Finance-Growth Nexus in Eastern and Southern African Countries: Insights from a Panel ARDL Analysis

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Abstract: *This study analysed the finance-growth nexus for countries in the East African Community (EAC) and the Southern Africa Development Community (SADC). This was done an attempt to identify countries where Financial Sector Development (FSD) has the largest/least growth effect and the regional bloc moderation in such effect based on panel Error correction ARDL model. The aggregate data were obtained from the World Development Indicators (WDI) for a total of 14 countries, five (5) of which being in the EAC and the rest being in the SADC. The observations suggested that the regional bloc moderation effect transforms an otherwise insignificant effect of FSD on growth into a positive one specifically for broad money growth among the EAC member countries. This is a signal that a monetary union for EAC member countries could spur an overall welfare gain. Growth-finance nexus however, exhibited short and long run trade-offs in countries within the SADC. In the short run there have been significant GDP growth responses as a result of FSD but such effect turns out to be detrimental in the long run. As such difficult choices had to be made between addressing short run GDP volatility and achieving higher GDP growth in the SADC.*

Key words: Monetary policy; economic growth, broad money, domestic credit, monetary expansion, regional integration

INTRODUCTION

Despite Schumpeter's (Schumpeter, 1911) emphasis on the positive role of Financial Sector Development (FSD) on economic growth, empirical evidences on such effect across the globe have been contradictory (Levine, 1997; Levine, 2003). Mathenge & Nikolaidou, (2018) suggests that the finance-growth nexus is at best weak unless the growth is at the intermediate level, where financial sectors are relatively well developed. Within the Geographic regions of Africa, there are empirical evidence indicating that FSD is detrimental to economic growth and stability (Mathenge & Nikolaidou, 2018; Zerbo, 2015; Mahawiya, 2015). Similarly, Saxegaard (2006), Zerbo, (2015) and Nketcha Nana & Samson (2014) argue that in some Sub-Saharan African (SSA) countries, Financial Sector Reform (FSR) policies that encourage credit rationing causes many banks to hold a large amounts of liquid assets which this in turn encourages overinvestment (Menyah, Nazlioglu, & Wolde-Rufael, 2014; Gries, Kraft, & Meierrieks, 2009). Such FSR may be considered detrimental to economic growth. From economic integration theory, specialization and income

differences are at the centre of the potential gains or losses from economic integration i.e., per capita growth (Marinov, 2015). Contrary to low-income countries integrations, the higher supply of liquidity through FSD can reduce investment and employment uncertainties thus attracting more capital into productive sectors leading to higher per capital growth in integrated developed countries. This is evident in cross-country studies across SSA where FSD have been observed to have insignificant effect on growth specifically in the Southern Africa Development Community (SADC) Region (Bara, Mugano, & Pierre, 2016; Mahawiya, 2015). A certain minimum per capital growth is therefore needed across a regional integration for FSD to have a positive growth effect.

The economic integration further posits for trade diversion if an integration curtails a country from a low-cost supplier outside the integration in favour of a high-cost supplier within the integration. This is common when the regional bloc specifies trading partners. In this case FSD might be inflationary as the opportunity cost of real resources tend to be relatively higher as resource owners are better-off retaining whatever they have than trading. These effect reversal and the countries where it is likely to happen is the subject matter of this study. The classical economic integration theory underly the benefit-cost principle under competitive markets where bloc into which competitive markets resides will be efficient as resources are efficiently moved from less productive areas into a more productive areas without the legal hurdles associated with geographic borders. For integration to create trade, information, transport and multiple producers must be accompanied with homogeneity of goods being traded. In practice however, this ideal situation is improbable but second-best solutions are often considered.

The gap that this study bridges relate to the moderating effect of regional integration in the finance-growth nexus. It is argued that effect reversal is likely in countries where FSD attract GDP growth when that country is in an integration (bloc of countries) that does not create trade. The main objective of the study was therefore, to analyse the finance-growth nexus of countries in the EAC and SADC bloc of countries in order to identify specific countries where FSD has the largest/least growth effect and whether such effect was moderated by the bloc effect. Policy-wise many countries bloc themselves in and undertake FSD policies that are incompatible with the nature of their bloc. This studywas therefore meant to address this challenge. A part from the above policy contribution, this study was also meant to contribute to the theoretical debate over the Schumpeterian hypothesis. Notably and for many African countries FSD has limited effect on growth. This is one of the areas that was not touched is the effect of regional blocs. We hypothesised here that the limited effect of FSD on GDP growth in EAC and SADC countries was related to the fact thay these countries bloc themselves in trade diverting integration and thus were better-off openning up their borders globally i.e, udertaking further trade openness.

Theoretical and Empirical Literature

Insights from Economic Integration Theory

The limited effect of finance on growth could partly be attributed to geographic factors (Acemoglu, Johnson, & Robinson, 2001). The link between geographic regions and economic growth can be traced in the theory of economic integration. The economic integration theory is benchmarked upon by the theory of customs union which was first expounded by Viner (1950) and later extended by Lipsey (1957). Viner's (1950) work suggests that customs union could be both trade creators and destructors. Trade is created when members state abandons high-cost suppliers in favour of low-cost suppliers within the union. According to Viner's (1950), trade is diverted when member countries upon integration are forced to abandon their low-cost non-member suppliers in favour of high-cost member States. In this theoretical construct, the likelihood of trade creation through customs union is rather low and what is important is a world-wide elimination of trade barriers. Balassa (1967) refers to economic integration as "the abolition of discrimination within an area" while Kahnert, Stoutjesdijk, & Thomopoulos, (1969) suggest that an economic integration is "the process of removing progressively those discriminations which occur at national borders". In a neo-classical microeconomics and Keynesian/monetarist macroeconomic tradition, integrations may be conceived as (i) a tariff arrangement, specifically Free Trade Area (FTA) or customs union (ii) the complete or partial liberation of factor movements (iii) the cooperation in the field of economic policy, ranging from loose forms of coordination to complete unification or any combinations of i, ii and iii (Haak, 1983).

The welfare extension of Viner's (1950) analysis was first carried out by Lipsey (1957) who suggested that production-based analysis of custom union cannot accommodate overall welfare changes in economic integrations. To do so one requires an analysis of the effect of price changes on the consumption of tradable. For that matter, the analysis must consider both "inter-country substitution" where one country is substituted by another as Viner's (1950) original trade creation and diversion analysis and "inter-commodity substitution" where one commodity is substituted by another as a result of the relative price changes. As such trade diversion's welfare effect does not automatically emanate from customs union rather intra-trade relationship that ensue thereafter. Johnson (1965) suggest that trade-diversion may actually be welfare-increasing if the welfare losses resulting from the diversion to a high-cost supplier country is more than compensated by the welfare gains resulting from the reduced prices to consumers due to the elimination of tariff on imports. Although the trade effect of integration on growth is a well-researched topic (Calderón & Castro, 2019; Menyah, Nazlioglu, & Wolde-Rufael, 2014; Polat, Shahbaz, Rehman, & Satti, 2013; Zerbo, 2015), there are still debates around the area. Linder (1961) observes that economic integrations have a greater potential to contribute to growth if it consists of countries with similar demand preferences or similar income per capita. This is in sharp contrast to Heckscher-Ohlin (H-O) model which propound that, differences in factor proportions or comparative advantage induces countries to specialize on goods they can produce cheaply and thus benefit the most. These two

