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The Relationship between Banking Sector Development and Economic Growth in Selected Sadc Countries: Panel Cointegration Approach (2005-2015)

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Abstract
Thedebates on the relationship between financial sector development (FSD)and Economic Growth (EG) have been inconclusive and have not considered much the differences in income levels across countries and political stability as possible determinants of the relationship between banking sector development and economic growth. In the debates, few have focused on developing countries such as the Southern African Development Community (SADC) region. The study however examined the relationship between banking sector development (BSD) and economic growth (EG) in the SADC region using balanced panel data from 13 selected SADC countries for the period 2005 to 2014usingPanel Cointegration and Panel Dynamic Ordinary Least Squares estimation techniques.The results revealed along run relationship between EG and BSDfor the thirteen selected SADC countries. When M2 was used, a statistically significant positive relationship between BSD and EG in either direction for all the SADC countries was found. The findings suggest that BSD augments EG and that EG extends to BSD. When domestic credit to private sector by banks(BANK) was used, a statistically significant positive relationship was found in the forward direction only suggesting that banking sector led finance enhances economic growth. The relationship between EG and BSD in the selected SADC countries varies acrosscountries of different income groups. Granger Causality tests revealed that EG Granger Causes BSD. The results also revealed thatEG Granger Causes BSD in the low-income and the middle income group and for the upper-middle income group, a bi-directional causality was revealed, suggesting feedback mechanism between BSD and EG. On this basis policy priority should be centered on initiatives that promote economic growth.
Keywords:Financial Sector Development, Banking Sector Development, Economic growth, Panel Cointegration, Panel Dynamic Ordinary Least Squares and Granger causality.

1. INTRODUCTION AND BACKGROUND

Ever since the global financial crisis, there has been heightened interest in the banking sector in particular how bank development and performance are of paramount importance in influencing economic growth (Krugman *et al*, 2015). In a world where financial inclusion has taken centre stage (Ardic *et al*, 2011) the role of banks cannot be over emphasized. The question remains whether the collective efforts around banking sector development translate toeconomic growth. A developed banking sector plays a pivotal role in ensuring access to basic financial services such as savings, payments and credit which contribute positively towards improving poor people's lives (Caskey *et al*, 2006; Dupas and Robinson, 2009.

A strong and stable banking system is the backbone of an effective economy (SADC, 2015). As Zhuang, J. *et* al, 2009 purport, supporting financial sector development has largely been a strategic priority of development assistance in the past decades. And yet the importance of promoting and developing banks in the context of developing countries, has not always been widely understood (DFID, 2004).Despite the duration and intensity of the debate on the EG and financial sector development (FSD) nexus, no consensus has been reached, with other studies (Levine, 2005; Akinlo and Egbetunde, 2010; Ahmed, 2013; Tyavambiza and Nyagara, 2015) supporting that the level of FSD is a predictor of future economic performance. Contrarily, substantial studies (Hakeem, 2009; Esso, 2010; Awdeh, 2012; Ndlovu, 2013, Sibindi and Bimha, 2014) suggest that FSD does not accelerate EG.

Few studies (Allen and Ndikumana, 1998; Phakedi, 2014) focused on the SADC region and analyzed the banking sector in isolation. Theyfound evidence of heterogeneity across countries shown by the mixed results (Phakedi, 2014). This study thus empirically examined the dynamic relationship between BSD and EG in selected SADC countries.

While the financial sector is comprised of the financial markets, financial institutions, banks, bond markets, insurance sector, securities sector,stock exchanges and microfinance sector all of which play a secondary role in providing access to finance,they do not optimally contribute to the resource mobilization for economic development (Ocran, 2012). Many countries largely rely on the banking sector which serves as a bridge between savers and borrowers among other functions (Adnan 2013).

There are a number of studies that have shown that the effective way for African countries to achieve 4 to 5% economic growth per year is to enhance the development of their financial sectors (World Bank, 1989),

cited in Mandiefe (2015). The general agreement hinges on the notion that macroeconomic stability is fundamental to the growth of the financial sector. It is because of this view that countries from SADC can proffer an interesting dimension to this discussion owing to the presence of different income tiers and the rugged nature of their economies which are marred by macroeconomic instability, political instability and underdeveloped financial sectors among other irregularities. More over SADC states have very interesting economies considering the noticeable differences in their levels of economic development (Mbulawa, 2015). The region boasts of countries such as South Africa (the economic hegemony of the SADC), Mozambique, Tanzania, Botswana (small but fast growing economies) and Zimbabwe, going through economic turbulences(Mbulawa, 2015).It is against this background that the study analyzed the contribution of the BSD to EG in the SADC region for the period 2005 to 2014.

1.2Overview of economic growth in the SADC

The SADC region consists of 15 countries from the continent. It has great economic potential, based on both the potential for domestic production and regional and international trade (SADC, 2015). The SADC region continues to pursue high and stable economic growth as a way of fighting poverty and inequality(Seleteng and Motelle, 2014). The last two decades have been characterized by increasing regional economic integration in Sub- Saharan African economies (SSA)(SADC, 2014) owing to improved market processes and multilateral political initiatives, such as the African Union and the New Partnership for Africa's Development. Economic growth in the SADC region thus differs greatly from country to country (SADC, 2015).

