

Banking Competition and Economic Growth: 2006-2015 Case of Rwanda

DOI: <https://doi.org/10.47175/rissj.v1i3.104>

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ABSTRACT

It has been argued that a competitive and efficient financial sector is a prerequisite for economic growth and development. The objective of this study therefore was to determine the influence of bank competition on economic growth in Rwanda for the period 2006 - 2015. The study used Error Correction Model after conducting Unit Root Test(ADF) and Cointegration Test(Johansen) so that to check the degree of adjustment in the short run. The results revealed that Credit to GDP is highly significant and this implied that there is a need to set the policy influencing credit distribution in order to influence economic growth. In addition disequilibrium found in the short run is corrected quarterly at 70.32%.

KEYWORDS

Banking competition; economic growth; Herfindahl Hirschmann Index (HHI)

INTRODUCTION

Banks being the financial institutions that accept deposits and provide credits to the borrowers, their essential role of bank credit as a factor of production of goods and services places them in a unique and influential position, such that any inefficiency in credit allocation, or other market distortions in banking, are almost certain to be felt throughout the economy (Shaffer, 2004; Mishikin, F.2010), hence, the issue of bank competition and economic growth plays a vital importance, and the study of the latter can help understand the social welfare implications of changes in the banking sector.

The theory on banking competition is vast and it took place with the classical views. It covers the major contributions to the concepts of competition due to Smith (1976), Chamberlain (1933), Schumpeter (1934), Hayek (1948) and Stigler (1995). A number of attempts have been made since then to develop the concept and its role to the economic growth. However, lack of clarity on the channels between bank competition and economic growth remains as it varies depending on the country specificity.

According to Adam Smith (1976), competition refers to the forcing of market price to its natural level and lowering of profits to a minimum. The classical view of competition looks at competition as a process for allocating resources to their optimal use through the instrument of price mechanism and when price mechanism functions properly, equilibrium emerges with prices equal to marginal social costs of production. When it does not function properly, equilibrium exists with price above marginal cost. In such a situation, the society suffers a welfare loss from the under consumption of these goods. Such malfunctions are immediately attributed to an insufficient number of buyers or sellers (Murthy, 2005).

In fact, the effectiveness of financial services in intermediating funds and thereby sustaining an efficient allocation of resources is tightly related to the ability of banking

institutions to solve the moral hazard and adverse selection problems typical of credit relationships on the one hand, and to the incentives banks face in taking risks on the other one (Gaffeo E.; Mazzocchi R., 2014).

The Rwandan banking sector is composed of twelve (12) commercial banks, three (3) microfinance banks, one (1) development bank and one (1) cooperative bank (BNR report, 2016). The Rwandan banking sector recognized successive changes mainly in commercial banks since 1999-2016 where some banks have been bought by others or companies and others sold their shares with the foreign companies.

Referring to the competition in Rwandan banking sector, development in concentration indicators such as share of number of big banks in deposits, loans and assets of the entire sector and the Herfindahl Hirschmann Index (HHI) shows that the competition in the banking sector in Rwanda has been significantly improving since 2009 due to the entry of new banks in the sector and the development of banking network across the country.

The share of three largest banks in loans, deposits and total assets declined from 52%, 58% and 54% in 2010 to 44%, 47% and 45% in June 2016, respectively. The measure of concentration was due to new banks entering the market and favorable legal environment on financial services which is coping with international and regional dynamism in the banking area. The HHI in assets, deposits and loans declined to 0.12, 0.13 and 0.12 in 2014 from 0.18, 0.21 and 0.18 in 2006, respectively (BNR Financial stability report, 2016).

A recent study done by Kigabo and Nyalihama (2015) using different indicators of competition established that competition in the banking sector in Rwanda has significantly improved. Lerner index reduced from 0.48 in 2006 to 0.29 in 2013 while the panzer Rose H increased from 0.24 to 0.65 in the same period. Despite this substantial improvement, the link of competition in Rwandan banking sector and economic growth is ambiguous where the bank lending interest rate which might influence economic growth is not flexible as it is desired comparatively to the presence of competition in Rwandan banking sector specifically for commercial banks as it is highlighted above.

