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Abstract

This paper provides an empirical analysis of the comparative study between the Economic Community of West African States (ECOWAS) and Southern African Development Community (SADC) on the role of inflation in explaining the state of financial development of the two regions. In addition, the study seeks to find out if Rajan and Zingales Hypothesis which argues that simultaneous opening of both trade and financial sector is the key for financial development to take place is supported in the two regions. Using dynamic panel approach and data for the period 1980-2011, our findings provide evidence that in both regions inflation robustly reverse financial development with the effect in ECOWAS greatest. In addition, the study indicates that even though more simultaneously opening of the financial sector and trade lead to more financial development in SADC, trade openness alone can still trigger growth in the sector but more financial openness alone is detrimental to financial development of the region. Hence this seems to provide partial support for the hypothesis. However, the hypothesis is rejected in ECOWAS.

JEL: G21, O16, O43 O55

Keywords: ECOWAS, SADC, financial development, real per capita income, dynamic panel technique

1 Introduction

The late 1980s witnessed several countries in Sub-Sahara Africa (SSA) moved towards economic and financial sector reforms following the adoption of the Structural Adjustment Programme as well Economic Recovery Program which were supported by the International Monetary Fund (IMF) and the World Bank. The poor economic performance of the countries of SSA was blamed on the repressive post-independent economic and financial system. The main focus of

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the reforms was to replace the protective economic policies with more market oriented reforms which were deemed not only to induced economic growth but also the financial system development which will further propel economic growth. Inadequate financial sector development was argued to be among other central reasons answerable for the slow growth process in the region. This is because a well-developed and efficient financial system results in mobilizing and channelling resources not only to productive areas but also to areas that are more risky but promising and productive which could have been left unattended without the financial sector and these processes could induce economic growth.

This argument above is supported by theoretical and many empirical studies. For instance the endogenous AK model developed by Pagano (1993) recognized a positive effect of finance on economic growth. In terms of empirical evidence even though ambiguity exists in the direction of causality between finance and economic growth, the general view points to finance inducing economic growth. Collaborating this assertion, Demetriades and Andrianova (2004) and Goodhart (2004) noted that the effects of financial development on the long run economic growth is now widely agreed to constitute a potential important channel. Among the many empirical studies that support finance-led economic growth include Allen and Ndikumana (2000), Beck (2002), Beck, Demirgüç-Kunt and Levine (2003), Ghirmay (2004), Ang and McKibbin (2007), Loesse (2010), Kar et.al (2011), Odhiambo (2011). Therefore if the financial system is deemed important in the growth process, why are some countries having underdeveloped financial system? Consequently, according to Baltagi, Demetriades and Law (2009) the frontier of literature in this field is shifting towards providing answers to the question Hence, this is the core of this study.

Most SSA countries are among the countries with least developed financial system. Hence, in an attempt to speed up progress in the financial sector, following the economic and financial sector reforms most of the countries in the region moved away from the repressive economic and financial sector regimes leading to dismantling of credit controls and reduced or removed obligatory reserve requirements of banking system. Also not only were state owned banks privatized, but interest rates were liberalized. Further, bank entry requirements as well as capital account restrictions were relaxed in the hope of triggering development in the financial sector

Currently, these efforts are ongoing and this has been demonstrated recently by more openness of the financial sector especially in the banking industry resulting in increases in foreign banking presence since 1995. The percentage of foreign banks in the domestic banking system increased from around 32 percent to about 55 percent in 2009 which is higher than foreign banking presence in other developing regions¹. Despite the relentless efforts as well as bold measures being taking to induce growth in the financial sector, SSA countries except South Africa are less successful in achieving development in the sector as compared with other developing economies and regions. The financial institution is not only much less deep and less efficient but also less accessible as compared to other

¹This figures were estimated using information from Global Financial Database, 2013.

regions as shown in Figure 1 of the Appendix (see Figure 1a in the Appendix). This Figure was constructed using information from Čihák, Demirgüç-Kunt, Feyen and Levine (2012) based on Global Financial Development Database for financial system characterization of 205 countries. The Figure shows the mean value of the indicators for the period 1960-2010. On financial markets development, SSA does better than South Asia region and Europe with Central Asia region in terms of depth but performs the least in terms of access² (see Figure 1b in the Appendix).

Although most of the countries in SSA took the steps mentioned above towards developing their financial sector through the policy reforms, aggregate indicators of financial development have, on average either stagnated or dropped as evidenced by Figure 1 in the appendix leaving the region with financial sector development gap.

Therefore the underdeveloped state of SSA financial system raises a number of issues and questions as to what is going wrong with the financial sector policies and what could be done to improve it. Is the financial sector insensitive to these policy measures or is it echoing policy failures? What factors have repressed or are stagnating its development to this point and how can they be overcome? Therefore, the purpose of this study is twofold: Firstly, to empirically analyse the role of inflation in explaining the state of financial development. And secondly, examine if Rajan and Zingales (2003) Hypothesis which stipulates that both trade and financial openness are key for financial development to take place is supported. This is done in the context of regional comparison of Economic Community of West African States (ECOWAS) and Southern Africa Development Community (SADC) in SSA. A comparative study is important because first, regional blocs are considered as pillars of the Africa Economic Community and are increasingly dominant feature today³, hence, the study does not only reveal the peculiarities in each bloc but also the extent by which the factors impact on financial development in each bloc and why if there is any difference between the two regions. This provides guidelines for policy recommendations. Second, it is particularly insightful to separate and compare regional groups in SSA since member states in each bloc pursue almost the same policies in attempt to achieve similar goals that will lead to meeting the convergence criteria⁴ set by the bloc. These two blocs were chosen because: (i) they seem to be one of the oldest and make up almost two thirds of SSA (ii) consistent data exist for most of the countries.

Although research in this area has seen some progress, to our knowledge there is no study conducted that provides an exclusive comparison of regional groupings in SSA on the factors associated with financial sector development (FSD). Thus, this is the first of its kind to be studied. Moreover, the novelty of

²Others such as .Boyd, Levine and Smith (2001) support this assertion. Also see Gelbard and Leite(1999) for more information on the level of financial development of the region.

³As evidenced by the recent ideas and call for the formation of Tripartite Cooperation in Trade in SSA.

⁴some of which includes achieving a low inflation rate as well stable exchange rate and stable economic growth rate.

the study is the extension of the empirical model to include the effects of communication infrastructure on finance. In addition, even though dynamic panel approach is used for the regions as whole, the effects of the factors on finance on each country is also determined in details using SURE approach. Hence this study is dissimilar to earlier studies such as Boyd, Levine and Smith (2001), Ito (2006), Detragiache, Gupta and Tressel (2006) Baltagi et.al (2009), Siong and Muzafar (2009) and Kablan (2010).⁵

Finally, even though these earlier studies help our understanding in this area, they have some shortcomings which include (i) the use of single measure of financial development as this measure may not be able to adequately capture the functions of the financial system and (ii) most studies are basically on the advanced economies like the Group of seven (G-7) and the Organization for Economic Co-operation and Development (OECD) or amalgamation of advanced and developing economies such as Chinn and Ito (2006), Baltagi et.al (2009) and Siong and Muzafar (2009). However, the results are generalised and may be deceptive. This may be misleading since differences exist between developed and developing economies and may be the reason for the financial sector development gap in SSA since policies mostly depend on such findings.

This study therefore fills in this gap by using a constructed composite measure of financial development comprising of three financial indicators. Accordingly, the analytical focus on these countries helps to deepen the understanding of appropriate factors responsible for the development of the financial sector of these two regions and more especially SSA.

Using a number of methodologies which include Least square dummy variable approach (LSDV), Feasible generalized least squares (FGLS) and Panel Corrected Standard Errors (PCSE) approach, the study provides evidence that in both regions inflation reverses financial development with the effects more perverse in ECOWAS. In addition, the study indicates that even though more simultaneously opening of the financial sector and trade lead to more financial development in SADC, trade openness alone can still trigger growth in the sector but more financial openness in the form of capital account openness alone is detrimental to financial development in the region. Hence, this evidence provides partial support to the Rajan and Zingales hypothesis. However, in ECOWAS, the hypothesis is rejected. In addition, access to communication infrastructure is an important factor that promotes financial development in the two regions with SADC benefiting more than ECOWAS.

The rest of the paper is structured as follows. Section 2 presents both theoretical and empirical literature review on the link between finance and factors responsible for its development. In section 3, the method and model specification are presented whereas in section 4 the data used in the study is discussed. Section 5 presents discussion of the results while the last section which is 6 gives summary and policy recommendations of the study.

⁵Even though Boyd, Levine & Smith (2001b) included both advanced countries and developing economies, they did not use composite measure of FSD.

2 Literature Review

The question of what determines FSD theoretically is a subject of a growing research. Some of the literature includes Finance-Inflation theory (macroeconomic variables) and Rajan and Zingales Interest Group theory of financial development.

2.1 Finance-Inflation theory

A number of studies explain the mechanism under which predictable increases in inflation rate interfere with financial sector ability to efficiently allocate resources. Specifically, the link developed by Huybens and Smith (1998) and Huybens and Smith (1999) emphasizes the importance of information asymmetries in the credit market. According to this model, increases in the rate of inflation adversely affect credit market friction which affect FSD negatively and hence long-run real activity. The bases of these arguments are that there is informational friction whose severity is endogenous. Therefore given this informational friction, an increase in inflation rate causes the rate of real returns on assets to fall and this worsens the credit market friction leading to credit rationing. Low real returns on assets are disincentive for agent to lend but incentive to borrow resulting in credit reduction as well as increases in low quality borrowers into the pool of credit seekers. The pool of low quality borrowers is swamped, informational frictions become more severe and credit becomes scarce in such an economy. Hence as inflation rises, financial sector makes only fewer loans causing inefficient resources allocation and reduced intermediation.

