

The Impact of Banking Sector Development on Economic Growth: Evidence from Sudan

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Abstract:

This paper aims to address the issue of the association between banking sector development and economic growth in Sudan over the period 1980 – 2017, by employing the Autoregressive Distributed Lag (ARDL) model of cointegration. The paper uses credit to GDP ratio, deposit to GDP ratio, Central Bank of Sudan (CBOS) asset to GDP ratio, consumer price index (CPI) and GDP per capita to specify the relationship between the above-mentioned variables. The overall evidence shows that there is no long run association between banking development and economic growth in Sudan. However, in the short run, we find that among financial development indicators, deposit to the GDP ratio is the only indicator that significantly affects the economic growth in the short run. These findings may be attributed to the low rate of credit provided by Sudanese banks, the sanctions imposed on Sudan and the inefficiency of the Sudanese banks. The study provides some recommendations for improving the performance of Sudanese banks, so that they contribute positively to economic growth. These recommendations include the need for optimum allocation of banking resources, appropriate merger and acquisition transactions, and the need to accelerate the adoption of Mobile Financial Services (MFS).

Keywords: Banking; Economic Growth; Credit; Deposit; ARDL; Sudan

1- INTRODUCTION

The argument that the banking sector development is positively associated with the economic growth attracted the attention of many researchers and has been investigated empirically by many researchers worldwide. According to Schumpeter (1911), Economic growth theory believes that financial institutions specially banks are considered as useful instrument for improving the productive capacity of the economy and represent an important internal source of fund for any country specially in the birth stages of economic growth. The basic role of the banking sector is the intermediation between deficient and sufficient economic units. Mediating between lenders and borrowers, the banking system is trying to reduce transaction and information costs that appear as a result of the financial markets' imperfections. As a crucial part of the financial sector, the banking sector facilitates the allocation of resources across time and space in the uncertain environment (Elena et al, 2015).

According to African Economic Outlook (AEO) 2020, published by the African Development Bank, Sudan's real GDP contracted in 2019 by an estimated 2.4%, it is projected to contract further by 1.6% in 2020 and 0.8% in 2021 due to the political situation, tepid domestic demand, and weak private sector investment. Inflation reached 50.6% in 2019, fueled by high production input costs due to currency depreciation. Moreover; Sudan has experienced prolonged civil war and lost about 70% of its oil production in July 2011, due to the South Sudan secession. The oil sector was the major contributor of Sudan's GDP growth from 1999 to 2010, in other words the boom of the Sudanese economy was mainly derived by the rising of oil production. On the other hand, Sudan was subject to comprehensive sanctions imposed in 1997 and have been expanded in 2006. In 2017, the sanctions on Sudan were lifted, however, the trade and financial transactions between Sudan and the World economy have remained conservative as Sudan continues to be designated by the U.S. as a state sponsor of terrorism (world bank, 2020).

The aim of this study is to investigate the impact of the Sudanese banking sector development on economic growth by estimating the short-run and the long-run relationship for the period of 1980 to 2017, by employing the Autoregressive Distributed Lag (ARDL) test of cointegration.

The results of this paper will help evaluate the effectiveness of Sudanese banking sector and its impact on the economic activities. This paper raises an important question about the significant impact of the Sudanese banking sector in promoting economic growth. The paper's outcomes are expected be useful to policy-makers in developing strategies to enhance the role of banking sector and promote the economic growth. In addition, it is also useful to researchers and the academic body of knowledge, as the research will enrich the existing theoretical frameworks regarding the role of banks as essential drivers of any economy.

There are few studies that have investigated the relationship between banking industry and economic growth in a sanctioned country that faced significant economic shocks, such as Sudan. Under such circumstances, the country has to rely on the mobilization of its internal resources and savings and to that end banks are expected to play a vital role in promoting the economic growth. The paper also takes into account a new

variable to express the role of banking sector, that is the Central Bank of Sudan (CBOS) asset to GDP ratio, to reflect the role of Central Bank as a key player in the banking industry.

The paper is organized in six sections. The next section sheds light on the Sudanese banking system, Section (3) provides a brief review on the relevant literature. Section (4) describes the econometric model specification. Section (5) provides the data analysis and the interpretation. Section (6) presents the conclusion of the paper and some recommendations to the concerned parties based on the empirical findings.

