittances from migrant labour working in South Africa (mainly in the mines), though the number employed have declined over the past decade. The magnitude of these remittances make of more than 30 percent of GNP.

Table 1: SACU Revenue Payments, 2001/02

	Botswana	Lesotho	Namibia	Swaziland	RSA (residual)
SACU Payment (R million)	2,622	1438	2,641	1,503	9,897
% of total Revenue Pool	14.5	7.9	14.6	8.3	54.7
% of total Govt. Revenue (excl. Grants)	12.8	51.0	30.4	54.1	3.9

Source: Kirk, R and M. Stern (2003) The New Southern African Customs Union Agreement, World Bank, Page 5.

Common Monetary Area (CMA)

Membership of the Common Monetary Area by BLNSS, except for Botswana, is the primary financial relationship among them. This was formalized in 1974 and then known as the Rand Monetary Agreement (RMA). Hitherto, particularly, between 1910 and 1960 there were no restrictions on the transfer of money and capital within the area encompassing South Africa, Swaziland, Lesotho and Botswana because the common currency in use was the pound sterling. The South African Rand replaced the pound sterling in 1961 (World Bank, 1996). Among other things, RMA provided for Botswana, Lesotho and Swaziland (BLS) to issue their own currencies, which would be legal tender each within its own territory only and were to circulate side by side with the South African Rand. Each currency was to be backed by the South African Rand and was to be pegged at par with the South African Rand (CBL, 1996).

³ This has only existed in principle, in practice official barriers still prevent free movements of labour among member countries.

⁴ Namibia joined the union after political independence in 1990

The agreement also provided for the countries to establish their own central banks. Swaziland established an independent monetary authority in 1974, converted to the Central Bank of Swaziland in 1979, and issued its own currency, the Lilangeni, pegged at par to the South African Rand. The monetary authority of Lesotho was established in 1979 and converted to Central Bank of Lesotho in 1982. The Lesotho government introduced the Loti in 1980, which was fixed at par with the South African Rand.

Botswana on its part left the RMA in 1976, and issued its own currency, the Pula. The Pula was initially linked to the US Dollar at a rate, which maintained parity to the Rand. Beginning in 1980, the Pula was pegged to a basket of currencies including the Rand, the Zimbabwe Dollar, and the SDR as a proxy for trade with the rest of the world (Guillaume and Stasavage, 1999). Since the 1990, the Pula has been floated, but in practice, it has been informally linked to the Rand through a currency basket where the latter weighs around 60 to 70 percent (indeed we may regard Botswana in this sense as a 'de facto' member of CMA). Other main departures from the CMA involved the imposition of strict capital controls and the obligation to keep all reserves within the central bank rather than with commercial banks (Guillaume and Stasavage, 1999).

In 1986, the RMA was replaced by the Common Monetary Area (CMA) Agreement. This was a set of three agreements. There was a Trilateral Agreement and within the context of that Trilateral Agreement were two Bilateral Agreements, one between the RSA and Lesotho and another between the RSA and Swaziland (CBL 1996). Namibia joined in 1992 shortly after independence and it also introduced its own national currency, the dollar in 1993, which remained pegged to the rand while the latter is a legal tender in the country.

A major feature of the new agreement is the 'free flow of funds for current and capital account transactions within the contracting parties'. By agreeing to this clause, members indicated that they subscribe to the principle that capital should flow to any country where it would earn the highest returns. It rejects, again by implication, the notion that their national interests can be best served by attempting to control long-term capital flows. Consequently, returns will dictate the general direction of movement of long-term capital among members. Thus, instead of attempting to administratively control movements of capital the viable alternative would be for

members to seek to eliminate distortions that could lead to long-term capital outflow or lower than optimal capital inflows.

However, the level of development of financial systems among the countries is comparatively different, with South Africa having the most developed and most sophisticated financial system. This asymmetry could cause imbalances in financial flows and also have serious implication for the contributions of domestic financial intermediation to economic growth. The imbalances in financial flow could further be exacerbated by unfavourable domestic institutional, structural and economic policies.

Banking in the SACU Countries.

A major feature of the banking sector in the BLNS is the dominance of banks from South Africa. Except in few instances, South African banks own most banks in the four countries. The high degree of South African ownership coupled with membership of the CMA ensures that the banking sectors in the other SACU countries follow South African trends in product innovation and pricing. However, there is still a wide disparity in the level of development of financial systems between South Africa and the other four countries. While South Africa has a well developed, sophisticated and highly competitive banking sector, the BLNS are far behind. Indeed the banking system in BLNS can be described in the following ways:

- High market concentration with little effective competition, which has led to high cost of capital for entrepreneurs. The high spread between lending and deposit rates among countries, except for Botswana is as can be seen from table 3, is an indication of this low effective competition among the banks.
- High excess liquidity in the financial systems mainly due to low domestic investment (low credit extension to domestic private investors, especially small and micro enterprises) instead of higher than normal rate of savings. And in some cases, especially in Botswana and Namibia, more of the private sector credit is increasingly being granted to household to finance consumption instead of businesses for productive investments (Genesis Analytics, 2003).
- In some cases there are low deposit rates coupled with inefficiencies in banking operations resulting in long queues and time wasted in bank transactions and often, high charges for banking services. As a consequence many people operate dual accounts, one domestically and the other across the border in South Africa.

Financial Intermediation

From table 2 which provides the country-specific values of the mean and standard deviations for the period 1980 to 2000, we can see that using all the indicators South Africa has the highest level of financial intermediation, closely followed by Botswana, then Namibia while Swaziland and Lesotho lag behind. According to theory, interest rate spread, which represents the cost of financial intermediation (FI) in a competitive environment should fall as the level of FI increases. As shown in the table, Botswana has the lowest spread, closely followed by South Africa, with Swaziland coming next, while Lesotho and Namibia recorded the highest spread. Also, Lesotho shows a higher variability on the spread as reflected by its standard deviation.

Table: 2 Sample: 1980 – 2000: Balanced panel.

Country	FI1		FI2		FI3		FI4		IDR	
	Mean	Std.D.	Mean	Std.D.	Mean	Std.D.	Mean	Std.D.	Mean	Std.D.
Botswana	46.63	7.45	79.54	15.08	72.30	10.92	117.00	15.17	3.26	1.73
Lesotho	17.83	3.85	34.28	4.11	66.77	11.29	99.52	11.47	7.19	2.59
Namibia	33.80	21.09	35.97	6.84	86.47	7.48	100.53	14.84	8.31	1.33
South Africa	57.76	9.50	49.72	6.26	89.05	2.16	117.15	12.31	4.46	1.04
Swaziland	20.80	4.12	28.13	3.59	79.99	2.46	100.54	10.06	6.80	0.91

Note: FI1 is the ratio of credit extended to the private sector by commercial banks to GDP; FI2 is the ratio of liquid liabilities of commercial banks to GDP, where liquid liabilities equals demand deposit plus time and savings deposits; FI3 is the ratio of commercial bank assets to the sum of commercial banks and central banks' assets; and FI4 is a composite index computed from the combination of the other three indexes.