2.2 Rajan and Zingales Interest Group Argument of financial development

According to this argument interest groups particularly industrial and financial incumbent stands to lose from financial sector development since this will create opportunity and chances for new firms to be established. Basically, under financial sector expansion, competition is established which tends to erode the rents of the incumbent. Significantly, the model posits that trade openness without financial openness is unlikely to yield desirable financial development. This is because, it may lead to large industrial incumbents to access cheap funds to stifle competition which will cause financial repression. In the same way, financial openness alone may not induce FSD since it will only allow the largest firms to access such foreign funds.

Rajan and Zingales (2003) argue that financial liberalization alone may give access to the largest incumbent firms to acquire foreign funds which they may not need. On the contrary, this may prevent small and promising domestic firm's access to such foreign funds. Hence domestic financial sector may viewed its profitability threatened by this process and will therefore call for liberalization which will be opposed by industrial incumbents in order to prevent competition. Accordingly, cross border capital flows alone are not sufficient condition

to induce FSD and are unlikely to reconcile the interest of both groups to push for financial development. Hence, Rajan and Zingales (2003) proposed that, simultaneous opening of both capital accounts and international trade is sufficient condition to curtail the incumbent's hostility to financial development. Thus there will FSD if there is simultaneous opening of both capital accounts and international trade.

Concerning the contemporary empirical literature, some recent studies include: Haslag and Koo (1999) using cross-sectional approach; Boyd, Levine and Smith (2001b) using cross-sectional and panel data of 65 countries; Ben-Naceur and Ghazouani (2005); Zoli (2007) on emerging European countries; Andrianaivo and Yartey (2010) on African countries; and Bittencourt, (2011) using both time series and dynamic panel analysis on Brazil all confirmed a significant negative relationship between finance and inflation. But Aziakpono (2004) concluded that the level of income and exchange rate were the most important determinants of financial intermediation in the Southern Africa Custom Union. Detragiache, Gupta and Tressel (2006) found that whereas corruption, inflation and foreign bank penetration have negative effects on FSD, better contracts enforcement and information on borrowers have a positive effects on FSD. A more recent study, however, of Kablan (2010) showed inflation and foreign bank penetration have negative effects on FSD⁶ corroborating earlier results by Detragiache, Gupta and Tressel (2006). Even though these studies broaden our understanding on the inflation-finance relationship, only the study of Aziakpono (2004) is directed at examining regional bloc of Southern Africa Custom Union. Additionally, these studies mostly depend on single measure of financial development which may not capture the financial development adequately.

With regards to finance-openness relationship, Baltagi et.al (2009) using data from developed and developing economies and dynamic panel approach provide evidence that showed that both openness are statistical significant determinants of banking sector development. However, the study provides partial support for Rajan and Zingales hypothesis. Also using dynamic panel approach on 27 economies including G-7, Siong and Muzafar (2009), argue that trade openness is prominent in promoting capital market development and financial sector liberalization promotes banking sector development. Svaleryd and Vlachos (2002) and Huang and Temple (2005) all indicate that trade openness induces financial development. Levine (2001), however, indicates that financial liberalisation on international portfolio flows does not only induce stock market liquidity, but also attraction of foreign banking inflows which tend to enhance efficiency in the domestic banking system. In addition Chinn and Ito (2006) used a panel of 108 countries over the period 1980 to 2000 and argued that higher level of financial openness spurs equity market development only if a threshold level of legal development has been attained. Finally, Klein and Olivei (2008) indicate that capital accounts liberalization has robust impact on growth through financial system deepening in industrialised economies but there was little evidence of such relationship for countries outside the OECD states.

⁶In some selected countries of SSA.

Other studies focus on institutional effects on finance and these studies: Djankov, McLiesh and Shleifer (2007) found that both creditor protection through the legal system and information sharing institution are associated with higher private credit to GDP. Also Yartey (2008) concluded that law and order, political risk and bureaucracy quality are important determinants of stock market development for a panel of 42 countries. However, Girma and Shortland (2008) reveal that the degree of democracy and political stability are important factors determining the speed of FSD which was corroborated by the findings of Roe and Siegel (2011). Additionally, financial backwardness was significantly rooted in severe political unstable economies. Hence, current political instability explains the level of FSD more than historical legal origin. But Toroyan and Anayiotos (2009) show that institutional factors in SSA affect financial depth and access to financial services more than asset equality and profitability. Finally, the study of Cherif and Gazdar (2010) on Middle East and North Africa (MENA) countries show that institutional quality is more relevant for banking sector than for stock market development.

Based on these empirical studies it is evident to our knowledge that no study has attempted to exclusively analyze a comparative study on FSD between two regional groupings especially in SSA. Moreover, the prevailing studies considered only single measure of FSD which may be misleading. In addition, the studies are focused on either developed countries or mixture of developed and developing countries which failed to give information on SSA especially on the regional groupings. This is necessary since these blocs adopt almost similar policies which may lead to dissimilar response of FSD to the set of controls variables used in each region. Hence, this study fills in this gap by not only considering a comparative study but also using a composite measure of FSD which captures the functions of the financial system as well as using the individual measures for policy implication.

3 Method and Model specification

We start by specifying a static empirical model which takes the following semi-log form and following Baltagi *et al.* (2009) we use lagged values of regressors to avoid simultaneity. Thus

$$\begin{aligned} \ln index_{it} = & \alpha_i + \beta_1 \ln inf\ fl_{i,t-1} + \beta_2 \ln rgdppc_{i,t-1} + \beta_3 \ln gov_{i,t-1} \\ & + \beta_4 pol_{i,t-1} + \beta_5 finop_{i,t-1} + \beta_6 \ln traop_{i,t-1} + \beta_7 lncom_{i,t-1} \\ & + \beta_8 fintraop_{i,t-1} + \beta_9 trapol_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Where i is individual country at time t and $i=1 \dots N$; $t=1 \dots T$. $\varepsilon_{i,t}$ is the error term. $inf\ l$ is inflation, $rgdppc$ is real GDP per capita and gov is government spending. pol represents type of governance measured by Polity2 whereas $finop$ and $traop$ indicate financial and trade openness respectively. Communication infrastructure is proxied by access to mobile phones and telephone lines per thousand people and is represented by com . To measure the effects of Rajan and

Zingales hypothesis, the interaction term between financial and trade openness is included which is *fintraop*. Also it is contended that trade openness can influence financial development through better institutional environment. We provide institutions with governance system and an interaction term between trade openness and governance system, *trapol*, is included. Finally, *findex_{it}* is a composite measure of FSD computed using equation 2.

$$\frac{1}{n} \sum_{j=1}^n \left[100 * \left(\frac{F_{j,it}}{\bar{F}} \right) \right] \quad (2)$$

F_j and \bar{F} are FSD indicator and sample mean of F_j respectively, n is the number of FSD indicators. Equation 2 is instrumental because the measures of FSD face definitional problems. According to Levine (1997), FSD is improvement in the quality of five key financial functions⁷. Therefore a measure of FSD should reflect the different functions of the financial system⁸. With this assessment, equation 2 is estimated following Demirgüç-Kunt and Levine (1996) and Allen and Ndikumana (2000). We include three indicators: bank private credit to GDP, liquid liabilities (M3 to GDP) and bank assets to the sum of bank assets and central bank assets. The reasons for the selection of these variables are done in section 4.1. Even though we used the composite measure, the study also considered each individual indicator in order to determine specific policy relevant to FSD.

As a macroeconomic stability variable inflation is expected to have reversed relationship with financial development as discussed in section 2. The level of economic development as measured by real GDP per capita is a conditioning variable expected to induce development in the financial sector as incomes increase.

Government fiscal policy indicator is represented by *gov*. It shows macroeconomic stability and accounts the influence on finance. In most developing economies government debt which composes mainly securities represents relatively large proportion of government expenditure. It is usually proxied by stock of domestic government debt or interest payment on government debt. However, there is no consistent data on this variable. It results in transfer of resources from the private sector to central government securities. Hence, this process impairs FSD as resources that would have been mobilized by the financial sector is diverted to the central government. However, if government securities pay competitive interest rates, it may offer the financial sector an attractive instrument to manage their liquidity as well as a relatively safe investment. Hence, the effect is ambiguous.

Autocratic regimes follow from revolutions and usually characterised by expropriation and corruption which may increase the cost of doing business and more so uncertainty about property rights. With this caveat, these processes

⁷These functions are (i) Producing information on investment and allocating capital (ii) Monitoring and exerting corporate governance (iii) Facilitating trading and management of risk (iv) Mobilizing and pooling of risk and (v) Easing exchange of goods and services.

⁸Accordingly, Aziakpono (2004) suggests that if the functional definition is accepted, then a single indicator cannot adequately measure FSD.

impair FSD. However, good governance is expected to stimulate FSD. Hence *pol* captures this effects in the model which measures from -10 indicating extreme autocratic regimes to +10 showing extreme democratic governance.

Access to mobile and telephone lines are expected to induce financial development. This promotes FSD by facilitating information flows among suppliers and demanders of financial services. This may reduce information asymmetry in the financial system leading to efficient operation of the market.

Lastly, financial liberalization measure and trade policy measure are expected to complement each other in order to promote financial development as envisaged by the Rajan and Zingales hypothesis. However, we also use governance system to complement trade openness in the model. As in Ito (2006) and Baltagi *et al.* (2009), the study used the “de jure” financial liberalization index of Chinn and Ito Index of liberalization. This is an index of capital accounts openness (KAOPEN). It is constructed from four binary dummy variables that codify restrictions on cross-border financial flows. Even though this measure is accused of sometime overstating the measure of openness, it is broadly available for many countries in SSA for long time period⁹. More so data on countries in SSA is not readily available from any alternative source for long period. The variable is expected to promote FSD as more financial openness results in competition, it induces expansion of the sector¹⁰.