1.3Banking Sector Developments in the SADC

From as far back as the 1990s, there have been notable developments in the financial sector landscape largely attributed to financial sector reforms in many SSA countries which include strengthened capital bases for commercial banks, improved risk management practices,regional banking groups and the use of plastic money (SADC, 2013).Despite the reforms and increasing profitability in the banking sector,the banking systems remain underdeveloped with low and inefficient intermediation. Moreover inherent challenges such as the non-performing loans, bank closures, and lack of political stability among others have been working against the banks' ability to positively influence investment, thereby making sustainable economic growth to remain elusive. At a time when the SADC is pursuing regional integration and development efforts orchestrated in the Regional Indicative Strategic Development Plan (RISDP), it would be good for the SADC to understand the role of the banking sector on regional economic growth.

2. LITERATURE REVIEW

Theoretical underpinnings of the study emanate from the propositions by Schumpeter (1912) which were supported by Mackinnon and Shaw (1973).The recent resurgence of interest in the link between financial development and growth stems from the insights of Endogenous growth models, in which growth is self-sustaining without exogenous technical progress. Many authors (Greenwood and Jovanovic, 1990; and King and Levine, 1993b) incorporated financial institutions in their analysis of Endogenous growth models. Well-developed financial markets promote investment and growth by channeling financial resources to the most productive uses (Caporale, et al, 2009).

2.1 Finance-led Growth Hypothesis: The theory is based on the notion that finance causes economic development through the transfer of scarce resources from savers to investors (Levine, 1997).The supply-leading finance transfer of resources from traditional (non-growth) sectors to modern high-growth sectors and stimulate an entrepreneurial response in the modern productive sectors. The hypothesis assumes a causal relationship from FSD to EG, meaning the establishment of financial institutions and markets increases the supply of financial services leading to economic growth (Awdeh, 2012).

2.2 Growth-led Finance Hypothesis: The growth-led finance (demand-following) was linked to earlier studies by Robin (1952) stating that economic growth creates demand for financial instruments and that enterprises lead and finance follows, so the relationship starts from growth to finance, hence the demand following- hypothesis. The theory posits that financial development and innovative products are engineered in a passive response to the demands of a growing economy(Balago, 2014). As the economy grows, demand for financial services grows and this demand forces the financial system to respond by providing new products and services specifically meant for new needs (Tyavambiza and Nyagara, 2015).

2.3The Feedback Hypothesis: This is based on the view that there is a bi-directional causal relationship between financial growth and economic performance supported by the empirical works of Demetriades and Hussein, (1996); Luintel and Khan, (1999).

Interestingly, some economists (Lucas, 1988; Stern, 1989) do not believe that the finance-growth relationship is important. Qayyum *et al*. (2012) find no link between the two for both high and low income countries using panel data. On the other extreme, Van Wijnberg, (1983) and Buffie, (1984)suggested that FSD is anti-growth.Levine, (2004), Kemal *et al.,* (2007)and Tyavambiza and Nyagara, (2015) bring in the dimension of macroeconomic instability in their analysis and find that financial development may be damaging to EG for high inflation nations.

Consistent with the demand-leading hypothesis (Growth-led finance), Awdeh (2012) examined the banking sector and economic growth link in Lebanon using Granger causality tests and the OLS estimation method on deposit growth, credit by banks to the private sector, as well as measures of size, efficiency and concentration over the period 1992 and 2012 and found one-way causality running from EG to BSD. Abubakar (2013), used ratio of liquid liabilities of commercial banks to nominal GDP, the ratio of private credit to GDP and Interest rate spread as BSD indicators from 1970 to 2010 and found that liquid liabilities and trade openness exert significant positive influence on EG, while credit to the private sector, interest rate spread and government expenditure exert significant negative influence on growth.

Petkovski and Kjosevski (2014) studied 16 countries in Central and Southern Europe over the period 1991-2011 using a panel data set and employed a GMM technique. Their results suggest that bank credit to the private sector and interest margin (IM) are negatively related to EG, while the ratio of quasi money is positively related to EG and the findings, being a mixture, both agree with the anti-growth and the supply –leading hypothesis respectively.

Numerous studies that have employed cross section analysis include King and Levine (1993), Levine (1999) and Levine *et al* (2000). Cross-country regressions however were noted to have some intrinsic challenges, (Ndlovu, 2013; Petkovski and Kjosevski, 2014) as they tend to generate estimates of the average effects of financial development andoverlook reverse causation. Other recent studies on FSD and growth used time series data (Levine, 2005) to examine the finance-growth relationship. Panel data have been used, albeit to a limited extent.

Notwithstanding the use of different indicators and methodologies, findings from Sindano (2009), Sibindi and Bimha (2014) and Sunde (2012) support the view that causality runs from EG to FSD. Phakedi (2014) conducted a study with panel data that empirically examined the nature of the relationship between FSD and EG in the SADC and found that money supply and credit extension (FSD proxies) were negatively related to economic growth.

The views expressed by several authors suggest that there are inconclusive results on howFSD impacts EG and their relationships (both long run and causal relationships). In recent studies for countries such as Nigeria, Gabon, Kenya, South Africa, and Chad mixed results have been found (Akinlo and Egbetunde, 2010). A few panel data studies (Hakeem, 2009; Phakedi, 2014) carried out in SADC conclude that FSD does not matter for economic growth.