seemingly opposing views provide an important juncture for the examination of regional bloc effect in the finance-growth linkage. That is while on one hand countries with significant differences in factor endowment and level of development are likely to significantly benefit from economic integration, on the other, theoretical effects of FSD on economic growth lies on a well-developed and functional financial system which enhances the efficiency of financial intermediation by reducing transaction and information costs and minimizes the associated risks (Beck, Demirgüç-Kunt, & Levine, 2009). The effects of FSD on growth are likely to be higher only if the regional bloc is based on similar aggregate demand conditions alongside Linder (1961) rather than factor endowment as propounded in the Heckscher-Ohlin (H-O) model. As such the causal-effect of FSD onto growth in economically integrated countries with homogenous demand preferences may be reversed in response to expanded FSD in one of the countries. This is because expanded FSD in some countries such as; Croatia, Australia, Ireland, Japan, Korea, New Zealand, Canada, and the United States, have proved to have a direct consequence on the real economy of the other countries (i.e. European Union and the rest of the world) in response to the H-O factor equalization effect(Bilas & Bošnjak, 2015; Brecher & Choudhri, 1993; Clifton & Marxsen, 1984) but other countries such as Israel, Kenya, and the United Kingdom do not follow the H-O hypothesis (Clifton & Marxsen, 1984). It is the perverse of this research to expound the geographic dimension i.e. regional bloc of the finance-growth link with the aim of understanding the underlying mechanics of the finance-growth puzzle.

Empirics on Integration and Economic Growth

The preceding discussion provides different perspectives through which regional economic integration may explain disparities in the effect of FSD on long-run GDP growth. Hanson (1996) observes that deeper economic integration increases market access pulls for Mexican firms. As a result, most local production has relocated towards the bordering regions with the US. The US-Mexican example highlights that economic proximity between a developed and a developing area may influence both the geographical distribution of economic activities through market access considerations as well as the location of different stages of production across countries and regions (Ascani, Crescenzi, & Iammarino, 2012). On the empirical side of the Finance-growth relationship in Africa, Adusei, (2013) has noted that FSD induce economic growth in both SADC and ECOWAS in the long run though the impact on SADC was greater than in ECOWAS potentially reflecting a stronger cherry-picking behaviour in the ECOWAS than the SADC (Mahawiya, 2015). That is how most of the FSD effect in the ECOWAS ended-up being inflationary rather than contributing towards real GDP growth. Within the SADC Region, Dzikiti (2017) observes both unidirectional and bidirectional finance-growth causal relationship in Zimbabwe and concludes that there is a unidirectional short-run causality running from economic growth to FSD. For certain FSD indicators such as banking credit to private sector (BCP) and value traded (VTR) Dzikiti (2017) noted a neutral causality between GDP and FSD. Similar support to the DFH in the SADC member countries are provided by Muyambiri & Chabaefe, (2017) for Botswana and Matadeen, (2015) for Madagascar. The majority of studies in the SADC regional bloc however, favour the

Supply Leading Hypothesis (SLH). These include Tyavambiza and Nyangara (2015) and Dzikiti (2017) for Zimbabwe, Sibindi (2014) for Lesotho, Muyambiri & Chabaefe, (2017) in South Africa, and Matadeen (2015) in Madagascar. There are also a limited number of studies supporting the neutrality and bidirectional causality in the SADC. Dzikiti (2017) suggest that for the majority of FSD proxies in South Africa, a bi-directional causality exists between FSD and economic growth. Furthermore, Chirwa and Odhiambo (2016) observed that the speed of adjustment towards the long-run equilibrium path was around -0.30% per annum for Malawi, -0.22% for Zambia. Similarly, in South Africa, Nyasha and Odhiambo(2015) established a long-run conditional convergence at a rate of 73% per annum. Dingela & Khobai (2017), observe that adjustment towards long-run equilibrium is around 24% per annum. Hashikutuva (2016) suggests that the South African economy converges towards long-run equilibrium at a rate of 3% each quarter but Chirwa and Odhiambo (2016) posits a different figure i.e., 7%. Polat, et al. (2013) notes that it will take almost 6 years to reach the long run equilibrium path of growth function in South Africa. The Zimbabwean economic disequilibrium is corrected by changes in FSD at the speed of 4.5% (Dzikiti, 2017). Evidence of the finance-growth causal direction in EAC has been well investigated in Kenya whereby the 'Demand-following' Hypothesis (DFH) has been strongly supported (Arayssi & Fakih, 2017; Waiyaki, 2016).

In Tanzania, studies conducted by Fille, (2013) and Hyera & Mutasa, (2016) have noted evidence of DFH whereby causality runs from Real GDP per capita growth to Domestic Credit to the Private Sector (DCPS) but the relationship reverses in the long run. There are also contra observations when the interaction between FSD and FDI are included in the analysis whereby Arayssi & Fakih, (2017) note evidence of the SLH. The SLH is also supported when DCPS is used as an indicator of FSD whereby the DCPS ratio granger causes economic growth in Kenya (Qin & Ndiege, 2013). This is also evident in Hyera & Mutasa, (2016) and Fille, (2013) who noted that FSD granger causes economic growth in the short-run. Arayssi & Fakih, (2017) provide evidence of the existence of bidirectional Granger causality between FSD and economic growth in Kenya. Similar observations are also noted by Urgaia, (2016) and Waiyaki, (2016). Qin & Ndiege, (2013) uses financial deepening as an indicator of FSD and observes a bi-directional causality between economic growth and FSD in Tanzania. This is also the case when broad money (M3) as a percentage of GDP and Bank deposits as a percentage of GDP were employed as indicators of FSD (Fille, 2013). Akinboade, (2000) suggest that FSD and economic growth do not cause one another i.e., causal independent in Tanzania. Studies on adjustment towards long run equilibrium in EAC countries are however still scanty and are dominated by Kenya. Bakang, (2015) observes that between 32 percent and 50 percent of the previous quarter`s deviation from equilibrium is corrected within the next quarter in Kenya. Waiyaki, (2016) notes that about 10 percent of previous period shock is restored to equilibrium in the next period. Based on the preceding discussion, the fastest growing economies seem to be within the SADC given the limited literature on EAC. Although observations in both the SADC and EAC regional-wise, suggest for a limited

homogeneity in terms of finance-growth links, there is a clear divergence in terms of adjustments towards long run equilibrium path.

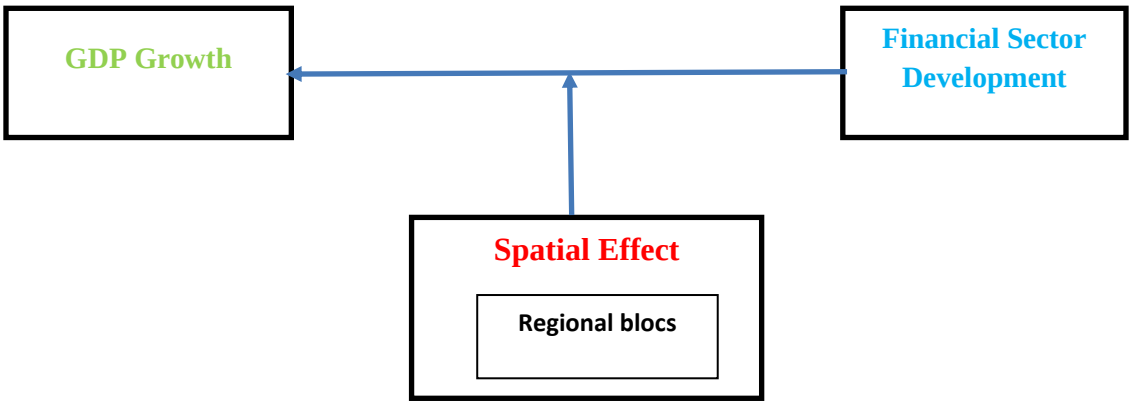


Figure 1: Moderating Effect of Regional Blocs in the Finance-growth exus

The moderating effect of economic integrations in the finance-growth nexus is summarized in Figure 1. It can be observed that FSD is associated with GDP growth through geographically defined regional bloc of countries in this case EAC and SADC. The regional bloc effect suggests that expanded FSD in some member countries can spur GDP growth in other countries given that such a bloc of countries have similar demand preferences that foster growth of the real economy (Linder, 1961). In response to expanded FSD in one of the member countries, all integrated countries gain not only from lower prices following improved productivity but also from improved resource allocation in response to intra-industry specialisation (Ezzahid & Elouaourti,, 2017; Gwahura, 2013; Sissoko, Sloboda, & Kone, 2018; Pelzman, 1978; Zdenek & Greenway, 1984).