To obtain a dynamic panel model and also allow for any possible partial adjustment, we introduced the lagged dependent variable into equation 1 to arrive at our final model as follows:

$$\begin{aligned} \ln findex_{it} = & \alpha_i + \beta_1 \ln inf fl_{i,t-1} + \beta_2 \ln rgdppc_{i,t-1} + \beta_3 \ln gov_{i,t-1} \\ & + \beta_4 pol_{i,t-1} + \beta_5 finop_{i,t-1} + \beta_6 \ln traop_{i,t-1} + \beta_7 lncom_{i,t-1} \\ & + \beta_8 fintraop_{i,t-1} + \beta_9 trapol_{i,t-1} + \beta_{10} \ln findex_{it-1} + \varepsilon_{i,t} \end{aligned} \quad (3)$$

The significance of the inclusion of the past history of the dependent variable does not only capture the dynamics in the model but also the possible omitted variables

Given the nature of our dataset, this paper uses a number of panel data techniques to estimate the regression model of equation 3 which includes: Fixed effects (FE) or Random effect (RE), Feasible generalized least squares (FGLS), Panel corrected standard errors (PCSE) and Seeming unrelated regression (SURE). These techniques are appropriate since $T > N$. According to Beck and Katz (1995), this approach provides estimates of sampling variability which are very accurate even under the presence of complicated panel error structure than other approaches such as pooled GLS¹¹. Another preferred estimator for the dynamic model is the system Generalised Method Moments proposed by Arellano and Bover (1995). However, this approach is suitable for short panels ($T < N$) which is not the case in this study since $N = 12$ and $T = 32$.

⁹See Ito (2006) for details of the advantages in using this index.

¹⁰The effects of real interest rate on finance is also important, however, there is no consistent data on this variable, hence was not included in the model which may be shortcoming of the study. The problem is more serious in ECOWAS.

¹¹For details discussion of this approach see Beck and Katz (1995).

3.1 The Fixed Effect estimator

Consider the following dynamic panel model;

$$y_{it} = \alpha_i + \beta_1 y_{it-1} + \beta_2 x_{it-1} + \varepsilon_{it} \quad (4)$$

$$i = 1, 2, \dots, N$$

$$t = 1, 2, \dots, T$$

Where y_{it} is the measure of financial development, α_i are random individual-specific effects, x_{it-1} are the regressors as in equation 1 or 3 and ε_{it} are the errors.

The effects of α_i gives the distinction between the Fixed effects (FE) and random effects (RE). In the FE estimator, α_i is permitted to be correlated with x_{it} . However, in RE model, α_i is purely random and implying it is uncorrelated with x_{it} which leads to a strong assumption.

The FE estimator implies that: $E(y_{it}|\alpha_i, x_{it}) = \alpha_i + x_{it}\beta$ assuming $E(\varepsilon_{it}|\alpha_i, x_{it}) = 0$.

The advantage of the FE modelling is that consistent estimates of the regressors can be obtained if the regressors are time-varying and even endogenous to some extent (Cameron and Trivedi, 2010).

Therefore let the error $u_{it} = \alpha_i + \gamma_t + \varepsilon_{it}$, then we have error component model with γ_t the unobserved time effect as;

$$y_{it} = \alpha_i + \beta_1 y_{it-1} + \beta_2 x_{it-1} + u_{it} \quad (5)$$

Including the lagged dependent variables along with FE introduces a basic problem of correlation between the regressor and the error term. This generates a bias in the estimate known as the Nickell bias¹². However, since $T > N$ the Nickell bias goes to zero as T increases and is a problem with fixed T . To determine which model is suitable we used Hausman test that supported the use of FE rather than RE. However, in some cases for the individual financial development measures, the RE modelling is the appropriate approach. Since $T > N$ we use Least squares dummy variable technique.

3.2 Feasible Generalised Least Squares

In the pooled feasible generalised least squares, it is necessary to specify a model for serial correlation, heteroscedascity and model of contemporaneous correlation in the errors. Once heteroscedascity is present, the data cannot be pooled. This approach is preferred since in many cases the variance-covariance matrix is unknown and hence we cannot use Pooled generalised least squares (GLS) that assumes known variance-covariance.

Hence, this model deals with model error complications by specifying a model of heteroscedascity, model of contemporaneous correlation and model of serial correlation in equations 6, 7 and 8 respectively. Hence we have:

$$E(\varepsilon_{it}^2) = \sigma_{it} \quad (6)$$

¹²See Nickell (1981) for details.

$$E(\varepsilon_{it}\varepsilon_{jt}) = \sigma_{ij} \tag{7}$$

$$\varepsilon_{it} = \rho_i\varepsilon_{it-1} + v_{it} \tag{8}$$

The advantage of this model is that ρ which is coefficient of the first order correlation is allowed to vary across the panel. Further, the model does not only capture short run dynamics but also controls for simultaneity bias.

3.3 Seemingly Unrelated regression technique

The Seemingly Unrelated regression technique (SURE) according to Zellner (1962) takes the system of ‘seemingly unrelated regression equations’ as a single large equation to be estimated. Hence, by postulating a separate dynamic regressions for each individual country, thus we have:

$$\begin{aligned}
 y_{it} &= \gamma_1 y_{it-1} + \beta_1 x_{it-1} + \varepsilon_{it} \\
 &\quad \cdot \\
 &\quad \cdot \\
 &\quad \cdot \\
 y_{NT} &= \gamma_N y_{NT-1} + \beta_N x_{NT-1} + \varepsilon_{NT}
 \end{aligned}
 \tag{9}$$

$i=1, 2 \dots \dots \dots N$
 $t=1, 2 \dots \dots \dots T$

The equations are simplified by stacking into a single model. Let $Y_t = [y_{it} \dots, y_{NT}]'$, $X_t = \text{diag}(x_{1t} \dots, x_{NT})$, a bloc diagonal matrix with $x_{1t} \dots, x_{NT}$ on its diagonal, $U_t = [\varepsilon_{1t} \dots, \varepsilon_{NT}]$, $\beta = [\beta_1 \dots \beta_N]'$ and $\gamma = [\gamma_1 \dots, \gamma_N]'$. Then our final SURE model is given 10:

$$Y_t = \gamma Y_{t-1} + \beta X_{t-1} + U_t \tag{10}$$

The idea is to estimate each equation in the bloc. The main advantage of SURE over estimates using equation by equation under ordinary least squares is that there is gain in efficiency if there exists contemporaneous correlation among the equations.

The underlying assumption of the Zellner method is that the equations are related through the non-zero covariances associated with the error term. Thus, while it is assumed that statistically the errors for each country taken separately conform to the standard linear regression model each country’s errors may also correlate with the contemporaneous errors of the other countries (Judge et al, 1988). There is reason to believe that common factors may influence macroeconomic and financial data from the SADC and ECOWAS countries and therefore increase the chances of the presence of contemporaneous correlation in the model. This cross-sectional dependency may arise because of several reasons that may include; spatial correlation, economic distance, spill over effects and common unobserved shocks. To determine the existence of such contemporaneous correlation, the study used Breuch-Pagan (LM) test.

4 Data description

We used annual data obtained from World Bank's *Africa Development Indicators*, 2013, and *Global Financial Development Database*, 2013 limited to 1980-2011. Financial variables are obtained from the latter and the rest from the former. Financial variables are stock variables whereas GDP measures are flows. Most studies ignored this problem. However, *Global Financial Development Database* solves this flow-stock problem by deflating these variables with the relevant consumer price indices¹³ and this gives rich and better measures of these indicators. Financial liberalisation index is obtained from Chinn-Ito Financial Index. Both ECOWAS and SADC include 12 states¹⁴ The sources and description of the data is given in Table 8 in the Appendix.

4.1 Measures of financial development

Bank-based measures of FSD are used. Stock market-based financial indicators are not developed in SSA except for South Africa. Others with relative developed stock markets include Ghana, Cote D'voire, Botswana, Zimbabwe, Nigeria, Swaziland, Namibia and Zambia. We followed the work of Levine, Loayza and Beck (2000) in choosing these indicators. Firstly, bank private credit to GDP (*bankprcr*). This is credit extended to the private sector by commercial banks and other FIs. It does not only isolate credit to the private sector but also excludes credit to government (Levine, Loayza and Beck, 2000). It generates increases in investment and productivity to a much larger extent than credits to the public sector since loans are given under more stringent conditions motivated by profits drives (Levine and Zervos, 1998). Hence, this measure is good proxy for FSD.

The second indicator is the ratio of bank assets to the sum of bank assets and central bank assets (*dmba*). This proxy shows the influence of the commercial banking sector in the economy. It can also reveal diminishing influence of central bank in the financial sector as the assets of bank increases. And as commercial banks are more likely to perform all the functions of the financial system the measure becomes a good proxy of the financial system.

The final indicator is $M3/GDP$ which proxies for financial depth. This is preferred to $M2/GDP$ because an increasing $M2/GDP$ has been criticized¹⁵ that it might be reflecting more monetization rather than an increase in bank deposits. Thus, $M3/GDP$ provides more direct information on the extent of financial intermediation. Even though the above proxies are selected for this study, we admit that in finance literature what proxy for FSD proved to be

¹³This is done using this formula: $F_j = \frac{(0,5)[f_{it}/CPI(e)_{i,t-1}]}{GDP_{it}/CPI(a)_{it}}$, where F_j is the financial variable, $CPI(e)$ is the end of period consumer price index and $CPI(a)$ average annual CPI.