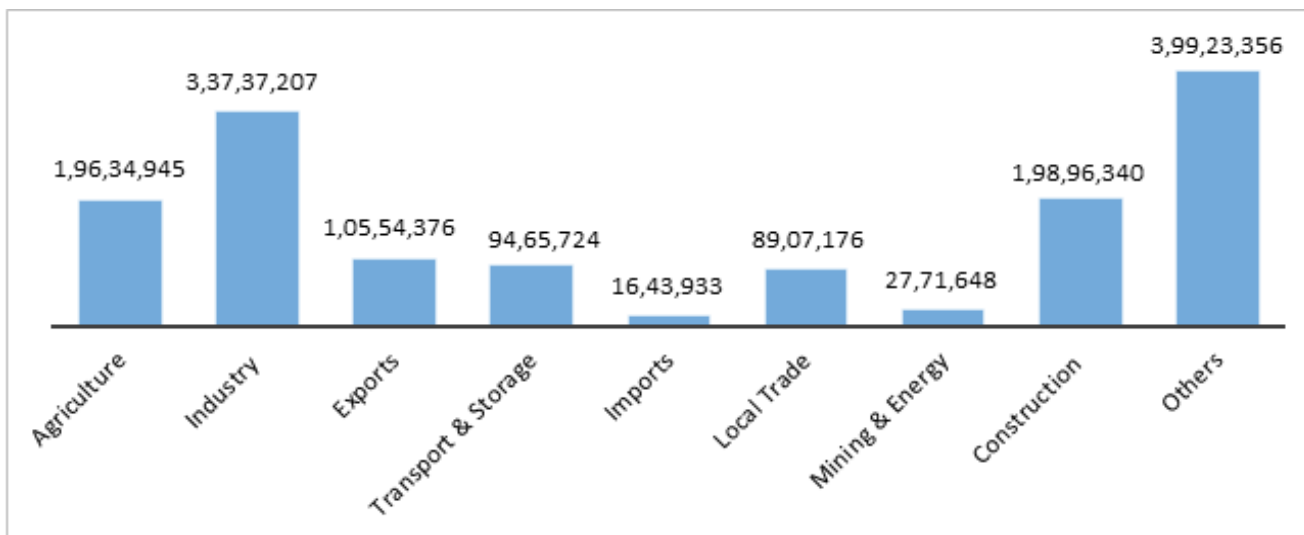
2- BANKING SYSTEM IN SUDAN

The banking sector in Sudan is composed of 37 banks, five of which are state-owned specialized banks, 23 are joint-venture banks, some of them are owned jointly by the government and the private sector, others national-foreign banks and some are wholly owned private banks (one of those banks is an investment bank), and nine banks are fully owned by foreigners (CBOS website).

In 1992, the banking system in Sudan has been converted to Islamic mode, and the country's entire financial system adopted the Islamic finance regulations. Hence, Sudan is considered as one of few countries in the world with a full-fledged Islamic banking system. Sudan introduced Islamic banking in 1977, by opening the Faisal Islamic Bank as the first Islamic bank in the country.

The outstanding credit provided by Sudanese Banks at the end of the year 2018 is distributed mainly between Industrial sector (%23), Construction sector (%14), Agricultural sector (%13), Exports (%7), Transport and Storage (%6), Imports Local Trade (%6), Mining and Energy (%6) and 27% for other sectors, as shown in figure (1) below:

Figure (1) The distribution of Sudanese banking credit (in thousands of Sudanese Pounds)



Source: (Central Bank of Sudan Website)

The Central Bank of Sudan (CBOS), which started its operation in 1960, plays the key role in determining the credit policies which are introduced every year by the bank act as directives to the commercial banking sector, setting lending priorities according to macroeconomic policy in order to encourage growth. Meanwhile, it prevents them from financing certain commodities in order to stop the monopoly which leads to rising prices of some strategic commodities such as sugar and wheat.

3- LITERATURE REVIEW

The role banking sector on the economic growth has been and still is a subject of a considerable debate in the financial and economic literature. The association between banking development and economic growth has been analyzed by many studies. Some researchers confirm the positive relationship between the variables in the short and long terms, while others believe that banking is a relatively unimportant factor for economic growth.

Kabir et al. (2011), investigated the relationship between financial development and economic growth in the Organization of Islamic Conference (OIC) Countries. They adopted panel regressions and variance decompositions technique. The findings revealed a positive association between financial development and

economic growth in OIC developing countries. Moreover, short-term multivariate analysis implies one-way causality that runs from growth to finance.