3 RESEARCH METHODOLOGY

3.1 Research Population

The SADC regions consists of 15 member states namely Angola, Botswana,Democratic Republic of the Congo (DRC), Lesotho, Malawi, Madagascar, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe and 13 of them make up the unit of analysis in the study. The World Bank(2005)categorizedthe SADC countries into Upper middle-income group (Angola, Botswana, Mauritius, Namibia, Seychelles and South Africa), the Lower-middle income group (Lesotho, Swaziland and Zambia) and the Low-Income group (DRC, Madagascar, Malawi, Mozambique, Tanzania and Zimbabwe) and the same groupingwas followed in this study. Secondary data for the period 2005 to 2014 was obtained from the Global Economy Database, the World Bank Development Indicators and the IMF financialdatabase for all the different series excluding Human Development and Political Stability Index which were converted into logarithms.

The data consist of observations for 13 countries whichrepresent the three different income groups from 2005 to 2014. The indicator for the real sector is GDP per capita. BSDis measured through two proxies to capture the various ways through which the banking sector (finance) can influence economic growth and these are M2 and Domestic Credit to Private sector by banks (BANK). Four variables, Trade Openness (Trade), Gross Capital Formation (INV), Human Development (HUM) and Political Stability (POL) have been included in this study to control for other factors linked to economic growth.

3.2Model Specification and Econometric Techniques

The banking sector (finance) – growth link has been explored by following an organic process that employed panel cointegration techniques to examine and estimate the dynamic equilibrium relationship between EG and BSD. The model follows Bangake, (2009); Murari, (2015); Saikkonen (1991) and Stock & Watson (1993) who considered the extension of the single equation dynamic ordinary least squares (DOLS) methodand developed a model for estimating and testing hypotheses about a cointegrating vector to panel data. A panel DOLS equation follows:

$Y_{it} + \alpha_i + \beta X_{it} + \mu_{it}$ ..... (1)
Where $_{i = 1.....}$N and$_t$ = 1…….T
In equation (1) Y_{it}……*matrix (1, 1)* whileβ is a vector of slopes (k, 1) dimension, $\alpha_i$represents the individual effect. X_{it} becomes the ith observation on K explanatory variables andμ_{it} is the error term made up of the following:
$\mu_{it} = \psi_i + \varepsilon_{it}$ …… ..... *(2)*
The DOLS estimator makes use of parametric adjustments to the errors by strengthening the static regression with the leads/lags as well as the concurrent values of the regressors in the first difference to attain unbiased estimators of the long-run parameters(Stock & Watson, 1993). Drawing from equation 1 above, the study assumed that X_{it} *(*k,1) trajectory is an autoregressive process AR (1) as follows:
$X_{it} = X_{it-1} + \varepsilon_{it}$…… ..... *(3)*
The DOLS estimator model is presented as:
$Y_{it} = \alpha_i + X_{it}\beta + \sum_{j=-q1}^{j=q2}(C_{ij}\Delta X_{it+j}) + V_{it}$……..... (4)
Where$C_{ij}$is the coefficient of a lead/lag of first differenced explanatory variables and ΔX_{it} becomes the differenced explanatory variable while $V_{it}$is the error-term (Bangake, 2009)
According to Bangake(2009), the above equation is estimated as:
$Y_{it} = \alpha_i + \beta_1 F_{it} + \sum_{j=-q1}^{j=q2}(\beta_{j+3}\Delta F_{it+j}) + \gamma_1 X_{it} + \sum_{j=-q1}^{j=q2}(\gamma_{j+3}\Delta X_{it+j}) + V_{it}$……..... (5)
Where:
F_{it} = Financial Sector measures which are Liquid Liabilities (M3), Deposit-money bank assets to GDP, Private Domestic Credit and Ratio. $X =$ is a vector of exogenous variables namely Government expenditure as a percentage of GDP and openness to trade. The study thus modified the above equation, by changing the Financial Sector measures (F) to include M2 and Domestic Credit provided by banks instead of the three variables used by Bangake (2009) which are (M3), Deposit-money bank assets to GDP and Private Domestic Credit. The study also included Trade, Investment, Human Development and Political stability.
As such the two estimated equations in the study were then specified as:
$\ln GDP = \ln M2 + \ln TRADE + \ln INV + \ln HUM + \ln POL + V_{it}$……... (6)
$\ln GDP = \ln BANK + \ln TRADE + \ln INV + \ln HUM + \ln POL + V_{it}$……..... (7)
Apart from analyzing a period of 10 years and the use of additional variables in the study, this model considered political stability and human development indexes.Logarithmic transformation has been chosen owing to its many advantages that allow the regression coefficients to be interpreted as elasticities (Asteriou, 2006). Panel data were also selected in order toaddress heterogeneity and for theirability to provide more information and more variability among others reasons and the ability to provide more efficient estimates of parameters by considering broader sources of variation, Asteriou (2006) and Gujarati(2005).

EMPIRICAL RESULTS

4.1 Panel Unit root tests

The study made use of threedifferent unit root tests (Levin and Lin (LL) test (1992), ADF- Fisher Chi-Square and the PP-Fisher Chi-Square) to ascertain the panel non-stationarity of the series in recognition of the fact that regressing non-stationary variables may yield spurious relationships. LL test assumes common unit root process across cross- sections whileADF Fisher Chi-Square and the PP-Fisher Chi-Square propose panel unit root tests that allow for individual unit root processes so that the persistence parameter may vary across cross-sections (Im& Shin, 2003; Asteriou, 2006).Table 4.1 below presents the results of the panel unit root tests.