¹⁴ECOWAS: Benin Burkina Faso, Cape Verde, Cote D'voire, Gambia, Ghana, Mali, Niger, Nigeria, Senegal Guinea Bissau and Togo

SADC: Botswana, DRC, Lesotho, Malawi, Mauritius, Madagascar, South Africa, Swaziland, Tanzania, Zambia, Mozambique and Zimbabwe.

¹⁵Such as by Eita and Jordaan (2010)

controversial and that no proxy exists without shortcomings.

Credit by nonbank financial sector is also important since it supplements the credit needs of the real sector. It is basically composed of microfinance institutions. However there is no consistent data on this variable. Therefore this variable is not considered.

5 Empirical analysis

5.1 Diagnostic tests

Before employing panel based approach, we tested for serial correlation as well as heteroscedascity and the existence of contemporaneous correlation in both regions which help determine the appropriate modelling. The result is reported in Table 1. Table 1 shows presence of heteroscedascity is confirmed by Likelihood ratio test whereas the existence of first order autocorrelation cannot be ignored as suggested by the test of serial correlation in both regions.

Breuch-Pagan LM test of cross-sectional dependence from the Table supports the existence of contemporaneous correlation in both regions which was based on the FE model at 1% significance level. The correlation matrix of the errors in SADC and ECOWAS are shown in Tables 6 and 7 in the Appendix respectively which indicate each country's errors correlate with the contemporaneous errors of other countries. Hence, this suggests any random shock to one country would also impact on the other countries in the regional bloc since financial and macroeconomic data from the same regional bloc are likely to be influenced by common factors. Therefore this support the application of Zellner seemingly unrelated regression technique that results in gain in efficiency in the estimates as opposed to estimates of equation by equation using OLS. Due to the limitation of the approach to ten countries we dropped Lesotho and Zambia in SADC and Burkina Faso and Guinea Bissau in ECOWAS.

Additionally, Hausman test confirmed that the dynamic relationship between the measure of financial development, inflation, government spending, openness and other conditioning variables for the two sub-regions is adequately modelled by FE model rather than RE approach as shown in Table 1. In addition, the F -tests for the FE model for both sub-regions indicate heterogeneity and that the coefficients are different from zero. To control for spatial effect and error complications, dynamic FGLS as well as PCSE are also estimated. These tests are based on the dynamic panel regression of 3.

5.2 Estimated results of composite measure of financial development as a dependent variable

Table 2 reports the main results of the composite measure of financial development for the two regions. All the panel approaches used indicate that the main variable of interest which is inflation has detrimental effect on financial development of the two regions which is not only in line with theory but lends

support to earlier studies such as Boyd, Levine and Smith (2001b), BenNaceur and Ghazouani (2005), Andrianaivo and Yartey (2009) and Bittencourt (2011). Among some of the studies on SSA that this result corroborates include Aziakpono (2004) on South Africa, Botswana, Namibia, Swaziland and Lesotho (SACU countries) and Kablan (2010). These studies confirmed that increases in inflation reverse FSD.

The result shows that given a 10% increases in inflation in the two regions, the LSDV approach indicates 0.44% and 2.1% reduction in financial development in SADC and ECOWAS respectively indicating that the effect is much felt in the latter bloc. This means that increases in the rate of inflation adversely affect credit market friction which affects FSD negatively. This is because an increase in inflation rate causes the rate of real returns on assets to fall and this worsens credit market friction leading to credit rationing. Hence, the financial sector makes only fewer loans causing inefficient resources allocation and reduced intermediation in the two regions. The relatively small negative effects of inflation on the financial sector of SADC could be explained by the fact that its financial sector is relatively more developed than ECOWAS. Hence, the weak financial sector of ECOWAS is more susceptible to inflation shocks than SADC. Further, the South African financial system which is well developed in the region and ranks very high in the world has its footprints all over the bloc especially the banking industry¹⁶. And given her strong monetary policy with inflation targeting frame, it is not surprising the impact of inflation is not as strong as in ECOWAS since these policies usually reflects in countries such as Lesotho, Swaziland, Namibia and Botswana.

To determine the robustness of the reversed effects of inflation on financial development in the two regions, we re-estimated the LSDV regression by adding the conditioning variables one after the other as shown in Tables 1 and 2 in the Appendix and the results seem to confirm that inflation robustly reduces financial development in both regions. Furthermore, to examine if this negative relationship was driven by Zimbabwe as well as DRC in SADC since Zimbabwe in recent times experienced phenomenal increases in inflation and DRC during the civil conflicts in that country, we re-estimated the baseline regression by dropping one country after the other and also dropping the two at the same time. The results seem to suggest a robust negative relationship between inflation and finance in SADC as shown by Table 3 in the Appendix without these countries.

In terms of history of financial development captured by the summary of the lagged of the financial development measure, the results show this significantly promote current financial development at 1% which is in line with *a priori* expectation. However, the level of development proxied by real GDP per capita indicates mixed results. Whereas all regressions in SADC suggest a negative relationship, the LSDV which is our main model indicates that the relationship is statistically insignificant. However, the LSDV technique reveals real GDP per capita to have statistically positive effects on financial development in ECOWAS which is contrary to the FGLS results as shown by Table 2.

¹⁶Our measure of financial development is broadly bank based.

Government spending in both regions suggests a negative effects on financial development (except FGLS in ECOWAS) but only statistically significant in SADC for all methods. It shows that a 10% increase in government spending in SADC will cause about 0.4% drop in financial development as indicated by the LSDV method but about 0.3% drop from the FGLS and PCSE approaches. This finding may lead us to conclude that government expenditure may serve as a channel that divert resources away from the financial sector of SADC to the government and this way interferes with the financial sector activities negatively. On average, government expenditure in SADC is as high as 18% against 14% of ECOWAS and this may be the reason.

In both regions, not only is the political environment variable statistically insignificant as shown by the standard errors but also its interaction with trade openness is also insignificant which is contrary to our expectations. This seems to suggest that the current governance system for the period under study may be weak and does not support financial development or complement trade openness to propel FSD in both regions

Observe that trade openness alone reveals statistically significant positive effects on financial development for all methods in SADC whereas financial openness enters with statistically significant negative effects. This suggests that more trade openness alone induces financial development in the bloc which rejects the suggestion by Rajan and Zingales that trade openness without financial openness is unlikely to cause financial development. But the same cannot be said about financial openness as more financial openness reverses financial development and this evidence seems to support Rajan and Zingales assertion that cross border capital flows alone are unlikely to convince both interest groups to push for financial development. Importantly, the complementary term between trade and financial openness indicates statistically significant positive effects on financial development for all three regressions indicating that simultaneously opening of trade and financial sectors holds the key to financial development of SADC. Hence, the evidence seems to give partial support to the hypothesis in SADC. Studies that found this results include Baltagi *et al.* (2009).

Comparing with ECOWAS, even though all three regressions indicate that openness measures promote financial development separately, they are not statistically significant. Furthermore, the interaction term between these measures is negative indicating that relatively closed economies may gain from more trade openness or financial liberalization. However, it is statistically insignificant. The evidence therefore suggests that the hypothesis may be rejected in the case of ECOWAS as indicated in Table 2.

Real GDP per capita which is a proxy for economic development reveals positive coefficient but only statistically significant in ECOWAS for all regression. This means as incomes of this region increase more financial services are demanded leading to the expansion of the financial sector and this is in line with expectations. Like the composite measure of financial development, inflation present detrimental effects on financial depth of the two regions with the effects in ECOWAS over five times that of SADC. In the same direction, government expenditure reveals a negative effects on financial depth of both regions but only

statistically significant in SADC with the FGLS regression.

However, governance system is not statistically significant in SADC, on the contrary this is an important determinant of financial depth in ECOWAS. The coefficient is not only positive but statistically significant under all regressions. This is intuitive because a more democratic governance results in protection of private property, and hence an incentive to the financial sector to grow. However, the complementarity between trade and governance system reveals that more democratic governance results in trade openness to promote financial depth in SADC but this is statistically significant under only the FGLS regression. In contrast, this complementarity term is negatively related to financial depth in ECOWAS indicating that less democratic governance complement trade to promote financial development. This argument may be intuitive since democracy is a necessary condition but not sufficient condition to promote FSD as evidenced by development dictators of South Asia.

Additionally, more trade openness alone promotes financial depth but financial openness alone retards the development in all regressions in SADC. The complementarity term reveals that more financial and trade openness are important determinants of financial depth in SADC. This findings corroborates the findings of the composite measure and therefore it gives a partial support for the Rajan and Zingales assertion. On the contrary, in ECOWAS, the complementarity term indicates a negative coefficient which suggests that relatively closed economies stand to benefits from opening up trade or their financial sector; however, it is only the FGLS regression that shows the coefficient is significant. It also indicates that financial openness alone induces financial development of the region.

Finally, access to communication shows positive coefficients in all regressions but only statistically significant in FGLS and PCSE in SADC. However, in ECOWAS, it is only FGLS that reveals that the variable is significant at 1%. The magnitude of the impact is almost similar in the two regions.

5.3 Estimated results of ratio of domestic bank assets to the sum of domestic bank assets and Central Bank assets as a dependent variable

Table 4 reports the results of the ratio of bank assets to the sum of bank assets and central bank assets as a measure of financial development. It indicates that the relationship under investigation is adequately modelled by FE representation as confirmed by the Hausman test. Hence, we implement the LSDV approach. The results show that even though the coefficient of finance-inflation relationship is negative in SADC for the three methods, which is in line with the earlier results, the coefficient under PCSE approach is statistically insignificant. This important findings reiterate the detrimental effect of inflation on financial development of the region. On the contrary, in ECOWAS inflation-finance coefficient for the three models does not only reveal mixed results but are all statistically insignificant. This is not surprising because theories such as

by Azariadis and Smith (1996) and Choi, Smith and Boyd (1996) argue that a threshold effect between inflation and finance exists. Under these theories, certain level of inflation is desirable for FSD and above which its effects will result in their detrimental impact on FSD. This may be the case when this type of measure of financial development is used.

