IMPACT OF FINANCIAL DEVELOPMENT ON ECONOMIC GROWTH IN SUDAN: SHORT-RUN AND LONG-RUN ANALYSIS

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ABSTRACT

Purpose: The aim of this paper is to investigate the influence of banking sector on economic growth apart from other financial development tools. Four control variables are included in the analysis, precisely, domestic credit provided by banks to private sector, liquid liabilities, bank deposit and trade ratio.

Design/Methodology/Approach: This study employs time series data of four financial indicators and economic growth in Sudan from 1980 to 2015. Using Auto Regressive Distributed Lag ARDL and associated ECM.

Findings: The study reveals positive link (relationship) between economic growth and the financial development indicators. Also, the empirical results indicate that change in economic growth is positively related to the most of financial development indicators coming from banking sector. In view of long-run results, the analysis pointed out, liquid liabilities, trade ratio and domestic credit provided to private sector bring to bear direct (positive) impact on economic growth, while bank deposit affects economic growth negatively. In the short-run, the local (domestic) credit by banks to private sector, liquid liability and trade ratio exert negative impact on economic growth, while bank deposit shows positive relationship.

Practical Implications: The findings suggest that policy makers need to concentrate on bank credit to private sector, raise the liquidity by offering e-banks services and

implement policies for financial system reform especially banks to ensure the sustainability of real GDP growth.

Originality/Value: *This article stretches a precise, truthful and objective evaluation of the banking sector and making operative recommendations on financial sector improvement in Sudan. This study also underlines the importance of giving more attention to the banking sector as financial institution that can promote economic growth in Sudan.*

JEL Classification Code: C10, G20, O40

Key words: economic growth, financial development, Sudan

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1. INTRODUCTION

Economists have given substantial attention to investigate the link between financial markets development and economic growth, at hypothetical and empirical levels together; the emphasis is largely given to the association between security markets expansion and economic growth. Empirical investigations of the relationship between growth and financial development indicators in Sudan have been relatively limited, because of the small size of the capital market.

In spite of the significance of the financial sector and its primary role in the economic growth, still its title role to expedite the growth in various third world economies is limited including Sudan. This is because, in lots of these countries the financial establishments are yet undeveloped, this combined with absence of fortification of their markets concerning the emergent competition. Furthermore, the the financial sector dominated by slight number of commercial banks in nearly most developing economies, which may possibly challenge the efficient distribution of resources (Mohamad, 2008).

Like in many developing and emerging economies, Kireyev A. (2001) concluded in his study that, after many years of suppression, financial and political volatility synchronize with extended old civil war, Sudanese financial market seems to be fledgling and underdeveloped. Financial institutions and financial markets other than banks are small and not having been developed, moreover financial mediation in Sudan is week. For long time, financial activities were ruled and controlled by banking sector mainly commercial banks. In recent times government authorities have proceeded on a chain of reformations in endeavor to build up the financial system and upgrade the efficiency of the banking sector by implementing together direct and indirect financial strategy tools that enable it to oversee the credit policy beside controlling the money supply via interest rates. Central Bank of Sudan (CBS) revolved to Islamic approaches of finance in the mid of 1990s, after the accomplishment of the Islamization of this sector in 1997 and espouses financial implements such as Murabaha, Musharaka, Mudaraba and Salam which have been applied as an alternative to interest rate.

This study is conducted in Sudan which, is one of the biggest countries in Sub-Saharan Africa. Sudan has over the years adopted various economic and financial reforms aimed at promoting economic growth and development. In addition, Sudan has witnessed radical change in its financial system from traditional to the adoption of Islamic rules at the beginning of 90s.

1.1. Sudan's Financial Services Sector

Sudan's financial sector continues to be dominated by banks operating under Islamic modes of finance and was composed of 37 banks at the end of 2016. Equity injections to recapitalize weak banks have led to the Central Bank of Sudan (CBS) and the government fully or partially owning 41% of the banks. Sudan is characterized by weak financial inclusion and depth, which can severely undermine the mobilization of savings and the reduction of poverty. Credit to the private sector dropped by 52.3 percentage points to 6.7% of GDP at the end of 2016 from the maximum score in 2012.