Safiat (2013), examined the long-run and short-run association between financial development and economic growth in Sudan during the period 1970- 2011 by employing (ARDL) test of cointegration. The study used the credit to GDP ratio, the ratio of liquid liabilities to nominal GDP and the broad money supply as a percentage of GDP as measures of financial development, beside other four control variables. The findings revealed that credit to the private sector and the liquid liabilities exert positive effect while money supply affect real per capita GDP negatively.

Ahmed M. K. A. (2014), examined the association between financial development and economic growth in Sudan during 1970–2012, by employing the Johnson approach to Co-integration and Vector Error Correction Model (VECM) to find out the long and short run effect of the financial sector development on economic growth. The paper's findings revealed that there was a linear long run relationship between real GDP growth and financial development; and showed that there was a marginal positive effect of financial sector development on economic growth in Sudan.

Sufian (2012) discussed the impact of financial development on economic performance in Sudan over the period (1970- 2007) by employing the ARDL model of co-integration. The main empirical results indicated a weak relationship between financial development and economic growth in Sudan.

Frikha and McMillan (2016) examined the role of Islamic banking development on the economic growth of developing countries (United Arab Emirates, Jordan, Kuwait, Pakistan, Saudi Arabia, Qatar, Turkey, Bahrain, Egypt and Sudan), by employing the ordinary least square regression (OLS) for testing 120 banks from different developing countries. Their results revealed that conventional banks support economic growth, while the Islamic banks did not have the same impact on the economic growth.

Abusharbeh (2017), examined the impact of some banking sector indicators (credit provided by banks, deposits, the total number of branches, and interest rate) on gross domestic product using quarterly data from the period of 2000 to 2015, by employing ordinary least square regression. The result proved that banking credits are positively related to economic growth, which indicated that banking sector development tends to improve productive capacity of Palestinian economy. On the other hand, interest rate, customer's deposits and number of branches have no significant impact on economic growth.

Puatwoe et al. (2017), discussed the impact of financial sector development on economic growth in Cameroon, by examining three common indicators of financial development (broad money, deposit/GDP and domestic credit to private sector). The study adopted the Auto Regressive Distributive Lag (ARDL) econometric technique. The findings revealed that there is a positive relationship between monetary mass (M2), government expenditure and economic growth in the short run. Moreover, a negative relationship between bank deposits, private investment and economic growth equally exists in the short run. However, in the long term, all indicators of financial development show a positive and significant impact on economic growth.

Akol et al. (2020) investigated the impact of financial development on economic growth in Sudan during the period of 1990–2014, by employing the Johnsen co-integration model of cointegration. Their findings revealed that there is an association and positive impact of the money supply and banking credit to private sector on economic growth (GDP) in short and long run.

4- METHODOLOGY

According to the empirical literature on the relationship between banking sector development and economic growth, we use Credit to GDP ratio, deposit to GDP ratio, central bank of Sudan (CBOS) asset to GDP ratio and GDP per capita (current US\$) to specify the long run association among the above-mentioned variables. In addition, we use consumer price index (CPI) as a control variable because it is considered as a measure of macroeconomic stability and it has an expected negative sign. We employ time series data for the period from 1980 to 2017, the data has been collected from the World Bank website.

The econometric model specification used in the analysis can be written in the following forms:

$$Y_t = \alpha + \beta_1 Credit_t + \beta_2 Deposit_t + \beta_3 CBOS_t + \beta_4 CPI_t + \epsilon_t \tag{1}$$

where Y denotes the GDP per capita (current US\$), $Credit$ stands for Credit to GDP ratio, $Deposit$ is deposit to GDP ratio, $CBOS$ is central bank of Sudan (CBOS) asset to GDP ratio, CPI is consumer price index, α stands for intercept terms, β_i ($i = 1,2,3,4$) signifies coefficients on respective variables, and finally ϵ_t denotes error terms. The following ARDL and error correction model (ECMs) is presented, where all variables are expressed in logarithm form:

$$\Delta LnY_t = c_1 + \pi_1 LnY_{t-1} + \pi_2 LnCredit_{t-1} + \pi_3 LnDeposit_{t-1} + \pi_4 LnCBOS_{t-1} + \pi_5 LnCPI_{t-1} + \sum_{i=1}^p \theta_i \Delta Y_{t-1} + \sum_{i=1}^p \phi_i \Delta LnCredit_{t-1} + \sum_{i=1}^p \delta_i \Delta LnDeposit_{t-1} + \sum_{i=1}^p \lambda_i \Delta LnCBOS_{t-1} + \sum_{i=1}^p \omega_i \Delta LnCPI_{t-1} + \mu_t \tag{2}$$

where Δ denotes the first difference operator. c_i ($i = 1 \dots 3$) indicates constants, π_i ($i = 1 \dots 5$) represents the coefficients on the lagged levels, $\theta_i, \phi_i, \delta_i, \lambda_i$ and ω_i ($i = 1 \dots p$) denote coefficients on the lagged variables, and finally μ_t stands for error terms. p indicates the maximum lag length.

Estimation of unit root for each variable means to examine the stationarity of the variables, it is a prerequisite for the right choice of cointegration model. We select an Augmented Dickey-Fuller test (ADF) (Dickey and Fuller 1979, Brooks 2014) to test for a unit root. There are other alternatives methods for determining the stationary of a variable such as the Phillips-Perron (PP) test.

The ADF test is a regression analysis based on equation 3 where β is a constant, P the chosen lag, ϕ and α are the coefficients of the regression, λ_t is a trend term and μ_t is the white noise. Note that if $\lambda_t = \beta = 0$ the equation is modelling a unit root test without trend and drift while if only $\lambda_t = 0$ the equation is a model with drift. The final possible case is if there are no constraints, then the test tries to assess if y_t has a unit root with drift and a deterministic time trend.

$$\Delta y_t = \beta + \lambda t + \phi y_{t-1} + \sum_{i=1}^P \alpha_i \Delta y_{t-i} + \mu_t \tag{3}$$

The unit root test is then conducted by investigating the following hypothesis test:

$H_0 : \phi = 0$, unit root is present, i.e. the time series is non stationary

$H_1 : \phi < 0$, no unit root is present, i.e. the time series is stationary

Furthermore, as the choice of the lag P affect the model, it is important to determine the optimal lag (Brooks 2014). There exist several methods for determining the optimal lag length P and a common method is to minimize the value of information criteria using the AIC (Akaike 1974) and/or the Schwarz-Bayesian (SIC) (Schwarz et al. 1978) criteria defined by equation 4 and equation 5

$$AIC = -2\ln(LH) + 2k \tag{4}$$

$$SIC = -2\ln(LH) + k\ln(n) \tag{5}$$

The variable n is the number of observations and k is the number of regression parameters to be estimated partly defined by the lag P (see equation 2, α_i, ϕ). LH is the maximum likelihood of the model. According to Brooks (2014) no criteria is superior to another.

5- EMPIRICAL ANALYSIS AND DISCUSSION

5.1. Descriptive Statistics

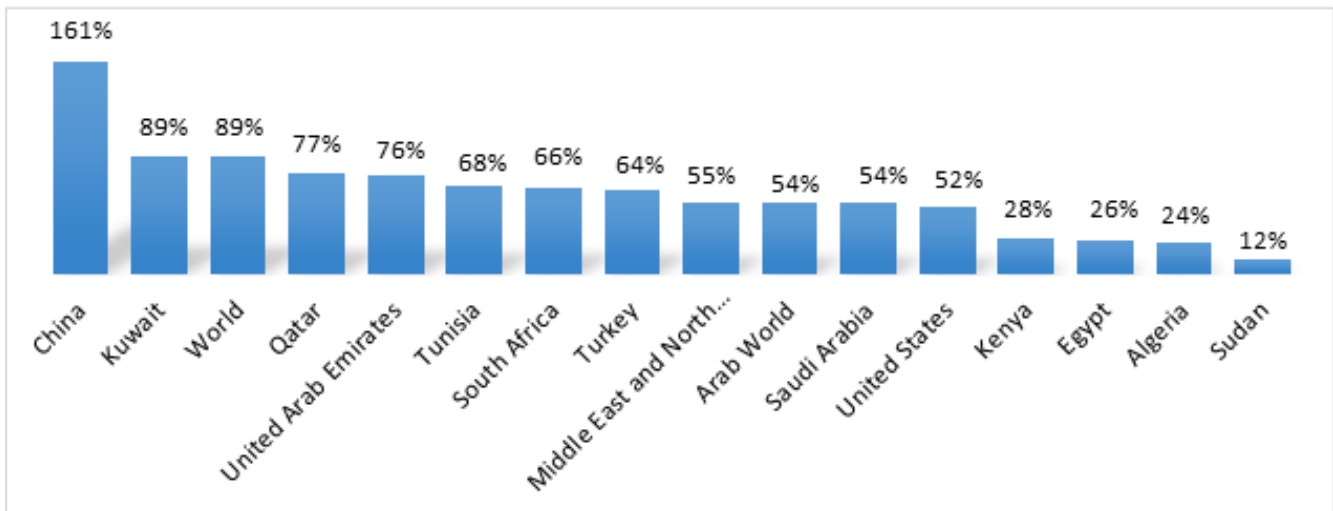
Table (1) reports the descriptive Statistics for the sample of the variables under investigation. The mean Median, Maximum, Minimum, Skewness, Kurtosis and JB values are reported.