More and better governance system promotes financial development as indicated by FGLS and PCSE approaches in SADC but this contracts financial development in ECOWAS. However, for the interaction term between governance and trade openness, the LSDV approach confirmed a statistically significant positive effect on financial development in ECOWAS but this is opposite in SADC as indicated by FGLS method.

The Table also indicated that even though there is partial support for Rajan and Zingales hypothesis in SADC confirming the earlier assertion of composite results, only the results in FGLS is significant. However, this is again rejected in ECOWAS. Finally, more access to communication infrastructure is again important in promoting financial development in these regions.

5.4 Estimated results of bank private credits (percentage of GDP) as a dependent variable

Table 5 reports bank private credit as a percentage of total economic activities of the two regions. Diagnostic test indicates FE is the appropriate model in both regions. However, in ECOWAS random effect approach was rejected at 10% level of significance. Hence we report the results of both approaches which give almost similar results.

From Table 5, like the earlier discussions, inflation presents detrimental effects on private credit as a percentage of GDP in both regions with the effects in ECOWAS the highest. The LSDV presents statistically significant reverse relationship between government expenditure and financial development in SADC, whereas its coefficient in all models in ECOWAS are not significant.

Further, the results indicate that whereas individually, trade openness is statistically insignificant, financial openness reverses financial development in SADC. However, simultaneous opening of trade and financial sector raises financial development as evidenced by the three models. Hence this confirms full support for Rajan and Zingales Hypothesis in terms of private credit as a percentage of total economic activities of the region. However, this hypothesis is rejected in ECOWAS. Finally, access to communication infrastructure robustly promotes private credit as a measure of financial development in SADC at 1% significance levels, but is only statistically significant at 10% in ECOWAS under the LSDV approach.

5.5 Estimated results using SURE for composite measure of financial development as a dependent variable

As mentioned above, the presence of cross-section dependence as evidence by Breusch-Pagan (LM) test cannot be overlooked. In light of this, we present the

SURE estimates in Tables 4 and 5 in the Appendix for SADC and ECOWAS respectively. Table 4 therefore provides disaggregated analysis of individual countries which provide strong evidence that inflation reverses financial development in four countries which includes Madagascar, Mauritius, Zimbabwe and DRC with Mauritius highly affected (-0.307). Others include South Africa and Swaziland but their coefficients are statistically insignificant. This lends support to the fact that South Africa and Swaziland belong to the Common Monetary Area (CMA) under which South Africa's monetary policy continue to influence and reflect in the group. In countries such as Botswana, Malawi, Tanzania and Mozambique, inflation presents positive impact on financial sector development, but with the coefficient in Botswana being statistically significant. Comparing with countries in ECOWAS, the results show that the negative effects of inflation on financial development is found to be statistically significant in five countries. These countries are Cape Verde, Niger, Nigeria, Senegal and Togo with Niger experiencing the biggest effect of 0.97 indicating 10% increases inflation will result in almost 10% fall in the development of the financial sector. Others that reveal negative but statistically insignificant coefficients includes Cote D'voire, The Gambia, Ghana and Mali. We therefore argue that the disaggregated analysis gives support to the reason why the impact of inflation in ECOWAS is greater than in SADC using LSDV, FGLS and PCSE.

On trade and financial openness and their interaction term, the result seems to suggest partial support for Rajan and Zingales hypothesis in four countries in SADC which includes Malawi, Mauritius, Tanzania and DRC. However, trade and financial openness alone promotes financial development in Botswana and Zimbabwe respectively leading to a rejection of the hypothesis. Hence in SADC, there is no country that provide full support for the hypothesis. However, in ECOWAS, only Cote D'voire seems to provide evidence of full support for the hypothesis. The results indicate that more opening of the financial sector alone will reverse financial development. On the contrary, simultaneous opening of trade and financial sector will promote financial development which is in line with the theory. Other countries in the region that provide partial support for the hypothesis include Benin, Cape Verde, The Gambia, Ghana, Mali, Niger, Nigeria and Togo.

Further, communication access accelerate financial development in five out of the ten countries in SADC which includes Botswana, Madagascar, Swaziland, Tanzania and DRC. However, in Malawi and Mozambique a positive relationship is presented, but the coefficients are statistically insignificant. For South Africa and Zimbabwe an inverse relationship is established. Comparing with ECOWAS, six countries reveal statistically significant positive relationship between communication infrastructure and finance which includes Benin, Cape Verde, Cote D'voire, Niger, Senegal and Togo.

The system of governance and its interactive term also reveal mixed results in the two regions. Whereas governance system promotes financial development in Madagascar, Mauritius and Mozambique, it reverses financial development in Malawi. The interactive term (i.e *pol* and *traop*) indicates a reversed relationship with finance in Botswana, Madagascar and Mauritius but positive effects

in countries like Malawi, South Africa and DRC. However, for ECOWAS, the system of governance promotes finance in Cape Verde and Gambia but retards financial development in Cote D'voire, Mali and Togo. However, the interactive term is negative in Cape Verde and Gambia but positive in Mali and Togo.

Finally, as is expected, the lagged dependent variable promotes financial development in seven countries of the two regions whereas the measure of economic development promotes financial development in only six countries in SADC and five countries in ECOWAS. Government spending presents mixed results in the two regions which is not surprising. Where as in SADC it reverses financial development in seven countries only the results of one country is statistically significant (i.e. Tanzania). However, the financial sector of Mozambique benefits from more government expenditure. Unlike SADC, the effects of government spending on financial development is negative in six countries with the coefficient of Gambia and Ghana statistically significant which is not surprising since in these countries especially in Ghana government keep issuing treasury bills and Eurobond which channel resources away from the financial sector. Like SADC only one country's financial system in ECOWAS which is Cote D'voire seems to benefit from more government expenditure.

6 Conclusion and Policy recommendation

In this paper we provided an empirical analysis of comparative study between ECOWAS and SADC on the role of inflation in explaining the state of financial development of the two regions. Furthermore, the study also seeks to find out if Rajan and Zingales Hypothesis which argues that simultaneous opening of both trade and financial sector is the key for financial development is supported in the two regions. Using dynamic panel approach and a composite measure of financial development, our findings provides evidence that in both regions inflation robustly reverses financial development with the effect in ECOWAS greatest. In addition, the study indicates that even though more simultaneously opening of the financial sector and trade lead to more financial development in SADC, trade openness alone can still trigger growth in the sector but more financial openness alone is detrimental to financial development of the region. Hence this seems to provide partial support for the hypothesis. However, in ECOWAS, the hypothesis is rejected.

Furthermore, one of the novelty of the study is the inclusion of communication variable in the form of access to mobile and telephones per thousand people in our model. The results indicate that financial system of both regions will expand more from increases access to mobile and telephones but with SADC benefiting more than ECOWAS. Other conditioning variables include government expenditure which seems to show that more of it reverses financial development in SADC but not in ECOWAS. Governance system and its interaction term were all statistically insignificant. The study therefore argues that the main factors explaining financial development in SADC are inflation, trade and financial openness and their complementarity term, government spending,

access to mobile and telephones. However, in ECOWAS, inflation, access to mobile and telephones and measure of economic development

On disaggregated analysis using SURE, the results presented mixed evidence. Nevertheless the evidence showed support to the dynamic panel approaches that inflation is a credible threat to financial development in many countries of the two regions. Furthermore, whereas access to communication induces financial development in many countries of the two regions, many countries revealed partial support for the Rajan and Zingales theory with Cote D'voire in ECOWAS revealing full support for the theory.

The study therefore recommends low and single digit inflation for these regions. This could be achieved by member states adopting inflation targeting framework as is done in some countries such as Ghana and South Africa. Further, easing access to mobile and telephone in the form of easing imports restrictions on smart phones can help promote financial development. In this direction, Ghana has taken the initiatives as it was demonstrated in 2015 budget that the importation of such phones will now come with duty free. Finally, since many countries have demonstrated partial support for the Rajan and Zingales hypothesis, it is necessary to consider optimal opening of trade and capital account flows but for Cote D'voire more simultaneous opening of the two holds the key to financial development of the country. Finally, in order to minimise the detrimental effects of government spending on finance in SADC, a more discipline fiscal policy should be adopted. This could be in the form of cutting expenditures on unproductive areas such as expenditure on recurrent expenditures.

