



Social and Economic Growth in Sub-Saharan Africa: Is the Soundness of Banking a missing element?

Isaiah Oino

Department of Economics Finance and Accounting, Coventry University, United Kingdom

Abstract

The importance of the banking industry has not been disputed, regardless where the research is undertaken. However, there is limited evidence on the significance of the sound banking system on economic and social growth. Using pooled panel fixed effect on 13 Sub-Saharan Africa countries from 2006 to 2016, this research assesses the significance of sound banking system in enhancing economic and social growth. The findings indicate that sound banking enhances economic and social growth. In addition, sound banking system encourages competition that leads to efficiency and hence a lower lending rate. The findings imply the need of the governments to strengthen banking supervision that may enhance sound banking policies.

Keywords: Sound; Banking; Economic; Social; Growth

1. Introduction

Africa is one of the continents that is endowed with vast resources and yet lags on economic fronts. Even though banks in Africa are the most profitable in the world, they have a modest global rating (Valentina et al., 2009). The profitability could be attributed to the standard asset pricing model, which implies that risk assets are remunerated with higher returns. Therefore, the profitability of the bank should indicate specific risks as well as risks associated with the macroeconomic environment. As a result of the 2007 global financial crisis, financial institutions have undergone tremendous reforms regarding financial operations. However, such reforms, which, among others, encompass minimum regulatory capital requirements, bonus payments, and identification of risks, are in tandem with the legal framework. Other recent reforms that have enhanced financial liberalization include interest rate controls, particularly in Kenya, Tanzania, and Ghana.

The financial liberation has led to the growth of banks across Africa, predominately for private banks and the entry of foreign banks. Attempts have been made to heighten financial stability, for instance, recapitalization, which resulted in a reduction in the number of banks¹. A basic comparison of data between developing and developed countries shows that financial systems in developing economies tend to be less efficient. For instance, the average depth of financial institutions (measured as private credit to gross domestic product [GDP]) and markets (measured as stock market capitalization plus outstanding domestic private debt securities to GDP) in developed economies is more than twice than that in developing economies. However, in terms of the stability of financial institutions (measured by the Z-score), on average, the banking systems in developing economies are less volatile than those in developed economies (World Bank Financial Database, 2013). The levels of stability

¹ Recapitalization led to a reduction of banks in Nigeria from 52 to 22.

of financial markets (measured as the asset price volatility) are similar, on average, for developed and developing economies. Although the banks in Africa are said to be very profitable in terms of return on equity (ROE), Africa still stands to be one of the poorest in continents in the world in terms of the social welfare and growth. On the flip side, Africa has a large quantity of natural resources, including not only diamonds, salt, gold, iron, cobalt, uranium, copper, bauxite, silver, petroleum, and cocoa beans but also woods and tropical fruits. Much of its natural resources are undiscovered or barely harnessed. Having a low human density for a long period of time, Africa has been colonized by more dynamic groups, exploiting African resources. For example, 40% of oil production in Congo is controlled by China. While a few Sub-Saharan African nations are doing relatively well, most are mired in poverty. This could be attributed to a number of factors including pervasive corruption, dysfunctional democratic institutions, justice system among the many. Therefore, the objective of this research is to examine empirically the nexus between the financial institutions' soundness and socioeconomic growth.

2. Literature Review

Banks, securities, markets, pension and mutual funds, insurers, market infrastructures, central banks, as well as regulatory and supervisory authorities in a country define a country's financial system. These institutions and markets provide a framework of crucial financial intermediation. The financial intermediation is paramount because an efficient financial system should be able to analyze borrowers or project risks in intermediating between the "surplus and deficit." This will lead to efficiency in the allocation of scarce economic resources, thereby supporting economic growth. Poor financial systems not only disrupt financial intermediation but also undermine the effectiveness of monetary policy, exacerbate economic downturns, trigger capital flight and exchange rate pressures, and create large fiscal costs related to rescue troubled financial institutions.

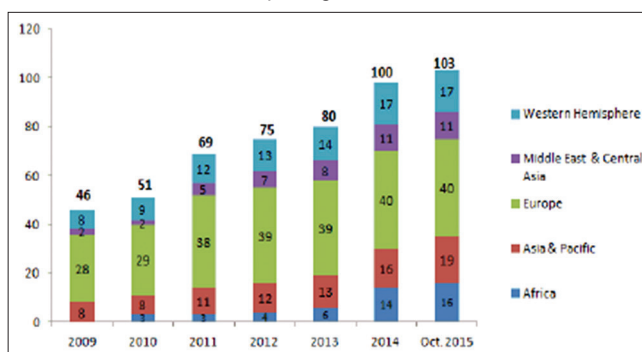
The stable financial system enables banks to perform the intermediation role that supports the economic growth and total productivity (Donou-Adonsou and Sylwester, 2015). As shown in Figure 1, the financial soundness of banks in Africa is the lowest compared with other regions.

Sound banking systems enable banks to enhance financial inclusion within a region. On the other hand, Stiglitz (1994) argued that financial market failure is the fundamental cause of poverty in developing countries. In addition, Jeanneney and Kpodar (2011) used the trickle-down approach - an indirect effect of financial development on poverty reduction through economic growth - to investigate financial development and poverty reduction in developing countries and find that financial development fosters growth which then reduces poverty. Due to poor sound financial systems, financial access to banking services in Africa is much lower compared with other economic regional group within the same economic frontiers, as shown in Figure 2. As argued by Jalilian and Kirkpatrick (2002) noted that widening financial services access to the poor enhances their income which will eventually reduces poverty. For example, an insurance service provided to the poor can better protect them against income shocks.

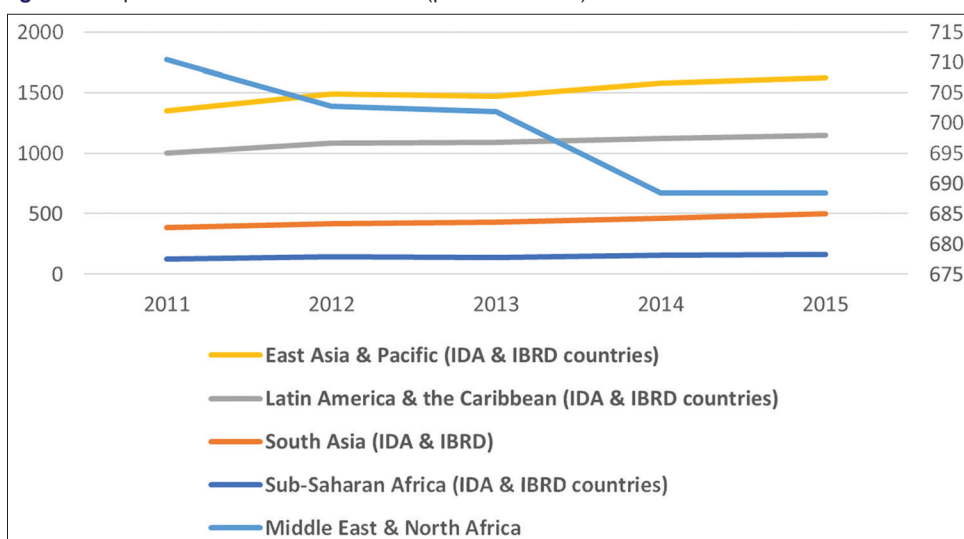
3. Key Indicators of Financial Soundness