A well-developed financial sector facilitates the efficient allocation of financial resources to various competing real sector activities and thus leading to economic growth (Karangwa M. and Gichondo A. (2016) but when we look at the competition in the Rwandan banking sector despite the substantial improvement, this has not been translated into a reduction in lending rate as expected due to other factors such as high operating cost but also low level of innovation in the banking sector (Kigabo R.; Karangwa M.; Nyalihama C., 2015).

Generally, the financial system such as lending system is one of the most important sources of financing economic decisions related to consumption and investment, and hence of the financing capital accumulation and technological innovations, aimed at medium-term productivity growth and more dynamic and sustainable rates of economic growth. Consequently, the price of financing through bank loans (for instance lending rates) and the efficiency of the banking system are essential for the possibility of allocation additional financial potential in the economy, and thus for the acceleration or sustainability of economic growth (Georgievska and Kabashi, 2011).

With the study done by Cecchetti, (2011) competition has helped in reducing the cost of borrowing and improves the quality of the services they render to the society. Thus, a competitive financial market has a positive impact not only on the wellbeing of the stakeholders, but also on the country's economy as a whole. Healthy competition in a financial system promotes the productivity of the real sector and, hence economic growth (Ajisafe, R. A. and Ajide F. M. 2014). Therefore what is the influence of banking competition on economic growth in Rwanda? The objective of this study is to assess the

relationship (influence) of banking competition on economic growth in Rwanda. It focuses on whether economic growth in Rwanda is influenced by bank competition indicators and macroeconomic indicators.

To this end, the rest of this paper is organized as follows. Section 2 provides theoretical and empirical review of the literature; Section 3 is related to the theoretical framework and methodology. Section 4 presents the results of the analysis, while the last section includes conclusion and policy implications.

REVIEW OF LITERATURE

Theoretical Review

The theoretical literature has offered conflicting results on the role of financial development and economic growth. Among them are Schumpeter (1911), Gurley and Shaw (1955), Goldsmith (1969), McKinnon (1973) and Shaw (1973); who have all argued that financial repression which characterized the Less Developed Countries tend to hinder economic growth. It states that rapid economic growth in Less developing countries can only be achieved when they anchor their financial sector on liberalization policy such as deregulating interest rate, removing selective credit control and encourage competition in the banking sector (Ajisafe, R. A. and Ajide F. M.,2014) .

According to Lucas (1988) the significance of financial development in the growth process has been over exaggerated and was of the opinion that financial development does not contribute to long-term economic growth. In addition, Stiglitz and Weiss (1981) also argued that in Less Developed Countries, banks may refuse to give loans to new comers in form of new innovative and productive borrowers because of high risk of default associated with new borrowers (Ajisafe, R. A. and Ajide F. M.,2014).

In empirical studies the degree of competition in the banking sector has been proxied by measures of market concentration like the Herfindhal-Hirschmann Index and the C3 indexes or price-cost margins like the Lerner index and the Panzar-Rosse H statistic (Gaffeo.E and Mazzocchi.R, 2014). However the Herfindahl-Hirschman index is the most widely treated summary measure of concentration in the theoretical literature and often serves as a benchmark for the evaluation of other concentration indices. Bikker and Haaf (2000) defined HHI as the sum of the squares of the bank sizes measured as market shares and it is often called the full-information index because it captures features of the entire distribution of bank sizes (Řepková, 2011)

Empirical Review

According to the study done by Georgievaska (2011) he found out the determinants of lending rate that is considered as one of the factor showing the link between bank competition and economic growth in Greece. Deposit rate, bank assets, market share, the share of non-performing loans in total credits exposure, bank liquidity, capital adequacy, operating costs and the share of foreign capital have been used as the Independent variables. He used random effects model for estimation with the time bound of 2001-2007 for 27 commercial banks. The results found that the reasons of high interest rate was the low level of savings, insufficient competition in banking system, unsatisfactory efficiency and profitability of commercial banks, uncertainty in the economic environment.

Referring to the study done by Ajisafe and Ajide (2014) on bank competition and economic growth in Nigeria, Solow model has been used as a baseline of the economic growth. Banking competition and macroeconomic variable have been incorporated in the model. Though GDP (annual growth rate) was a dependent variable and bank competition,

bank sector development and gross capital formation (GCF) were considered as the independent variables. The study employed the vector error correction mechanism in order to capture both the short run and the long run effect of the relationship between bank competition and economic growth. The findings on this study show that there is a positive relationship between bank competition and economic growth.