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Table 1. Diagnostic test

Tests	SADC	ECOWAS
1. Serial correlation test	$F(1, 11) = 32.64, Pr > F = 0.0016$	$F(1, 11) = 42.745, Pr > F = 0.0000$
2. Heteroscedasticity	$LR \chi^2(9) = 141.01$ (Ass: homosk) $Pr > = 0.0000$	$LR \chi^2(9) = 194.13$ $Pr > \chi^2 = 0.0000$
3. Breuch-Pagan LM test	$\chi^2(45) = 246.828, (Pr = 0.000)$	$\chi^2(45) = 353.823, (Pr = 0.0000)$
4. FE model	$F(7, 301) = 7.19, (Pr > F = 0.0000)$	$F(11, 341) = 3.17, (Pr > F = 0.0004)$
5 Hausman test	$\chi^2 = 20.04 Pr > \chi^2 = 0.0289$	$\chi^2 = 25.09 Pr > \chi^2 = 0.0029$

Table 2. Results of composite financial index

Variables	SADC			ECOWAS		
	FE (LSDV)	FGLS	PCSE	FE (LSDV)	FGLS	PCSE
	Composite measure of FSD			Composite measure of FSD		
findex _{t-1}	0.811*** (0.0334)	0.824*** (0.0254)	0.825*** (0.0350)	0.799*** (0.0412)	0.823*** (0.0252)	0.835*** (0.0331)
rgdppc	-0.00177 (0.0306)	-0.0227*** (0.00539)	-0.0297*** (0.00852)	0.231*** (0.0712)	-0.0308** (0.0122)	-0.0232 (0.0184)
infl	-0.0438*** (0.00831)	-0.0467*** (0.0103)	-0.0400*** (0.0136)	-0.213* (0.108)	-0.0910* (0.0471)	-0.104 (0.0671)
gov	-0.0418*** (0.0100)	-0.0260** (0.0105)	-0.0305** (0.0154)	-0.0115 (0.0210)	0.00367 (0.0126)	-0.0127 (0.0211)
pol	0.00248 (0.00279)	0.00116 (0.00139)	0.00167 (0.00245)	-0.00334 (0.00416)	0.000216 (0.00275)	0.000368 (0.00410)
traop	0.0705** (0.0308)	0.0346*** (0.0129)	0.0432* (0.0221)	0.0102 (0.0404)	0.00398 (0.0261)	0.00937 (0.0446)
finop	-0.0667** (0.0220)	-0.0240* (0.0126)	-0.0364* (0.0191)	0.0291 (0.0343)	0.0218 (0.0254)	0.0244 (0.0407)
fintraop	0.000654** (0.000225)	0.000265** (0.000131)	0.000422** (0.000197)	-0.000314 (0.000523)	-0.000431 (0.000384)	-0.000495 (0.000622)
com	0.0254*** (0.00661)	0.0202*** (0.00334)	0.0236*** (0.00507)	0.0118** (0.00510)	0.0160*** (0.00430)	0.0156*** (0.00591)
trapol	-3.24e-05 (0.00018)	-6.60e-06 (0.000012)	-1.30e-05 (0.00019)	8.29e-05 (5.42e-05)	3.66e-05 (4.28e-05)	2.80e-05 (5.94e-05)
Constant	0.619** (0.279)	0.831*** (0.124)	0.840*** (0.175)	-0.540* (0.270)	0.949*** (0.152)	0.864*** (0.239)
Observations	372	372	372	372	372	372
R-squared	0.852		0.993	0.881		0.989
N		12	12		12	12

Robust standard errors in parenthesis ***p<0.01, **p<0.05, *p<0.1

Where rgdppc = real GDP per capita, infl = inflation, gov = government expenditure (%GDP), pol = polity2 traop = international trade openness, finop = capital flows or financial openness, fintraop = interaction term between trade and financial openness, com = access to mobile and telephones per 1000 people and trapol = the interaction term between trade openness and polity2. All variables are logs except pol, finop and trapol

Table 3. Results of Liquid liabilities as a percentage of GDP

Variables	SADC			ECOWA S		
	RE (AR (1))	FGLS	PCSE	RE (AR (1))	FGLS	PCSE
	Liquid liabilities as a percentage of GDP			Liquid liabilities as a percentage of GDP		
M3 _{t-1}	0.931*** (0.0169)	0.929*** (0.0137)	0.932*** (0.0202)	0.836*** (0.0249)	0.846*** (0.0241)	0.849*** (0.0410)
rgdppc	0.0149 (0.0114)	0.00886 (0.00660)	0.00964 (0.00915)	0.0613* (0.0316)	0.0448** (0.0197)	0.0564* (0.0333)
infl	-0.0414** (0.0165)	-0.0505*** (0.0119)	-0.0402** (0.0170)	-0.293*** (0.106)	-0.214*** (0.0507)	-0.278** (0.117)
gov	-0.0325 (0.0217)	-0.0328*** (0.0127)	-0.0276 (0.0197)	-0.0392 (0.0347)	-0.0319 (0.0205)	-0.0726 (0.0474)
pol	-0.00169 (0.00329)	-0.000855 (0.00170)	0.000334 (0.00241)	0.0105* (0.00634)	0.011*** (0.00361)	0.0172** (0.00678)
traop	0.0784** (0.0315)	0.0583*** (0.0204)	0.0691** (0.0347)	0.00864 (0.0628)	-0.0372 (0.0354)	-0.0244 (0.0733)
finop	-0.0935*** (0.0284)	-0.0596*** (0.0212)	-0.0795** (0.0345)	0.0595 (0.0569)	0.0728** (0.0352)	0.0885 (0.0645)
fintraop	0.000727** (0.000305)	0.000450** (0.000202)	0.000637** (0.000313)	-0.000816 (0.00086)	-0.0011** (0.00053)	-0.00128 (0.00099)
com	0.0104 (0.00658)	0.0107*** (0.00338)	0.0128*** (0.00491)	0.00971 (0.00785)	0.012*** (0.00450)	0.00726 (0.00954)
trapol	0.00032 (2.87e-05)	0.00028* (1.53e-05)	0.000159 (2.07e-05)	-0.000101 (8.83e-05)	-0.0001*** (5.03e-05)	-0.0002** (9.16e-05)
Constant	-0.171 (0.135)	-0.0249 (0.0884)	-0.120 (0.139)	0.223 (0.285)	0.452*** (0.160)	0.443 (0.329)
Hausman test		11.99 (0.213)			15.57 (0.1128)	
Observations	372	372	372	372	372	372
R-squared			0.978			0.970
N	12	12	12	12	12	12

Table 4. Results of ratio of Bank assets to the sum of bank assets and central bank assets

Variables	SADC			ECOWAS		
	FE(LSDV)	FGLS	PCSE	FE(LSDV)	FGLS	PCSE
	Bank assets to the sum of bank assets and central bank assets			Bank assets to the sum of bank assets and central bank assets		
dmba _{t-1}	0.615*** (0.0622)	0.897*** (0.0205)	0.850*** (0.0385)	0.782*** (0.0349)	0.906*** (0.0193)	0.898*** (0.0329)
rgdppc	-0.0652 (0.0485)	-0.00204 (0.00467)	-0.00869 (0.0140)	0.172** (0.0793)	-0.0211** (0.00951)	-0.0166 (0.0310)
infl	-0.026*** (0.00585)	-0.0249* (0.0130)	-0.0175 (0.0197)	0.0423 (0.0937)	-0.0208 (0.0448)	-0.0306 (0.0885)
gov	0.0236 (0.0249)	0.00792 (0.00845)	0.0237 (0.0247)	0.0115 (0.0331)	0.00287 (0.0112)	-0.00252 (0.0264)
pol	0.00648 (0.00375)	0.00551*** (0.00131)	0.00807* (0.00433)	-0.0126** (0.00575)	-0.00143 (0.00232)	0.000476 (0.00550)
traop	0.0565 (0.0396)	0.0222*** (0.00795)	0.0315 (0.0313)	0.0388 (0.0528)	0.0215 (0.0243)	0.0292 (0.0509)
finop	-0.0342 (0.0240)	-0.0208*** (0.00681)	-0.0453 (0.0342)	0.0302 (0.0456)	0.0155 (0.0221)	0.0355 (0.0448)
fintraop	0.000381 (0.000216)	0.000170** (6.99e-05)	0.000359 (0.000313)	0.000154 (0.000677)	-0.000106 (0.000327)	-0.000355 (0.000649)
com	0.0221* (0.0117)	0.00531* (0.00295)	0.0121 (0.00905)	0.0173** (0.00698)	0.00908*** (0.00336)	0.0110** (0.00520)
trapol	-0.002.31 (3.13e-05)	-0.0003*** (1.05e-05)	-0.000479 (3.10e-05)	0.000264*** (9.05e-05)	0.000365 (3.30e-05)	0.000161 (7.94e-05)
Constant	1.661** (0.618)	0.319*** (0.0686)	0.441*** (0.170)	-0.380 (0.437)	0.427*** (0.117)	0.401 (0.260)
Hausman test		77.86 (0.0000)			20.57 (0.0147)	
Observations	372	372	372	372	372	372
R-squared	0.909		0.992	0.903		0.981
N		12	12		12	12

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Table 5. Results of Bank private credits as a percentage of GDP