Source: Aziakpono (2003)

Economic Performance among the SACU Countries

Table 3 and 4 summarise the economic performance of the countries studied. They reveal wide disparities. South Africa is the largest economy in the Southern African region, and in the sub-Saharan Africa. From a level of \$770 in 1970, the per capita income of South Africa rose to a level of \$3520 in 1996 and \$3310 in 1998, which places her among the upper middle-income countries of the world. Most of the neighbouring economies (particularly the SACU countries, and to a large extent other SADC countries) heavily depend on South Africa in the area of trade, investment and in some cases (migrant) employment.

The BLNS source most of their import from South Africa, although their exports are more geographically diverse. The commodity composition of South Africa's exports to the BLNS differs significantly from its exports to the rest of the world. Basically, South Africa exports consumer goods and services to the BLNS, whereas resource-based goods dominate its export

to the rest of the world (Kirk and Stern 2003). Moreover, South African companies dominate the business landscape in the BLNS.

Despite the economic and geographic closeness of the BLNS to South Africa, and the fact they share a common trade policy, the performance and the management of the smaller SACU economies differs markedly from each other and South Africa. The essential characteristics of the member countries are also presented in Tables 3 and 4.

Botswana, Lesotho and Swaziland gained political independence about the same time with similar socio-economic backgrounds. However, since then the rates and patterns of their growth and development have diverged. For instance, while Botswana has experienced a remarkable steady growth of per capita income from \$140 in 1970 to \$3210 in 1995 and \$3070 in 1998, Lesotho on the other hand, has recorded a much weaker growth rate for the same period with per capita income growing from \$100 in 1970 to \$660 in 1996 and fell to \$570 in 1998 and by 2001 it has reached a low level of \$386. The growth record of Botswana placed her among the upper middle-income countries of the world, while Lesotho remains among the low-income countries. Swaziland has experienced moderate growth over the years, from per capita income of \$230 in 1970 to \$1210 in 1996. This rose further to \$1390 in 1998, placing Swaziland among the lower middle-income countries of the world. Namibia since independence in 1990 has remained among the lower middle-income countries with a per capita income ranging between \$2250 in 1996 and \$1730 in 2001.

Table 3: SACU Countries Basic Data: 2001

Country	Area ('000sq.km)	Pop (million)	GDP (\$billion)	GDP per capita \$	Av. Growth rate GDP per capita 1990-2001	HDI rank	Life Expect. at birth (years)	Av. Inflation rate 1990 - 2001	Import as % of GDP	Export as % of GDP
Botswana	600 (22.3)	1.7 (3.3)	5.2 (3.6)	3066	2.5	125	39.7	10.0	35	51
Lesotho	30 (1.1)	1.8 (3.5)	0.8 (0.6)	386	2.1	137	35.1	8.8	86	34
Namibia	824 (30.6)	1.9 (3.7)	3.1 (2.2)	1730	2.2	124	44.3	9.5	66	54
RSA	1221(45.4)	44.4(87.2)	133.3 (92.8)	2620	0.2	111	47.7	8.3	25	28
Swaziland	17 (0.6)	1.1 (2.2)	1.3 (0.9)	1175	1.9	133	34.4	9.3	81	69
SACU	2692 (100)	50.9 (100)	143.7 (100)	2491.4						

Source: UNDP Human Development Report 2003

Table 4: Per Capita GNP (current US \$ and % compound annual growth rate)

Country	1965	1970	1975	1980	1985	1990	1996	1998	2001 ^c
Botswana	70	140	430	1020	1120	2490	3210 ^b	3070	3066
% growth		14.9	25.16	18.85	1.88	17.32	5.21		
Lesotho	60	100	250	440	380	550	660	570	386
% growth		10.8	20.11	11.97	-2.88	7.67	3.08		
Namibia	NA	NA	NA	NA	NA	1900	2250	1940	1730
% growth						9.08	2.85		
South Africa	530	770	1590	2490	2100	2860	3520	3310	2620
% growth		7.75	15.60	9.38	-3.35	7.87	3.52		
Swaziland	180	230	570	910	760	1110	1210	1390	1175
% growth		5.02	19.90	9.81	-3.53	7.87	1.45		

Source: World Bank, *World Development Indicators* 1998 in Allen and Ndikumana (1998) and African Development Bank, *African Development Report 2000*

GNP is in current US\$, World Bank's Atlas method.

^b For Botswana, GNP for 1996 is missing; the value reported here is for 1995

^c GDP per capita, obtained from UNDP, *Human Development report*, 2003.

3. Analytical framework and the Results

Measuring Financial Intermediation

Two indicators of financial intermediation are employed in this study. The first indicator is the ratio of private credit to nominal GDP (FIC), where private credit is the credit extended to the private sector by commercial banks. This ratio stresses the importance of the role played by the financial sector, especially the deposit money banks, in the financing of the private economy. It isolates credit issued to the private sector from credit issued to governments, government agencies, and public enterprises. Also, it excludes credits issued by the Central Bank ⁵ (Levine, et al 2000). The underlying assumption is that credit provided to the private sector generates increases in investment and productivity to a much larger extent than do credits to the public sector. It is also argued that loans to the private sector are given under more stringent conditions and that the improved quality of investment emanating from financial

⁵ A general finding is that Central Banks lose relative importance as one moves from low to high-income countries, and other financial institutions gain relative importance. Thus, by excluding Central Bank Credit, Private Credit provides a measure of relative size of financial intermediaries (Beck et al 1999).

intermediaries' evaluation of project viability is more significant for private sector credits⁶ (Levine and Zervos, 1998, Levine 1998).

The second indicator of financial intermediation is the ratio of liquid liabilities of commercial banks to nominal GDP (FIL). Liquid liabilities equal demand deposit plus time and savings deposits. This indicator provides an alternative to a broad money ratio especially when dealing with developing countries (e.g. Demetriades and Hussein, 1996; and Luintel and Khan, 1999). The argument is that in developing countries, a large component of the broad money stock is currency held outside the banking systems. Therefore, in principle a rising ratio of broad money to income may reflect the more extensive use of currency than an increase in the volume of bank deposits. Following this argument, bank deposit liabilities, which exclude currency in circulation from the broad money stock have been used as a better measure of financial depth and thus of the overall size of the financial intermediation. This indicator however, has been criticized in a number of ways (see Aziakpono, 2003).