Research Methodology

The baseline model is set such that economic growth depends on its one period lag to check for countries‟ conditional convergence effect (Andrianaivo & Yartey, 2009). The analysis is based on ARDL version of the ECM panel regression model represented as in equation 1.

$$\Delta grow_{it} = \emptyset_i\left[grow_{i,t-1} - \gamma_i X_{it}\right] + \sum_{j=1}^{P-1} \beta_{ij} \Delta grow_{it-j} + \sum_{j=1}^{P-1} \alpha_{ij} \Delta X_{it-j} + \mu_i + \varepsilon_{it}. \quad (1)$$

Where

$\Delta grow_{it}$ is the first difference of GDP growth of country i at time t,

$\emptyset_i$ is given by $-(1-\delta_i)$ group specific speed of adjustment coefficient expected that $\emptyset_i < 0$;

γ_i is a vector of long run relationships;

$ECT = [grow_{i,t-1} - \gamma_i X_{it}]$ is the error correction term;

X_{it} is a set of differenced covariates to achieve stationarity;

β_{ij}, α_{ij} are the short run dynamic coefficients

μ_{it} is the country specific unobserved random error term

ε_{it} is the overall unobserved random error term

Data and Variables

The relationship between FSD and Economic Growth in SSA countries is examined using data from the World Bank Indicator database. The core variable in the finance-growth relationship was a dummy variable for regional bloc (Bloc) which takes the value of one (1) if a country is a current member of the existing EAC/SADC and zero (0) otherwise. FSD is measured using two indicators:

i) Domestic Credit to the private Sector (dcps) equals the dcps (as a percentage of GDP); the indicator dcps includes non-bank credit to the private sector (Saci, Giorgioni, & Holden, 2009). and

ii) The liquid liabilities of the financial system are broad money (M3) (percentage of GDP) (Acaravci, Ozturk, & Acaravci, 2009).

A summary of the variables used in this study is provided in Table 1.

Table 1: Description of the Variables

Abbreviation	Variable name	Measurement	Data source
Dependent variable			
Grow	Constant (2010) annual GDP growth	Values	WDI
Intervening Variables			
eco_bloc	Regional integration	Dummy{1 if EAC, 0 otherwise}	SADC and EAC websites
Independent variables			
M3	Broad money as a share of GDP	Values	WDI
Dcps	Domestic credit to the private sector as a share of GDP	Values	WDI
Gfcf	Gross fixed capital formation as a share of GDP	Values	WDI
Open	Import plus export as a share of GDP	Values	WDI
wpop	Working population as a share of GDP	Values	WDI

Preliminary Tests

The results of the panel unit root based on Im, Pesaran, & Shin, 2003 (IPS) and Levin, Lin, & Chu (LLC), 2002) suggested that that all series become stationary after differencing once; the null hypothesis of unit root is therefore rejected suggesting that the panels become stationary after differencing once (autoregressive of order 1). Pedroni (1999; 2004) tests of co-integration led to the rejection of the null hypothesis of no co-integration across panels as they are significantly less than hypothetical critical values. The conclusion is that at least one panel series under consideration is co-integrated. The results of the Hausman test for the test between PMG and MG for EAC and SADC countries indicated that the PMG model was superior in either case as provided in Table 2. The Akaike Information Criterion (AIC) was used for optimal lag selection for the 14 countries based on ARDL model implemented on the observed series of each country. The most recurring lags across countries were then chosen as the best lags for the panel ARDL model implemented thereafter.

Table 2: The Hausman Test Results

	Coefficients				**Coefficients**			
	SADC				**EAC**			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**	**(b)**	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	mg	**pmg**	**Difference**	**S.E**	**mg**	**pmg**	**Difference**	**S.E**
m3_gdp	0.05	-0.26	0.30	1.00	0.05	-0.18	0.23	3.62
dcps_gdp	0.10	-0.31	0.41	0.99	0.10	-2.35	2.45	3.60
gfcf_gdp	1.11	0.24	0.87	0.99	1.11	1.30	-0.19	3.59
Open	-2.54	-0.07	-2.47	2.33	-2.54	1.72	-4.25	8.58
wpop_gdp	0.59	0.97	-0.38	1.54	0.59	-1.56	2.15	5.61
	chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B) **=3.69**				chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B) **=1.20**			
	Prob>chi2 = 0.5954				Prob>chi2 = 0.9446			

NB:

b = consistent under Ho and Ha; obtained from xtpmg

B = inconsistent under Ha, efficient under Ho; obtained from xtpmg

Test: Ho: difference in coefficients not systematic (PMG is not the best)

Model Specifications

Having established a co-integration relationship, the next step is to estimate the ECM model where the error correction term is incorporated within the short run dynamics (Hill, Griffiths, & Lim, 2011). The theoretical equation for this purpose is as provided in equation 2. Lagged variables of the dependent variable are used to address the reverse causality problem as a common practice in the growth literature (Mahawiya, 2015; Nwezeaku & Akujuobi, 2013; Singh, Kpodar, & Ghura, 2009). Lagged values of other control variables such as working population per GDP (wpop) are used to control for income and macroeconomic instability while those of gfcf are used because FSD allocate financial resources to investment projects (Andrianaivo & Yartey, 2009). The indicators of FSD are broad money as a share of GDP (M3) and domestic credit to the private sector as a share of GDP (dcps) both being lagged for the reasons explained.

$$\Delta grow_{it} = \propto_{0i} + \sum_{l=1}^{L} \beta_{1il} \Delta grow_{it-1} + \sum_{l=1}^{L} \propto_{11il} \Delta FSD_{it-1} + \sum_{l=1}^{L} \propto_{12il} \Delta wpop_{it-1} + \sum_{l=1}^{L} \propto_{13il} \Delta open_{it-1} + \sum_{l=1}^{L} \propto_{14il} \Delta gfcf_{it-1} + \emptyset_{1i} \Delta ECT_{it-1} + \varepsilon_{it}$$

…….…….... (2)

Where,

$\propto_{0i}$ is the constant

β_{1il} are the coefficients for the lagged (l) growth series

$\propto_{1il} s$ are short run dynamic coefficients for lagged X_{it} to be estimated

$$\emptyset_i \Delta ECT_{it-1} = \emptyset_i [\![grow_{it-1} - \gamma_i^1 X_{it}]\!]$$

γ_i^1 is a vector of long-run relationship for each X_i and

$$ECT = grow_{it-1} - \gamma_i^1 X_{it}$$

Since in this study, two indicators of FSD were employed and the most recurring lag for M3, dcps and population were two (2) in each case, these variables were lagged once to capture the lag order effect. The final implemented ECM based ARDL model is presented in equation 3.