Variables	SADC			ECOWAS			
	FE(LSDV)	FGLS	PCSE	FE(LSDV)	RE(AR 1)	FGLS	PCSE
	Bank private credits as a percentage of GDP			Bank private credits as a percentage of GDP			
Bankprcr _{t-1}	0.819*** (0.0489)	0.906*** (0.0158)	0.902*** (0.0269)	0.845*** (0.0274)	0.875*** (0.0212)	0.875*** (0.0194)	0.871*** (0.0235)
rgdppc	-0.0307 (0.0464)	0.0195 (0.0123)	0.00522 (0.0212)	0.342*** (0.100)	0.0642* (0.0386)	0.0741*** (0.0256)	0.0650* (0.0353)
Infl	-0.0729*** (0.0203)	-0.0648*** (0.0187)	-0.0524 (0.0345)	-0.294*** (0.112)	-0.380*** (0.108)	-0.364*** (0.0717)	-0.373*** (0.112)
Gov	-0.0952*** (0.0234)	-0.0174 (0.0190)	-0.00843 (0.0413)	0.0215 (0.0408)	0.0162 (0.0423)	0.0128 (0.0243)	-0.000366 (0.0394)
Pol	0.000639 (0.00552)	0.00292 (0.00256)	0.00594 (0.00555)	-0.00625 (0.00655)	-0.00403 (0.00728)	-0.000959 (0.00437)	0.000172 (0.00641)
Traop	0.0515 (0.0645)	0.0103 (0.0215)	0.0747 (0.0520)	0.0246 (0.0630)	0.0630 (0.0728)	0.0332 (0.0437)	0.0134 (0.0778)
Finop	-0.0884** (0.0329)	-0.0617*** (0.0191)	-0.113*** (0.0429)	-0.0356 (0.0545)	-0.0677 (0.0656)	-0.0339 (0.0402)	1.93e-05 (0.0701)
fintraop	0.000889** (0.000334)	0.000562*** (0.000196)	0.00109** (0.000445)	0.000317 (0.000810)	0.000760 (0.000989)	0.000269 (0.000615)	-0.000345 (0.00107)
com	0.0550*** (0.0141)	0.0368*** (0.00592)	0.0424*** (0.0131)	0.0142* (0.00824)	0.0147 (0.00960)	0.00589 (0.00745)	0.0138 (0.0102)
trapol	-0.000629* (3.41e-05)	-0.000248 (2.16e-05)	-0.0006 (4.53e-05)	0.00089 (9.86e-05)	0.000754 (0.000103)	0.000422 (6.71e-05)	0.000386 (8.98e-05)
Constant	0.527 (0.353)	0.00490 (0.0972)	-0.227 (0.214)	-1.921*** (0.604)	-0.395 (0.341)	-0.308 (0.209)	-0.135 (0.354)
Hausman test		20.98 (0.0212)				14.87 (0.0946)	
Observations	372	372	372	372	372	372	372
R-squared	0.970		0.946	0.938			0.959
N		12	12		12	12	12

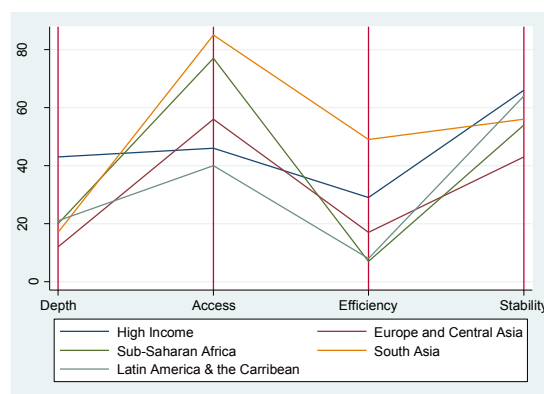
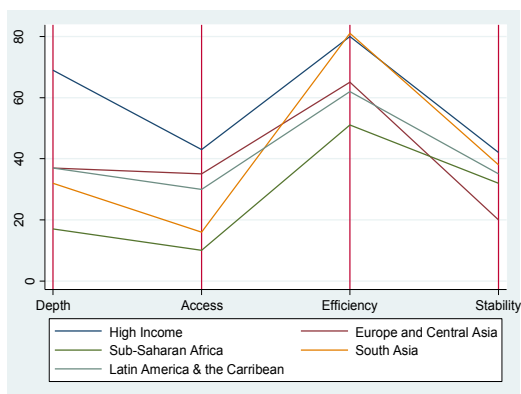
Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Appendix

Figure 1: Development in financial institution and markets

a. Development in the financial institutions.

b. Development in financial Markets



Source: own construction using information from Demirguc-Kunt, Cihak and Levine (2012)¹ based on Global Financial Development Database for financial system characterization of 205 countries. The figures show mean value of the indicators for the period 1960-2010.

¹ To show comparison between the proxy variables, the indicators are Winsorized truncating the top 5% and bottom 5% of the distribution by Čihák et al. (2012) see article for details

Table 1. Results of SADC

Variables	Composite measure of financial development					
	(1)	(2)	(3)	(4)	(5)	(6)
findex _{t-1}	0.903*** (0.0275)	0.864*** (0.0202)	0.861*** (0.0217)	0.852*** (0.0239)	0.812*** (0.0336)	0.811*** (0.0334)
rgdppc	0.0293 (0.0510)	0.0398 (0.0445)	0.0377 (0.0463)	0.0344 (0.0470)	-0.00756 (0.0324)	-0.00177 (0.0306)
infl	-0.0319*** (0.00510)	-0.0346*** (0.00427)	-0.0348*** (0.00386)	-0.0367*** (0.00443)	-0.0442*** (0.00927)	-0.0438*** (0.00831)
gov	-0.0476*** (0.0101)	-0.0402*** (0.0108)	-0.0393*** (0.0105)	-0.0403*** (0.0108)	-0.0488*** (0.00958)	-0.0418*** (0.0100)
traop		0.0719*** (0.0187)	0.0724*** (0.0185)	0.103*** (0.0299)	0.0761** (0.0298)	0.0705** (0.0308)
finop			0.00237 (0.0105)	-0.0307 (0.0214)	-0.0675** (0.0239)	-0.0667** (0.0220)
fintraop				0.000372* (0.000202)	0.000681** (0.000249)	0.000654** (0.000225)
com					0.0246*** (0.00686)	0.0254*** (0.00661)
pol						0.00248 (0.00279)
trapol						-3.24e-05 (1.89e-05)
Constant	0.401 (0.288)	0.184 (0.284)	0.206 (0.317)	0.136 (0.292)	0.650* (0.296)	0.619** (0.279)
Observations	372	372	372	372	372	372
R-squared	0.834	0.839	0.839	0.841	0.851	0.852

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Table 2. Results of ECOWAS

Variables	Composite measure of financial development					
	(1)	(2)	(3)	(4)	(5)	(6)
findex _{t-1}	0.830*** (0.0381)	0.827*** (0.0416)	0.829*** (0.0441)	0.828*** (0.0470)	0.816*** (0.0481)	0.799*** (0.0412)
rgdppc	0.290*** (0.0601)	0.279*** (0.0566)	0.276*** (0.0615)	0.281*** (0.0697)	0.229*** (0.0653)	0.231*** (0.0712)
infl	-0.288*** (0.0787)	-0.270** (0.0942)	-0.272** (0.0983)	-0.271** (0.0977)	-0.222* (0.104)	-0.213* (0.108)
gov	-0.0276* (0.0142)	-0.0297* (0.0159)	-0.0314** (0.0138)	-0.0339* (0.0164)	-0.00945 (0.0200)	-0.0115 (0.0210)
traop		0.0373 (0.0301)	0.0359 (0.0327)	0.0221 (0.0339)	0.00463 (0.0325)	0.0102 (0.0404)
finop			-0.00388 (0.00842)	0.0112 (0.0381)	0.0264 (0.0327)	0.0291 (0.0343)
fintraop				-0.000238 (0.000510)	-0.000416 (0.000462)	-0.000314 (0.000523)
com					0.0133** (0.00443)	0.0118** (0.00510)
pol						-0.00334 (0.00416)
trapol						8.29e-05 (5.42e-05)
Constant	-0.936*** (0.253)	-1.002*** (0.247)	-0.985*** (0.273)	-0.946*** (0.223)	-0.594** (0.215)	-0.540* (0.270)
Observations	372	372	372	372	372	372
R-squared	0.877	0.877	0.877	0.878	0.880	0.881

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Table 3. LSDV results without Zimbabwe and DRC

	No Zimbabwe	No DRC	No Zimbabwe and DRC
Variables	(1)	(2)	(3)
finde _{x_{t-1}}	0.829*** (0.0332)	0.824*** (0.0322)	0.848*** (0.0223)
rgdppc	-0.00475 (0.0344)	0.0434 (0.0242)	0.0612** (0.0226)
infl	-0.0340*** (0.00860)	-0.0540*** (0.0122)	-0.164** (0.0605)
gov	-0.0457** (0.0152)	-0.0493** (0.0160)	-0.0323 (0.0194)
pol	0.00293 (0.00321)	0.000941 (0.00261)	0.00262 (0.00240)
traop	0.0662* (0.0327)	0.0729* (0.0367)	0.0714* (0.0381)
finop	-0.0643** (0.0220)	-0.0524** (0.0189)	-0.0625** (0.0240)
fintraop	0.000609** (0.000219)	0.000498** (0.000195)	0.000550** (0.000206)
com	0.0251** (0.00843)	0.0182*** (0.00542)	0.0111* (0.00590)
trapol	-3.53e-05 (2.03e-05)	-2.38e-05 (1.77e-05)	-3.41e-05** (1.40e-05)
Constant	0.585* (0.312)	0.291 (0.166)	0.0532 (0.176)
Hausman test	17.13	19.01	24.78
prob	(0.0468)	(0.0401)	(0.0032)
Observations	341	341	310
R-squared	0.870	0.856	0.883

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Table 4. SURE estimates of SADC (composite measure of financial development)