Panel Unit root tests results

Series	LL Test	P- Value	ADF-Chi-Square Test	P-Value	PP- Fisher Test	P-Value
Null Hypothesis – Series has unit root						
GDP	0.08396	0.5335	28.8254	0.3191	56.7591	0.0005
ΔGDP	-8.04123	0.0000***	53.3426	0.0012***	62.8919	0.0001***
M2	-6.73272	0.0000***	47.1283	0.0568	87.6992	0.0000***
ΔM2	-8.08934	0.0000***	62.4875	0.0001***	92.4279	0.0000***
BANK	-4.18541	0.0000***	33.7592	0.1412	59.5887	0.0002***
ΔBANK	-11.9902	0.0000***	78.3005	0.0000***	83.1901	0.0000***
TRADE	-4.48576	0.0000***	38.4142	0.0554	45.4918	0.0104**
ΔTRADE	-15.5255	0.0000***	100.727	0.0000***	86.4091	0.0000***
INV	-4.60568	0.0000***	36.9411	0.0757	62.0730	0.0001***
ΔINV	-7.47678	0.0000***	59.3153	0.0002***	90.8959	0.0000***
HUM	-1.49804	0.0671	20.07862	0.7862	48.6635	0.0045***
ΔHUM	-6.98110	0.0000***	67.6434	0.0000***	71.3052	0.0000***
POL	-4.57640	0.0000***	45.7443	0.0097*	37.6926	0.0647
ΔPOL	-12.7340	0.0000***	74.9602	0.0000***	95.3811	0.0000***

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.1:Panel Unit root tests results

Source: Authors' computation's from the E-Views estimations

The results of the three Panel Unit Root tests confirm that the variables become stationary after first differencing. They are therefore integrated to order one*I* (1).The hypothesis of unit root could not be rejected at 5% LoS when the variables are taken in levels because the p-values at any one point in one of the 3 tests are above 0.05 for all the variables (GDP, M2, BANK, TRADE, INV, HUM and POL).

4.2 Correlation Matrix

	DGDP	DM2	DBANK	DTRADE	DINV	DHUM	DPOL
DGDP	1.000000	0.375848	0.371179	0.376657	0.465882	0.18549	0.138457
DM2	0.375848	1.00000	0.580494	0.270094	0.241834	0.124965	0.157869
DBANK	0.371179	0.580494	1.00000	0.09933	0.264011	0.095513	0.100692
DTRADE	0.376657	0.270094	0.09933	1.00000	0.196855	0.030217	-0.05633
DINV	0.465882	0.241834	0.264011	0.196855	1.00000	0.034875	0.139568
DHUM	0.18549	0.124965	0.095513	0.030217	0.034875	1.00000	-0.06995
DPOL	0.138457	0.157869	0.100692	-0.05633	0.139568	-0.06995	1.00000

Table 4.2: Correlation Matrix for all the variables

Source: Authors' computation's from the E-Views results

The table above displays correlations between the variables. A strong positive correlation (0.580494) is observed for the 2 of the main explanatory variables in the study, namely M2 and Bank whichis expected and supported by theory. An increase in money supply will enable banks to create wealth through onward lending. Including the same variables in the model would result in multicolinearity and over- parametisation (Gujarati, 2005; Jecheche, 2011). Given the above, the study therefore estimated 2 equations with M2 and Bank as proxies for BSD in the different equations. All the independent variables save for political stability; exhibit positive correlation among each other. This is expected because according to theory, BSD affects growth through the investment and trade channels. Political stability on the contrary is negatively correlated with trade (-0.05633) and Human Development (-0.06995). As the stability index reduces, instability sets in. Instability hampers productivity and investment leading to reduced trade.

4.3 Tests for Cointegration

The study employed two tests for cointegration i.e. the Pedroni Residual Cointegration tests and the Kao Cointegration both based on the null hypothesis that there is no cointegration under which we reject the null hypothesis if p-value is < 5%.

4.3.1 The Pedroni's tests

The Pedroni Residual Cointegration tests were done in 2 different levels, namely Individual Intercept and No intercept and trend. The same decision rule that the calculated statistic tests must be smaller than the tabulated critical value to reject the hypothesis of no cointegration was used.

Pedroni Panel Cointegration tests(Individual intercept/no trend)

	Within- Dimension (Panel)				Between – Dimension (Group)		
	v-Stat	rho-St	PP- Stat	ADF Stat	rho-St	PP- Stat	ADF Stat
All	-0.97033	4.006070	-4.79182	-3.791872	5.866758	-11.23836	-3.296377
P-Value	0.8341	1.0000	**0.0000*****	**0.0000*****	1.0000	**0.0000*****	**0.0005*****
Low-Inc.	-0.92987	2.375689	-3.591640	-2.866264	3.398046	-11.87762	-4.121477
P-Value	0.8238	0.9912	**0.0002*****	**0.0021*****	0.9997	**0.0000*****	**0.0000*****
Low-M	-0.80819	1.903576	-5.557569	-2.866322	2.690015	-9.790735	-3.156978
P-Value	0.7905	0.9715	**0.0000*****	**0.0021****	0.9964	**0.0000*****	**0.0008*****
Upper-M	-0.86302	2.447064	-3.570229	-2.671804	-3.42249	-10.17616	-3.736055
P-Value	0.8059	0.9928	**0.0002*****	**0.0038*****	0.9997	**0.0000*****	**0.0001*****

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.3**:** Pedroni Panel Cointegration (Individual intercept/no trend) tests results for all the countries

Source: Authors' computations from E-Views estimations

Table 4.3 shows the outcome of the Pedroni tests for all the country income groups for the within-dimension and the between dimension. The results of the within-dimension and the between-dimension show that the calculated statistics (-4.79182, -2.866264, -10.17616) tests are smaller than the critical values hence rejection of H_o of the absence of cointegrationat 1% LoS for both the within dimension and between dimension save for v-stat and rho-stat and concluding that the variables are cointegrated for the countries used in the model. The same applies to all the different income groups since the hypothesis can be rejected in both the panel and the group case.