$$\Delta grow_{it} = \propto_{0i} + \beta_{1i} \Delta grow_{it-1} + \propto_{1i} \Delta M3_{it} + \propto_{2i} \Delta M3_{it-1} + \propto_{3i} \Delta dcps_{it} + \propto_{4i} \Delta dcps_{it-1} + \propto_{5i} \Delta gfcf_{it} + \propto_{6i} \Delta open_{it} + \propto_{7i} \Delta wpop_{it} + \propto_{8i} \Delta wpop_{it-1} + A_1 Sadc_{leg} + A_2 Eac_{leg} + \emptyset_i \Delta ECT_{it-1}$$

…….…….... (3)

Where $A_1$and A_2 captures the regional bloc effect for SADC and EAC as moderating variables respectively. It is notable that the final model includes dummies for regions of interest i.e. SADC and EAC since their respective establishment i.e. 1992 and 1999 respectively. Apart from the overall ARDL model, three more similar models are also presented; the first is an overall model which neglects the regional bloc dummies and the last two estimated the relationship for each regional bloc separately. These separate models for EAC and SADC countries as well as the overall model were estimated as a robustness check mechanism. Dumitrescu & Hurlin (2012) pairwise tests of non-causality were further implemented to provide specific direction of effect in addition to inferring the causal direction from the panel ARDL models implemented.

Research Findings and Discussion

Descriptive Statistics

A description of all variables used in this study is provided in Table 2. Overall, there were 532 observations comprising of 342 from SADC countries and 190 from EAC. A total of 14 countries were involved out of which nine (9) came from SADC and five (5) from EAC. For SADC membership, a period before 1992 was considered "Unbloced" (as SADC as it is known today was not in existence)[1] while for EAC countries a period before 1999 was also considered "Unbloced" (Current EAC became operational in 1999)[2]. The time period of the dataset is 1980 – 2017 comprising 38 time periods (T). Average growth rate was higher and stable in the EAC than in the SADC and the period prior to the current EAC. EAC also have lower and stable broad money growth than the SADC and the period prior to unionisation. In terms of DCPS the EAC has lower expansion of credit to the private sector compared to both the SADC the period prior to unionisation. These observations points to a relatively stronger position that FSD occupies as a macroeconomic tool in the SADC than in the EAC.

Table 2: Descriptive Statistics for Regional Blocs

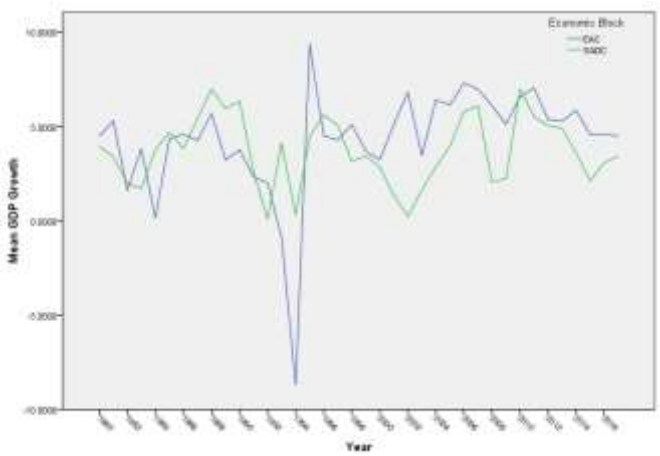
Variable	Mean	Std. Dev	Min	Max
Unbloc				
Grow	3.7	6.63	-50.25	35.22
m3	26.33	12.88	7.29	67.68
Dcps	16.65	15.17	1.58	78.47
Gfcf	18.43	6.65	6.1	36.54
Open	0.52	0.4	0.05	1.93
Wpop	8.23	5.99	0.76	25.99
N	203			
N	14			
T	15			
EAC				
Grow	5.48	2.88	-3.9	13.19
m3	24.5	7.72	15.12	43.25

[1] https://www.sadc.int/member-states/
[2] https://www.eac.int/overview-of-eac

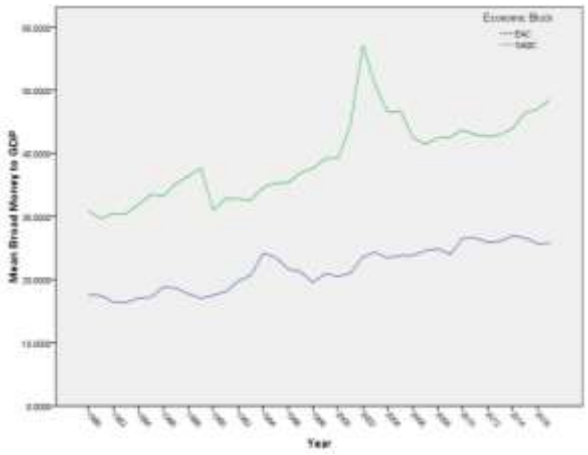
Table 2: Descriptive Statistics for Regional Blocs

Variable	Mean	Std. Dev	Min	Max
Dcps	16.36	7.13	4.09	34.25
Gfcf	20.14	6.7	2.78	34.25
Open	0.43	0.11	0.1	0.68
Wpop	11.4	6.14	4.86	24.57
N	95			
N	5			
T	19			
SADC				
Grow	3.46	4.67	-17.67	19.68
m3	42.17	28.78	4.68	151.55
Dcps	37.18	42.02	4.13	160.12
Gfcf	20.66	9.42	2	93.3
Open	0.91	0.46	0.05	2.43
Wpop	4.49	4.71	0.49	16.17
N	234			
N	9			
T	26			

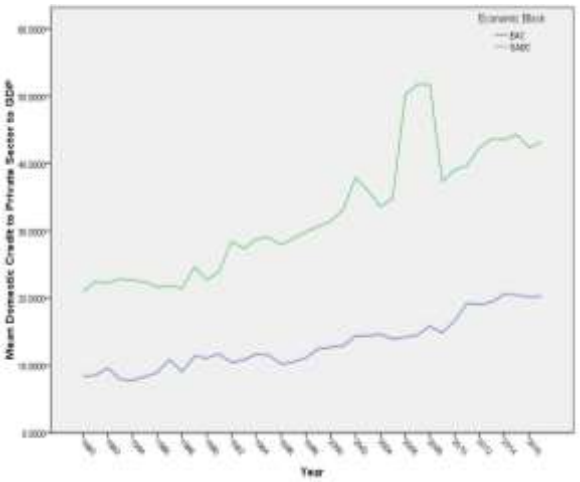
Figure 2 describes the economic bloc effect to three variables i.e., economic growth, broad money growth (m3_gdp) and domestic credit (dcps_gdp). Panel (a) suggest that the GDP growth trajectories for EAC and SADC countries were almost similar with the exception of few cases especially around 1994 and 1996 where abnormal behaviour were noted specifically for Rwanda. The Data suggest that before 1994 EAC countries were lagging behind their SADC counterparts in terms of GDP growth. However, since then growth in EAC has been similar or even higher than that of SADC although the differences are rather small. A similar pattern is not evident in the broad money growth data presented in panel (b). SADC countries display a remarkably higher m3_gdp ratio compared to EAC. This is also true for the variable dcps_gdp ratio. This clearly suggests that short run effect of finance on growth might be marginal or insignificant for the two blocs of countries thus calling for tests of long run co-integrating relationship



(a) Economic bloc effect on the trends of GDP growth



(b) Economic bloc effect on the trends of Broad money to GDP ratio



(c) Economic bloc effect on the trends of Domestic credit to the private sector

Figure 2: Trends in the effect of Economic bloc on the core variables considered in the finance-growth relationship

Without economic integration, both SADC and EAC member countries exhibited relatively higher correlations between broad money growth (M3) & DCPS and M3 & Working population as shown in Table 5. In the EAC however, such high correlation was only notable for M3 and DCPS while in the SADC such high correlation completely disappeared. These correlations suggested that region bloc can be used to explain the correlation between macroeconomic indicators especially FSD related variables. This, on one hand, reflect the level in the integration ladder: while EAC is

approaching a common market (EAC, 2010), the SADC was still far away into Preferential Trade Area (Free Trade). M3 and DCPS were highly correlated in EAC while growth was neither correlated strong with M3 nor DCPS. As such economic growth could be limitedly associated with FSD in the EAC regional bloc. However, when a similar comparison was carried out in the SADC and the period prior to the two integration it was obvious that the correlations between both "m3 and dcps" and "grow" was the lowest in EAC (highest negative) suggesting that potentials for FSD to be detrimental to growth were relatively higher in EAC than both the SADC and the period prior to the two regional integration.