The absence of an interbank market has led to persistent excess reserves. However, the Central Bank of Sudan (CBS) is in the process of developing an effective Sharia-compliant liquidity management instrument. Sudan's stock exchange and insurance sectors are small, with the Khartoum Stock Exchange being the principal market for stock exchange in the country. Nonetheless, the online trading system introduced in March 2016, with African Development Bank (AfDB) support, is expected to enhance domestic resource mobilization, such as sukuk bonds, on which Sudan heavily depends for financing infrastructure and social services. Sudan's financial system, while experiencing substantial growth in recent years, leftovers week compare to its district peers. Intermediation in Sudan is limited, the equity and currency marketplaces are insufficient, and non-bank financial institutions markets and are undersized and immature.

Still, the banking sector forms the backbone of Sudan's financial system and is the primary source of funding for the domestic economy. Public banks dominate the sector and account for around 50% of total banking sector assets. Systematic risk is low, largely due to low levels of intermediation and the sector's small size and relative isolation from global financial markets. Recent growth in the banking sector, Sudan continues to be under-banked, as most banking and financial institutions are concentrated around the Khartoum area. In efforts to increase access to finance, the CBS established a microfinance unit in 2007 and has since 2009 required all commercial banks operating in the country to have established microfinance offices and allocate 12% of total loans to microfinance lending operations. The CBS has also introduced the Private Sector Development Project in 2009, which offers grants to prospective entrepreneurs via a business plan competition.

About a decade ago, authorities get on a chains of restructurings to reinforce the whole financial system and advance the concert of the banking sector. Supervisory and legal and regulatory frameworks were improved, particularly in the areas of corporate governance, risk management, and provisioning. Restructuring processes were also implemented for two banks, including the Omdurman National Bank, to improve their financial position. Sudan's fixed income market is based on Islamic Sharia fundamentals. Government Musharaka Certificates and Government Investment Certificates, similar to conventional treasury bills and government bonds, as well as Central Bank Igarah Certificates (additional Islamic certificates), are regularly issued by the Ministry of Finance and National Economy. As of April 2011, Sudan received no long-term sovereign rating by any of the three major credit rating agencies.

1.2. Research Problem

Since 1980, economic growth in Sudan has witnessed many fluctuations due to different economic, social, political and cultural factors. These fluctuations can be classified in different periods of time. In 1980s economic growth was negative in some years, while in 1990s on average it was almost 5% due to liberalization policy implemented by the government as a reflection of deficit finance, which related to financial sector. While in the first decade of the 21st century, the economic growth was very high reaching 11% in one of the years and this is due to petroleum exports before secession of South Sudan in 2011. After secession, again Sudan

has faced bottleneck in production, which slowdown the economic growth, so the financial sector was expected to utilize the economic surplus came from petroleum sector to finance all sectors especially agricultural one, which is considered to be as an engine for economic growth. For this reason, the research is intended to study this vital area. With the huge economic resources of Sudan, still its economic growth is not showing progress except during the period of petroleum production. This indicates the inefficiency of factors influencing economic growth including the financial indicators which are assumed to play a significant role in increasing production. So the study states the problem as to what extent the financial sector impacts the economic growth, the consequences of this is that, the financial sector may not able to mobilize saving to finance the needy sectors which, may lead to slowdown of economic growth in Sudan.

1.3. Research Objectives

The basic objective of this paper is to examine the effect of financial development on economic growth in Sudan in short and long-run, while other objectives are:

- 1- To point out the short and long-run impact of the domestic credit provided by banks to private sector on economic growth.
- 2- To scan the impact of short and long-run liquid liabilities on economic growth.
- 3- To examine long and short-run impact of bank deposits on economic growth.
- 4- To investigate the short and long-run effect of the trade ratio on economic growth.

1.4. Research Hypotheses

The research is conducted with the aim of testing the subsequent hypotheses in the context of the as follow:

H1: Domestic credit provided by banks to private sector is significantly and positively related to economic growth in long and short run.

H2: Liquid liabilities is significantly and positively related to economic growth in long and short run.

H3: Bank deposit is significantly and positively related to economic growth in long and short run.

H4: Trade ratio is significantly and positively related to economic growth in long and short run.