Other variables of the model

Economic performance is estimated using the natural log of real GDP and growth in real GDP obtained by deflating nominal GDP with consumer price index (CPI) at 1990 base year. Other variables were added to control for the possible effects of other growth determining factors such as inflation, size of government, a measure of openness to trade and exchange rate variable. Human capital is an important variable that is commonly added in these types of studies (Levine 1997: 707), but could not be included in the present analysis due to unavailability of data. Growth theory suggests a positive relationship between education and economic growth (see Barro 1991)

The inflation rate and size of government expenditure are commonly used as indicators of macroeconomic stability (Easterly and Rebelo, 1993; Fischer, 1993; Allen and Ndikumana, 1998 and Levine et al 2000). High inflation distorts economic activity and reduces investment in productive enterprises, thus reducing economic growth. Government expenditure could reduce economic growth because of the crowding out effect on private investment and the inflationary pressures it can lead to (Allen and Ndikumana, 1998). Inflation is measured in the

⁶ However, where private loans are politically influenced, this ratio may not be efficient.

analysis as the percentage change in CPI (at 1990 base year). The size of government is measured as the percentage share of government expenditure in GDP.

The effect of international trade on growth is captured by the openness variable, which is measured as the sum of imports and exports as a percentage of nominal GDP (Levine et al 2000). Theoretically, the effects of trade can be negative and positive; as such the net effects can only be determined empirically. The exchange rate variable has been introduced to capture the price distortion effects it may have on the economy. The nominal exchange rate is used.

In order to avoid the problem of simultaneity bias, following the practice in most empirical studies, the lagged values of the variables, including that of the indicator of financial intermediation, were used. Since the series are quarterly, the fourth lag was employed for most variables, except for the exchange rate and openness variables where preliminary experiments indicated that the first and second lags respectively performed better. Contemporaneous values of the dependent variables were used. Quarterly data from 1980:1 to 2000:1 was employed⁷. All the data came from IMF International Financial Statistics 2001 and earlier issues.

Econometrics Techniques

A panel data econometric technique was adopted for the analyses. The objective of the technique is to overcome two major weaknesses of most cross-country panel data approaches. 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). Also, the pooling of data with the same parameters over time and across regions, common with most panel data methods (especially non-stationary panel data tools) begins with the presumption of independence across equations. This is a very restrictive assumption, which can only hold in very extreme situation (Baltagi 2001: 51). To this end the econometrics analysis in this paper applied the Zellner seemingly unrelated regressions estimation (SURE) method

⁷ Apart from South Africa where most data were available in quarterly form, in the rest of the countries most series are annual. The annual series were converted to quarterly series using interpolation methods as provided in the E-views 3.1. In the choice of an appropriate interpolation method for each series care was exercised to ensure that the resultant interpolated series reflect as much as possible the pattern of the original series. After a careful experimentation, the following pattern of interpolation methods were adopted: For series in rates e.g, inflation, interest, exchange rates etc, the *Quadratic: match average* was used; for flow variables, e.g Money supply, Savings etc, the *Cubic match last* was used; while in the case of stock variables like GDP, the *Quadratic: match sum* was used.

following Murinde (1996). The distinguishing features of SURE as a method for pooling time-series and cross-sectional data are:

- The assumption of contemporaneous correlation in the disturbances,
- Each cross-sectional unit has a different coefficient vector (Judge et al 1988)⁸.

The Zellner method according to Murinde (1996) takes the system of ‘seemingly unrelated regression equations’ as a single large equation to be estimated.

We start by postulating a separate regression for each individual country thus:

$$y_{it} = \alpha_i^* + \beta_i' x_{it} + e_{it} \quad \begin{matrix} i=1, \dots, N \\ t=1, \dots, T \end{matrix} \quad (1)$$

where y_{it} is the measure of economic performance and x_{it} is the vector of explanatory variables including the measure of financial intermediation. The idea is to estimate each equation simultaneously for Botswana, Lesotho, South Africa and Swaziland⁹. The underlying assumption of the Zellner method is that though equation (1) has four variants, the four equations are related through the non-zero covariances associated with the error term. Thus, while it is assumed that statistically the errors for each country taken separately conform to the standard linear regression model¹⁰ each country’s errors may also correlate with the contemporaneous errors of the other countries. There is reason to believe that common factors may influence macroeconomic and financial data from the SACU countries¹¹ and therefore increase the chances of the presence of contemporaneous correlation in the model.¹²

In addition to the potential for contemporaneous correlation, the varying degrees of economic and financial development across a cross-section of the countries, and other distinct structural differences that can endogenously determine the development of financial intermediation and economic performance, are likely to lead to variations in the coefficients of the model and as such the residual variances differ in a predictable way. However, to justify the use of the

⁸ For a detailed description of the SURE method see Judge et al (1988: chapter 11)

⁹ Namibia was excluded in the econometrics analysis in order to ensure a balanced panel.

¹⁰ See Judge et al (1988: 145-146) for a detail list of this assumptions

¹¹ Apart from belonging to Customs Union, three of the countries-Lesotho, South Africa and Swaziland are members of the Common Monetary Area (CMA), which require convergence in their monetary and financial policies. The SACU and CMA allow for free movement of goods, labour and funds. Also, the CMA arrangement mean single exchange rate, with the currencies of the other countries pegged at par to the South African rand, and the rand freely circulating in the other economies. Thus the SACU countries may be affected by the same shock

¹² Contemporaneous correlation occurs when the disturbance terms in a set of equations are correlated at a point in time.

method, the analysis commenced by testing these assumptions (or according to Baltagi (2001:51) the poolability of the data) (see appendix on Econometric tests for the methods and results) The results indicate that. there was evident of contemporaneous correlation, and neither the intercept and slope coefficients were the same across the cross-section of the countries. Hence this justifies the use of the Zellner SURE method.

All the estimations were carried out following the routine performed in E-Views software. Two sets of the model were estimated. In the first set, the growth in real GDP¹³ was used as the dependent variable in line with growth theory; while in the second set, the log of real GDP was used as the dependent variable. Also, two variances of each set of models were estimated, with each including the alternative indicator of financial intermediation as the explanatory variable.

In what follows the paper highlights the Zellner estimation results, which account for the variable-coefficients. The results corresponding to each model are presented in tables 1-4 in the Appendix. In estimating the model using the Zellner SURE method, we employed the system approach instead of a single equation approach. This is because Zellner (1962) has shown that the regression coefficients obtained by a joint estimation approach were asymptotically more efficient than by the equation-by-equation least squares approach. The gain in efficiency by the joint estimation method as compared to the single equation least squares approach can be quite high if the explanatory variables are less correlated and the disturbances are highly correlated.