4.3.2 The Kao Cointegration Tests

For the purposes of guaranteeing robustness of the results, the study also ran Kao Cointegration tests to check for cointegration in all the 13 countries. The Null Hypothesis on the absence of cointegration was rejected for p-values less than 5%. Ifthe Kao's t-statistic and the p-values are both less than the critical value, the pair is considered as cointegrated in both directions. If one of the 2 had a t-statistic less than the p-value, a forward or reverse direction would be concluded.

Kao Cointegration Tests

	t-Statistic	Prob.
ADF	-4.519121	0.0000

Table 4.4: Kao Residual Cointegration tests results for all the countries

Source: Author's computations from E-Views estimations

The Kao Cointegration tests showed that at 1% LoS, H_o of absence of cointegration is rejected for all the variables. Based on the results from the different cointegration tests the study concluded that there exists a long-run relationship between economic growth (GDP growth rates), the two proxies for BSD (M2 and BANK) and the four auxiliary variables, Trade, INV, HUM and POL.

Panel Co-integration Tests for the individual regressors using the Kao Residual test

Panel Co. Tests	**Dep. Var. of the Coint. Regression**		**Dep. Var. of the Coint. Regression**		**Dep. Var. of the Coint. Regression**	
	GDP	M2	GDP	BANK	GDP	TRADE
Kao's ADF	-2.43694	-2.692720	-2.88093	-3.2222	-3.414711	-4.430840
Prob.	0.0074***	0.0035***	0.0020***	0.0006***	0.0003***	0.0000***
Panel Co. Tests	**Dep. Var. of the Coint. Regression**		**Dep. Var. of the Coint. Regression**		**Dep. Var. of the Coint. Regression**	
	GDP	INV.	GDP	HUM	GDP	POL
Kao's ADF	-2.622802	-2.57372	-3.43	-1.663940	0.132687	-1.596931
Prob.	0.0044***	0.0050***	0.0003***	0.0481**	0.4472	0.0551

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.5: Kao Residual Cointegration tests results for all the countries

Source**:** Authors' computations from E-Views estimations

Table 4.5 shows results of panel cointegration for the regressors when Kao ADF t-statistic is used to determine cointegration among panel series. The calculated statistic for GDP (-2.43694) is smaller than the critical value which implies that GDP is co-integrated with M2 (0.0074). M2 on the other hand has a t-statistic of -2.69270, which is less than the critical value. M2 is thus cointegrated with GDP. As the table shows, all data are cointegrated in either direction save for GDP and POL with p-values greater than 5% LoS each. The Kao's ADF statistic suggests the likelihood of a long-run relationship between GDP, BSD and the other auxiliary variables used in the study.

Panel Dynamic OLS Model for the long run relationship

The study thus used the dynamic OLS (DOLS) an estimator with error correction to establish the long run

relationship between BSD and economic growth through estimating long run regression equations where BSD proxies and EG are interchanged as the regressor and regressand. It is possible to run DOLS models when the variables have a cointegrating relationship. The advantage of this model is that it has the error correction estimators(Pedroni, 1999) and also needs no diagnostic and model fitness tests such as the normality test of residuals, serial correlation and heteroskedasticity to the long run (equilibrium) model as they are taken care of in the estimation of Panel DOLS equations(Pedroni, 1999).

Panel DOLS Estimated Equations

$$\ln GDP_{it} = \beta_{0i} + \beta_{1i}\ln BSD_{it} + \beta_{2i}\ln TRADE_{it} + \beta_{3i}\ln INV_{it} + \beta_{4i}\ln HUM_{it} + \beta_{5i}\ln POL_{it} + \varepsilon_{it} \ldots\ldots (8)$$

$$\ln BSD_{it} = \beta_{0i} + \beta_{1i}\ln GDP_{it} + \beta_{2i}\ln TRADE_{it} + \beta_{3i}\ln INV_{it} + \beta_{4i}\ln HUM_{it} + \beta_{5i}\ln POL_{it} + \varepsilon_{it} \ldots\ldots (9)$$

Panel Cointegration estimation using M2 (2005-2014) - All countries

Dep. Var.	**GDP**		**Dep. Var.**	**M2**	
Regressors	**Coefficient**	**P-Value**	**Regressors**	**Coefficient**	**P-Value**
M2	0.119734	0.0003***	**GDP**	0.960209	0.0198**
TRADE	0.099472	0.0016***	**TRADE**	0.542343	0.0000***
INV	0.075108	0.0070***	**INV**	0.085341	0.2603
HUM	0.948904	0.0045***	**HUM**	2.519923	0.0000***
POL	0.001290	0.9501	**POL**	0.012571	0.8223
R – Squared	0.657786		**R – Squared**	0.683843	
Ad. R-Squared	0.637236		**Ad. R-Squared**	0.664126	

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.6: Panel Cointegration estimation for all the countries

Source: Author's computations from E-Views estimations

GDP = 0.119734M2 + 0.099472TRADE + 0.075108 INV+ 0.948904HUM + 0.001290 POL...*(1)*

M2 = 0.960209 GDP + 0.542343 TRADE + 0.085341INV + 2.519923HUM + 0.012571POL. *(2)*

The estimated results in the table above show that M2 is a significant variable in explaining GDP. The p-value for the coefficient of M2 (0.0003) is less than 5% level of significance. On the other hand GDP is also statistically significant in explaining M2. The coefficient for GDP has a p-value of 0.0198 which is also less than 5% LoS.There is a statistically significant relationship between GDP and M2 in both directions shown by the p-values that are less than 5% for the 2 coefficients. The results show that BSDproxied by M2 augments economic growth and economic growth tends to extend to BSD in the selected SADC countries.