3.1. Capitalization

As a result of the recent financial crisis, there is a continued huge drive for banks to increase their capital level to enhance the soundness of the financial system. Increased capital does not only lead to soundness of banks but, in the long-run, improves profitability. Pasiouras and Kosmidou (2007) and García-Herrero et al. (2009) noted that the best-performing banks are those that maintain a high level of equity relative to their assets. The authors explained this relation with the observation that banks with higher capital ratios tend to face lower costs of funding due to lower prospective bankruptcy costs. For a bank with capital below its equilibrium ratio, the expected bankruptcy costs are relatively high,

Figure 1: Financial soundness indicators: Reporting Countries and Economies

Source: International Monetary Fund (IMF) 2015

Figure 2: Depositors with commercial banks (per 1000 adults)

Source: World Bank (2017), Compiled by Author

and an increase in the capital ratios raises the expected profits by lowering the interest expenses on uninsured debt. Empirical studies observing this positive relationship between capital and profitability are abundant, including those by Alexiou and Sofoklis (2009), Angbazo (1997), and Athanasoglou et al. (2008). Therefore, one expects banks with higher capital-to-asset ratios to be relatively safer, sound, and less risky than institutions with lower capital ratios.

3.2. Cost to income ratio

The cost-to-income ratio, a proxy for operational efficiency, has been declining almost everywhere to different degrees (Albertazzi and Gambacorta, 2009), meaning that banks have lower expenses for a given level of output. Previous studies have suggested a positive and highly significant effect of efficiency on profitability (Alexiou and Sofoklis, 2009; Athanasoglou et al., 2008). This association shows that the operational efficiency of a bank is a prerequisite for not only sustainable but also sound

banking. This implies that managerial ability in controlling costs (the so-called X-efficiency) is much more important than economies of scale. Sound internal banking policies will lead to organic growth that leads to the development of the financial market and economic growth as a result of private credit. This could have a domino effect on social development.

3.3. Asset quality

Cihak and Schaeck (2012) analyzed how aggregate banking system ratios identify systemic banking crises. Their results demonstrated that bank regulatory capital to risk weighted assets does not show any variability before the crisis, and it only increases as a consequence of the crisis. This is probably because regulators impose a higher capital requirement after a financial crisis. Their results also indicated that non-performing loans to total loans increase before the crisis deteriorating the asset quality of institutions and gradually fall following the crisis. Consequently, bank provisions to non-performing loans increase following the recognition of non-performing loans. Berger and DeYoung (1997) investigate the association between asset quality and cost efficiency using the US data. They noted a negative correlation between cost efficiency and asset quality, which runs both ways, as well as that reductions, in capital at thinly capitalized banks, precede increases in problem loans. Therefore, cost efficiency may be an important indicator of future problem loans. Similarly, Salas and Saurina (2002) using Spanish data analyzed the relationship between macroeconomic and efficiency variables to explain asset quality. The results indicated that there is a significant negative effect of output and bank capitalization on non-performing loans. Furthermore, Podpiera and Weill (2008) noted that low efficiency led to increasing non-performing loans among the Czech banking sector.

4. Financial Market and Economic Growth

Not with standing, Lucas (1988) noted that economists badly overstress the role of financial factors in economic growth, and Joan Robertson, in 1952, argued that “where enterprise leads, finance follows,” the role of banking in economic growth cannot be underestimated. As noted earlier, the financial sector facilitates an efficient allocation of resources that is important in enhancing economic growth. That is, to some degree, banks can analyze the financial worthiness of an individual/business and the projects that the money requires. This is in line with a study of Rajan (1992), who noted that the banks can monitor companies and control their investment decisions, and this can distort incentives from the company. Therefore, when there is financial uncertainty due to many factors including political climate, we are more likely to see hard capital rationing. In addition, strong local markets can also provide a more stable source of financing for the public and the private sectors, insulating them to some extent against volatile global capital flows.

On the other hand, there are authors who argue that the two aspects of the financial system, bank-based and market-based, are complementary, and both contribute to economic growth. For example, Levine and Zervos (1998) concluded that the development of banks and the liquidity of the stock market (both) are good predictors of economic growth, capital accumulation, and productivity growth.

However, Rafiu (2016), using data generated from the African development indicators between 1980 and 2012 in contemporary econometric estimations, noted that local financial markets play crucial roles in the economic development of each of these groupings, although in varying magnitudes. The study also indicated that the local financial market plays a very little role in the overall economic development of the three groups when interacted. The latter results could be attributed to heterogeneity as a result of grouping. This is because when Gengenbach et al. (2011) sampled five countries (Malaysia, Mexico, Nigeria, Philippines, and Thailand) from 1997 to 2007, they demonstrated a link between economic growth and financial development.

As the economy grows and grows more complex, the financial sector needs to keep pace. Banks need to grow and become more sophisticated in their ability to assess prospects for risks and returns; in parallel, there needs to be the development of other financial sources of investment capital.

Sustained and rapid growth needs to be underpinned by a broadening and deepening of the financial system, capable of serving the needs of all parts of the economy. Those economies that have sustained rapid growth over the long term have experienced enormous structural change, as they have shifted from being predominantly rural and agricultural to a more urban-, manufacturing-, and service-based structure.

5. Economic Growth and Social Development

Social development may be defined as improving the well-being of every individual in society, so they can reach their full potential. The relationship between economic growth and social development has dominated in both academic and political debates for decades. On the one hand, one could argue that, as the economy grows, jobs are created and hence reduce poverty levels. In line with this, Barro (1996) and Barro and Lee (1997) noted that education, health, civil liberties, and environmental policies improved significantly during the periods of positive economic growth. Surprisingly, the recent World Happiness Index 2017 rated Somalia to be the happiest country in Sub-Saharan Africa, ranked at 93 ahead of South Africa at 101. On the other hand, there are some studies which have noted an opposite effect of economic growth. For example, Reuveny and Li (2003) coined that, depending on the types of economic policies implemented, income inequality may worsen or improve with economic growth. Furthermore, Shahbaz (2010) argued that economic growth in Pakistan increases income inequality which is a major obstacle in social development.

6. Methodology

We extract data from the World Bank database, International Monetary Fund (IMF), datamarket.com, and Africa Development Bank. These are credible sources that can be relied on. Credibility of the data sources affects the reliability and validity of the results.

Having extracted the data, we used the pooled time series and cross sections that allow us to consider the unobserved and time-invariant heterogeneity across different countries. For the estimation of the models, we use a dataset which consists of N is spatial units, denoted $i = 1, \dots, N$ observed at T time periods, denoted $t = 1, \dots, T$. Therefore, the total number of observations is $T \times N$. Then, y is a $TN \times 1$ vector of endogenous variables, X is a $TN \times k$ matrix of exogenous variables, which does not include a column of units for the constant term. In the context of the research, $N = 13$ and $T = 11$. Given this, we can write a generic pooled linear regression model by ordinary least square procedure as:

$$y_{it} = \beta_0 + \sum_{N=1}^N \beta_1 X_{it} + \varepsilon_{it} \quad (1)$$

Where y_{it} is the dependent variable, i.e. the economic and social development indicators, β_0 is the intercept term, β_i is a $k \times 1$ vector of parameters to be estimated on the explanatory variables (financial soundness), and x_{it} is a $1 \times k$ vector of observations on the explanatory variables, $t = 1, \dots, T$, $i = 1, \dots, N$ and is a random error term. Pooled OLS enables the researcher to capture the variation of what emerges through time or space simultaneously.