In general the explanatory variables demonstrated a high explanatory power, especially in the model using the log of real GDP. The explanatory power of the models with growth of real GDP as the dependent variable ranges from 0.364 to 0.546, with an average of 0.468 adjusted R². This shows that some growth determining variables must have been omitted from the model. One such variable as noted earlier is human capital, which theory predicts to have positive effect on growth (see Barro 1991, Levine et al, 2000). Thus it would be appropriate that efforts should be made in subsequent studies to search for other growth-determining factors and incorporate these as control variables in the model.

¹³ The most appropriate measure of economic growth in line the growth theory is the per capita GDP growth, but because data limitations we could not employ this series, instead we used the growth rate of real GDP which does not adequately account for the variations in the countries sizes.

The adjusted R^2 in the model with log of real GDP ranges from 0.7806 to 0.9536, with an average of 0.903. Thus in this model, the included variables explained about 90 percent of the systematic variations in the log of real GDP. Comparing the models with alternative indicators of financial indicators also reveal some differences in their explanatory powers. Such difference was more pronounced in the growth in real GDP model than it is in log of real GDP model.

Effects of financial intermediation indicators

Table 5 provides a summary of the effects of financial intermediation on economic performance in each of the countries. In general the signs of the coefficients of financial intermediation obtained among the countries and across the models were mixed. Using liquid liabilities of commercial banks as indicator of financial intermediation in the growth in the real GDP model, we obtained positive coefficients for Lesotho and South Africa, while Botswana and Swaziland have negative signs. Only South Africa was however significant (at one percent). Using credit to private sector as the indicator of financial intermediation also produced similar signs in the growth in real GDP model, except that the coefficient in Botswana became very significant. This implies that the development of the financial sector in Botswana and Swaziland has not promoted economic growth as theory suggests. But in South Africa it does appear that there is a significant positive influence of financial intermediation on growth. In Lesotho, while the development of financial intermediation has the potential to influence economic growth positively, such impact is not significant.

In the model using the log of real GDP, the coefficient of liquid liabilities was positive for Botswana and South Africa and significant at the one percent level. In Lesotho and Swaziland, the coefficient was negative, but only in Lesotho was it significant (at one percent). On the other hand, the coefficient of credit to private sector was positive for Botswana, Lesotho and South African with the coefficient being very significant (at one percent) in Botswana and South Africa. This coefficient was however negative and insignificant in Swaziland.

Overall, using both indicators the evidence on the positive effects of financial intermediation on growth within the SACU is weak. This finding agrees with an earlier study by Allen and Ndikumana (1998) for the SADC countries of which SACU is a part. They argued that the weak link between financial intermediation and economic growth might reflect pervasive inefficiencies in the credit allocation mechanism, probably requiring the strengthening of

financial sector legislation and banking system supervision as one way of enhancing the financial sector efficiency. However, since their study did not provide country-specific results, it would be difficult to generalize their conclusions. A country-specific result as shown in the analysis indicates some variation across the countries of SACU in terms of the gains from financial intermediation.

The results suggest that South Africa enjoys the highest gain from financial intermediation among the SACU countries. Deposits mobilized within the economy are used to finance private investment, which then help to boost economic performance in the economy. It is also possible that in the quest for higher returns, deposits mobilized in the other economies are invested in South African economy which further helps to boost the performance of the economy. This is made easier because of the SACU and CMA arrangements.

As for Botswana, the results show that the country gains from financial intermediation, however the evidence is not strong. One would have expected that given the high level of financial development in the country (closely following South Africa), its effects on growth should be strong. One possible explanation of this outcome, is that given the dependence of the economy on export of diamonds, which is controlled by the Government, and the obligation to keep all reserves within the central bank rather than with commercial banks (Guillaume and Stasavage, 1999), it is possible that the economy is then driven by the efficiency of government management of these resources rather than the efficiency of bank financing of private sector investment. This seems to be supported by the results on the coefficient of the ratio of government expenditure to GDP, which exerts a positive and highly significant effect on economic performance in all the models. This is in sharp contrast to other countries of the SACU, except South Africa where in some case the variable exerts a weakly significant positive effect on economic performance. Thus, it would seem reasonable to regard Botswana's case in Patrick's (1966) term as "demand following finance" rather than 'supply leading finance'. That is, the development of the financial system merely responds to the growth of the economy generated from other sectors and not actively promoting growth¹⁴. The weak impact of financial intermediation on economic growth could also be a reflection of a

¹⁴ It has been suggested that in Botswana, the availability of income to the government from the exports of the diamond producing sector allowed the state to 'but off' the demands of politically important and right groups in the economy, while continuing to increase social services benefiting the poor. This has allowed Botswana to retain political stability and widely accepted rule by the same party since independence (See Johnson and Martin, 1986)

general shift of resources from productive investment to consumption, which may indicate a lack of local industries but a high level of consumption. A recent study of Botswana's financial system succinctly 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 Analytical, 2003: III).

Lesotho on its part demonstrates some positive effects of financial intermediation on economic performance. However, the effects are not significant. A major problem lies with the use of the deposits mobilized in the economy. It is apparent that the bulk of the deposit resources (liquid liabilities) of the commercial banks are not used for financing private domestic investment. There are little 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 other CMA countries (especially South Africa) where they can earn higher returns on their investments. The CMA agreement, which permits free flow of fund among member countries coupled with the fact that most banks are branches of South African banks make the whole process very easy.

Restrictive government policies have also inadvertently discouraged advancement of credits to the private sector for productive investments. As noted in a paper presented by the Central Bank of Lesotho (CBL) in 2002, such policies include the use of credit ceilings by the CBL for controlling money supply between 1988 and 1996, which restricted the growth of banks loan portfolios. Such restriction on aggregate lending constraints banks to lend only to the best clients and established companies. As the paper further noted, following the imposition of the Minimum Local Assets Requirement (MLAR) in 1981, the CBL adopted a policy of paying interest on commercial banks' surplus funds. This provided banks with a relatively risk-free investment opportunity compare to lending to private investors.

Other possible explanations for the poor contribution of financial intermediation to growth in Lesotho are: poor institutional capacity- a weak and slow legal system to enforce contracts and debt repayment, confusion on property rights (Hernando de Soto, 1999), the weak banking institutions themselves, including poor entrepreneurial capacity. There is also the perception of a non-loan repayment culture and all the difficulties in pursuing defaulted debt. The specific

impacts of these factors on the development of financial intermediation in Lesotho however need to be investigated for appropriate policy recommendations.