The coefficients are positive for both M2 and GDP at 0.11973 and 0.960209 respectively indicating a positive relationship between the 2 variables. Holding other things constant, a 1% increase in M2 will lead to a 0.119734 % increase in GDP and also a 1% increase in GDP will lead to a 0.960209 % increase in M2. Increase in M2 reduces interest rates thereby encouraging investment, which through the multiplier effect result in economic growth. This is consistent with the demand-following hypothesis whereGDP precipitates financial development.

Trade (TRADE) is a significant variable (0.0016) in explaining GDP in the selected SADC countries, with a positive coefficient of 0.099472 implying a positive relationship between Trade and GDP. *Ceteris paribus* a 1% increase in Trade will lead to a 0.099472% increase in GDP. INV is a significant variable in explaining GDP. This is shown by a p-value of 0.0070 implying a positive relationship between the two variables that is a 1% increase in investment leads to a 0.075108% increase in GDP. HUM is statistically significant (0.0045) in explaining GDP as shown by a positive sign, at 0.948904. A 1% increase in HUM leads to a 0. 948904 % increase in GDP. According to economic theory there is a positive relationship between Human Development and economic growth.Political stability (POL) is insignificant in explaining the GDP shown by a coefficient with a p-value of 0.9501 which is greater than the 5% LoS.

Panel Cointegration estimation using M2 (2005-2014) - Low –Income countries

Dep. Var.	**GDP**		**Dep. Var.**	**M2**	
Regressors	**Coefficient**	**P-Value**	**Regressors**	**Coefficient**	**P-Value**
M2	0.062452	0.0280**	**GDP**	1.188336	0.0211**
TRADE	0.095005	0.0019***	**TRADE**	0.504798	0.0001***
INV	0.097395	0.0000***	**INV**	0.127949	0.1479
HUM	0.669060	0.0059***	**HUM**	1.773514	0.0975*
POL	0.049517	0.0061***	**POL**	0.159226	0.06098*
R – Squared	0.622161		**R – Squared**	0.798529	
Ad. R-Squared	0.597464		**Ad. R-Squared**	0.732399	

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.7: Panel Cointegration test results for the Low-Income countries

Source: Author's computations from E-Views estimations

Table 4.7 exhibits results of the GDP – M2 regression by DOLS model of panel cointegration estimation for the Low-Income panel.

GDP = 0.062452M2 + 0.095005TRADE + 0.097395INV+ 0.669060HUM + 0.049517POL... *(3)*

M2 = 1.188336GDP + 0.504798TRADE + 0.127949INV + 1.773514HUM + 0.159226POL... *(4)*

The results in the above table show that there is a statistically significant positive relationship between GDP and M2 in both directions as explained by the p-values that are less than 5% LoS for both GDP (0.0211) and M2 (0.0280). This shows that even in the Low income countries, BSD proxied by M2 augments economic growth and economic growth tends to extend to BSD in the selected SADC countries.

Panel Cointegration estimation using M2 (2005-2014) for the Lower-Middle income SADC nations

Dep. Var.	**GDP**		**Dep. Var.**	**M2**	
Regressors	**Coefficient**	**P-Value**	**Regressors**	**Coefficient**	**P-Value**
M2	0.378112	0.0001***	**GDP**	0.082079	0.8871
TRADE	0.065211	0.3145	**TRADE**	0.142815	0.0424**
INV	0.150683	0.0339**	**INV**	0.735444	0.0000***
HUM	0.101438	0.0000***	**HUM**	0.249846	0.0356
POL	0.002211	0.8666	**POL**	0.091252	0.1035
R – Squared	0.588133		**R – Squared**	0.578793	
Ad. R-Squared	0.514634		**Ad. R-Squared**	0.499090	

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.8: Panel Cointegration test results for the Lower-Middle income countries

Source: Author's computations from E-Views estimations

GDP = 0.378112M2 + 0.065211TRADE + 0.150683INV+ 0.101438HUM + 0.002211POL… *(5)*

M2 = 0.082079GDP + 0.142815TRADE +0.735444INV + 0.249846HUM + 0.091252POL… *(6)*

The estimation results in the above table confirm a statistically significant positive association between GDP and M2 in the forward direction. This suggests that the BSD led development proxied by M2 enhances EG and on the contrary EG does not tend to stimulate further BSD (M2) in the middle income countries.