The specification in equation (1) suggests a linear panel data model. The associated assumptions to the model that we take into account are as follows:

- The error term is normally distributed and has zero mean and standard deviation s_i^2 , it \sim i.i.d. $(0, s_i^2)$
- Similar variances among banks, $s_i^2 = s_e^2$ i
- Zero covariances among banks, $\text{Cov}(e_{it}, e_{jt}) = 0$ for $i \neq j$

If the homogeneity hypothesis is rejected, the estimates based on the pooled model will lack meaning:

$$\begin{array}{ccc}
 Y_1 & X_1 & \varepsilon_1 \\
 Y_2 & X_2 & \varepsilon_2 \\
 \vdots & \vdots & \vdots \\
 Y_N & X_N & \varepsilon_N
 \end{array}
 \quad
 \begin{array}{l}
 \\
 \\
 = \beta + \cdot = X\beta + \varepsilon \\
 \\
 \end{array}
 \quad (2)$$

However, if the difference between β s, though significant, is thought to be small, then one could consider a trade-off of accepting some bias to reduce variances. If the departure of homogeneity is so great, then this could result in serious distortion in the conclusion, hence the need to proceed with the choice of the best alternative static specification that links to the pros and cons of each specification. The fixed effect model assumes that, despite the intercept potentially varies across the banks in different countries because of differences in the regulatory framework, each individual intercept does not vary from time to time. Therefore, the intercept β_{it} means that it is time invariant. Therefore, the fixed effect model can be expressed as:

$$y_{it} = \beta_{1it} + \sum_{N=1}^N \beta_1 X_{it} + \varepsilon_{it} \quad (3)$$

Y in this case will be social and economic growth proxies and x is the financial soundness index.

The common slope coefficients and constants may not be fixed but random. In this case, the random effect model would be appropriate. In a nutshell, random effect is a compromise between pooling under complete homogeneity and pooling with common slope coefficient, but with the intercept, which may vary by the cross-section. That is, all of the elements in the coefficient vector, slopes as well as intercepts are random variables rather than fixed parameters. Under the assumption of intercepts for the cross-section which are random variables and slope coefficients which are fixed parameters, the vector would represent slopes only while the random error term would have two components. Thus:

$$\begin{array}{ccc}
 \mu_i & \eta_{i1} \\
 \mu_i & \eta_{i2} \\
 \varepsilon_i = & \cdot + \cdot \\
 & \cdot \\
 \mu_i & \eta_{iT}
 \end{array}
 \quad (4)$$

The μ_i represents randomness which is due to the choice of the cross section, while η_{it} represents the randomness stemming from cross-section and time period.

To identify the best estimator, a Hausman test was used. It is assumed that both the “random effects” and the “fixed effects” panel estimators are consistent under the assumption that the model is correctly specified and that the parameters are independent of the “individual-specific effects” (the “random effects” assumption). In this case, the random effects estimator is also asymptotically efficient. The difference between the random effects and the fixed effects estimators will, thus, tend to be small. On the other hand, if the random effects assumption fails, but the model is otherwise correctly specified, then the fixed effects estimator remains consistent, but the random effects estimator is inconsistent. In other words, the Hausman test checks a more efficient model against a less efficient but consistent model to make sure that the more efficient model also gives consistent results. The test is based on two hypotheses:

$$\begin{array}{l}
 H_0: E(x_{itit}) = 0 \text{ vs } E(x_{itit}) \neq 0 \\
 FE: y_{it} = \alpha_i + x'_{it}\beta + \mu_{it} \Leftrightarrow E(y_{it} | x_{it}, \alpha_i) = \alpha_i + x'_{it}\beta
 \end{array}
 \quad (5)$$

$$RE: y_{it} = x'_{it}\beta + \varepsilon_{it} \Leftrightarrow E(y_{it} | x_{it}) = x'_{it}\beta \quad (6)$$

In this research, several variables are used to measure the soundness of banking. Table 1, below, shows a summary of the variables used to assess soundness of banking. In conducting the correlation of the various dependent variables, ROE is controlled to assess whether indeed (although obvious) soundness of banking will lead to profitability in the long-run (Table 1).

Table 1: Banking soundness variables

1	Regulatory capital to risk-weighted assets
2	Regulatory tier 1 capital to risk-weighted assets
3	Common equity tier 1 to risk-weighted assets (solvency ratio)
4	Capital to assets
5	Non-performing loans net of provisions to capital
6	Non-performing loans to total gross loans
7	Provisions to non-performing loans
8	Sectoral distribution of loans to total loans
9	Return on assets
10	ROE
11	Interest margin to gross income
12	Noninterest expenses to gross income
13	Liquid assets to total assets
14	Liquid assets to short-term liabilities (liquidity coverage ratio will replace this measure when Basel III is fully adopted)
15	Available amount of stable funding to required amount of stable funding (Net stable funding ratio)
16	Net open position in foreign exchange to capital
17	Geographical distribution of loans to total loans
18	Trading income to total income
19	Personnel expenses to noninterest expenses
20	Spread between reference lending and deposit rates (base points)
21	Spread between highest and lowest interbank rates (base points)
22	Customer deposits to total (non-interbank) loans
23	Foreign-currency-denominated loans to total loans
24	Foreign-currency-denominated liabilities to total liabilities
25	Credit growth to private sector

ROE: Return on equity

6.1. Financial stability

A sound banking system will lead to stable financial industry. This paper uses Z score as a measure of financial stability following the work of Schaeck and Cihak (2012). Z score measures the distance from insolvency, where insolvency is a condition in which the loss exceed equity. The Z score is calculated as follows:

$$Z_{ijt} = \frac{ROA_{ijt} + E_{ijt} / TA_{ijt}}{\delta ROA_{ijt}}$$

Where Z_{ijt} is a measure of financial stability of i bank, in j country, at t time. ROA_{ijt} stands for the return on assets of i bank, in j country, at t time; E_{ijt}/TA_{ijt} is a ratio of equity to total assets of i bank, in j country, at t time; δROA_{ijt} is a standard deviation of ROA_{ijt} .

6.2. Bank concentration

To measure bank concentration, this work uses the share of assets held by the top three banks or the Herfindahl index. This is based on the structure-conduct-performance paradigm. That is where there are fewer and larger banks, they are more likely to engage in anticompetitive behavior and reap abnormal returns (Tables 2 and 3).