Despite the foregoing, there is hope that Lesotho could improve its gain from financial intermediation. As can be seen from the table 5, the coefficient of credit to the private sector is positive though not significant. This means that there is some efficiency in the few private investments financed by the banks, with a potential to stimulate growth of the economy. The implication for policy is that efforts geared towards promoting domestic investment (such as building domestic entrepreneurial capacity) and encouraging banks to finance investments within the economy will be desirable. In this regard, the recent efforts by the Central Bank of Lesotho in encouraging greater financial intermediation through creating postal banking arrangements in the rural areas that presently have almost no access to banking facilities, is a step in the right direction.

The case of Swaziland looks gloomier than in the other countries in terms of gains from financial intermediation. As the results show (table 5), all the coefficients of financial intermediation have negative signs though none was significant at the standard levels of significance. The literal interpretation of this result is that the developments in the financial system are actually inhibiting growth of the economy. Even more worrying is the fact that the efficiency of domestic investments financed by banks seems doubtful, as shown by the negative coefficients of private credits across all models used. This result seems to echo the concerns raised in a 1996 World Bank study of the Swaziland financial system, which observed a declining trend in the level of performance of the financial system- especially the commercial banking system- and predicted further decline in the future (World Bank, 1996). The problems are similar to those in Lesotho. However, they seem more pronounced now that the gains the Swaziland economy used to enjoy during the economic instability and political uncertainty in South Africa have now ceased since the end of the apartheid in South Africa. As noted by the World Bank (1996), economic instability and political uncertainty in South Africa in the 1980s led to increase in corporate investment in Swaziland, which serves as an outlet for investors from South Africa. With the end of apartheid in South Africa, new investment opportunities in Swaziland have declined which in turn affected banking activities.

Table 5: Financial Intermediation and Economic Performance- SURE Estimation Results

Country / Variable	Model 1 (GRY)	Model 2 (LRY)
Botswana		
FIL	-0.042 (-0.49)	0.02 (9.05)a
FIC	-1.71 (-7.32)a	0.019 (3.48)a
Lesotho		
FIL	0.017 (0.84)	-0.011 (-6.89)a
FIC	0.297 (1.34)	0.0004 (0.19)
South Africa		
FIL	0.51 (4.8)a	0.01 (14.69)a
FIC	0.018 (1.79)a	0.002 (6.13)a
Swaziland		
FIL	-0.41 (-.41)	-0.005 (-0.97)
FIC	-0.57 (-1.57)	-0.001 (-0.14)

Note: a-significant at 1% level of significance, b-significance at 5% level of significance and c- significance at 10% level of significance.

Effects of the controlled variables

Tables B-2 to B-5 in the Appendix report the regression results with all the controlled variables. Overall, openness to trade has a negative impact on growth in most countries of the SACU. Apart from South Africa where the coefficient of openness to trade was positive and significant, in the remaining three countries the coefficient was negative and significant. This implies that openness to trade has only stimulated growth in South Africa, while it has inhibited growth in the other countries. A possible explanation is that since imports dominate the trade in these countries, except for South Africa, and apparently most imports are consumer goods, this may tend to crowd out domestic production. With relative easy movement of people and goods across the border, by virtue of the SACU arrangement, citizens of the smaller SACU member have increasingly developed a taste for shopping in South Africa. In order to facilitate importation of goods both firms and individuals increasingly tend to operate dual bank accounts—one with South African Banks across the border and the other with domestic banks. In some instances, it is possible that the larger part of their funds are held across the border not only to finance their purchases, but in many instances, their financial transactions are also carried out there rather than at home, given the better services and higher interest rates offered in South Africa. All of these work to inhibit economic growth domestically among the smaller members of SACU while promoting growth in South Africa. The rapid growth of the border towns in South Africa is clear evidence.

The results on government expenditure are mixed. In Botswana the coefficient was positive and significant for all the entire models, reflecting a possible high level of prudence in the management of the resources of the economy by the government. In the remaining countries, the negative coefficient dominates and was significant in most cases. As expected inflation has the potential to inhibit the growth of the economies as indicated by the negative coefficients of inflation variable, although the coefficient is not significant. Allen and Ndikumana (1998) obtained similar result for all the SADC countries. As noted by them, this may be due to the fact that the countries experienced only a moderate inflation. Thus, it does appear that the inflation control measures among SACU countries are yielding the desired results. Lastly, the coefficients of the exchange rate were positive and significant in most of the equations. A one-period lag of the exchange rate variable was used, since preliminary experiments show the one-period lag performs better. This implies that the response of the economies to exchange rate movements is quite fast. Thus the use of exchange rate management as a tool of macroeconomic management, by the smaller countries of the SACU may be beneficial as they continue to align their exchange rate policies to that of South Africa.

5. Conclusion

This paper has examined for the SACU countries, whether domestic financial intermediation matters in an integrated financial market. Using two indicators of financial intermediation and the Zellner seemingly unrelated regression estimation method gave mixed evidence for the importance of domestic financial intermediation across the countries.

Within the SACU, South Africa, which is the dominant economy, demonstrated strong evidence of the relevance of domestic financial intermediation in promoting growth. The evidence was however, weak for Botswana and Lesotho. Since the financial system in Botswana is highly developed, the weak effects of financial development on growth may therefore be seen as supporting the 'demand following finance' hypothesis, rather than being the result of a negative externalities from belonging to the union. Another factor is the pattern of domestic credit, which has become increasingly skewed to households for consumptions rather than businesses for productive investments. However, it is hoped that if efforts are directed at changing the prevailing pattern of credit to the private sector such that more emphasis is given to businesses rather than households, that with passage of time and as the

economy and the financial sector develop in Botswana the mutual positive effect may become more pronounced.

In the case of Lesotho, it does appear that the weak effect of financial intermediation on growth may partly be due to some negative externalities of belonging to the union, which might have been exacerbated by the weak domestic institutions. Theory suggests that in an integrated market capital will seek higher returns and possibly greater security of investment. Thus, given the relatively weak financial systems, coupled with low returns and other institutional and structural problems, Lesotho may continue to lose the gains of financial intermediation to other members of the union, especially South Africa. Steps towards strengthening the weak financial system, and resolving the institutional and structural problems within the economy may avert this. For instance, attention must be given to building domestic entrepreneurial capacity, strengthening the legal system and bank supervision. Also, the problems of property rights and titles deserve immediate attention. This will make it easier for individuals to provide the collateral needed to access credits from the banks.

The case of Swaziland looks very gloomy. It appears that the role of domestic financial institutions, especially commercial banks, in stimulating growth is becoming less important, particularly now that political and economic stability has returned to South Africa. This however, does not diminish the importance of financial intermediation in the economy. It only underscores the need for some vigorous efforts to address the institutional and structural problems within the economy. The recommendations for Lesotho may equally be applicable.