Panel Cointegration estimation using M2 (2005-2014) – Upper- Middle Income countries

Dep. Var.	**GDP**		**Dep. Var.**	**M2**	
Regressors	**Coefficient**	**P-Value**	**Regressors**	**Coefficient**	**P-Value**
M2	0.251296	0.1282	**GDP**	0.513045	0.0006***
TRADE	0.453287	0.0002***	**TRADE**	0.175644	0.1541
INV	0.413028	0.0001***	**INV**	0.172211	0.0407**
HUM	2.834484	0.0483**	**HUM**	6.130651	0.0000***
POL	0.361264	0.0146**	**POL**	0.003537	0.9774
R – Squared	0.717242		**R – Squared**	0.596619	
Ad. R-Squared	0.683219		**Ad. R-Squared**	0.516318	

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.9: Panel Cointegration test results for the Upper Middle Income countries

Source: Author's computations from E-Views estimations

GDP = 0.251296M2 + 0.453287 TRADE + 0.413028INV+ 2.834484HUM + 0.361264POL... (7)

M2 = 0.513045GDP + 0.175644TRADE +0.172211INV + 6.130651HUM + 0.003537POL… (8)

The results confirm a statistically significant positive association between GDP and M2 in the reverse direction only shown by the insignificant coefficient of M2 (0.1282). This suggests that in the upper middle-income countries economic growth leads and BSD follows which is in line with the demand-following hypothesis.

DOLS Panel Cointegration estimation using Bank for all countries (2005-2014)- All countries

Dep. Var.	**GDP**		**Dep. Var.**	**BANK**	
Regressors	**Coefficient**	**P-Value**	**Regressors**	**Coefficient**	**P-Value**
BANK	0.146692	0.0000***	**GDP**	0.781202	0.3342
TRADE	0.132475	0.0000***	**TRADE**	0.333728	0.0265**
INV	0.023878	0.1978	**INV**	0.263754	0.0220**
HUM	0.651213	0.0012***	**HUM**	5.399142	0.0000***
POL	0.012238	0.4554	**POL**	0.144917	0.1420
R – Squared	0.687241		**R – Squared**	0.725739	
Ad. R-Squared	0.667632		**Ad. R-Squared**	0.672163	

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.10: Panel Cointegration test results for all the countries

Source: Author's computations from E-Views estimations

The estimation results in table above confirm a statistically significant positive association between GDP

and BANK only in the forward direction. This suggests that the BSD led financial development proxied by BANK enhances EG while on the contrary EG does not stimulate BSD in all selected SADC countries.

DOLS Panel Cointegration estimation using BANK (2005-2014)- Low –Income countries

Dep. Var.	**GDP**		**Dep. Var.**	**BANK**	
Regressors	**Coefficient**	**P-Value**	**Regressors**	**Coefficient**	**P-Value**
BANK	0.069984	0.0140**	**GDP**	0.915892	0.2573
TRADE	0.139700	0.0000***	**TRADE**	0.252799	0.0668*
INV	0.049677	0.0071***	**INV**	0.354512	0.0106**
HUM	0.535236	0.0653*	**HUM**	7.643459	0.0003***
POL	0.033613	0.2831	**POL**	0.508682	0.0054***
R – Squared	0.769203		**R – Squared**	0.600230	
Ad. R-Squared	0.730910		**Ad. R-Squared**	0.533584	

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.11: Panel Cointegration test results for the Low-Income countries

Source: Author's computations from E-Views estimations

The results confirm a statistically significant positive relationship between GDP and BANK only in the forward direction. Such results suggest that the BSD led financial development proxied by BANK enhances EG and on the contrary EG does not tend to stimulate further BSD in the Low-Income panel.

Panel Cointegration estimation using Bank (2005-2014) - Lower- Middle Income countries

Dep. Var.	**GDP**		**Dep. Var.**	**BANK**	
Regressors	**Coefficient**	**P-Value**	**Regressors**	**Coefficient**	**P-Value**
BANK	0.094163	0.0064***	**GDP**	0.790173	0.1932
TRADE	0.135357	0.0002***	**TRADE**	0.899065	0.0050
INV	0.122171	0.0025***	**INV**	0.178870	0.2468
HUM	0.113871	0.0026***	**HUM**	0.505743	0.0019
POL	0.030032	0.0826	**POL**	0.223794	0.0059
R – Squared	0.694001		**R – Squared**	0.585349	
Ad. R-Squared	0.609642		**Ad. R-Squared**	0.519004	

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.12: Panel Cointegration test results for the Lower – Middle income countries

Source: Author's computations from E-Views estimations

The results confirm a statistically significant positive association between GDP and BANK only in the forward direction implying that the BSD led financial development enhances economic growth and on the contrary economic growth does not tend to stimulate further BSD in the Lower-Middle Income group.

DOLS Panel Cointegration estimation using Bank (2005-2014) - Upper Income Countries

Dep. Var.	**GDP**		**Dep. Var.**	**BANK**	
Regressors	**Coefficient**	**P-Value**	**Regressors**	**Coefficient**	**P-Value**
BANK	0.364644	0.0053***	**GDP**	0.329507	0.2056
TRADE	0.662196	0.0000***	**TRADE**	0.294870	0.0025***
INV	0.128168	0.0120**	**INV**	0.414167	0.0087***
HUM	3.835162	0.0222**	**HUM**	11.83910	0.0000***
POL	0.325211	0.1607	**POL**	0.265955	0.2633
R – Squared	0.688279		**R – Squared**	0.639584	
Ad. R-Squared	0.569891		**Ad. R-Squared**	0.574213	

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.13: Panel Cointegration test results for the Upper-Middle Income countries

Source: Author's computations from E-Views estimations

The estimation results confirm a statistically significant positive association between GDP and BANK only in the forward direction. The results suggest that the BSD led financial development BANK enhances EG and on the contrary EG does not tend to stimulate further BSD (BANK) in the upper-middle panel.