Fernandez and Joaquin (2015) conducted the similar study for the cross country evidence for 1993-2003 for a sample of 53 sectors in 26¹ countries. The explained variable was average annual growth rate and the explanatory variables were the share in value added, financial dependence, financial development (proxied by Credit/GDP, Market capitalization/GDP, Total Capitalization/GDP) and banking competition (lerner index, H-Statistics and Market Concentration (CR3 and CR5 and by the Herfindahl-Hirschman Index). OLS technique has been used to analyze data through a simple linear regression equation. The results obtained show a positive effect of financial development on the economic growth of the sectors.

In the same view, Gaffeo and Mazzocchi (2014) conducted the study also on the competition in the banking sector and economic growth by using a dynamic GMM model to analyze panel data from a sample of 15 countries of OECD economies during 1997-2010. The growth rate of the per capita real GDP was considered as the dependent variable and Boone indicator has been used as a proxy of bank competition in each country.

The results confirm that an increase in the efficiency of banks driven by fiercer competition will contribute positively to economic growth. In addition, a panel-based Granger-causality test shows a strong causality running from real growth to the competitiveness of the banking sector, whereas a bi-directional causality appears clearly only for lags higher than 1.

In addition, Mihail and Jordan (2014) conducted the study on the influence of banking sector development on economic growth in Central and South Eastern Europe by using growth model of Barro and Sala-i-Martin (2004) and they used GDP growth as the dependant variable and GDP per capita, ratio of quasi money, interest margin, private credit, export, inflation rate, investment, government expenditure as independent variables. Allerano Bond has been used to estimate the model of panel data set (1991-2011) and the results revealed that credit to private sector and interest margin are negatively related to the economic growth while quasi money was positively related to economic growth.

In my best of knowledge no study has been done within the national economy with a liberalized financial sector showing the influence of banking competition on economic growth in Rwanda. Hence the contribution of the researcher is to raise out this gap by showing the influence of the bank competition and as well as macroeconomic indicators on economic growth. In addition lending interest rate needs to be given a high consideration as it plays a big role on the loan delivery in the banking system in Rwanda.

RESEARCH METHODS

Model specification and Technique of Analysis

In this study we refer to the estimation model used by Ajisafe and Ajide (2014) where the theoretical underpinning of the relationship between Bank Competition and Economic growth is based on the Solow growth model which is used as a baseline model of economic growth. Gross Capital Formation will be replaced by savings and other additional variables will be needed to be inserted in the model such as lending interest rate due to its role on

¹ The EU-15, Norway, Central and Eastern Europe, USA, Canada, Japan, Korea, Taiwan and Austria

economic growth, credit to GDP, HHI by loans and HHI by deposits. The growth function of the Solow model is of the form:

$$Y = AK^\alpha L^{1-\alpha} \quad (1)$$

Where $0 < \alpha < 1$ and the parameter implied diminishing marginal returns to capital accumulation

Given the restriction that $\alpha = 1$, equation 1 becomes:

$$Y = AK \quad (2)$$

Where A is taking as given in the economy and K is capital stock which can be generated from the financial sector activities. Incorporating banking competition variable and a macroeconomic variable in the AK model gives:

$$Y = f(BC, BS, LR, Savings, GDPER) \quad (3)$$

Where: BC: Bank competition indicators, BS: Bank sector indicators. By rewriting the full equation (3) mathematically and first differencing, we have this form:

$$\ln GDP_t = \beta_0 + \beta_1 HHIL_t + \beta_2 GDP_C_t + \beta_3 LR_t + \beta_4 SAV_t + \beta_5 C_GDP_t + \mu_t \quad (4)$$

Where, $t = 1, \dots, T$ " and $\ln y_t$ = Natural logarithm of GDP at period t, $HHIL_t$ = The bank competition by loans measured by HH Index at period t, GDP_C_t : Credit per capita at period t, LR_t = The lending rate at period t, SAV_t = The savings at period t, C_GDP_t = Credit to GDP at period t while μ_t = represents the error term at period t. $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are the coefficients.

Estimation Technique

This study depends on secondary data sourced from National Bank of Rwanda and National Institute of Statistics in Rwanda.

The study employed the Vector Error correction Mechanism in order to capture both the short run and the long run effect of the relationship between bank competition and economic growth. Stationarity test will be performed by using Augmented Dickey Fuller test (ADF).