Table (1): Descriptive Statistics (1980 – 2017)

	GDP per capita (current US \$)	Credit to GDP ratio	Deposit to GDP ratio	CBOS asset to GDP ratio	CPI
Mean	890.7292	7.822595	10.66360	8.587780	38.42778
Median	531.0525	8.232822	11.11370	7.513320	24.96405
Maximum	3015.024	13.96019	17.86980	21.32460	132.8238
Minimum	260.5102	1.615531	3.676940	2.571080	4.871467
Std. Dev.	724.8488	4.110547	3.940846	5.508637	36.21362
Skewness	1.411004	-0.124149	-0.099658	1.002016	1.383753
Kurtosis	3.884812	1.577527	1.876517	2.756859	3.782470
Jarque-Bera	13.84882	3.301381	2.061408	6.452492	13.09630
Probability	0.000983	0.191917	0.356756	0.039706	0.001433
Observations	38	38	38	38	38

The average of Sudanese Banking Credit rate is % 7.8 for the period from 1980 to 2017. During this period, the maximum rate of Banking Credit was %13.96 in 2006; while the minimum rate was % 1.6 in 1995. This rate is substantially low compared to the international average as the average of domestic credit provided by banks in Arab world is 54%, while the international average rate is %84. Figure (2) shows the credit to GDP ratios for some Arab, African and other countries.

Figure (2) Credit to GDP ratio



Source: World Bank Website – World Development Indicators

5.2. Econometric Model Results

The results of unit root test included in table (2) indicate all variables are random walk (non-stationary) at levels, but at the first difference they reject the null-hypothesis of random walk which indicates all variables are integrated of order one (I(1)).

Table (2): ADF test statistic (with intercept)

Variables	Level	First Difference
LnGDP	0.340223	-5.377306***
LnCredit	-1.226232	-4.432772***
LnDeposit	-1.221200	-5.397613***
LnCBOS	-1.195549	-4.275258***
LnCPI	-1.557775	-5.719862***

Note: *** indicates significant at 1% level

The calculated F-statistic for the cointegration test is displayed in Table (3); The F-statistic (1.337072) is below than the lower bound critical value at the 1% and 10% level of significance. This implies that the null hypothesis of no cointegration cannot be rejected. there is a no cointegration relationship among the variables. This result will help in answering the critical question raised by this research, as the result of the ARDL model showed that the Sudanese banking industry does not support Sudanese economic growth.

Table (3): F-Statistics Test for Long Run Co-integration

1% Level		10% Level		Calculated F Statistics
1(0)	1(1)	1(0)	1(1)	
3.74	5.06	2.45	3.52	1.337072

Since all of the series are integrated of the same order (I(1)), and they are not cointegrated, in this case, we can just appropriately difference each series, and estimate a standard regression model using the Least Squares method. Table (4) shows the results of the least squares test for the variables under study:

Table (4): Least Squares Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.043465	0.029378	1.479489	0.1494
D(LNGDP(-1))	0.168231	0.153810	1.093756	0.2828
D(LNCREDIT(-1))	-0.166669	0.209775	-0.794512	0.4331
D(LNDEPOSIT(-1))	1.001969	0.366714	2.732288	0.0104
D(LNCBOS(-1))	-0.123098	0.165130	-0.745461	0.4618
D(LNCPI(-1))	-0.005236	0.065191	-0.080312	0.9365