Table 3: Correlation Analysis

Variable	**Grow**	**m3**	**Dcps**	**gfcf**	**open**	**wpop**
Unbloc						
Grow	1.00					
m3	-0.01	1.00				
Dcps	-0.08	0.75	1.00			
Gfcf	0.22	0.41	0.23	1.00		
Open	0.26	0.39	0.14	0.57	1.00	
Wpop	-0.21	-0.73	-0.50	-0.55	-0.52	1.00
EAC						
Grow	1.00					
m3	-0.24	1.00				
Dcps	-0.25	0.85	1.00			
Gfcf	0.42	-0.01	-0.10	1.00		
Open	0.34	0.39	0.39	0.64	1.00	
Wpop	-0.39	-0.32	-0.23	-0.64	-0.58	1.00
SADC						
Grow	1.00					
m3	-0.07	1.00				
Dcps	-0.18	0.56	1.00			
Gfcf	0.16	0.28	-0.09	1.00		

Table 3: Correlation Analysis

Variable	Grow	m3	Dcps	gfcf	open	wpop
Open	0.08	0.40	-0.09	0.37	1.00	
Wpop	-0.07	-0.55	-0.40	-0.36	-0.40	1.00

Panel ARDL Model Results and Discussion

To establish a causal relationship between finance and growth for the different bloc of countries it was necessary to carry out a panel-based error correction model using Auto Regressive Distributed Lag ARDL. Table 4 summarises the results of the four models that were implemented; i) The model that included the economic integration blocs as dummies (Moderated) ii) The model that combined all the data and assumes no bloc effect (not moderated), iii) EAC model Separately (Independent) and iv) SADC Model Separately (Independent). The ECT section provides the long run relationship (γ_i^1) for the six independent variables of the ARDL model in equation 1. It is notable that both m3 and dcps have a significant and positive effect on growth in the overall model. However, the dcps was the only FSD variable whose effect was significant and negative in both EAC and SADC. It seems the integration has removed most of the positive dcps's effect on economic growth for the two blocs of countries and such removal was slightly higher in EAC than the SADC. M3 remains positive even with integration though its effect on growth was not statistically significant.

The observations in Table 3 suggest that M3 was only significant in EAC where it reduces growth at a rate of around 3% while DCPS contributes positively to growth at around 17%. In the short-run DCPS was trade diverting in all regional blocks while broad money supportted trade creation. In the long run the effect remained negative in the un-moderated model when regional integration was moderated the effect was positive but insignificant. It seems that regional integrations eliminated the trade diverting effect of dcps in the long run though the effect was not statistically significant. However, at the country specific effect suggests that FSD was a significant determinant of growth in a number of cases. In Rwanda and Tanzania there was a positive effect for the DCPS and a negative effect for M3. While expanding M3 significantly and positively induces growth in Rwanda, it had an insignificant effect in Tanzania and Uganda while in the other EAC countries the respective models were explosive. The findings from this study further compounded in favour of the sequencing hypothesis specifically in the SADC (Muyambiri & Chabaefe, 2017).

Table 4: Pooled Mean Group (PMG) Regression Results

	OVERALL1	Sig.	OVERALL2	Sig.	EAC	Sig.	SADC	Sig.
Number of Obs	504		504		95		234	
Number of groups	14		14		5		9	
Obs per group: min	36		36		19		26	
Avg	36		36		19		26	
Max	36		36		19		26	
Log Likelihood	-443.092		-496.743		32.155		-96.544	
ECT								
m3	-0.010		0.021	***	0.030		0.003	
	(0.008)		(0.007)		(0.022)		(0.007)	
Dcps	0.009		0.011	**	-0.080	**	-0.020	***
	(0.006)		(0.005)		(0.032)		(0.006)	
Gfcf	0.023	**	0.020	*	0.037	***	0.012	**
	(0.010)		(0.012)		(0.009)		(0.006)	
Open	-0.764	**	0.041		-1.604	***	-0.662	***
	(0.306)		(0.329)		(0.591)		(0.234)	
Wpop	-0.217	**	-0.275	***	-0.498	***	0.254	***
	(0.075)		(0.050)		(0.059)		(0.080)	
SR								
ECT	-0.580	***	-0.494	***	-0.723	***	-0.505	***
	(0.100)		(0.088)		(0.246)		(0.145)	
grow LD.	0.003		-0.007		0.001		-0.001	
	(0.012)		(0.008)		(0.046)		(0.007)	
m3 LD.	-0.088		-0.074		-0.044		-0.008	
	(0.095)		(0.070)		(0.039)		(0.012)	
m3 D1.	0.031		0.016		-0.055	***	-0.002	

	OVERALL1	Sig.	OVERALL2	Sig.	EAC	Sig.	SADC	Sig.
	(0.099)		(0.070)		(0.014)		(0.015)	
dcps LD.	-0.061	**	-0.042	**	0.093		-0.012	
	(0.021)		(0.021)		(0.116)		(0.024)	
dcps D1.	0.080		0.072		0.169	**	0.017	
	(0.069)		(0.074)		(0.086)		(0.016)	
gfcf D1	-0.016		0.007		0.021		0.002	
	(0.020)		(0.015)		(0.038)		(0.021)	
open D1	-0.519		-0.176		-3.032		1.127	
	(1.346)		(2.101)		(2.788)		(1.004)	
wpop LD.	11.936	*	15.362	**	2.185		23.643	**
	(6.881)		(6.712)		(2.177)		(11.850)	
wpop D1.	-36.210	***	-36.107	***	-9.853	***	-58.925	***
	(10.879)		(10.943)		(2.002)		(15.797)	
Sadc_leg	0.140							
	(0.195)							
Eac_leg	0.110							
	(0.145)							
_cons	2.525	***	1.799	***	5.984	***	1.148	***
	(0.504)		(0.448)		(1.822)		(0.378)	

NB: Standard errors for coefficient are given in parentheses

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

Regardless of the model, the short run ($\propto_{il}$)adjustment towards equilibrium is correctly signed (-) thus augmenting the existing body of literature that across countries, there was a short run adjustment towards long run equilibrium (Zerbo, 2015; Mathenge & Nikolaidou, 2018; Mahawiya, 2015). EAC adjusts at the rate of 72% while the SADC adjusts at a rate of around 50% both being relatively higher than the overall rate of adjustment. The overall significant and negative ECT provided evidence for long run convergence towards equilibrium. However, with the regional bloc effect eliminated in the Overal1 model, the adjustment across countries was around 58% a clear indicator that EAC adjustment towards steady state is relatively above average while SADC

adjustment was slightly below average. The bloc effect here was that expansionary monetary policy would theoretically created trade to all EAC countries if they unanimously adopted it. Otherwise, individual monetary expansion might not have significant effect on GDP growth and to countries like Uganda it was detrimental to growth a finding that was in line with Zerbo, (2015). The regional bloc effect could be at work here since Uganda had the highest level of broad money growth and was negatively impacted in the short run but regional-wise long run effect was positive. The EAC regional bloc was trade creating in the long run despite having short-run diversion effect.