Table 2: Economic growth indicators

1	GDP growth
2	MS
3	Employment rate

MS: Money supply, GDP: Gross domestic product

Table 3: Social development indicators

1	Poverty level
2	Life expectancy
3	Employment level

7. Results and Analysis

Table 4 shows the descriptive statistics of the variables. The results show that on average, the bank concentration across sub-Saharan Africa is 66%. The minimum is 32%, while the maximum is 100%. When compared with major economies in the world in 2015, the US is 35% and the UK is 45%. This indicates that there are few banks in Sub-Saharan Africa with the highest total banking assets. High concentration of banks tends to lead to higher prices, lower outputs, and a smaller consumer surplus even in the absence of collusion. Banks in highly concentrated markets often sustain abnormal profits for long periods of time. In the same vein, when examining the correlation between bank concentration and return on assets, Table 5 indicates a positive association. This supports earlier studies that indicate that less concentrated banking system erode market power, hence affecting the net present value of profits (Allen and Gale, 2004).

In addition, the ROE before tax indicates that the average within Sub-Saharan Africa is a healthy 25%, the minimum being 0.6%, and the maximum 64%. Compared with other regions, banks in Sub-Saharan Africa have indicated superior return consistently from the year 2000 as shown in Figure 3.

Although banks in Sub-Saharan regions are more profitable compared with those in developed countries, Table 4 (descriptive) indicates that, on average, the financial soundness in the region is 18, and the minimum and maximum being 33 and 1.7, respectively. This compares unfavorably with the soundness level of most developed economies as shown in Figure 1. The more sound the financial institutions is the more efficient they are as shown in the correlation matrix in Table 5. In turn, it is expected that sound banks are more likely to be profitable as shown by a positive relationship between FS and ROE. The fact that the banks in Sub-Saharan Africa are less sound than those in developed countries but more profitable is a puzzle that can attributed to many factors. The fact that banks in sub-Saharan Africa are less sound but more profitable is a puzzle that can be attributed to a number of factors including the environmental riskiness. In addition, higher profitability could be attributed to the oligopolistic power of few banks that control the market in the region. However, the results indicate that the more sound the banks are, they more efficient they tend to be.

Further, the results indicate that the more sound the banks are, the lower the lending rate. Similarly, there is a positive association between financial soundness and economic growth that leads to higher employment rate.

More interesting is that there is a positive correlation between financial soundness and life expectancy and a negative association with poverty level. This implies that better financial systems tend to have a positive impact, not only on economic but also on social development.

8. Significance of Financial Soundness

Governments across the world devote much of their resources to the regulation of banking. There are many arguments that support this within the framework of financial intermediation and liquidity creation.

Table 4: Descriptive statistics

Measurements	BANK_CONC	BANK_Z_SC	CIR	EMPL.R	FS	GDPG	LR	LE	MSG	PL	ROE
Mean	66.366	25.768	64.527	10.701	18.113	5.296	17.284	58.338	17.548	44.108	25.326
Median	65.620	10.445	61.800	6.300	18.450	5.295	16.104	59.605	14.738	43.420	23.700
Maxi	100.00	1094.00	130.770	37.600	33.120	22.593	43.800	69.117	66.155	68.030	64.870
Min.	31.910	3.730	37.240	0.744	1.750	-7.652	7.300	33.740	-1.302	14.000	0.640
Std. Dev.	17.897	127.638	16.108	9.756	5.140	3.651	6.288	6.767	13.001	14.497	11.466
Obs.	142	142	143	143	115	143	143	143	143	143	143

BANK_CONC: Bank concentration level, BANK_Z_SC: Bank Z score, CIR: Cost-income -ratio, EMPL.R: Employment rate, FS: Financial soundness, GDPG: Gross domestic product growth, LR: Lending rate, LE: Life expectancy, MSG: Money supply growth, PL: Poverty level, ROE: Return on equity

Table 5: Correlation of the variables

Variables	BANK_CONC	BANK_Z_SC	CIR	EMPL.R	FS	GDPG	LR	LE	MSG	PL	ROE
BANK_CONC	1.000										
BANK_Z_SC	-0.055	0.00									
CIR	0.149	-0.034	1.000								
EMPL.R	0.501	-0.079	-0.157	1.000							
FS	0.203	0.024	-0.083	0.101	1.000						
GDPG	-0.308	0.010	-0.266	-0.31	0.007	1.000					
LR	0.085	0.022	-0.166	-0.099	-0.402	0.114	1.000				
LE	0.009	-0.002	0.092	0.047	0.379	0.012	0.070	1.000			
MSG	-0.185	0.187	-0.278	-0.228	-0.043	-0.335	0.322	-0.157	1.000		
PL	0.227	-0.103	0.073	-0.079	-0.134	-0.182	-0.145	-0.084	-0.077	1.000	
ROE	0.141	-0.001	-0.535	0.110	0.006	0.293	0.218	0.120	0.359	-0.237	1.000

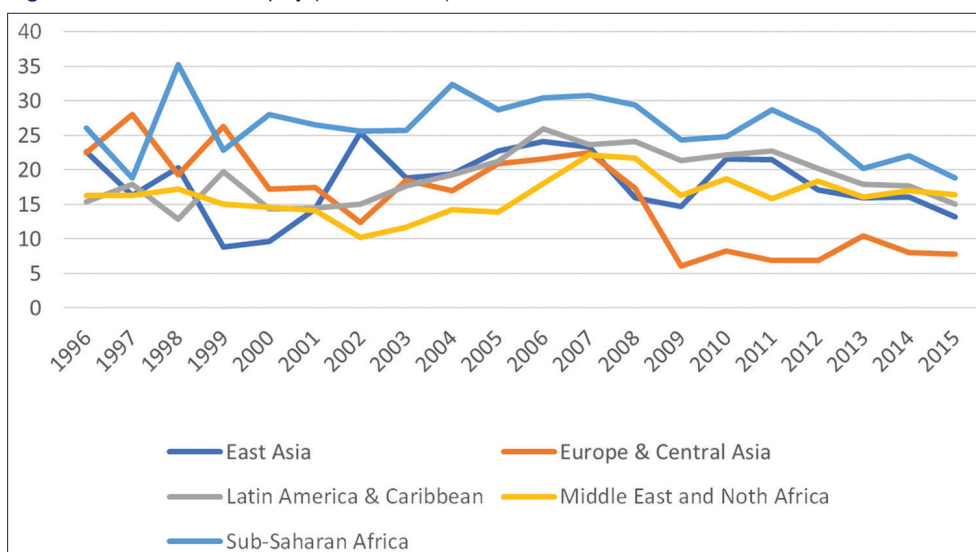
BANK_CONC: Bank concentration level, BANK_Z_SC: Bank Z score, CIR: Cost-income -ratio, EMPL.R: Employment rate, FS: Financial soundness, GDPG: Gross domestic product growth, LR: Lending rate, LE: Life expectancy, MSG: Money supply growth, PL: Poverty level

Table 6: Pooled fixed effect

Dependent variable	Coefficient	T statistics	P value	Adjusted R2	DW
GDPG	0.008	0.518 (0.016)	0.0603	0.002	1.78
MSG	-0.084	-1.383 (0.006)	0.167	0.005	0.97
PL	-0.325	-4.413 (0.074)	0.000	0.015	1.86
EMPL	0.177	3.301 (0.054)	0.001	0.008	1.73
LIFE EXP	0.376	14.086 (0.002)	0.000	0.136	1.53
BANK CONC	0.707	7.196 (0.098)	0.000	0.04	1.6
BANK Z. SC.	0.476	0.864 (0.552)	0.051	0.001	2.16
CIR	-0.261	-3.013 (0.086)	0.003	0.007	1.77
LR	-0.497	-4.312 (0.115)	0.000	0.141	1.33