From the foregoing, an obvious lesson for countries contemplating forming or entering an economic integration, in particular a monetary union, is that the development of their financial system along with addressing other institutional and structural problems in their economy would be a necessary precondition for them to derive maximum gains from financial intermediation.

References

- African Development Bank (2000) **African Development Report 2000: *Regional Integration in Africa***. New York: Oxford University Press.
- Allen, D.S. and L. Ndikumana (1998) “ Financial Intermediation and Economic Growth in Southern Africa,” Working Paper Series 1998-004, The Federal Reserve Bank of ST. Louis, available On-line: <http://research.stlouifed.org/wp/1998/98-004.pdf>
- Aziakpono, M.J. (2003) “Explaining the Behaviour of Financial Intermediation in the Southern African Customs Union Countries: Evidence from a Panel Data Analysis”, Paper presented at the Eight Annual Conference on Econometric Modeling in Africa by the African Econometric Society, held in Stellenbosch, South Africa, 1-4 July 2003.
- Baltagi H. B (2001) *Econometric Analysis of Panel Data*, Second Edition, New York: John Wiley & Sons LTD.
- Barro, R.J. (1991) “Economic Growth in a Cross Section of Countries”, *Quarterly Journal of Economics* Vol. 106, No 2, pp 407-443
- Beck, T., A. Demirguc-Kunt, and R. Levine (1999) “A New Database on Financial Development and Structure,” *World Bank Policy Research Paper* No. 2146
- Beck, T., R. Levine, and N. Loayza (1999) “Finance and the Sources of Growth,” *World Bank Policy Review Working Paper* no. 2057
- Bloch, H. and S. H.K. Tang (2003) “The role of Financial Development in Economic Growth,” *Progress in Development Studies*, Vol. 3, No. 3, pp. 243-251
- Breusch, T. S., and A. R. Pagan (1980) “The LaGrange Multiplier Test and Its Applications to Model Specification in Econometrics,” *Review of Economic Studies*, 47, 239-254
- Central Bank of Lesotho (1996) Capital Flows Survey.
- Central Bank of Lesotho (2000) Annual Report for 2000.
- Central Bank of Lesotho (2002) Financial Intermediation in Lesotho: Problems, Causes and Solutions.
- Demetriades, P. and K. Hussein (1996) “Does Financial Development Cause Economic Growth? Time Series Evidence from 16 Countries,” *Journal of Development Economics*, Vol. 51, No.2 pp.387-411.
- Dehejia, R. and A. Lleras-Munney (2003) “ Why does Financial Development Matter? The United States from 1900 to 1940”, NBER WP9551
- De Soto, Hernando (2000) **The Mystery of Capital: Why capitalism triumphs in the west and fails everywhere else**, London, Black Swan Books

- Easterly, W., and S. Rebelo (1993) “ Fiscal Policy and Economic Growth: an empirical investigation. *Journal of Monetary Economics*, Vol. 32, pp 417-458.
- Fischer, S. (1993) “The Role of Macroeconomic Factors in Growth”. *Journal of Monetary Economics*, Vol. 32. pp 485-512
- Genesis Analytics (2003) Access to Financial Services in Botswana, FinMark Trust Research Paper No. 1
- Genesis Analytics (2003) Access to Financial Services in Lesotho, FinMark Trust Research Paper No. 2
- Genesis Analytics (2003) Access to Financial Services in Namibia, FinMark Trust Research Paper No. 3
- Genesis Analytics (2003) Access to Financial Services in Swaziland, FinMark Trust Research Paper No. 4
- Green H. W. (2003) **Econometric Analysis**, *Fifth Edition*, New Jersey: Prentice Hall,
- Guillaume, D. and D. Stasavage (1999) “Making and Breaking Monetary Policy Rules: the Experience of African Countries” *Working Paper Series* 99-2, Centre for the Study of African Economies, Oxford University.
- Guiso, L., P. Sapienza and L. Zingales (2003) “Does Local Financial Development Matter?” Available on-line:
- Hsiao C. (1986) **Analysis of Panel Data**. Cambridge, Eng: Cambridge University Press.
- Jayaratne, J. and P. E. Strahan (1996), “The Finance-Growth Nexus: Evidence from Bank Branch Deregulation,” *Quarterly Journal of Economics*, CXI, pp. 639-671
- Jenkins, C. and L. Thomas (1998) “Is Southern Africa ready for Regional Monetary Integration” in Petersson L.(ed.) **Post-Apartheid Southern Africa: Economic Challenges and Policies for the future**, London: Routledge. Chapter 8, pp.145-170
- Johnson, P. and D. Martin (1986) **Destructive Engagement**, Harare: ZPH
- Judge G.G., R.C. Hill, W.E. Griffiths, H. Lutkepohl and T. Lee (1988) **Introduction to the Theory and Practice of Econometrics (Second Edition)**. New York: John Wiley & Sons.
- Kirk, R. and M. Stern (2003) The New Southern African Customs Union Agreement, World Bank, African Regional Working Paper Series No. 7
- Kuh, E. (1963) **Capital Stock Growth: A Micro-Econometric Approach**. Amsterdam: North-Holland

- Levine, R. (1997) "Financial Development and Economic Growth: Views and Agenda," *Journal of Economic Literature*, Vol. XXXV, and PP. 688-726.
- Levine, R. (1998) "The Legal Environment, Banks, and Long-Run Economic Growth," *Journal of Money, Credit, and Banking*, August, Vol.30, No. 3, pp.596-613.
- Levine, R.; N. Loayza and T. Beck (2000) "Financial Intermediation and Economic Growth: Causality and Causes," *Journal of Monetary Economics*, Vol. 46, pp. 31-77.
- Levine, R. and S. Zervos (1998) "Stock Markets, Banks, and Economic Growth," *American Economic Review*, June, Vol.88, No. 3, pp. 537-58.
- Luintel, K.B. and M. Khan (1999) "A Quantitative Reassessment of the Finance-Growth Nexus: Evidence from a Multivariate VAR," *Journal of Development Economics*, Vol. 60, pp.381-405.
- Murinde, V. (1996) "Financial Markets and Endogenous Growth: An econometric analysis for Pacific Basin", in Hermes, N and R. Lensink (ed): *Financial Development and Economic Growth: Theory and experiences from developing countries*. London: Routledge. Pp 94-114.
- Nissanke, M. and H. Stein (2003) "Financial Globalization and Economic Development: Toward an Institutional Foundation." *Eastern Economic Journal*, Vol. 29, No.2, Spring .
- Patrick, H.T., (1966), "Financial Development and Economic Growth in Underdeveloped Countries", *Economic Development and Cultural Change*, Vol. XIV, No.2, Jan., pp174 – 89
- UNDP (2003) Human Development Report, 2003
- World Bank (1996) Swaziland Financial Sector Study. Washington DC. USA
- Zellner, A (1962) "An Efficient Method of Estimating Seemingly Unrelated Regressions and Tests of Aggregation Bias." *Journal of the American Statistical Association*, 57 pp. 500-509

