

Assessing the Impact of the Banking Sector Performance on Economic Growth: An Empirical Study of East African Countries

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Abstract

the study assessed the impact of banking sector performance on economic growth in a panel study of 7 East African countries for the period of 1996 to 2017. In pursuit of achieving the study's objective, it adopted panel data methodologies such as panel generalized linear model and granger causality test to perform its statistical analysis. The study found that banking sector performance has a negative and significant impact on economic growth in East African countries. Moreover, no evidence of a causal relationship between banks' return on assets and economic growth was established but there is unidirectional causality from economic growth to banks' return on equity. The study recommends further studies on the topic to either reject or validate its findings.

Keywords: *Banking sector performance; East Africa; Economic growth; generalized linear model; Granger causality*

1. Introduction

Banks play a vital role in the pursuit of economic growth and economic growth mostly serves as a stimulus for banks. A tremendous increase in financial inclusion with a boost in GDP growth continuously supports growth in the banking sector in the medium term. The banking sector in Eastern Africa region looks promising, all indicators show positive results (Ernst & Young, 2014). Economic growth is the major important macroeconomic strategy with the crucial means of raising expectations of the standard of living as well as the comfortable living (Ayman, 2017). According to Ayman (2017), countries that have strong and resilient monetary and financial systems have the tendency to create and build their economic development at a rapid pace. Economic growth across East Africa has so far proved resilient and tougher to emerging market turmoil. Slower growth in Rwanda in 2013 was offset by stronger growth in both Kenya and Uganda, while Tanzania's growth held steady.

There is a direct relationship between the banking sector's performance and economic growth nexus; prior studies have mixed results either positive or negative. Ayman (2017) studied the impact of banking sector performance on economic growth in Jordan; by employing ordinary least square methodology, the study found that banking sector performance has a positive and significant impact on economic growth. Another study from Svetlana and Olga (2017) postulates that banks' performance has a positive impact on economic growth but they are of the view that the link between banks retains earnings and economic growth is more robust than that of credit growth. The banking sector is an actor of financial development in an economy hence many studies have positioned that relationship between financial development and economic growth as positive (Goldsmith, 1969; King & Levine, 1993; Beck & Levine, 2004; Beck et al., 2005; Ahmad & Malik, 2009; Bangake & Eggoh, 2011; Mwenda & Mutoti, 2011; Cecchetti & Kharroubi, 2012; Akpansung & Babalola; 2012; Greenwood et al., 2013; Law & Singh, 2014).

Some researchers opined that the relationship between the financial sector and economic growth is not linear hence other factors could affect economic growth through the causality of the financial sector. Albertazzi and Gambacorta (2009) posit that there is a positive relationship between bank profit (performance) and economic growth as a result of the business cycle on net interest income through lending and provision for bad loans to the variations in the quality of loan portfolio. Dietrich and Wanzenried (2014) argue that the rise in the profitability of banks is mostly a result of economic growth and an increase in inflation. Meanwhile, Hippler

and Hassan (2015) found that the U. S financial sector saw an astronomical jump in their performance due to an increase in their macroeconomic and financial stress resulting from the drive by non-depository finance, investment and real-estate firms. Most of the literature reviewed position that financial development in which the banking sector is an actor has a positive relationship with economic growth but Fadare (2010) is of a different view in which his studies found a negative relationship between banking sector performance and economic growth in Nigeria.

The study intends to assess the impact of banking sector performance on economic growth and find the direction of causality between the two in the Eastern Africa region. Hence, the study contributes to the existing literature on banking sector performance and economic growth for academic perusal and policymaking direction.

The study is divided into four folds; section 1 introduces the study, section 2 explains the data and methodology for the study, section 3 reports the results and findings and finally section 4 concludes the study.

2. Data and Methodology

2.1 Data

The study used panel data of 7 East African countries for the period of 1996 to 2017 and employed panel data methodologies such as panel unit root tests, panel correlation matrix, and panel generalized linear model and panel granger causality test to make its statistical conclusion. The study used data sourced from the IMF global financial development database and Worldwide Governance Indicators. The variables and their descriptions can be found in table 1. The countries used for the study are as follows; Tanzania, Burundi, Rwanda, Uganda, Sudan, Ethiopia and Kenya.