2. LITERATURE REVIEW

The discussion has conventionally turned around two subjects. The first concerns with whether improvement in the financial scheme upshots in a more rapidly economic growth, and the second issue re-counts to how financial growth influences economic growth. A substantial part of literature has developed, equally at the hypothetical and practical level, trying to respond to the above questions. Even though several empirical studies have examined the link between financial depth and economic growth, where the outcomes are unclear (Pagano, 1993; and Levine, 1997, 2003).

Ahmed Khater (2014) examined the vigorous link between financial development and economic growth in Sudan for the period of 1970–2012. The study shown the long-run association given the variables examined. The outcomes of this study indicate that financial development has made a minor impact (contribution) to speed up economic growth in this country. Sufian (2012) examined the influence of financial development on economic enactment in Sudan during the period (1970- 2007) by applying the Autoregressive Distributed Lag (ARDL) technique to co-integration. The key observed outcomes show a weak link between financial development and economic growth in Sudan. These outcomes may be credited to the miss-allocation of financial resources by banks, together with the lack (absence)

of a proper investment environment needed to boost substantial private investment and encourage growth in the long run, and improve the poor quality of credit exchange of the banking system in Sudan. Safiat (2013) examined empirically the long and short-run link between financial development and economic growth in Sudan for the period of 1970- 2011. Her study uses (ARDL) method to co-integration. The investigation is done by implementing three variables to measure the scale of financial developments namely the ratio of liquid liabilities to nominal GDP, credit ratio to private sector as a proportion of GDP and broad money supply to GDP. Concerning financial development variables, the outcome of the long run investigation shows that liquid liabilities and credit provided to the private sector reveal direct (positive) effect whereas, money supply has negative effect on real per capita GDP. These outcomes may be accredited to the frail capital sordid of Sudanese banks, the too much cost of borrowing because of inadequate inter-bank competition, the risk of spread out credit to activities other than trade, and the inappropriate investment environment needed to enhance substantial private investment and encourage growth in the long run. Constantinou et al (2013), concluded that, concerning the economy in Sudan, one of the key significant factors in describing economic growth is the quality of the institutional surroundings. They use ARDL approach to cointegration to test for long and short-run link between institutional (including financial) quality and other conditioning economic indicators with economic growth. The political freedom index revealed a negative impact on the economic performance of Sudan and statistically significant, which indicate that, the absence of political freedoms is detrimental to its society in general which, in turn affect negatively the performance of financial institutions. Eugene, (2016) investigated the link concerning economic growth and financial intermediary development in Nigeria during the period 1981–2011. The outcomes demonstrate that the link between financial development and economic growth in Nigeria is almost similar to that is noticed mostly in oil-dependent countries. The link between economic growth and financial intermediary development in Nigeria is bring into being negative and insignificant in the long-run, while in the short-run is found to be significantly negative. Tran & Nguyen, (2020), utilizes a sample of 95 registered commercial banks through fifteen years from 2004 to 2018 in six Southeast Asian countries. They concluded that the non-linear relationship proposes that economic growth might react in a different way to the degree of financial development when it leftovers under or above the definite threshold level. That is to say, alterations in financial development strategies might impact the level of financial development and economic growth differently in an altered state of policy interference.

Kumar & Paramanik, (2020), studies the relationship between financial development and economic growth in India during 1996-2018. The study uses time-series data of real gross domestic product (GDP) and ratio of broad money to GDP as a measure for financial development. The findings propose that; financial development influences economic growth positively in the long run, while the effect is negative in the short run. Aluko and Ibrahim (2020) examined twenty-eight Sub-Saharan African countries to find the verge between institutions and finance-growth relationship. They employed different institutional deputations as threshold variable and conclude that, when International Country Risk Guide (ICRG) dataset was applied, then the financial development does not stimulate economic growth below the optimal level of institutions and the opposite is true. Unexpectedly, they found that growth encouraging sound effects of finance are greater for those states framing low institutional quality than high institutional quality. Bong, A., & Premaratne, G. (2019), investigated the influence of financial integration on economic growth in different countries of Southeast Asia during the period 1993-2013. They concluded that financial integration has a substantial positive influence on economic growth in Southeast Asia. These results propose that growth of financial integration might advance the productive capacity of the economy, together with more investments and effectual distribution of capital, and therefore improving economic growth in