(A) Econometric Appendix

A-1) Test for contemporaneous correlation

In order to test for the presence of contemporaneous correlation we followed the procedure outlined in Judge et al (1988: 456). In the context of the four-equation system (1) in text, the null and the alternative hypotheses for this test are:

$$H_0 : \sigma_{12} = \sigma_{13} = \sigma_{14} = \sigma_{23} = \sigma_{24} = \sigma_{34} = 0$$

$$H_1 : \text{at least one covariance is non-zero} \quad (2)$$

where $\sigma_{ij} = E[e_{it}e_{jt}]$ and $t = s$ (3)

According to Judge et al (1988) an appropriate test statistic is the Lagrange multiplier statistic suggested by Breusch and Pagan (1980). In the four-equation case, this statistic is given by:

$$\lambda = T(r^2_{21} + r^2_{31} + r^2_{41} + r^2_{23} + r^2_{34} + r^2_{42}) \quad (4)$$

where r^2_{ij} is the squared correlation:

$$r^2_{ij} = \frac{\hat{\sigma}^2_{ij}}{\hat{\sigma}_{ii}\hat{\sigma}_{jj}} \quad (5)$$

Under H_0 , λ has an asymptotic χ^2 - distribution with 6 degrees of freedom. If the λ is greater than the critical value at the specified significant level, then we reject the null hypothesis.

By applying the test procedure outlined in equations (2) to (5) in testing for contemporaneous correlation, we obtained from the least squares residuals the following λ values corresponding to the alternative models estimated:

Eq1a: GRY (FIL) $\lambda = 45.0$

Eq1b: GRY (FIC) $\lambda = 32.77$

Eq1c: LRY (FIL) $\lambda = 28.5$

Eq1d: LRY (FIC) $\lambda = 68.9$

The 1% critical value from the χ^2 - distribution with 6 degrees of freedom is 16.81 (Gujarati, 2003: 817). Since the computed values of λ are greater than the critical values we reject the null hypothesis and conclude that contemporaneous correlation does exist.

A-2) *Test for the Homogeneity of the countries*

The standard method of testing the hypothesis of homogeneity of the countries is the F test (see Baltagi 2001: 52-56 for detailed description of the test). The question of whether the countries have homogenous coefficients is examined by testing two separate hypotheses, namely: (1) that the slopes and intercepts are simultaneously homogeneous among individual countries; and (2) that the regression slopes are collectively homogeneous. For simplicity we limited the tests to variations across countries, while variations over time are assumed constant¹⁵.

Following Hsiao (1986:12-16) in order to test the sets of hypotheses, two restrictions are imposed on equation (1):

H_1 : Both slope and intercepts are the same. That is,

$$y_{it} = \alpha^* + \beta' x_{it} + u_{it} \quad (6)$$

H_2 : Regression slope coefficients are identical, and intercepts are not. That is,

$$y_{it} = \alpha_i^* + \beta' x_{it} + u_{it} \quad (7)$$

Equation (1) is the unrestricted model, (6) is the pooled regression (restricted) and (7) is the individual-mean or cell-mean corrected regression model. Using least squares the three models were estimated and the corresponding residual sum of squares (S_1 , S_2 and S_3) were obtained. Under the assumption that the u_{it} are independently normally distributed over i and t with mean and variance σ^2_u , F tests is used to test the restrictions postulated by (6) and (7). In effect, equations (6) and (7) can be viewed as (1) subject to different types of restrictions. For example, the hypothesis of overall homogeneity can be viewed as (1) subject to $(K+1)(N-1)$ linear restrictions:

$$\begin{aligned} H_1 : \alpha_1^* &= \alpha_2^* = \dots = \alpha_N^*, \\ \beta_1 &= \beta_2 = \dots = \beta_N. \end{aligned} \quad (8)$$

On the other hand, the hypothesis of homogeneous slope and but heterogeneous intercept can be viewed as equation (1) subject to $(N-1)K$ linear restrictions:

$$H_2 = \beta_1 = \beta_2 = \dots = \beta_N. \quad (9)$$

The corresponding F statistics and their degrees of freedom are:

¹⁵ Although there are reasons to believe that over time variations among the parameters are possible. The change in the political environment in South Africa since 1994 is an example.

$$F_1 = \frac{(S_2 - S_1) / [(N-1)(K+1)]}{S_1 / [NT - N(K+1)]}. \quad (10)$$

with $(N-1)(K+1)$ and $N(T-K-1)$ degrees of freedom, and where S_1 and S_2 are the residuals sum of squares for equations (1) and (6) respectively;

and

$$F_2 = \frac{(S_3 - S_1) / [(N-1)K]}{S_1 / [NT - N(K+1)]}. \quad (11)$$

with $(N-1)K$ and $NT-N(K+1)$ degrees of freedom and S_3 is the residual sum of square for equation (7)

Given the degrees of freedom, if the F_1 statistic is significant it means the parameters are not homogeneous, the reverse is the case if it is not significant. If the hypothesis of overall homogeneity is rejected then, one can proceed to test whether there is slope heterogeneity, the second hypothesis. If given the degrees of freedom, F_2 is significant, then the hypothesis of homogeneous slopes is rejected. When this occurs, it would seem reasonable to allow variations in parameters across cross-sectional units to take account of the interindividual heterogeneity (Hsiao, 1986: 128).

The results of the F test, as discussed above, for testing the overall homogeneity and slope homogeneity across cross-section of the countries are reported in Table A-1. From the statistics, in all the alternative specifications, the tests failed to accept the hypotheses of overall homogeneity and slope homogeneity. The hypotheses were rejected even at 1% level of significance. Thus, neither the intercept nor the slope coefficients can be assumed to be the same across the cross-section of the countries. In such a circumstance, it would be appropriated to use an estimation method that allows the coefficients to differ across the cross-sectional units (Hsiao, 1986:137; Baltagi 2001:105 and Green 2003:350).

Table A-1: Covariance tests for regression-coefficient homogeneity across-sectional countries

Equation / Hypothesis	F-Stat	Degrees of Freedom		F _(table-value)	Decision
		Numerator	Denominator		
Eq1a: GRY (FIL)					
H ₁	8.05	15	216	2.13	Reject
H ₂	2.87	27	216	1.29	Reject
Eq1b: GRY (FIC)					
H ₁	8.45	15	216	2.13	Reject
H ₂	2.94	27	216	1.79	Reject
Eq1c: LRY (FIL)					
H ₁	592.4	15	216	2.13	Reject
H ₂	9.16	27	216	1.79	Reject
Eq1d: LRY (FIC)					
H ₁	381.66	15	216	2.13	Reject
H ₂	12.05	27	216	1.79	Reject

Note: H₁ is the hypothesis of overall homogeneity and H₂ is the hypothesis of slope homogeneity. The tests were based on the estimated model (1) using least squares method. Eq1 uses growth in real GDP as the dependent variable, and FIL and FIC were included among the explanatory variables in the option (a) and (b) respectively; while in the same vein Eq2 uses the log of real GDP as the dependent variable.