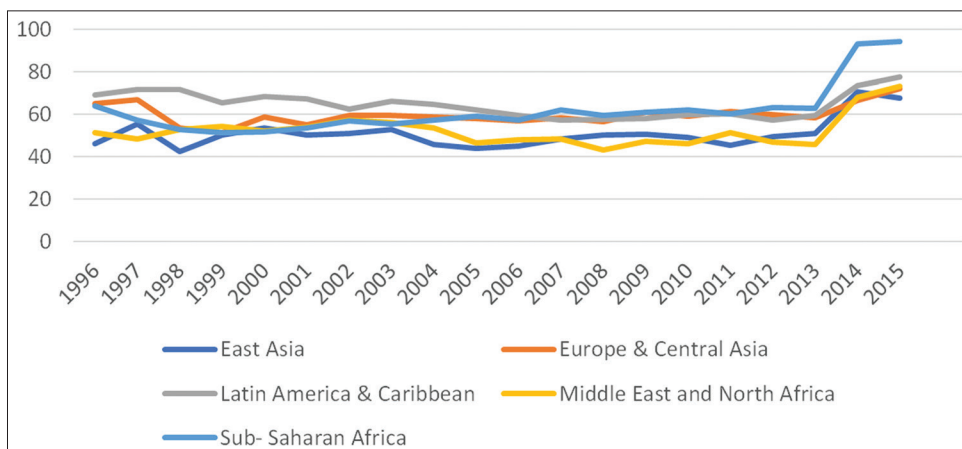
Dependent variables: BANK_CONC: Bank concentration level, BANK_Z. SC.: Bank Z score, CIR: Cost income ratio), EMPL.

R: Employment rate, GDPG: Gross domestic product growth, LR: Lending rate, LE: Life expectancy, MSG: Money supply growth, PL: Poverty level. Independent variable: FS: Financial soundness

Figure 3: Bank return on equity (% , before tax)

Source: Market Intelligence (2017) compiled by author

As the correlation results indicated a positive association between the soundness of banking and GDPG, the panel fixed effect regression (Table 6) indicates a positive coefficient significant at 5%. This implies that a 1% change in the soundness of the financial industry in Sub-Saharan Africa will lead to 0.8% overall economic growth. Examining the pairwise Granger causality (Appendix 1) to assess the bidirectional relationship, the null hypothesis is that GDPG does not make Granger cause FS. The $P = 0.9106$, hence rejecting the null hypothesis in favor of the alternative. That is, the growth of the economy does enhance the financial soundness of banks. As the economy grows, one will expect that overall individuals and firms will honor their financial obligations, including loan interest commitments. As a result of increasing the honoring of loan commitments, the quality of the bank assets will be improved, leading to the soundness of the bank. Likewise, the soundness of the banks does influence the economic growth.

Figure 4: Bank cost income ratio

Source: Market Intelligence (2017) compiled by author

8.1. Financial soundness and money supply

The changes in money supply in the economy emanate from the way that financial institutions conduct their business. As indicated above, credit creation is one of the functions of the banks. In doing so, they (banks) undertake the screening and monitoring of borrowers' creditworthiness, redistribute risks, and transform asset characteristics. Although not foolproof, the sounder the banks are, the less the non-performing loans or assets. Consequently, the results (Table 6) indicate that the sounder the banks are, the less money supply growth. This might be seen as negative on the periphery, but a critical look will imply that sounder banks will eliminate or mitigate "excess money." Thus, financial systems that are less sound are likely to create too much quickly that may push house prices and encourage financial market speculation. This leads to a financial crisis such as one that was observed in 2008–2009. Excess money leads to artificial reduction of interest rates and credit expansion. Lionel (2008), the former chairman of the UK's Financial Services Authority, Lord (Adair) Turner stated, "*The financial crisis of 2007 to 2008 occurred because we failed to constrain the financial system's creation of private credit and money.*" Further analysis using the Granger causality (Appendix 1) indicates that financial soundness does drive the money supply growth and not *vice versa*. That is, money supply will depend on how sound the financial institutions are.

8.2. Poverty level

In the 1990s, Africa was viewed as a continent of wars, famines, and entrenched poverty. The latest World Bank (2016) estimates that the share of Africans who are poor fell from 56% in 1990 to 43% in 2012. However, due to population growth, many more people are poor, the report says. The most optimistic scenario shows about 330 million poor in 2012, up from about 280 million in 1990. Poverty reduction has been much slower in fragile countries with the rural areas remaining poor, although the urban–rural gap has narrowed. In terms of financial access, rural areas remain predominately unbanked compared with urban regions. The access to finance in developing countries has been considered as a necessity, just like safe water or primary education (Beck and de la Torre, 2006). In developed countries, financial services cover almost the majority of the population (Peachy and Roe, 2004). On the other hand, it is only 20% of the population who have access to formal financial services in developing countries (World Savings Banks Institute, 2004). One of the objectives of this research was to assess whether sounder financial institutions will lead to a reduction in the poverty level in Sub-Saharan Africa. Table 6 indicates that a 1% improvement on how sound the banks are led to a reduction of

the poverty level by a whopping 32.5%. On the flip side, this implies that unsound banking acts as a fundamental source of poverty. This implies that poverty causes a low demand for organized financial system and financial exclusion causes poverty. Therefore, there is a bidirectional cause-and-effect relationship between poverty and financial soundness as shown in the Granger causality.

8.3. Employment level

One of the functions of the financial institutions is to create credit in terms of identifying the deficit and surplus. In doing so, banks may lend to firms that have liquidity problems either in the short term or long term. In addition, firms may need to expand or invest in various projects that may require additional capital injection that may be accessed through banking facilities. As shown in Table 6, financial soundness has a positive significant at 1% coefficient in influencing the level of employment. This implies that a 1% improvement in the financial soundness will lead to a 17% increase in the employment level. This is because the sounder the banks are, the more sustainable they will be, and this will lead to efficient allocation of financial resources that support the economic growth. Enhanced economic growth will lead to an increase in employment level.

8.4. Life expectancy

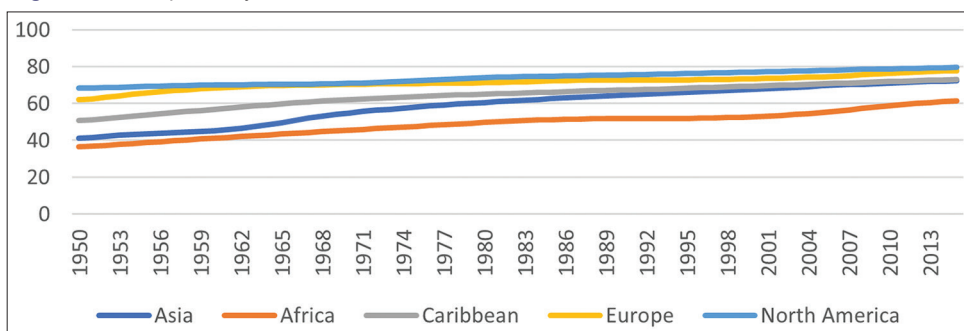
Figure 5 shows a dramatic increase in life expectancy over the past 60 years across the world. However, a close examination shows that life expectancy in Africa remains lower compared with other continents. There are many factors that affect life expectancy. These include employment, income, education, and economic well-being and the quality of health system and access to it. Although, globally, life expectancy has increased, it has been argued that globalization has profoundly affected the distribution of income both among and within countries. For example, Piketty's (2014) study indicated that globalization favors capital relative to other sources of income, such as labor and rent. Increased capital mobility pulled many countries out of poverty, but the benefits favor the rich capital owning countries.