this region. Camba, A. C., & Camba, A. L. (2020), uses the autoregressive distributed lag (ARDL) bounds testing approach to cointegration, jointly with Granger causality test based on vector error correction model (VECM) to investigate the vigorous link between domestic credit, liquidity and stock market as proxy for financial development on the economic growth in Philippine including the period 1995 to 2018. The results showed a long-run relationship of these variables on GDP growth. Rahman, et al. (2020), examines the influence of financial development on economic growth applying the Markov Switching Model in Pakistan during the era 1980–2017. The outcomes founded on two-state Markov switching model ratify the Schumpeter's opinion that finance motivate growth. The outcome discloses that financial development supplements economic growth equally in low and high economic growth regimes in Pakistan. Yet, the influence of financial development on economic growth is set up to be comparatively higher in the high-growth regime. This indicates that economic growth reacts in a different way to financial development in low-growth and high-growth regimes. Qazi, et al. (2014), applies self-growing economic model and use time series data (1975-2009) from China to specify the long run link between trade openness and economic growth. By means of autoregressive distributed lag approach (ARDL) to cointegration and rolling regression technique they conclude that trade openness as proxy of financial development is positively linked to economic growth in the long run and short run. Ali & Fie (2016), examines the influence of capital market, foreign direct investment and real interest on Economic Growth in Malaysia during 1988- 2012, by applying ARDL and Error Correction Model (ECM). The outcomes of the study propose that there is long- run cointegration between the capital market, foreign direct investment, real Interest rate and economic growth. The outcome also proposes that capital market and real interest rate have positive impact on economic growth in the short run and long run. Hussein et al. (2020), examined the relationship between financial development and economic growth in Oman using data covers the period from 1980 to 2017. They applied ARDL technique to test for cointegration and Error Correction Model (ECM). The key outcome of the study proposed that the financial development indicators specified particularly trade ratio and broad money, influence the economic growth positively in Oman. Whereas the domestic credit provided to the private sector influences the real GDP growth negatively.

3. METHODOLOGY, MODEL AND DATA

This part Clarify the methodology adopted to test the impact of financial development as independent variable which is measured by four indicators precisely (credit provided to private sector domestically by banks, trade ratio, bank deposits and liquid liabilities) on economic growth as dependent variable in Sudan. This study focuses on econometric techniques which was employed to examine long and short-run relationship between variables under study. The declared relationships were estimated using Ordinary Least Square, co-integration and error correction model methods (approaches).

In the present research, the ARDL approach for co-integration is used which, was basically introduced by Pesaran and Shin (1999) and future developed by Pesaran et al. (2001).

3.1. Empirical Model

The form of the empirical model to be estimated is as follow:

$$RGDP \equiv F(DCPSB, LLR, BD, TRR) \quad (1)$$

$$\text{LogRGDP} = \alpha_0 + \alpha_1 \text{LogDCPSB} + \alpha_2 \text{LogLLR} + \alpha_3 \text{LogBD} + \alpha_4 \text{LogTRR} + \varepsilon_t \quad (2)$$

RGDP $\equiv$ real GDP per capita used to indicate economic growth

DCPSB $\equiv$ Domestic Credit to Private Sector by Banks as percentage of GDP

LLR $\equiv$ Liquid Liabilities Ratio as percentage of GDP

BD $\equiv$ Bank Deposits Ratio as percentage of GDP

TRR $\equiv$ Trade Ratio as percentage of GDP

The data used represent a set of all indicators considered to conduct the study in Sudan 1980 to 2015. The data is attained basically from two sources, the Central Bank of Sudan's the annual reports and the data published by the World Bank as World Development Indicators.

4. EMPIRICAL RESULTS

4.1. Unit Root Test Result

Since current research is reliant on the examination of impact of indicators of financial development (local credit by banks to private sector, liquid liabilities, trade ratio and bank deposit) on growth in Sudan covering 25 years from 1980 to 2015, it requires testing stationary of every indicator (variable) involved in this research. The stationary tests allow for verifying if the whole chain is stationary or non-stationary. To examine the non-stationary, Phillip-Perron (PP) test is used. The outcomes of PP test are displayed in table (1). Outcomes show that all indicators are integrated of the order 1(1) which in this case shows stationary at first difference. The result supported the run of ARDL bounds procedure to determine whether there is a long-run relationship between the indicators and its consistent with what in the economic literature which suggests that many macroeconomic indicators are non-stationary at the level, while they stationary at the first difference 1(1).