At country level, results are included in Appendix 1 where there were remarkable differences in terms of short run adjustment towards steady state between Tanzania and Rwanda. While Rwanda adjusted at a rate of 30% per annum, Tanzania adjusted only at the rate of 6% as shown in Table 4. Uganda led the race with almost 37% of previous deviation corrected in the current year. The other EAC countries adjusted the previous period deviations at a rate of between 26% and 27%. This provided a further deviation from the dominance of Kenya with adjustment speed of between 10% – 50% (Bakang, 2015; Waiyaki, 2016). The higher speed of adjustment in Rwanda potentially reflected economic stability and the benefits that broad money growth brought to economic growth in Rwanda. As such being the EAC regional bloc, it had the highest finance-growth positive effect to Rwanda as the regional-wise adjustment towards steady state was relatively faster than country specific effect.

For the SADC, the results suggested that the FSD – growth link in the short run was at best insignificant alongside Bara, Mugano, & Pierre, (2016) and Mahawiya, (2015). In country specific models however, the finance-growth relationship was significant in Botswana, Madagascar, Eswatini and Zimbabwe. A further scrutiny of observations in Appendix 2 suggested that out of the nine SADC countries, two were explosive i.e., Zambia and Zimbabwe. Of all the SADC countries broad money growth significantly increased GDP growth in Eswatini just like in Rwanda but unlike Rwanda the lag of broad money as a share of GDP was also positive in Eswatini an observation that somehow contradicts previous observations on the same (Bara, Mugano, & Pierre, 2016; Mahawiya, 2015). The lag of broad money as a share of GDP was also positive in Madagascar and Zimbabwe. Thus, out of the 14 countries included in this study only two (2) suggested that there was a significant positive short-run effect on broad money to GDP growth and observations from three (3) countries suggested that such positive effect occurs at one lag. In the lagged M3, Mauritius and South Africa also experienced short run negative effect of M3 on GDP growth. The negative effect could be linked to several factors including overinvestment in response to expansionary monetary policy or credit rationing (Zerbo, 2015; Saxegaard, 2006; Nketcha Nana & Samson, 2014). In terms of adjustment towards steady state, in the SADC region, among the 14 SADC countries, Zimbabwe led the race with around 8% adjustment rate surpassing previous observations of around 3 – 4.5% in single series models (Dzikiti, 2017). Apart from the adjustment speed, these observations indicated that been in the SADC provided an added

advantage as growth was likely to be higher than without it. Mahawiya, (2015) noted an adjustment rate of around 15% and a long run convergent growth and a convergent growth rate of between 0.3 – 7% were observed by Chirwa & Odhiambo, (2016). In this region, South Africa had the highest adjustment rate of up to 73% (Nyasha & Odhiambo, 2015). This study however, suggested that short run adjustment towards steady state for SADC ranged between 10% - 43%, with an overall ECT of 51%.

Panel Finance-Growth Causal Effect

Table 5 summarises the Dumitrescu & Hurlin (2012) pairwise tests of non-causality. Although in the general model growth caused FSD through M3 such effect existed only for EAC. In the EAC growth caused DCPS and at the same time DCPS caused growth. As such, there was a strong conclusion of a bidirectional finance-growth nexus within the EAC based on DCPS. M3 however unidirectional with causal effect runned from growth to M3. Based on M3, in the EAC FSD-growth nexus did follow the DFH (Arayssi & Fakih, 2017) contrary to SLH alongside Waiyaki, (2016). The SADC economy also favoured a unidirectional hypothesis with DCPS causing growth without any feedback.

Table 5: Dumitrescu & Hurlin (2012) Granger Non-Causality Test Results

Xtgcause	**OVERALL**		**EAC**		**SADC**	
	Z-bar tilde	**Sig**	**Z-bar tilde**	**Sig**	**Z-bar tilde**	**Sig**
Forward causal effect						
grow dm3	9.25	***	6.49	***	1.13	
grow dcps	0.86		3.60	***	1.04	
grow dgfcf	2.28	**	14.99	***	6.28	***
grow dopen	1.54		16.72	***	1.48	
grow wpop	2.26	**	9.69	***	0.92	
Reverse causal effect						
dm3 grow	0.14		-0.95		-0.28	
dcps grow	-0.01		6.30	***	2.65	***
dgfcf grow	-0.05		0.07		-0.44	
dopen grow	1.98	**	4.18	***	-1.32	
wpop grow	0.71		8.75	***	0.61	

NB: Standard errors for coefficient are given in parentheses

Table 5: Dumitrescu & Hurlin (2012) Granger Non-Causality Test Results

Xtgcause	**OVERALL**		**EAC**		**SADC**	
	Z-bar tilde	**Sig**	**Z-bar tilde**	**Sig**	**Z-bar tilde**	**Sig**

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

Conclusion and Policy Implications

There are major disparities in term of the adoption of monetary policies across the countries that form the EAC and the SADC regional blocs. Generally, monetary expansionary policies within the SADC were more prevalent in Zimbabwe and Zambia compared to all other SADC countries while in EAC they were relatively more prevalent in Uganda. This reflect the financial repression policies which were more prevalent in the EAC than the SADC leading to negative effect on FSD development while financial openness might have favoured higher growth in the SADC (Andrianaivo & Yartey, 2010). The situation in Zimbabwe had been well documented and it was clear that monetary expansion in Zimbabwe had been detrimental to growth (Dzikiti, 2017). Broad money growth in Zimbabwe seemed to bring a positive short run effect specifically at one lag possibly reflecting some of the benefits accrued from both financial and trade openness regardless of the effected regional bloc (Mahawiya, 2015; Zerbo, 2015). Based on the evidence from this study, it was clear that GDP growth in the EAC increased with DCPS while the same declines within the SADC region. Considering DCPS as an indicator of FSD, FSD contribution to growth was country specific.

While for example it contributed positively to growth in Tanzania and Rwanda it also contributed negatively in Botswana and Eswatini. At the regional bloc level, DCPS reduced growth in both SADC and EAC in the long run and since the causal effect was bidirectional in EAC, it was an important policy instrument to avoid in EAC with the exception of Tanzania and Rwanda where it had a positive contribution to growth. In the SADC the causal direction was from DCPS to growth suggesting that it could be used as policy instrument in countries where long run FSD-growth nexuswas positive such as Botswana and Eswatini. With the exception of Uganda where short run effect on broad money was negative, all the other EAC countries provided evidence that expanding money growth had no short run significant effect and such effect could only be observable in the long run. Similarly, DCPS hadno specific significant effect on growth to any of the countries in the EAC regional bloc but had a significant bloc effect. Although broad money growth was generally negative on GDP growth in the short run among SADC countries, Eswatini was the only exception. With these observations only a partial conclusion on the positive finance-growth nexus in the EAC is favoured. In EAC countries finance-growth nexus were both bidirectional and unidirectional in the sense that growth granger caused broad money but not the other way around while DCPS granger caused GDP growth and at the same time GDP growth

granger caused DCPS. Expanding DCPS in the EAC countries had a feedback mechanism. In as long as DCPS reduced growth, this feedback mechanism entailed a downward growth spiral as DCPS was expanded suggesting that DCPS was not a good policy instrument for the EAC as a regional bloc. This did not however detract countries such as Tanzania and Rwanda whose DCPS-growth relationship was positive from using DCPS as a policy instrument to bolster growth. It is obvious from the finding of this study that Market-based FSD, preceded both bank-based FSD in both the short run and the long run while Market-based FSD Granger-caused bank-based FSD in the short run and long run (Muyambiri & Chabaefe, 2017). The sequencing hypothesis suggested that FSD could only had a positive effect on GDP growth if properly sequenced and timed out. This indicated that policies such as the liquidation of defunct financial institutions and strengthening of regulatory and supervisory functions should have superseded chartering of new banks. In a similar manner stabilization policy targeting elimination of huge fiscal deficit, persistent depreciation of the exchange rate and tight credit policies were needed before any financial openness policy was adopted (Ikhide, 2015).