As shown in Table 6, an improvement of banking soundness will lead to an increase in life expectancy significantly. In assessing the bidirectional relationship, the null hypothesis was that life expectancy does not Granger cause financial soundness, and the result indicates a failure to reject for the alternative. On the other hand, the result indicates that financial soundness does cause life expectancy.

8.5. Bank concentration

Allen and Gale (2000, 2003) analyzed the impact of bank concentration and noted that a less concentrated banking sector with many small banks is more prone to financial crises than a concentrated banking sector with a few large banks. However, a highly concentrated financial industry with large banks

Figure 5: Life expectancy



Source: Our World Data (2017) compiled by author

can enhance diversification than banking systems with many small banks. In other words, greater concentration could lead to an increase in size, hence huge market power, and profits of banks, thereby enhancing diversification. Analyzing the link between financial soundness and bank concentration, the results indicate that a positive association is significant at 5%. That is, stable or sound financial institutions could enhance bank concentration. Highly concentrated system that leads to bigger and politically connected banks may become more leveraged and take on greater risks that lead to the coining of “too big to fail.” Nevertheless, large, influential banks may shape the policies and financial regulations.

8.6. Efficiency

Cost income ratio (CIR) was used as a proxy to measure the efficiency level of the banks. The fixed effect model indicates that there is a significant negative association between the soundness of banking and CIR. This implies that sound banking policies will tend to reduce the cost of operations. As shown in Figure 4, the CIR for banks operating in the SSA is higher than those operating in the regions. Indeed, a survey that was conducted by the World Bank (2004b) indicated that Africa lags in most of the dimensions of the doing business indicators and price and costs are also high, considering Africa’s low-income level. Conversely, as indicated above, banks operating in the SSA are more profitable than those operating in other regions. This implies a higher profit margin to recover the costs. These costs include the corporate taxes. As shown in Table 7, overall, Africa has the highest average corporate tax rate among all regions, at 28.73%. Europe has the lowest average statutory corporate tax rate among all regions, at 18.35%.

In terms of corporate tax rate weighted on GDP again, Africa and South America tie for the highest regional average statutory rate, at 28.73% (28.2% weighted by GDP for Africa and 32.98% weighted by GDP for South America). Therefore, governments across SSA need to ensure to conduct reforms to reduce their recurrent expenditure. In doing so, they will reduce the corporate tax rate to not only make the cost of trading in the region high but also to attract foreign direct investments.

9. Conclusion

Although the SSA economies have shown a health growth over the recent years, the growth does not match its potential considering the endowment of the resources. Further, the growth has led to a shift to the “Africa Raising” notion although the number of poor people has increased over the past 20 years. This could be attributed to the population growth and the gap between rich and poor increasing. This

Table 7: Average corporate tax rate across regional grouping

Region or group	Average rate (%)	Weighted average rate (%)	Number of countries
Africa	28.73	28.20	48
Asia	20.05	26.26	45
Europe	18.35	25.58	49
North America	23.08	37.01	30
Oceania	23.67	27.10	18
South America	28.73	32.98	13
BRICS	28.32	27.34	5
EU	21.82	26.25	28
G20	28.04	30.90	19
G7	29.57	33.48	7
OECD	24.18	31.12	35
World	22.96	29.41	202

Source: Kari and Kyle (2017)

research has identified that financial soundness could help in improving the socioeconomic growth. In doing so, it is important that governments undertake major reforms in streamlining the recurrent expenditures. This, in turn, will lead to a reduction in corporate tax rates. Ultimately, this will reduce the cost of doing business within the region. The results point out that, in ensuring that banks are sound, this will lead to lower lending rates. Lower rates will, in turn, reduce the cost of operations in non-financial firms and will encourage investments. This will lead to increased employment level and hence a reduced poverty level.

References

- Albertazzi, U., Gambacorta, L. (2009), Bank profitability and the business cycle. *Journal of Financial Stability*, 5, 393-409.
- Alexiou, C., Sofoklis, V. (2009), Determinants of bank profitability: Evidence from the Greek banking sector, *Economic Annals*, 182, 93-118.
- Allen, F., Gale, D. (2004), Competition and financial stability. *Journal of Money, Credit, and Banking*, 36(3), 453-80.
- Angebazo, L. (1997), Commercial banks, net interest margins, default risk, interest rate risk and off-balance sheet banking. *Journal of banking and Finance*, 21, 55-87.
- Athanasoglou, P., Brissimis, S., Delis, M. (2008), Bank-specific. Industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets. Institutions and Money*, 18(2), 121-136.
- Barro, R. (1996), International measures of schooling years and schooling quality. *The American Economic Review*, 86, 218-223.
- Barro, R., Lee, J.W. (1997), *Schooling Quality in a Cross-Section of Countries*. Working Paper 6198. Cambridge, Mass: National Bureau of Economic Research.
- Beck, T., de la Torre, A. (2006), *The Basic Analytics of Access to Financial Services* (English). Policy, Research Working Paper; No. WPS 4026. Washington, DC: World Bank.
- Berger, A.N. and De Young, R. (1997) Problem Loans and Cost Efficiency in Commercial Banks. *Journal of Banking & Finance*, 21, 849-870. [https://doi.org/10.1016/S0378-4266\(97\)00003-4](https://doi.org/10.1016/S0378-4266(97)00003-4).
- Donou-Adonsou, F., Sylwester, K. (2015), Macroeconomic effects of microfinance: Evidence from developing countries. *Journal of Economics*, 41(1), 21-35.
- García-Herrero, A., Gavilá, S., Santabábara, D. (2009), What explains the low profitability of Chinese banks? *Journal of Banking and Finance*, 33(11), 2080-2092.
- Gengenbach, C., Palm, F., Urbain, J.P. (2010), Panel unit root tests in the presence of cross-sectional dependencies: Comparison and implications for modelling. *Econometric Reviews*, 29(2), 111-145.
- George, G., Kotha, R., Parikh, P., Alnauaimi, T., Bahaj, A.S. (2016), Social structure, reasonable gain, and entrepreneurship in Africa. *Strategic Management Journal*, 37, 1118-1131.
- International Monetary Fund. (2015), Financial Soundness Indicators and the IMF. Available from: <https://www.imf.org/external/np/sta/fsi/eng/fsi.htm>. [Last accessed on 2018 Feb 01].
- Jalilian, H and Kirkpatrick, C (2002), Financial development and poverty reduction in developing countries, *International Journal of Finance Economics*. Vol. 7 (2), pp. 97-108.
- Jeanneney, S.G., Kpodar, K. (2011), Financial development and poverty reduction: Can there be a benefit without a cost? *Journal of Development Studies*, 47(1), 143-163.
- Kari, J., Kyle, P. (2017), Corporate Income Tax Rates around the World. *Fiscal Fact*, No. 559 Sept. 2017. Available from: <https://www.files.taxfoundation.org/20170907092820/Tax-Foundation-FF559.pdf>. [Last accessed on 2018 Mar 10].
- Kolk, A., Lenfant, F. (2012), Business-NGO collaboration in a conflict setting: Partnership activities in the democratic republic of Congo. *Business and Society*, 51, 478-511.
- Levine, R., Zervos, S. (1998), Stock markets, banks, and economic growth. *American Economic Review*, 88, 537-558. Available from: <https://www.ssrn.com/abstract=236909>. [Last accessed on 2018 Feb 10].
- Lionel, B. (2008), Adair Turner Interview Transcript on Failure of Banking Industry in 2008, *Financial Times*; 2008.
- Lucas, R.E Jr. (1988), On the mechanics of economic development. *Journal of Monetary Economics*, 22, 3-42.
- Market Intelligence. (2017), Cost-to-Income Ratios of Banks Worldwide. Available from: <https://www.marketintelligence.spiglobal.com/our-thinking/ideas/cost-to-income-ratios-of-banks-worldwide>. [Last accessed on 2018 Feb 10].
- Our World Data. (2017), Life Expectancy. Available from: <https://www.ourworldindata.org/life-expectancy>. [Last accessed on 2018 Feb 15]