Table 1 Test of Unit Root for Stationary of Variables

variable	Level			1 st Difference			Order of integration
	With Constant	With Constant & Trend	Without Constant & Trend	With Constant	With Constant & Trend	Without Constant & Trend	
Log(RGDP)	2.9986	-1.1582	2.8352	-1.5797	-7.6037 ***	0.0828	1(1)
Log(LR)	-1.2285	-1.5002	-0.6790	-5.3809 ***	-5.3043 ***	-5.4417 ***	1(1)
Log(TR)	-1.3870	-1.5273	-0.9856	-5.9503 ***	-5.8571 ***	-5.9976 ***	1(1)
Log(DCPS)	-2.5504	-2.5531	-1.2443	-3.8173 ***	-3.8391 **	-3.8344 ***	1(1)
Log(BD)	-1.6798	-1.3275	-0.4900	-4.4797 ***	-4.4221 ***	-4.5468 ***	1(1)

Source: Calculation of the author based on data

Notes:

a: (***) Significant at the 1%; (**) Significant at the 5%; and (*) Significant at the 10%.

b: Lag Length according to Schwarz's information criterion (SIC)

c: Probability is according to MacKinnon (1996) one-sided p-values.

4.2. Bound Test for Co-Integration

In this part co-integration test is used to find long run relationship between growth and indicators of financial development. Based on the unit root test results, the long run link is going to be examined by running out bound test for co-integration given ARDL techniques. Table (2) below shows outcomes of the bound test of a long-run link, where calculated F (8.353648) is greater than critical value (the upper limit) at the 1% (5.7) level of significance. The result indicates the null hypothesis of no co-integration is rejected, which means co-integration

association among variables subsists. This result indicates that, the financial development indicators considered in this study impact the economic growth in Sudan.

Table 2 ARDL Bounds Test for Co-integration

Test statistics	value	K= number of variables
F-statistics	8.353648	4
Critical Value Bounds		
Significance	Lower limit	Upper limit
10%	3.03	4.06
5%	3.47	4.57
2.5%	3.89	5.07
1%	4.4	5.72

Source: Author own calculation based on data

4.3 Estimated Coefficients (Elasticities) in the Long run

Table (3) below shows overall goodness of fit of the assessed equation is reasonably high, where Adjusted $R^2 = 0.89$. The F-Statistics test is statistically significant at 1% level, which indicates the significance of the overall model. Additionally, the outcomes in table (3) show that three of financial development variables particularly, liquid liabilities, domestic credit provided to private sector by banks, and trade ratio influence the real GDP directly (positively) and bank deposits has negative impact on real GDP in Sudan.

Table 3 The Long-run estimation of Coefficients (elasticities)

Variable	Coefficient	Std. Error		R^2	Adj. R^2	F-Statistic	Prob.
Constant	4.744597 (14.803383)*	0.320508	0.0000	0.96	0.89	13.3	0.0000
LOG(DCPSB)	0.289455 (6.087012)*	0.047553	0.0002				
LOG(LLR)	1.520499 (4.367619)*	0.348130	0.0018				
LOG(BD)	-1.832560 (-4.643637)*	0.394639	0.0012				
LOG(TR)	0.115710 (2.452615)**	0.047178	0.0366				
@TREND	0.041295 (16.822472)*	0.002455	0.0000				

Source: Author own calculation based on data

*Significant at 1% level

**Significant at 5% level

Table (3) indicates the outcomes of the long- run association between growth of real GDP per capita (GRGDP) and the other regressors. As expected, the local (domestic) credit by banks to private sector has shown the positive sign. But, still the link between them in terms of elasticities leftovers highly weak, in the sense that an increase in domestic credit provided by banks to private sector by 1%, results in a respective increase in economic growth by only 0.29 %. This outcome is consistent with Ying, Abdul Galil , (2008), Umar (2010) and Safiat (2013).