Table 1 Variables and descriptions

Variable	Description	Measurement	
Inim	Bank net interest margin (%)	Banks performance	Independent variable
Inroa	Bank return on assets (% , after tax)	Banks performance	Independent variable
Lnroe	Bank return on equity (% , after tax)	Banks performance	Independent variable
lninf	Consumer price index (2010=100, average)	inflation	control variable
lngdppc	GDP per capita (constant 2005 US\$)	Economic growth	Dependent variable
regqty	Regulatory Quality: Estimate	regulation of the private sector	control variable

2.2 Methodology

The study applied panel data methodologies to assess the impact of the banking sector performance of economic in East Africa and these methodologies are as follows; panel unit root tests, panel correlation matrix, panel generalized linear model and panel granger causality test. The first step of the study was to compute the summary statistics of the variables to ascertain the normality in distribution. Subsequently, Levin-Lin & Chu LLC (Levin et al., 2002), Im-Pesaran & Shim IPS (Im et al., 2003) and, ADF-Fisher and PP-Fisher (Maddala & Wu,1999) tests are performed to check whether there is an existence of unit root in the variables. The null hypothesis of the unit tests assumes that there is a unit root in the variables so when the regression analysis is performed then it is considered as spurious. If no evidence of unit root is witnessed then it paves the way for the study to undertake its regression analysis. However, the specification proposed by Im et al. (2003) is as follows:

Equation 1

$$y_{it} = \rho_i y_{i,t-1} + \sigma_i x_{it} + \varepsilon_{it}$$

In equation (1), x_{it} stands for the combination of all the explanatory variables; ρ_i represents the autoregressive elasticities, ε_{it} represents the residual term whilst i and t refers to the time period. Im et al. (2003) paves the way for a different order of serial correlation (Apergis and Payne, 2010) and follow the normal averaging of augmented dickey Fuller (Inglesi-Lotz, 2016) shown as:

Equation 2

$$\varepsilon_{it} = \sum_{j=1}^{n-1} \theta_{ij} \varepsilon_{i,t-1} + \varepsilon_{it}$$

By substituting Equation (1) into Equation (2) yield the following:

Equation 3

$$y_{it} = \rho_i y_{i,t-1} + \sigma_i x_{it} + \varepsilon_{it} + \sum_{j=1}^{n-1} \theta_{ij} \varepsilon_{i,t-1} + \varepsilon_{it}$$

In equation (3), ρ_i denotes the number of lags in the ADF regression. The null hypothesis of the panel unit root tests is that each variable has a unit root and the alternate hypothesis claims that at least one of the variables in the panel is stationary in series.

Afterwards, the correlation matrix is computed to check for multicollinearity among the independent variables and the dependent variables. The final test that the study will perform is the granger causality test which throws more light on the direction of causality either bidirectional or unidirectional to affirm granger causality linkage among the variables. The null hypothesis postulates that no variable granger causes another.

The econometric model for the study can be written as:

Economic growth = f (Banking sector performance, regulation quality, inflation)

The variables are transformed into natural logarithm and the resulting models can be found as:

$$LNGDPPC_{it} = \beta_0 + \beta_1 LNIM_{it} + \beta_2 REGQTY_{it} + \beta_3 LNINF_{it} + \varepsilon_{it} \tag{1}$$

$$LNGDPPC_{it} = \beta_0 + \beta_1 LNROE_{it} + \beta_2 REGQTY_{it} + \beta_3 LNINF_{it} + \varepsilon_{it} \tag{2}$$

$$LNGDPPC_{it} = \beta_0 + \beta_1 LNROA_{it} + \beta_2 REGQTY_{it} + \beta_3 LNINF_{it} + \varepsilon_{it} \tag{3}$$

In the equations (1), (2) and (3), $lngdppc$ refers to economic growth, $lnim$ refers to banks net interest margins, $lnroe$ refers to banks return on equity, $lnroa$ refers to banks return of assets, $lninf$ refers to consumer price index as a measure of inflation, $regqty$ refers to regulation quality, β_0 represents the intercept, ε_{it} represents the error term (stochastic error term), i represents the cross section of the seven countries and t is the time period from 1996 to 2017.

3. Results and discussion

3.1 Summary statistics

Table 2 reports the summary statistics of the variables adopted for the study and it reports that the mean and the median are closely related, the standard deviation is homogenous in nature and the Jarque-Bera test confirms that the majority of the variables are not in a normal distribution. The Kurtosis test confirms that the variable is positive and leptokurtic whiles the Skewness test reports that the variables are negatively skewed. Economic growth over the sample period can be reported as a 6.28% average rate annually whiles the

performance of the banking sectors can be presented as 1.93%, 0.71% and 2.83% with regards to net interest margins, return on assets and return on equity respectively. Moreover, inflation recorded an average increase of 4.33% annually. Meanwhile, regulatory quality within the East Africa regions was poor considering the average score of -0.593 annually.