Finally, regional bloc monetary policies effects suggested that finance-growth nexuses were negative in both the EAC and the SADC in the long-run. Short run dynamics in the SADC suggested that Eswatini, Seychelles and Zambia achieved higher GDP growth in the short run-in response to broad money growth an indicator that such countries could use broad money growth to smoothen short run fluctuation though the long run impact would have been negative. These countries faced a trade-off between short run and long run goals; the choices might be shaped by the most beneficial and least costly option. What this observation implies is that choices had to be made between addressing short run GDP volatility and achieving higher GDP growth in the future. Politically, short term objectives were likely to override long term ambitions. Both objectives could have been made, however, if the negative long run consequences of FSD were mitigated through appropriate development of infrastructure that facilitate the absorption of expanded monetary instruments. As such short run monetary expansionary policies must be accompanied with long terms investment strategies that foster job creation, improved infrastructure in the real economy and technological improvement that increases the finance absorption capacity of the economy. With these were in place, SADC could have used FSD as an important tool to foster both short term volatility and ensure long run growth.

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Appendix 1: Panel ARDL Model Results for EAC

D.grow	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]		Percent
Burundi							
ECT	-0.989	0.041	-23.830	0.000	-1.070	-0.907	0.271
Grow							0.500
L1							0.500
m3_gdp							0.500
D1	0.449	1.536	0.290	0.770	-2.562	3.460	0.610
LD							
dcps_gdp							
D1	-0.857	1.025	-0.840	0.403	-2.866	1.151	0.298
LD							
gfcf_gdp							
D1	0.343	0.529	0.650	0.517	-0.695	1.380	0.585
Open							
D1	7.917	2.979	2.660	0.008	2.079	13.755	1.000
wpop_gdp							
D1	-100.946	4.058	-24.880	0.000	-108.899	-92.993	0.000
LD							0.500
_cons	-1.005	1.757	-0.570	0.567	-4.447	2.438	0.268
Kenya							
ECT	-1.021	0.014	-71.160	0.000	-1.049	-0.993	0.265
Grow							
L1							
m3_gdp							
D1	-0.487	0.574	-0.850	0.396	-1.612	0.638	0.381
LD							
dcps_gdp							
D1	0.039	0.405	0.100	0.923	-0.755	0.833	0.510
LD							
gfcf_gdp							
D1	-0.397	0.383	-1.040	0.300	-1.148	0.353	0.402
Open							
D1	3.679	1.124	3.270	0.001	1.476	5.881	0.975
wpop_gdp							
D1	-101.642	1.500	-67.760	0.000	-104.582	-98.702	0.000
LD							
_cons	-2.785	1.664	-1.670	0.094	-6.046	0.477	0.058
Rwanda							
ECT	-1.011	0.044	-23.040	0.000	-1.097	-0.925	0.267
Grow							
L1							
m3_gdp							
D1	6.092	7.244	0.840	0.400	-8.106	20.291	0.998
LD							
dcps_gdp							
D1	4.571	3.833	1.190	0.233	-2.942	12.084	0.990
LD							
gfcf_gdp							
D1	-10.493	6.260	-1.680	0.094	-22.762	1.776	0.000
Open							

D.grow	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]	Percent
D1	-19.132	12.200	-1.570	0.117	-43.044	4.779	0.000
wpop_gdp							
D1	-91.413	5.957	-15.350	0.000	-103.089	-79.738	0.000
LD							
_cons	-0.152	1.759	-0.090	0.931	-3.601	3.296	0.462
Tanzania							
ECT	-1.038	0.087	-11.870	0.000	-1.210	-0.867	0.262
Grow							
L1							
m3_gdp							
D1	-1.005	2.061	-0.490	0.626	-5.044	3.034	0.268
LD							
dcps_gdp							
D1	0.418	0.243	1.720	0.085	-0.058	0.894	0.603
LD							
gfcf_gdp							
D1	-0.312	1.477	-0.210	0.833	-3.207	2.583	0.423
Open							
D1	0.771	3.642	0.210	0.832	-6.367	7.909	0.684
wpop_gdp							
D1	-103.229	8.842	-11.670	0.000	-120.560	-85.898	0.000
LD							
_cons	-2.337	1.831	-1.280	0.202	-5.925	1.251	0.088
Uganda							
ECT	-0.551	0.137	-4.020	0.000	-0.819	-0.282	0.366
Grow							
L1							
m3_gdp							
D1	-6.857	2.471	-2.770	0.006	-11.700	-2.014	0.001
LD							
dcps_gdp							
D1	0.788	1.227	0.640	0.521	-1.618	3.194	0.687
LD							
gfcf_gdp							
D1	-0.340	4.444	-0.080	0.939	-9.051	8.371	0.416
Open							
D1	19.342	12.159	1.590	0.112	-4.489	43.174	1.000
wpop_gdp							
D1	-0.686	2.310	-0.300	0.767	-5.213	3.841	0.335
LD							
_cons	1.055	1.009	1.050	0.295	-0.922	3.033	0.742

Appendix 2: Panel ARDL Model Results for SADC

D.grow	Coef.	Std. Err.	Z	P>|z|	[95% Conf. Interval]		percent
Botswana							
ECT	-1.098	0.160	-6.850	0.000	-1.412	-0.784	0.250
Grow							0.500
L1	0.110	0.157	0.700	0.483	-0.197	0.417	0.527
m3_gdp							0.500
D1	-1.136	0.490	-2.320	0.021	-2.097	-0.175	0.243
LD	-0.738	0.454	-1.630	0.104	-1.627	0.151	0.323
dcps_gdp							
D1	0.304	0.590	0.510	0.607	-0.852	1.459	0.575
LD	0.720	0.490	1.470	0.142	-0.241	1.681	0.673
gfcf_gdp							0.500
D1	1.660	0.851	1.950	0.051	-0.008	3.328	0.840
Open							0.500
D1	-0.773	0.715	-1.080	0.279	-2.175	0.628	0.316
wpop_gdp							
D1	-105.410	1.817	-58.020	0.000	-108.971	-101.850	0.000
LD							
_cons	3.756	0.649	5.790	0.000	2.485	5.027	0.977
Madagascar							
ECT	-0.608	0.140	-4.330	0.000	-0.883	-0.333	0.353
Grow							0.500
L1	-0.397	0.140	-2.840	0.004	-0.671	-0.123	0.402
m3_gdp							0.500
D1	-0.337	0.180	-1.870	0.061	-0.690	0.015	0.417
LD	0.210	0.173	1.210	0.225	-0.130	0.550	0.552
dcps_gdp							0.500
D1	1.045	0.228	4.590	0.000	0.599	1.491	0.740
LD	-0.143	0.227	-0.630	0.529	-0.588	0.302	0.464
gfcf_gdp							0.500
D1	0.233	0.139	1.680	0.093	-0.039	0.506	0.558
Open							0.500
D1	0.556	0.391	1.420	0.155	-0.210	1.323	0.636
wpop_gdp							0.500
D1	-96.879	0.712	-136.130	0.000	-98.274	-95.485	0.000
LD							0.500
_cons	1.341	0.393	3.410	0.001	0.570	2.111	0.793
Mauritius							
ECT	-0.668	0.082	-8.160	0.000	-0.829	-0.508	0.339
Grow							0.500
L1	-0.290	0.084	-3.460	0.001	-0.455	-0.126	0.428
m3_gdp							0.500
D1	-2.195	0.830	-2.640	0.008	-3.822	-0.568	0.100
LD	-1.900	0.700	-2.720	0.007	-3.271	-0.529	0.130
dcps_gdp							0.500
D1	1.200	0.514	2.340	0.020	0.193	2.208	0.769
LD	0.788	0.507	1.550	0.120	-0.206	1.783	0.687
gfcf_gdp							0.500
D1	0.013	0.341	0.040	0.970	-0.656	0.681	0.503
Open							0.500