- Pasiouras, F., Kosmidou, K. (2007), Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, 21(2), 222-237.
- Peachy, S., Roe, A. (2004), Access to Finance-What Does it Mean and How Do Savings Banks Foster Access? Brussels: World Savings Bank Institute.
- Piketty, T. (2014), *Capital in the Twenty-first Century*. Cambridge, MA: Harvard University Press.
- Podpiera, J. and Weill, L. (2008). Bad Luck or Bad Management? Emerging Banking Market Experience. *Journal of Financial Stability*, vol. 4, 135–148.
- Rafiu, A.A., (2016), The role of local financial market on economic growth: A sample of three African economic groupings. *African Journal of Economic and Management Studies*, 7(2), 225-240.
- Rajan, R. (1992), Insiders and outsiders: The choice between informed and arms length debt. *Journal of Finance*, 47(4), 1367-1400. Available from: http://www.econpapers.repec.org/article/blajfinan/v_3a47_3ay_3a1992_3ai_3a4_3ap_3a1367-400.htm. [Last accessed on 2018 Mar 10].
- Reuveny, R., Li, Q. (2003), Economic openness, democracy, and income inequality: An empirical analysis. *Comparative Political Studies*, 36(5), 575.
- Salas, V. and Saurina, J. (2002). Credit Risk in Two Institutional Regimes: Spanish Commercial and Savings Banks. *Journal of Financial Services Research*. Vol. 22, 203–224.
- Schaeck, K., Cihák, M. (2012), Banking competition and capital ratios. *European Financial Management*, 18, 836-866.
- Shahbaz, M. (2010), Income inequality-economic growth and non-linearity: A case of Pakistan. *International Journal of Social Economics*, 37(9), 613-636.
- Stiglitz, J.E. (1994), *The Role of the State in Financial Markets* (English). Washington, D.C.: The World Bank. Available from: <http://www.documents.worldbank.org/curated/en/239281468741290885/The-role-of-the-state-in-financial-markets>.
- Valentina, F., Calvin, M., Liliana, S. (2009), *The Determinants of Commercial Bank Profitability in Sub-Saharan Africa*. IMF Working Paper, WP/09/15.
- World Bank. (2004b), *Doing Business 2005*. New York: Oxford University Press.
- World Bank. (2017), Depositors with Commercial Banks (per 1,000 adults). Available from: <https://www.data.worldbank.org/indicator/FB.CBK.DPTR.P3>. [Last accessed on 2018 Mar 10].
- World Savings Bank Institute. (2004), *WSBI Access to Finance Resolution*. Brussels: WSBI.

Appendix

Appendix 1: Pairwise granger causality tests

Date: 01/31/18 time: 13:24

Sample: 2006 2150

Lags: 5

Null hypothesis	Obs	F-statistic	P
BANK_Z_SCORE does not Granger Cause BANK_CONCENTRATION	126	0.17318	0.9721
BANK_CONCENTRATION does not Granger Cause BANK_Z_SCORE		3.87104	0.0028
CIR does not Granger Cause BANK_CONCENTRATION	132	2.60135	0.0285
BANK_CONCENTRATION does not Granger Cause CIR		0.90501	0.4803
EMPLOYMENT_RATE does not Granger Cause BANK_CONCENTRATION	132	0.91076	0.4765
BANK_CONCENTRATION does not Granger Cause EMPLOYMENT_RATE		1.02631	0.4053
FS does not Granger Cause BANK_CONCENTRATION	69	2.11629	0.0762
BANK_CONCENTRATION does not Granger Cause FS		2.17342	0.0694
GDPG does not Granger Cause BANK_CONCENTRATION	132	0.95996	0.4452
BANK_CONCENTRATION does not Granger Cause GDPG		2.01327	0.0815
LENDINGRATE does not Granger Cause BANK_CONCENTRATION	132	0.12529	0.9865
BANK_CONCENTRATION does not Granger Cause LENDINGRATE		0.07352	0.9961
LIFE_EXPECTANCY does not Granger Cause BANK_CONCENTRATION	132	0.31293	0.9044
BANK_CONCENTRATION does not Granger Cause LIFE_EXPECTANCY		0.19229	0.9650
MSG does not Granger Cause BANK_CONCENTRATION	132	1.75154	0.1280
BANK_CONCENTRATION does not Granger Cause MSG		1.21298	0.3071
POVERTY_LEVEL does not Granger Cause BANK_CONCENTRATION	132	0.74918	0.5882
BANK_CONCENTRATION does not Granger Cause POVERTY_LEVEL		0.55382	0.7352
ROE does not Granger Cause BANK_CONCENTRATION	132	0.52320	0.7583
BANK_CONCENTRATION does not Granger Cause ROE		0.98715	0.4285
CIR does not Granger Cause BANK_Z_SCORE	132	1.50643	0.1928
BANK_Z_SCORE does not Granger Cause CIR		0.75105	0.5869
EMPLOYMENT_RATE does not Granger Cause BANK_Z_SCORE	132	0.39073	0.8544
BANK_Z_SCORE does not Granger Cause EMPLOYMENT_RATE		0.09138	0.9935
FS does not Granger Cause BANK_Z_SCORE	74	0.08651	0.9941
BANK_Z_SCORE does not Granger Cause FS		0.04444	0.9988
GDPG does not Granger Cause BANK_Z_SCORE	132	7.08234	8.E-06
BANK_Z_SCORE does not Granger Cause GDPG		0.19483	0.9640
LENDINGRATE does not Granger Cause BANK_Z_SCORE	132	0.29228	0.9164
BANK_Z_SCORE does not Granger Cause LENDINGRATE		0.20416	0.9602
LIFE_EXPECTANCY does not Granger Cause BANK_Z_SCORE	132	2.86337	0.0177
BANK_Z_SCORE does not Granger Cause LIFE_EXPECTANCY		0.72786	0.6038

(Contd...)