As it is shown also liquid liabilities has the expected positive sign. That means liquid liabilities reveals a direct (positive) influence on economic growth in the long run and statistically significant, the association between them in term of elasticities come to be strong, as an increase by 1% in liquid liabilities results to a corresponding economic growth increase

by 1.5%. This outcome is consistent with Sufian (2007), Abdul Galil and Ying, (2008) and Kivank (2014) results.

The effect of bank deposit as it is shown in table (3) on economic growth is negative. That means bank deposit bring to bear a negative impact on economic growth in the long run and statistically significant. The link between them in term of elasticities continue to exist effective, where an increase by 1% in bank deposit cause to a corresponding economic growth decrease of 1.8 % point. The anticipated coefficient is extremely significant in the case of bank deposit. Even though the outcome of the negative association between bank deposit and economic growth stated in this paper is conflicting with common proof in the empirical literature, it is not astonishing in the case of Sudan. A conceivable clarification for that over our study period is that not all the households in the country are covered with various banking facilities. Another reason may be the distrust of people on banks; in addition, deposits are used in fast profit generation activities rather than productive activities. Or it may be attributed to the weak regulatory environment where the financial institutions are operating in. This finding is consistent with Chauhan (2015), Liang and Reichert (2006), Awdeh (2012) and Samson and Tarila (2013).

The effects of trade on growth are captured by openness variable, which is measured as the sum of imports and exports as a percentage of GDP (Levine et al, 2000). Hypothetically the sound effects of trade on economic growth may be negative or positive (Safiat 2013), in this way, the net sound effects can be specified only empirically. As it is shown in table (3) trade ratio has the expected positive sign. That means trade ratio shows positive effect on economic growth in the long run and statistically significant, the association between them concerning elasticities leftovers weak. An increase in trade ratio by 1% cause an increase to a corresponding economic growth by 0.11%. This is may be accredited to the pattern of trade since it is not in favor of inputs (capital goods) instead of directed towards consumption goods, this might have a tendency to jostle out domestic production. Likewise, it might be accredited to the constraint (restrictions) on trade (tariffs). This outcome is consistent with Sufian (2007) results.

The time trend which is significant shows that there has been an upward trend in economic growth, much of which could be explained in terms of the impact of the financial development indicators. The overall trend of the model is shown in table (3) which indicate it is significant and the average economic growth rate taking into consideration the financial development indicators used is about 4.1 % (dynamic economic growth with respect to variables taken in the model).

4.4. Short-run estimated Coefficients (Elasticities)

At last, the short-run drives were assessed using ARDL method in which the residuals generated from the corresponding assessed long-run equation are applied as error correction term (ECT). The results are presented in the following table. Lagged residual coefficient (EC_{t-1}) in the ECM form indicates the quickness of correction in the equilibrium direction subsequent to a shock to the system. When ECT is having negative and statistically significant, which is the case in our study as it is shown in table (4), this authenticates (validate) our system and the following results are shown:

The local (domestic) credit by banks to private sector indicator revealed negative sign. However, it shows a negative effect in the short run at both first and second difference, but the effect remains weak. If DCPSB increase by 1%, then economic growth will decline by 0.09% point. This outcome is exactly consistent with (Muazu Ibrahim 2017)

The liquid liability shows negative impact on growth of the economy but, in the short run it is statistically insignificant mainly at the first difference which, indicate that there in on link

between liquid liability and economic growth particularly in the short run. This result is consistent with (Safiat 2013)

Bank deposits exert positive relation to economic growth in short-run and statistically significant, this unlike the result in the long run. Due to the elasticity the impact remains moderate, since an increase in BD by 1% can lead to an increase in economic growth by 0.23% point

Trade ratio showed negative effect in the short run and statistically significant. Hypothetically the sound effect of trade on economic growth could be inverse or positive (Safiat 2013), in this way, net impact may be specified just empirically. Thus, outcome is matching with economic theory (literature). Concerning elasticity, the effect remainders powerless since the end result show that a 1% rise in TR cause a decline in economic growth by 0.03% point.

The error correction term (ECT) multiplier of factor (coefficient0 is predestined nearly as (-0.78), which indicates that the system might relocate to equilibrium back approximately in one year and quarter (1.28 years) after a shock.