Granger Causality Tests

Countries	# Obs.	Hypothesis	F-Statistic	Probability	Decision
All countries	91	DM2 does not Granger Cause DGDP	0.40095	0.6709	Do not rejectH_o
		DGDP does not Granger Cause DM2	8.42642	0.0005***	Reject H_o
		DBANK does not Granger Cause DGDP	0.07319	0.9295	Do not reject
		DGDP does not Granger Cause DBANK	6.79138	0.0018***	Reject H_o
		DTRADE does not Granger Cause DBANK	9.17325	0.0002***	Reject H_o
		DBANK does not Granger Cause DTRADE	6.72574	0.0019***	Reject H_o
Low income	35	DM2 does not Granger Cause DGDP	0.52009	0.5997	Decision
		DGDP does not Granger Cause DM2	6.72574	0.0019***	Reject H_o
		DBANK does not Granger Cause DGDP	0.25893	0.7736	Do not rejectH_o
		DGDP does not Granger Cause DBANK	5.06923	0.0121**	Reject H_o
		DTRADE does not Granger Cause DBANK	5.69583	0.0065	Reject H_o
		DBANK does not Granger Cause DTRADE	3.50220	0.0102	Reject H_o
Lower-Middle	21	DM2 does not Granger Cause DGDP	1.22568	0.3197	Do not rejectH_o
		DGDP does not Granger Cause DM2	6.34518	0.0084***	Reject H_o
		DBANK does not Granger Cause DGDP	0.50223	0.6144	Do not reject
		DGDP does not Granger Cause DBANK	6.82193	0.0078***	Reject H_o
		DTRADE does not Granger Cause DBANK	3.51386	0.0067***	Reject H_o
		DBANK does not Granger Cause DTRADE	4.06334	0.0038***	Reject H_o
Upper-middle	**35**	DM2 does not Granger Cause DGDP	4.52009	0.0204**	Reject H_o
		DGDP does not Granger Cause DM2	4.65360	0.0201**	Reject H_o
		DBANK does not Granger Cause DGDP	5.25893	0.0134**	Reject H_o
		DGDP does not Granger Cause DBANK	4.84035	0.0198**	Reject H_o
		DTRADE does not Granger Cause DBANK	5.69583	0.0065***	Reject H_o
		DBANK does not Granger Cause DTRADE	3.50220	0.0120***	Reject H_o

*(**)[***] Indicates statistical significance at a 10(5)[1] % level

Table 4.14: Pair wise Granger Causality results

Source: Author's computations from E-Views estimations

Table 4.14 above shows results of the granger causality test. Based on the probability outcome of the Granger Causality test of 0.0005, the study rejected H_0 that DGDP does not Granger Cause DM2 and the second one that DGDP does not Granger Cause DBANK (0.0018) at 5% LoS.

The Granger causality tests results above therefore suggest that for the selected SADC countries, the direction of causality runs from EG to BSD implying that EG precipitates BSD and that a unidirectional causality exists. The same was also observed for the low-income group and lower-middle income groups of countries where$H_o$was rejected at 0.0019 and 0.0121 for the lower income group and at 0.084 and 0.0078 for the lower middle-Income group. For the Upper-Middle income group, there is bi-directional causality confirming that the stages of development and income levels have a significant bearing on the direction of causality since causality varies among countries of different income.

5. CONCLUSION

The results suggest that there is a long run relationship between EG and BSD for the thirteen SADC countries. When M2 is used there is a significant positive relationship between BSD and EG in either direction for all the SADC countries across the lower income groups.The evidence also suggested that BSD augments EG and that EG tends to extend to BSD. In the middle-income countries BSD enhances growth while in the Upper-Middle income countries growth led to BSD. When Domestic credit to private sector by banks as a percentage of GDP **(**BANK)

was used a statistically positive relationship was found in the forward direction only suggesting that banking sector led finance enhances economic growth. There is enough evidence from the study to suggest that the relationship between EG and BSD in the selected SADC countries varies among countries of different income groups. Also, for the 13 countries assessed EG Granger Causes BSD. Looking closely at the different income groups, the same direction of causality applied to the low-income and the middle income group.

Policy Recommendations

Policy priority in the SADC countries should be centered on promoting initiatives that promote economic growth. This includes among others ensuring reduced cost of production to improve the international competitiveness of local industries in order to benefit from global trade. Governments should put appropriate measures to stimulate and sustain the development and deepening of the financial sector as a driver of trade following the bidirectional causality between bank credit and trade. In such a case the implication is that the countries' current and future trade trajectory depend on how deep the financial sectors are. The Government policy should be focused on promoting trade and by extension growth which eventually leads to demand for financial services. The need to promote financial inclusion cannot be overemphasized since Domestic Credit provided by Banks as a percentage of GDP (BANK) has a significant positive relationship with growth.

Suggestions for further research

Further research be conducted and incorporate the new measures of banking sector development (access, efficiency and stability) without limiting the study to the traditional ones that only measure size and intermediation.

The study also recommends a closer analysis of the effects of political stability (instability) as evidence suggested that the political stability variable is the least in explaining economic growth. It could be that the proxy used to measure Political Stability might have been less sensitive to some of the political instability changes.

Financial Inclusion can also be assessed in the SADC region since it will not only encourage trade and by extension growth but also improve the stability of the banking sector, restoring confidence in the system through making financial resources available. The study recommends inclusion of Zimbabwe and Seychelles which were left as a result of non-availability of data once data become available.

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