(B) Appendix

Table B-1: Banking in the SACU Countries

Country	Number of Commercial Banks	Origin of Banks
Botswana	Five: <ul style="list-style-type: none">- Barclays Bank- First National Bank- Stanbic Bank- Standard Chartered Bank- Bank of Baroda	Dominated by Banks from South Africa
Lesotho	Three: <ul style="list-style-type: none">-Standard Bank of Lesotho-Nedbank-Lesotho Bank (1999) Ltd	Dominated by South African Banks.
Namibia	Four: <ul style="list-style-type: none">-First National Bank of Namibia (Ltd) (which merged with SWABOU Bank in 2003)-Standard Bank of Namibia (Ltd)-Commercial Bank of Namibia (Ltd)-Bank of Windhoek (Ltd)	Namibia banking sector is dominated by South African Banks. The only fully Namibian-owned bank, SWABOU Bank merged with First National Bank in 2003.
South Africa	<ul style="list-style-type: none">- 42 Registered Banks as at December 2001-3 Mutual Banks as at 31 December 2001-15 Local branches of foreign banks as at 31 December 2001-61 Foreign banks with local representative offices as at 31 December 2001.	
Swaziland	Three: <ul style="list-style-type: none">NedbankStandard BankFirst National Bank of Swaziland	Dominated by foreign banks from South Africa.

Sources: SADC Financial Systems: Structures, Policies and Markets, for Botswana, Lesotho, Namibia, South Africa and Swaziland, Available on-line: SADC website.2003.

Table B-2 Seemingly Unrelated Regression Estimation Results for Growth in Real GDP

Equation (1)	Botswana	Lesotho	South Africa	Swaziland
Constant	-11.52 (-1.47)	24.2 (4.1)a	11.19 (1.8)c	24.56 (1.95)b
FIL (-4)	-0.042 (-0.49)	0.017 (0.84)	0.51(4.8)a	-0.41(-1.07)
OPN (-2)	-0.33 (-2.98)a	-0.44 (-5.13)a	0.15 (2.01)b	-0.22 (-1.44)
GEY(-4)	2.72 (4.96)a	0.175 (0.796)	-0.17 (-0.81)	1.06 (1.31)
INF(-4)	-1.75 (-1.5)	0.427 (1.03)	-0.18 (-2.87)	-0.26 (-0.48)
ER(-1)	3.77 (1.1)	0.77 (0.89)	0.59 (1.26)	-2.42 (-1.52)
SER	17.611	6.37	2.416	13.585
Adj.R2	0.491	0.494	.448	0.364

Note: a-significant at 1% level of significance, b-significance at 5% level of significance and c- significance at 10% level of significance.

Table B-3: Seemingly Unrelated Regression Estimation Results for Growth in Real GDP

Equation (2)	Botswana	Lesotho	South Africa	Swaziland
Constant	0.35 (0.17)	17.79 (1.59)	15.44 (2.42)b	27.14 (3.14)a
FIC (-4)	-1.71(-7.32)a	0.297 (1.34)	0.018 (1.79)c	-0.57 (-1.57)
OPN (-2)	-0.41 (-3.97)a	-0.26 (-2.91)a	0.185 (2.45)b	-0.43(-2.24)b
GEY(-4)	4.81 (8.61)a	0.64 (2.48)a	-0.38 (-1.75)c	1.57 (1.66)c
INF(-4)	-1.01 (-0.71)	0.93 (2.0)b	-0.19 (-2.96)a	-0.396(-0.63)
ER(-1)	-1.54 (-0.86)	-1.79 (-2.16)b	0.137 (0.27)	-2.04 (-1.48)
SER	13.552	6.799	2.44	13.267
Adj.R2	0.495	0.501	0.546	0.402

Note: a-significant at 1% level of significance, b-significance at 5% level of significance and c- significance at 10% level of significance.

Table B-4: Seemingly Unrelated Regression Estimation Results for log of Real GDP

Equation (3)	Botswana	Lesotho	South Africa	Swaziland
Constant	7.68 (17.29)a	9.71 (78.05)a	11.74 (96.77)a	8.65 (36.97)a
FIL (-4)	0.02 (9.05)a	-0.011 (-6.89)a	0.01 (14.69)a	-0.005(-0.97)
OPN (-2)	-0.007 (-3.78)a	-0.012 (-9.64)a	0.003 (1.79)c	-0.012(-3.9)a
GEY(-4)	0.016 (1.37)	-0.017 (-4.9)a	0.017 (4.49)a	-0.065(-4.26)a
INF(-4)	-0.025 (-0.76)	-0.0009 (-0.14)	-0.001 (-1.0)	-0.004(-0.72)
ER(-1)	0.36 (6.012)	0.098 (12.16)a	0.069 (12.5)a	0.21 (13.86)a
SER	0.2438	0.065	0.045	0.1137
Adj.R2	0.7806	0.9536	0.9335	0.9333

Note: a-significant at 1% level of significance, b-significance at 5% level of significance and c- significance at 10% level of significance.

Table B-5: Seemingly Unrelated Regression Estimation Results for log of Real GDP

Equation (4)	Botswana	Lesotho	South Africa	Swaziland
Constant	7.96 (12.67)a	9.32 (54.42)a	12.182 (125)a	8.01 (84.02)a
FIC (-4)	0.019 (3.48)a	0.0004 (0.19)	0.002 (6.13)a	-0.001(-0.14)
OPN (-2)	-0.007(-2.83)a	-0.008 (-9.5)a	0.003 (2.99)a	-0.01 (-2.99)a
GEY(-4)	0.029 (1.97)b	-0.18 (-8.16)a	0.002 (0.56)	-0.05 (-2.51)a
INF(-4)	-0.04 (-1.03)	0.005 (1.52)	-0.001(-1.62)	-0.007(-0.61)
ER(-1)	0.41 (11.35)a	0.109 (14.66)a	0.05 (9.02)a	0.25 (25.16)a
SER	0.246	0.0688	0.0296	0.098
Adj.R2	0.784	0.945	0.945	0.949

Note: a-significant at 1% level of significance, b-significance at 5% level of significance and c- significance at 10% level of significance.