R-squared	0.359624	Mean dependent var	0.049407
Adjusted R-squared	0.252895	S.D. dependent var	0.196184
S.E. of regression	0.169572	Akaike info criterion	-0.560066
Sum squared resid	0.862640	Schwarz criterion	-0.296146
Log likelihood	16.08119	Hannan-Quinn criter.	-0.467951
F-statistic	3.369496	Durbin-Watson stat	2.180053
Prob(F-statistic)	0.015594		

The results of the lease squares regression indicate only banking deposit has a positive and significant relation with economic growth. The other variables have no impact on the economic growth in the short run. Our results are consistent with the outcomes of Bloch and Tang (2003), who investigated the relationship between the financial development and economic growth in 75 countries, and found that there was no significant relationship between economic growth and development of financial sector. Other studies that support our results include: Andersen and Tarp (2003), Ram (1999).

Our empirical findings are in contrast with the results of: Fry (1988), Ikhide (1993), Seck and EINil (1993), Christopoulos and Tsionas (2004), Beck et al. (2000), Beck and Levine (2004), Kabir et al. (2011),Jeanneney et al. (2006) and Akol et al. (2020), as they found that there is positive and significant relationship between financial development and economic growth.

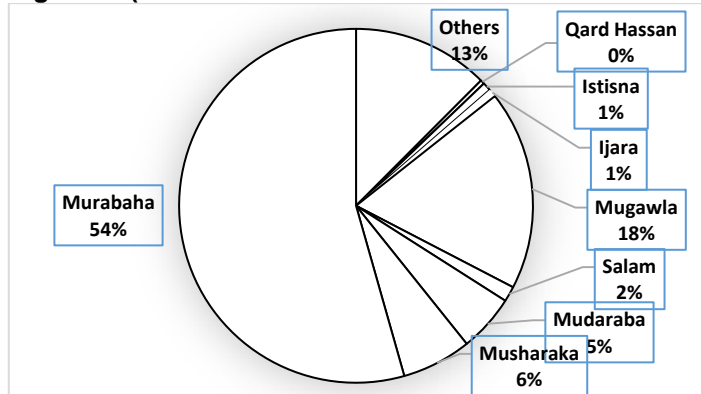
The results may be attributed to the weakness of banking sector in Sudan. Safiat (2013) stated the financial system in Sudan has been characterized by heavy government interventions and regulations, centralized lending by the central bank to public enterprises, absence of indirect monetary policy instruments, lack of bank supervision and an inadequate accounting system. In addition, (Kireyev, 2001) stated that the Sudanese banks still remain very small even by the modest international standard as compared with the banks in other countries.

According to IMF, 2020 (www.imf.org), the banking sector in Sudan is fragile, with several banks undercapitalized and the reported nonperforming loan (NPL) ratios significantly underestimate the true state of impairment of bank loans. And even with the low reported NPL estimates twelve banks have capital adequacy ratios below the minimum rate required by regulatory authorities, and some banks have been undercapitalized for many years. Another struggle facing the Sudanese banking sector is the sharp decline in correspondent banking lines due to large U.S. penalties on international banks in 2014. While sanctions have now been revoked, most correspondent banks have been reluctant to re-establish relationships with Sudanese banks for risk factor. Hence, a study of the IMF showed that 16 out of 37 commercial banks in 2019, had short net foreign exchange positions, with 6 banks positions outside the regulatory limit.

Moreover, the credit provided by Sudanese banks as a percentage of GDP is relatively low if we compare it with the international standard. The average of domestic credit provided by banks in Arab world is 54%, while it the international rate is %84. The detail of selective sample from Arab, African and other countries is presented in figure (2).

The majority of credit provided by Sudanese banks is dominated by Murabaha mode of finance with around 54% from the total finance provided, followed by Mugawla (%18) and Musharaka (6%). The contribution of each mode of finance from the total credit is shown in figure 3. The opponents of modern Murabaha see the large scale use of this mode as a deviation from Islamic banking principles and criticize the long-term tendency of Islamic banks to utilize debt-like instruments. They demand from Islamic banks to replace them with profit-and-loss based instruments (Gunev, 2015).

Figure 3: (The Distribution of credit in Sudanese Banks)



Source: Central Bank of Sudan website

Another possible reason is the inefficiency of banking system in Sudan. Saber et al (2011), in their study of the efficiency of Sudanese banks showed that these banks are inefficient, suffer from diseconomies of scale and have not yet exploited the advantages of increasing returns to scale.