D.grow	Coef.	Std. Err.	Z	P>|z|	[95% Conf. Interval]		percent
D1	-0.611	0.553	-1.110	0.269	-1.694	0.472	0.352
wpop_gdp							0.500
D1	-104.236	1.691	-61.650	0.000	-107.550	-100.923	0.000
LD							0.500
_cons	1.794	0.476	3.770	0.000	0.861	2.727	0.857
Malawi							
ECT	0.169	0.776	0.220	0.827	-1.353	1.691	0.542
Grow							0.500
L1	-1.195	0.785	-1.520	0.128	-2.734	0.344	0.232
m3_gdp							0.500
D1	-0.233	1.891	-0.120	0.902	-3.939	3.473	0.442
LD	0.133	1.998	0.070	0.947	-3.784	4.050	0.533
dcps_gdp							0.500
D1	-0.082	1.647	-0.050	0.960	-3.310	3.146	0.480
LD	-0.136	1.525	-0.090	0.929	-3.125	2.852	0.466
gfcf_gdp							0.500
D1	0.150	1.550	0.100	0.923	-2.887	3.188	0.538
Open							0.500
D1	0.584	1.666	0.350	0.726	-2.681	3.849	0.642
wpop_gdp							0.500
D1	-91.772	5.941	-15.450	0.000	-103.416	-80.129	0.000
LD							0.500
_cons	4.022	2.770	1.450	0.147	-1.407	9.451	0.982
Eswatin							
ECT	-0.273	0.265	-1.030	0.304	-0.793	0.247	0.432
Grow							0.500
L1	-0.580	0.263	-2.210	0.027	-1.096	-0.065	0.359
m3_gdp							0.500
D1	2.358	0.868	2.720	0.007	0.656	4.059	0.914
LD	3.907	0.842	4.640	0.000	2.256	5.558	0.980
dcps_gdp							0.500
D1	-3.863	0.790	-4.890	0.000	-5.411	-2.316	0.021
LD	-2.855	0.693	-4.120	0.000	-4.213	-1.497	0.054
gfcf_gdp							0.500
D1	0.979	0.619	1.580	0.114	-0.234	2.192	0.727
Open							0.500
D1	0.061	0.874	0.070	0.944	-1.651	1.773	0.515
wpop_gdp							0.500
D1	-120.246	2.903	-41.420	0.000	-125.936	-114.556	0.000
LD							0.500
_cons	1.943	0.217	8.950	0.000	1.518	2.369	0.875
Seychelles							
ECT	-0.329	0.381	-0.860	0.387	-1.075	0.417	0.418
Grow							0.500
L1	-0.667	0.384	-1.740	0.082	-1.419	0.085	0.339
m3_gdp							0.500
D1	0.558	2.538	0.220	0.826	-4.416	5.533	0.636
LD	-0.422	2.646	-0.160	0.873	-5.607	4.764	0.396
dcps_gdp							0.500
D1	3.168	1.839	1.720	0.085	-0.436	6.771	0.960
LD	-2.063	1.944	-1.060	0.289	-5.874	1.748	0.113

D.grow	Coef.	Std. Err.	Z	P>|z|	[95% Conf. Interval]		percent
gfcf_gdp							0.500
D1	0.773	0.716	1.080	0.280	-0.630	2.175	0.684
Open							0.500
D1	-1.172	1.044	-1.120	0.262	-3.219	0.875	0.236
wpop_gdp							0.500
D1	-93.852	4.901	-19.150	0.000	-103.459	-84.246	0.000
LD							0.500
_cons	2.561	0.720	3.560	0.000	1.150	3.971	0.928
South Africa							
ECT	-2.201	0.024	-90.200	0.000	-2.249	-2.153	0.100
Grow							
L1	1.181	.	.	.	.	.	0.765
m3_gdp							0.500
D1	-0.816	0.920	-0.890	0.375	-2.619	0.987	0.307
LD	-1.592	0.792	-2.010	0.044	-3.144	-0.041	0.169
dcps_gdp							0.500
D1	0.870	0.415	2.090	0.036	0.055	1.684	0.705
LD	1.271	0.450	2.830	0.005	0.390	2.153	0.781
gfcf_gdp							0.500
D1	1.645	0.881	1.870	0.062	-0.082	3.373	0.838
Open							0.500
D1	3.231	1.670	1.930	0.053	-0.042	6.503	0.962
wpop_gdp							0.500
D1	-95.219	1.961	-48.550	0.000	-99.063	-91.375	0.000
LD							0.500
_cons	6.654	1.249	5.330	0.000	4.207	9.102	0.999
Zambia							
ECT	0.661	0.098	6.730	0.000	0.468	0.853	0.659
Grow							0.500
L1	-1.666	0.100	-16.580	0.000	-1.863	-1.469	0.159
m3_gdp							0.500
D1	0.642	0.262	2.450	0.014	0.129	1.155	0.655
LD	0.632	0.287	2.210	0.027	0.071	1.194	0.653
dcps_gdp							0.500
D1	-0.441	0.119	-3.700	0.000	-0.675	-0.208	0.391
LD	-0.282	0.134	-2.110	0.035	-0.544	-0.021	0.430
gfcf_gdp							0.500
D1	0.152	0.111	1.370	0.170	-0.065	0.370	0.538
Open							0.500
D1	0.625	1.082	0.580	0.564	-1.496	2.745	0.651
wpop_gdp							0.500
D1	-98.902	1.186	-83.370	0.000	-101.227	-96.577	0.000
LD							
_cons	4.317	0.469	9.210	0.000	3.399	5.236	0.987
Zimbabwe							
ECT	0.086	0.393	0.220	0.828	-0.685	0.856	0.521
Grow							
L1	-1.039	0.392	-2.650	0.008	-1.808	-0.271	0.261
m3_gdp							
D1	-0.140	0.305	-0.460	0.646	-0.738	0.458	0.465
LD	0.482	0.308	1.560	0.118	-0.122	1.087	0.618

D.grow	Coef.	Std. Err.	Z	P>|z|	[95% Conf. Interval]		percent
dcps_gdp							
D1	-0.293	0.264	-1.110	0.267	-0.811	0.225	0.427
LD	0.091	0.227	0.400	0.688	-0.353	0.535	0.523
gfcf_gdp							
D1	0.067	0.259	0.260	0.795	-0.440	0.574	0.517
Open							
D1	1.566	1.817	0.860	0.389	-1.996	5.129	0.827
wpop_gdp							0.500
D1	-100.051	2.195	-45.590	0.000	-104.352	-95.749	0.000
LD							0.500
_cons	2.967	0.467	6.350	0.000	2.051	3.883	0.951