Appendix 1: (Continued)**Date: 01/31/18 time: 13:24****Sample: 2006 2150****Lags: 5**

Null hypothesis	Obs	F-statistic	P
MSG does not Granger Cause BANK_Z_SCORE	132	4.99207	0.0003
BANK_Z_SCORE does not Granger Cause MSG		0.56845	0.7240
POVERTY_LEVEL does not Granger Cause BANK_Z_SCORE	132	1.11812	0.3544
BANK_Z_SCORE does not Granger Cause POVERTY_LEVEL		0.05525	0.9980
ROE does not Granger Cause BANK_Z_SCORE	132	2.22377	0.0562
BANK_Z_SCORE does not Granger Cause ROE		0.43889	0.8206
EMPLOYMENT_RATE does not Granger Cause CIR	138	0.18101	0.9693
CIR does not Granger Cause EMPLOYMENT_RATE		0.42363	0.8315
FS does not Granger Cause CIR	75	0.97413	0.4404
CIR does not Granger Cause FS		4.85646	0.0008
GDPG does not Granger Cause CIR	138	1.52729	0.1859
CIR does not Granger Cause GDPG		2.12169	0.0670
LENDINGRATE does not Granger Cause CIR	138	0.58081	0.7146
CIR does not Granger Cause LENDINGRATE		0.98555	0.4293
LIFE_EXPECTANCY does not Granger Cause CIR	138	0.61605	0.6878
CIR does not Granger Cause LIFE_EXPECTANCY		3.23421	0.0088
MSG does not Granger Cause CIR	138	0.86717	0.5052
CIR does not Granger Cause MSG		2.29959	0.0488
POVERTY_LEVEL does not Granger Cause CIR	138	1.00308	0.4187
CIR does not Granger Cause POVERTY_LEVEL		1.68767	0.1422
ROE does not Granger Cause CIR	138	1.68176	0.1436
CIR does not Granger Cause ROE		3.06848	0.0120
FS does not Granger Cause EMPLOYMENT_RATE	75	2.01219	0.0887
EMPLOYMENT_RATE does not Granger Cause FS		0.93624	0.4637
GDPG does not Granger Cause EMPLOYMENT_RATE	138	0.61114	0.6915
EMPLOYMENT_RATE does not Granger Cause GDPG		1.10730	0.3598
LENDINGRATE does not Granger Cause EMPLOYMENT_RATE	138	0.04107	0.9990
EMPLOYMENT_RATE does not Granger Cause LENDINGRATE		0.06101	0.9975
LIFE_EXPECTANCY does not Granger Cause EMPLOYMENT_RATE	138	0.14882	0.9801
EMPLOYMENT_RATE does not Granger Cause LIFE_EXPECTANCY		0.70309	0.6221
MSG does not Granger Cause EMPLOYMENT_RATE	138	0.22997	0.9488
EMPLOYMENT_RATE does not Granger Cause MSG		1.13371	0.3460
POVERTY_LEVEL does not Granger Cause EMPLOYMENT_RATE	138	0.67921	0.6400
EMPLOYMENT_RATE does not Granger Cause POVERTY_LEVEL		0.19264	0.9649
ROE does not Granger Cause EMPLOYMENT_RATE	138	1.38728	0.2334
EMPLOYMENT_RATE does not Granger Cause ROE		0.38081	0.8612
GDPG does not Granger Cause FS	75	0.30080	0.9106
FS does not Granger Cause GDPG		0.80550	0.5500
LENDINGRATE does not Granger Cause FS	75	4.82235	0.0008

(Contd...)

Appendix 1: (Continued)**Date: 01/31/18 time: 13:24****Sample: 2006 2150****Lags: 5**

Null hypothesis	Obs	F-statistic	P
FS does not Granger Cause LENDINGRATE		0.68388	0.6373
LIFE_EXPECTANCY does not Granger Cause FS	75	3.84023	0.0042
FS does not Granger Cause LIFE_EXPECTANCY		0.35768	0.8754
MSG does not Granger Cause FS	75	4.50245	0.0014
FS does not Granger Cause MSG		0.78115	0.5670
POVERTY_LEVEL does not Granger Cause FS	75	2.20783	0.0642
FS does not Granger Cause POVERTY_LEVEL		0.56587	0.7258
ROE does not Granger Cause FS	75	2.00119	0.0904
FS does not Granger Cause ROE		0.67054	0.6472
LENDINGRATE does not Granger Cause GDPG	138	0.51404	0.7652
GDPG does not Granger Cause LENDINGRATE		0.79678	0.5539
LIFE_EXPECTANCY does not Granger Cause GDPG	138	6.14873	4.E-05
GDPG does not Granger Cause LIFE_EXPECTANCY		0.30534	0.9089
MSG does not Granger Cause GDPG	138	0.66754	0.6488
GDPG does not Granger Cause MSG		2.46993	0.0359
POVERTY_LEVEL does not Granger Cause GDPG	138	1.39617	0.2301
GDPG does not Granger Cause POVERTY_LEVEL		0.79202	0.5573
ROE does not Granger Cause GDPG	138	1.30081	0.2677
GDPG does not Granger Cause ROE		0.49805	0.7772
LIFE_EXPECTANCY does not Granger Cause LENDINGRATE	138	0.22575	0.9508
LENDINGRATE does not Granger Cause LIFE_EXPECTANCY		0.35217	0.8801
MSG does not Granger Cause LENDINGRATE	138	0.66167	0.6532
LENDINGRATE does not Granger Cause MSG		3.32151	0.0075
POVERTY_LEVEL does not Granger Cause LENDINGRATE	138	0.99726	0.4222
LENDINGRATE does not Granger Cause POVERTY_LEVEL		0.29329	0.9159
ROE does not Granger Cause LENDINGRATE	138	0.35884	0.8757
LENDINGRATE does not Granger Cause ROE		0.63740	0.6716
MSG does not Granger Cause LIFE_EXPECTANCY	138	0.10722	0.9905
LIFE_EXPECTANCY does not Granger Cause MSG		4.96075	0.0003
POVERTY_LEVEL does not Granger Cause LIFE_EXPECTANCY	138	0.34232	0.8864
LIFE_EXPECTANCY does not Granger Cause POVERTY_LEVEL		0.34736	0.8831
ROE does not Granger Cause LIFE_EXPECTANCY	138	1.38588	0.2339
LIFE_EXPECTANCY does not Granger Cause ROE		1.23492	0.2966
POVERTY_LEVEL does not Granger Cause MSG	138	1.87403	0.1034
MSG does not Granger Cause POVERTY_LEVEL		0.57477	0.7192
ROE does not Granger Cause MSG	138	0.96928	0.4393
MSG does not Granger Cause ROE		0.36379	0.8725
ROE does not Granger Cause POVERTY_LEVEL	138	1.63112	0.1564
POVERTY_LEVEL does not Granger Cause ROE		2.31619	0.0473

(Contd...)