Table 4 Estimation of Coefficients (elasticities) in the Short run

Variable	Coefficient	Std. Error	Prob.	F-Stat.	R ²	Adj. R ²
$\Delta\text{LOG}(\text{DCPSB}(-1))$	-0.099660 (-3.757376)	0.026524	0.0045	13.3	0.85	0.72
$\Delta\text{LOG}(\text{DCPSB}(-2))$	-0.128891 (-3.537314)	0.036438	0.0063			
$\Delta\text{LOG}(\text{LLR}(-1))$	-0.416394 (-1.622368)	0.256658	0.1392			
$\Delta\text{LOG}(\text{LLR}(-2))$	-0.448137 (-2.442291)	0.183491	0.0372			
$\Delta\text{LOG}(\text{BD}(-1))$	0.454069 (1.949968)	0.232860	0.0830			
$\Delta\text{LOG}(\text{BD}(-2))$	0.388059 (2.200119)	0.176381	0.0553			
$\Delta\text{LOG}(\text{TR}(-1))$	-0.103308 (-3.100258)	0.033322	0.0127			
CointEq(-1)	-0.786438 (-5.847178)	0.149891	0.0002			

Source: Author own calculation based on data

4.5. Cumulative Sum (CUSUM) and Cumulative Sum of the Squares (CUSUMSQ) Test

The stability of long-run relationships mentioned in table (3) was investigated for the whole period of study. This stability of the factors of the model is tested by the (CUSUM) and the (CUSUMSQ) of the recursive residual test suggested by Brown et al. (1975). CUSUM and CUSUMSQ are schemed related the break points. The stability of the factor (parameter) is point out when the CUSUM and CUSUMSQ conspiracies (plots) against time persist in the interior 5 % level of significance through the sample interval, whereas parameters (factors) and therefore the variance is unsteady if these conspiracies (plots) shift abroad the 5 % critical lines. The conspiracies (plots) of (Figure 1) for CUSUM and (Figures 2) for CUSUMSQ are developed out of a recursive estimate of the three versions of the model. These conspiracies (plots) point out stability in the factors of the first and the third versions of the model.

Figure 1 Cumulative sum of recursive of residuals: model 1

Figure 2 Cumulative Sum of Squares of Recursive Residuals: model 1

5. CONCLUSION

The purpose of this research is to examine the long and short-run link between financial development and economic growth in Sudan using annual time series data during (1980-2015) by employing the ARDL bounds testing approach to co-integration and the related error correction model (ECM). Concerning the indicators of financial development, the result of the long run analysis indicates that domestic credit provided to the private sector by banks, the liquid liabilities and trade ratio show positive effect, whereas bank deposits negatively affect economic growth. All results have shown expected signs by means of per the economic theory except for bank deposits, which is not matching with general evidence in the empirical literature, but it is not surprising in the case of Sudan. A possible explanation for the negative relation between bank deposit and economic growth is the use of deposits in unproductive activities (the incidence of non-performing loans has increased which indicates that most of the banks' credit may have gone into the wrong hands and the wrong sectors). This result is consistent with the studies in the literature as it is mentioned before.

The outcomes of this paper indicate that financial development indicators tested in this study has made a good support to speed up economic growth in Sudan. The coefficient of the lagged ECT (-0.786438) is negative and statistically significant at the 1% level. The amount of the coefficient denotes that 78 % of the disequilibrium caused by former year's shocks converges back to the long-run equilibrium in the current year.

RECOMMENDATIONS

- To ensure the sustainability of real GDP growth, policy makers need to concentrate in policies that encourage trade in capital goods which enhance development, because it is an important indicator for economic growth.
- To ensure the sustainability of real GDP growth, policy makers need to concentrate in policies that encourage bank credit to private sector, because it is an important indicator for economic growth.
- To ensure the sustainability of real GDP growth, policy makers need to concentrate in policies that encourage banks to raise the liquidity by offering e-banks services, because it is an important indicator for economic growth.
- Government should implement policies for financial system reform especially banks.
- The most important general recommendation here is that, Sudan has to improve its institutional development above a certain edge. So, Sudan can increase its amount of benefits from financial integration, financial development and trade openness. Moreover, the low level effect of financial openness in institutionally underdeveloped countries (as in the case of Sudan), like being more crisis liable to, disappears and it becomes positive when the country becomes institutionally developed.

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