Table 2 Summary statistics

	LNGDPPC	LIM	LNINF	LNROA	LNROE	REGQTY
Mean	6.280	1.925	4.326	0.712	2.831	-0.593
Median	6.315	2.099	4.244	0.895	2.995	-0.421
Maximum	7.580	2.844	6.018	2.075	4.990	0.246
Minimum	5.229	-0.559	2.966	-2.428	-0.083	-1.641
Std. Dev.	0.621	0.602	0.609	0.710	1.006	0.522
Skewness	0.024	-1.852	0.312	-1.487	-1.163	-0.330
Kurtosis	2.102	7.141	2.517	6.906	4.823	1.699
Jarque-Bera	5.192	198.107	4.002	154.680	56.061	13.667
Probability	0.075	0.000	0.135	0.000	0.000	0.001
Observations	154	154	154	154	154	154

3.2 Panel unit root tests

At level form, the unit root tests performed to confirm that lngdppc has the unit root and lninf has unit root in three of the tests thus IPS, ADF-Fisher and PP-Fisher but was stationary with LLC while regqty was also not stationary with LLC. Moreover, lnroa, lnroe and lnim showed stationary at level form. Subsequently, the unit tests were performed at the first difference to ascertain whether the variables are stationary in level form or at the first difference, it is evidenced from table 3 that at first difference all the variables are stationary therefore there is no unit root hence the rejection of the null hypothesis.

Table 3 Panel unit root tests

Unit root test	lngdppc	lnroa	lnroe	lim	lninf	regqty
Level						
LLC	2.626	-2.743**	-4.125***	-5.535***	-2.402**	0.120
IPS	5.674	-3.328***	-4.832***	-4.786***	0.779	-1.787**
ADF-Fisher	2.060	38.074***	54.622***	48.078***	8.322	28.976**
PP-Fisher	2.341	53.542***	59.817***	58.729***	6.534	91.712***
First difference						
LLC	-8.044***	-23.933***	-20.320***	-11.734***	-2.596**	-41.563***
IPS	-6.078***	-19.505***	-18.940***	-10.972***	-3.533***	-36.523***
ADF-Fisher	60.555***	390.970***	382.707***	112.154***	36.687***	962.924***
PP-Fisher	57.482***	549.197***	651.675***	512.073***	38.228***	1225.92***

Note: *** indicates 1% significance, ** indicates 5% significance

3.3 Correlation matrix

Table 4 exhibits the results of the correlation matrix executed to ascertain whether there is multicollinearity in the variables. From the results, it can be witnessed that there is no multicollinearity in the variables. The rule of thumb assumes that two independent variables should not be highly correlated with the dependent variable with a coefficient of $-/+ 0.70$ and from table 4, the highest coefficient is 0.371 and the second is -0.312 which are far below the assumption coefficient. Therefore, the null hypothesis that there is multicollinearity in the variables is rejected.

Table 4 Correlation matrix

	LNGDPPC	LNROA	LNROE	LIM	BCRISIS	LNINF	REGQTY
LNGDPPC	1						
LNROA	-0.198	1					
LNROE	-0.312	0.818	1				
LIM	-0.050	0.565	0.550	1			
BCRISIS	-0.184	0.030	0.035	0.079	1		
LNINF	0.371	0.096	0.049	0.083	-0.235	1	
REGQTY	0.053	0.232	0.105	0.297	-0.127	-0.116	1

3.4 Assessing the impact of banking sector performance on economic growth (Generalized linear model)

The objective of the study is to assess the banking sector's performance on economic growth in Eastern African countries. The econometric model used was the generalized linear model; table 5 exhibits the results of the analysis. From table 5, it is estimated that the banking sector performance has a negative and statistically significant relationship with economic growth. The coefficient of the three proxies used to measure banking performances is reported as -0.128, -0.214 and -0.242. Moreover, LNIM which represents banks' net income margins showed an insignificant relationship with or impact on economic growth in the East African countries while LNROE and LNROA which represents banks' return of equity and banks' return on assets respectively showed a negative and statistically significant impact on economic growth. However, it can be inferred that banking sector performance has an inverse relationship with economic growth hence a percentage increase in banks' return on equity and banks' return of assets will lead to a decrease in economic growth by 0.214% and 0.242% respectively. Perhaps, REGQTY which reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development showed a positive and statistically significant impact on economic growth confirming the reason why it is imperative for governments to create an enabling environment with sound policies to ensure private sector growth. With a coefficient of 0.162, 0.162 and 0.197 in all the three models signal that a percentage increase in the regulation quality of the private sector will lead to 0.162%, 0.162% and 0.197% increase in economic growth. Inflation showed a positive and statistically significant relationship with economic growth in the East African countries sample with a coefficient of 0.405, 0.412 and 0.425 which means that a percentage increase in inflation will lead to 0.405%, 0.412% and 0.425% increase in economic growth.