Variables	Botswana	Madagascar	Malawi	Mauritius	S. Africa	Swaziland	Zimbabwe	Tanzania	Mozam	DRC
findex _{t-1}	0.354*** (0.118)	0.454*** (0.0994)	0.587*** (0.125)	0.504*** (0.102)	0.745*** (0.0801)	0.601*** (0.171)	-0.519*** (0.188)	0.0590 (0.184)	0.242** (0.113)	0.224 (0.156)
rgdppc	0.113 (0.114)	0.454*** (0.134)	0.815*** (0.232)	0.285** (0.120)	0.606*** (0.126)	-0.312* (0.172)	-0.0364 (0.268)	-4.897*** (1.154)	0.671*** (0.223)	0.350* (0.204)
gov	-0.124 (0.0967)	0.0500 (0.0478)	-0.108 (0.0793)	-0.115 (0.0703)	0.0650 (0.101)	-0.0221 (0.132)	-0.00455 (0.0554)	-0.344*** (0.120)	0.364*** (0.0997)	-0.0316 (0.0815)
infl	1.889*** (0.393)	-0.225*** (0.0817)	0.0604 (0.169)	-0.307*** (0.113)	-0.118 (0.302)	-0.167 (0.271)	-0.244** (0.110)	0.0494 (0.358)	0.172 (0.188)	-0.0543** (0.0256)
com	0.0793** (0.0316)	0.0259*** (0.00902)	0.0130 (0.0226)	-0.00751 (0.0319)	-0.0561** (0.0236)	0.0495** (0.0225)	-0.408*** (0.0935)	0.600*** (0.116)	0.0102 (0.0363)	0.110*** (0.0318)
finop	0.0514 (0.0893)	-0.0538 (0.0814)	-0.928* (0.495)	0.132*** (0.0386)	-0.0149 (0.0983)	0.112 (0.169)	0.468** (0.235)	0.638* (0.329)	0.0457 (0.246)	-0.0791 (0.201)
traop	2.803** (1.207)	0.0550 (0.0552)	0.981* (0.516)	1.643** (0.811)	-0.250 (0.235)	-1.245 (0.943)	0.117 (0.259)	-0.369* (0.218)	-0.213 (0.289)	0.499* (0.275)
fintraop	-0.000237 (0.00097)	0.000239 (0.00166)	0.0115* (0.00653)	-0.00094*** (0.000309)	-0.000122 (0.00210)	-0.000927 (0.00109)	-0.00256 (0.00273)	-0.0134** (0.00563)	0.00324 (0.0047)	0.00767* (0.00441)
pol	0.278 (0.191)	0.0140*** (0.00526)	-0.0656*** (0.0169)	0.184** (0.0796)	-0.00587 (0.0191)	0.0550 (0.103)	-0.0341 (0.0223)	-0.0117 (0.0642)	0.0367** (0.0164)	-0.0360 (0.0274)
trapol	-0.00330* (0.00177)	-0.000190* (9.95e-05)	0.00088*** (0.000294)	-0.00140** (0.000684)	0.000627* (0.000343)	-0.000690 (0.000643)	0.000527 (0.00048)	-0.000802 (0.00094)	-0.00027 (0.0003)	0.0011*** (0.00041)
Constant	-10.61* (5.888)	-0.450 (0.587)	-6.563*** (2.381)	-7.698** (3.824)	-3.093** (1.435)	9.832* (5.810)	8.403*** (2.199)	33.38*** (6.823)	0.0597 (1.076)	0.0537 (1.506)
Observations	31	31	31	31	31	31	31	31	31	31
R-squared	0.950	0.893	0.868	0.994	0.935	0.880	0.679	0.976	0.927	0.897

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5. SURE estimates of ECOWAS (composite measure of financial development)

Variables	Benin	Cape Verde	Cote D'voire	Gambia	Ghana	Mali	Niger	Nigeria	Senegal	Togo
findex _{t-1}	0.560*** (0.153)	0.638*** (0.0758)	0.0640 (0.0417)	0.642*** (0.137)	-0.306** (0.152)	0.368* (0.192)	0.884*** (0.0626)	0.623*** (0.125)	0.505*** (0.0560)	0.110 (0.139)
rgdppc	0.925 (0.777)	-1.209** (0.541)	0.225*** (0.0584)	1.943 (1.227)	2.077*** (0.516)	1.010*** (0.338)	0.658*** (0.171)	0.0380 (0.338)	1.132*** (0.138)	0.237 (0.258)
gov	0.0979 (0.0978)	-0.141 (0.148)	0.327*** (0.0358)	-0.494*** (0.191)	-0.325*** (0.110)	-0.0783 (0.0597)	-0.0523 (0.0941)	-0.00698 (0.0525)	0.0472 (0.0288)	0.0964 (0.130)
infl	0.0236 (0.301)	-1.434** (0.658)	-0.152 (0.113)	-0.664 (0.410)	-0.0572 (0.102)	-0.261 (0.168)	-0.966*** (0.151)	-0.413*** (0.133)	-0.397*** (0.0891)	-0.857*** (0.259)
com	0.0902** (0.0390)	0.375** (0.162)	0.0482*** (0.00516)	-0.0494 (0.0488)	0.0242 (0.0375)	-0.0335 (0.0233)	0.0447** (0.0178)	0.0299 (0.0243)	0.0122*** (0.00415)	0.0212* (0.0124)
finop	1.591** (0.771)	0.00866 (0.0402)	-0.348*** (0.112)	1.347*** (0.484)	0.349*** (0.118)	-1.084*** (0.239)	-0.219* (0.117)	0.283 (0.209)	0.0404 (0.424)	-13.60** (5.383)
traop	-0.845* (0.476)	-3.250*** (1.094)	0.273 (0.192)	1.421** (0.553)	-0.0210 (0.120)	1.095*** (0.206)	0.269* (0.162)	-0.406* (0.226)	0.0956 (0.130)	-4.318** (1.877)
fintraop	-0.0257** (0.0125)	-0.037*** (0.0118)	0.00537*** (0.00179)	-0.014*** (0.00508)	-0.0064*** (0.00216)	0.0185*** (0.00463)	0.00500** (0.00238)	-0.00505* (0.00305)	0.000131 (0.00695)	-0.0551** (0.0216)
pol	0.00753 (0.0431)	0.101*** (0.0379)	-0.0505** (0.0243)	0.177*** (0.0672)	-0.00849 (0.0112)	-0.0622** (0.0276)	0.0151 (0.00990)	0.00440 (0.0120)	0.0156 (0.0589)	-0.290*** (0.0978)
trapol	-0.000259 (0.000747)	-0.000883* (0.000475)	0.000536 (0.000331)	-0.0017** (0.000703)	0.000213 (0.000218)	0.000939* (0.000549)	-0.000179 (0.000247)	0.000179 (0.000257)	-0.000224 (0.000942)	0.00288*** (0.00105)
Constant	-0.678 (3.787)	19.91*** (5.588)	0.564 (0.821)	-15.29** (6.857)	-5.902** (2.854)	-7.206*** (2.499)	-4.098*** (1.080)	3.132 (2.148)	-5.678*** (1.010)	0.2.677 (2.851)
Obs	31	31	31	31	31	31	31	31	31	31
R-squared	0.903	0.987	0.986	0.662	0.965	0.876	0.978	0.897	0.971	0.735

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6. Correlation matrix of residuals of SADC

	Botswana	Madagascar	Malawi	Mauritius	S. Africa	Swaziland	Zimbabwe	Tanzania	Mozambique	DRC
Botswana	1.000									
Madagascar	-0.0672	1.000								
Malawi	0.3309	0.5564	1.000							
Mauritius	-0.1484	-0.5842	-0.5081	1.000						
S. Africa	-0.028	0.2235	0.611	-0.0646	1.000					
Swaziland	0.3989	0.6514	0.8125	-0.7558	0.3118	1.000				
Zimbabwe	-0.6122	0.6154	0.2692	-0.2905	0.399	0.2106	1.000			
Tanzania	0.0743	-0.7427	-0.5503	0.6343	-0.1222	-0.6866	-0.5211	1.000		
Mozambique	0.0842	-0.4107	-0.1203	-0.0545	0.202	-0.2085	-0.1845	0.4682	1.000	
DRC	0.536	-0.3834	0.111	0.1129	0.1123	0.0315	-0.53	0.3671	0.1522	1.000

Breusch-Pagan LM test of independence: $\chi^2(45) = 246.828$, Pr = 0.0000

Table 7. Correlation matrix of residuals of ECOWAS

	Benin	C.Verde	C.D'voire	Gambia	Ghana	Mali	Niger	Nigeria	Senegal	Togo
Benin	1.000									
C.Verdi	-0.3461	1.000								
C.D'voire	0.04	-0.862	1.000							
Gambia	0.2692	0.004	-0.3525	1.000						
Ghana	-0.023	0.8043	-0.8771	0.1592	1.000					
Mali	-0.086	0.147	-0.4021	0.3044	0.3763	1.000				
Niger	0.4375	-0.8396	0.7562	0.0414	-0.7799	-0.3779	1.000			
Nigeria	0.2617	-0.277	0.1822	0.3715	-0.2134	-0.3062	0.5999	1.000		
Senegal	0.5323	-0.6039	0.3794	0.2198	-0.4524	-0.0227	0.7984	0.6362	1.000	
Togo	0.4286	-0.8275	0.6818	0.6818	-0.6515	-0.1267	0.8182	0.5324	0.7836	1.000

Breusch-Pagan LM test of independence: $\chi^2(45) = 353.823$, Pr = 0.0000. C.D'voire =Cote D'voire, C.Verdi=Cape Verdi

Table 8. Showing variables used in the study with description and sources

Variable	Description	Source
<i>bankprcr</i>	Private credit provided banks to GDP	Global Financial Development database (GFDD)
<i>dmba</i>	Ratio of deposit money bank assets to the sum of deposit money bank asset and Central Bank assets	GFDD
<i>m3</i>	Ratio of liquid liabilities to GDP (m3)	(GFDD)
<i>gov</i>	Government expenditure to GDP	World Bank's Africa Development Indicators, 2013,
<i>Infl</i>	This inflation calculated as annual percent change of the consumer price index	World Bank's Africa Development Indicators, 2013,
<i>Com</i>	Telephone lines per 1000 people	World Bank's Africa Development Indicators, 2013,
<i>pol</i>	negative ten for extreme autocratic regime and positive ten for extreme democracy	Polity IV
<i>traop</i>	This trade openness which is the sum of imports and exports	World Bank's Africa Development Indicators, 2013,
<i>finop</i>	Financial openness index	Chinn and Ito index
<i>rgdppc</i>	Real GDP per capita (at 2005 US \$)	World Bank's Africa Development Indicators, 2013,