5.3. Diagnostic Testing

The diagnostic tests (tables 5 and 6 and figure 4) reveal that the residuals are homoscedastic, normally distributed and there is no evidence of serial correlation. In addition, the model is dynamically stable as shown in table (7) of (Ramsey RESET Test).

Table (5): Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.201931	Prob. F(5,30)	0.3321
Obs*R-squared	6.008043	Prob. Chi-Square(5)	0.3054
Scaled explained SS	5.891635	Prob. Chi-Square(5)	0.3169

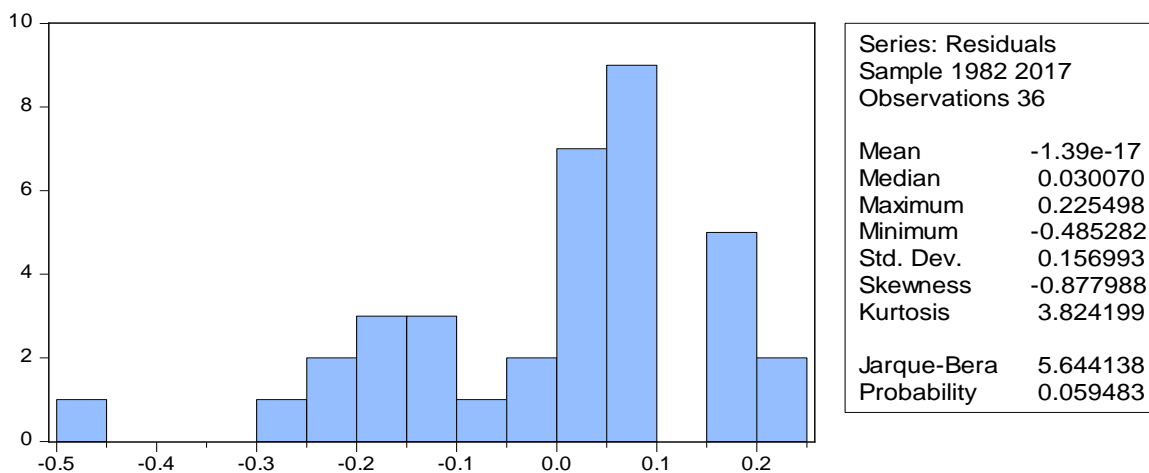
Table (6): Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.880370	Prob. F(2,28)	0.4258
Obs*R-squared	2.129875	Prob. Chi-Square(2)	0.3447

Table (7): Ramsey RESET Test:

	Value	df	Probability
t-statistic	0.564177	29	0.5770
F-statistic	0.318296	(1, 29)	0.5770

Figure (4): Normality Test



6- CONCLUDING REMARKS AND IMPLICATIONS

The paper aims to investigate the long run and short run relation between the development of the banking sector and economic growth in Sudan. We use three variables as proxy of the financial development in Sudan, which are the Credit to GDP ratio, deposit to GDP ratio and the Central Bank of Sudan (CBOS) asset to GDP ratio. The GDP per capita is used as a proxy of the economic growth, while Consumer Price Index is used as a control variable. The data is extracted from the world bank website for the period from 1980 to 2017. The Autoregressive Distributed Lag model (ARDL) test of cointegration is used to examine the presence of the long-run linear association among the selected variables as well as the short run movement. The overall evidence shows that there is no long run association between banking development and economic growth in Sudan. However, in the short run, we find that the deposit to the GDP ratio is the only indicator that significantly affects the economy in the short run. These findings may be attributed to the low rate of credit provided by Sudanese banks, inefficient allocation of resources by banks, sanctions imposed on Sudan and the inefficiency of the Sudanese banks. The finding of this research has potential benefits to decision makers, as it implies that Sudan can accelerate its economic growth by improving the banking system, as the literature states that the well-developed financial systems can be expected to accelerate the development process by channeling financial recourses to the most productive use. Based on the findings of this paper and the relevant literature discussed previously, some recommendations have been presented to improve the performance of Sudanese banks, so that they contribute positively to economic growth. These

recommendations include, among others, the necessity for an optimum allocation of banking resources, improvement of banks capitalization, appropriate merger and acquisition transactions, and increasing the adoption of Mobile Financial Services (MFS).

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