Table 5 Result of Generalized linear model estimations

Dependent Variable: LNGDPPC			
Method: Generalized Linear Model (Quadratic Hill Climbing)			
Sample: 1996 2017			
Included observations: 154			
Family: Normal			
Link: Identity			
Dispersion computed using Pearson Chi-Square			
Convergence achieved after 1 iteration			
Coefficient covariance computed using observed Hessian			
Variable	coef./z-stat.	coef./z-stat.	coef./z-stat.
REGQTY	0.162 (1.714)*	0.162 (1.921)**	0.197 (2.208)**
LNINF	0.405 (5.228)***	0.412 (5.717)***	0.425 (5.682)***

LIM	-0.128 (-1.566)		
LNROE		-0.214 (-4.913)***	
LNROA			-0.242 (-3.693)***
Constant	4.870 (13.556)***	5.200 (15.709)***	4.731 (14.656)***
LR statistic	28.684***	54.097***	41.798***

Note: *** indicates 1% significance, ** indicates 5% significance, * indicates 10% significance. Z-statistics are in parentheses.

3.5 Granger causality test

Evidence from table 6 reports that there is granger causality among the variables hence the null hypothesis that none of the variables granger causes the other is rejected. It is evidenced that there is both unidirectional and bidirectional granger causality among the variables. The bidirectional causality linkage root from banks' net interest margins to banks return on assets and from banks' net interest margins to banks' return on equity, vice versa. The bidirectional causality affirms that a variation or change in any of the variables affects the other variable vice versa. However, the unidirectional granger causality can be traced from economic growth to banks' return on equity, economic growth to inflation, banks' net interest income margin to inflation, regulation quality to banks interest income margins and regulatory quality to inflation. The unidirectional causality confirms that the first variable granger causes the latter but not vice versa.

Table 6 Granger causality test

Null Hypothesis:	Obs	F-Statistic	Prob.	sig.
LNROA does not Granger Cause LNGDPPC	140	2.053	0.132	
LNGDPPC does not Granger Cause LNROA		0.700	0.498	
LNROE does not Granger Cause LNGDPPC	140	2.227	0.112	
LNGDPPC does not Granger Cause LNROE		3.282	0.041	**
LIM does not Granger Cause LNGDPPC	140	0.037	0.964	
LNGDPPC does not Granger Cause LIM		0.335	0.716	
LNINF does not Granger Cause LNGDPPC	140	0.199	0.820	
LNGDPPC does not Granger Cause LNINF		5.419	0.005	**
REGQTY does not Granger Cause LNGDPPC	140	0.905	0.407	
LNGDPPC does not Granger Cause REGQTY		0.119	0.888	
LNROE does not Granger Cause LNROA	140	0.809	0.448	
LNROA does not Granger Cause LNROE		9.338	0.000	***
LIM does not Granger Cause LNROA	140	2.389	0.096	*
LNROA does not Granger Cause LIM		3.513	0.033	**
LNINF does not Granger Cause LNROA	140	0.204	0.816	
LNROA does not Granger Cause LNINF		0.569	0.568	
REGQTY does not Granger Cause LNROA	140	0.934	0.395	
LNROA does not Granger Cause REGQTY		0.964	0.384	
LIM does not Granger Cause LNROE	140	3.628	0.029	**
LNROE does not Granger Cause LIM		4.043	0.020	**
LNINF does not Granger Cause LNROE	140	0.635	0.532	
LNROE does not Granger Cause LNINF		0.805	0.449	
REGQTY does not Granger Cause LNROE	140	1.464	0.235	
LNROE does not Granger Cause REGQTY		0.469	0.627	
LNINF does not Granger Cause LIM	140	0.579	0.562	

LIM does not Granger Cause LNINF		3.979	0.021	**
REGQTY does not Granger Cause LIM	140	3.521	0.032	**
LIM does not Granger Cause REGQTY		1.184	0.309	
REGQTY does not Granger Cause LNINF	140	3.269	0.041	**
LNINF does not Granger Cause REGQTY		1.347	0.263	

Note: *** indicates 1% significance, ** indicates 5% significance, * indicates 10% significance.

4. Conclusion

The objective of the study was to assess how banking sector performance could affect economic growth in East Africa. In this regard, a panel of 7 East African countries was used for the period of 1996 to 2017.

The study performed all relevant tests and found no unit root and no multicollinearity in the variables before performing the analysis hence the results confirm that banking sector performance has a negative and statistically significant impact on economic growth. These findings are in support of Fadare (2010). Moreover, no evidence of granger causality was established between banks' return on assets (ROA) and economic growth but there is unidirectional granger causality from economic growth to banks' return on equity (ROE). On the other hand, regulation quality showed a positive impact on economic growth significantly as well as inflation.

The study recommends further study by using a non-linear regression method and different macroeconomic variables as control variables to ascertain the impact of banking sector performance on economic growth in the East Africa countries.

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