RESULTS AND DISCUSSION

The regression results of economic growth model are presented in the below table.

Table 1. Regression Results

| Explanatory Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------------------|-------------|------------------------------|-------------|-----------------------------|
| HHIL | -0.865654 | 0.977614 | -0.885476 | 0.3821 |
| LGDP_C | 0.463821 | 0.086248 | 5.377774 | 0.0000 |
| LR | 0.021280 | 0.017798 | 1.195677 | 0.2401 |
| SAV | 0.000908 | 0.001933 | 0.469576 | 0.6417 |
| C_GDP | 0.018647 | 0.004660 | 4.001491 | 0.0003 |
| C | 3.609222 | 0.620985 | 5.812088 | 0.0000 |
| R-squared: 0.982073 | | Adjusted R-squared: 0.979437 | | Prob(F-Statistic): 0.000000 |

The estimated results in table 4.1 as it is shown in the appendices have an adjusted R-squared of 97.94 per cent. This implies that 97.94% of the changes in growth rate are explained by the explanatory variables used in this model. The probability (F-statistic) is

equal to 0.000000 that is less than 0.05. Though this implies that Jointly explanatory variables included in this model are statistically significant to explain the GDP growth in Rwanda. Some diagnostic tests have been done to check the statistical properties of the model. On the long run model there has been a problem of serial correlation that has been corrected in the short run after using vector error correction model by using Breusch – Godfrey test where the prob(F-statistic) is equal to 0.2221 > 0.05. This implies that there is no serial correlation i.e absence of autocorrelation in the short run.

The results of the heteroscedasticity test of Breusch-Pagan-Godfrey showed the prob(F-statistic)=0.7416 and this is greater than 0.05 leading to the acceptance of the null hypothesis of homoscedasticity. As explanation of this the errors of economic growth model have a constant variance and hence, there is no problem of heteroscedasticity. The normality test of residuals have been conducted as the results are show in the Figure.1 below:

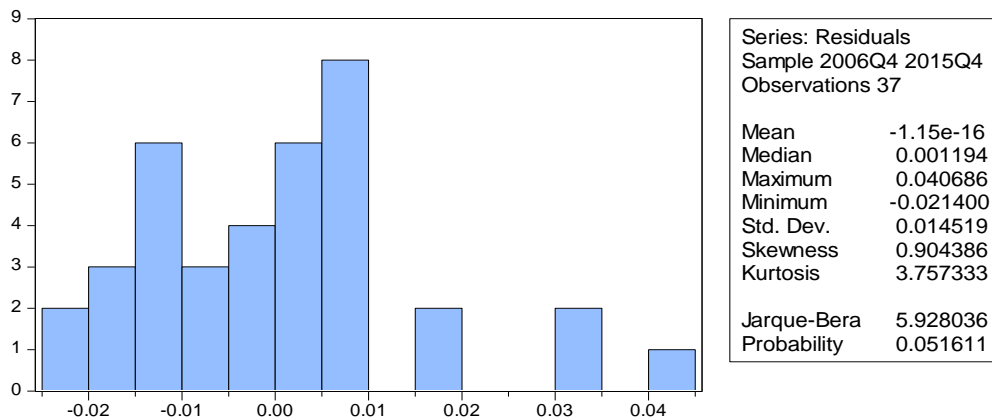


Figure 1.

Jarque-Berra results showed that the residuals are normal distributed as Prob(0.051611) > 0.05. Though the null hypothesis is accepted that's means that the residuals are normal distributed.

In our study we examined the stability of the model to check the consistency of parameters by using the stability test. We examined the structural stability of model as shown by Brown et al. (1975) and we used cumulative sum (CUSUM) and cumulative sum of square (CUSUM) tests. Cumulative sum test is used for systematic change in the parameters. On the other hand cumulative sum of squares helps in showing sudden change in the regression coefficients.

Cumulative sum test is used for systematic change in the parameters as shown in Figure.2 the model is stable, because the residual lies between the two straight lines showing 5% critical bounds. On the other hand cumulative sum of squares helps in showing sudden change in the regression coefficients as shown in Figure.3; accordingly if a series is excluded from the model, there is effect on the rest of the series so the regression coefficient were not stable for 2013Q4.

For the stability test, CUSUM has been used and the results are highlighted here below

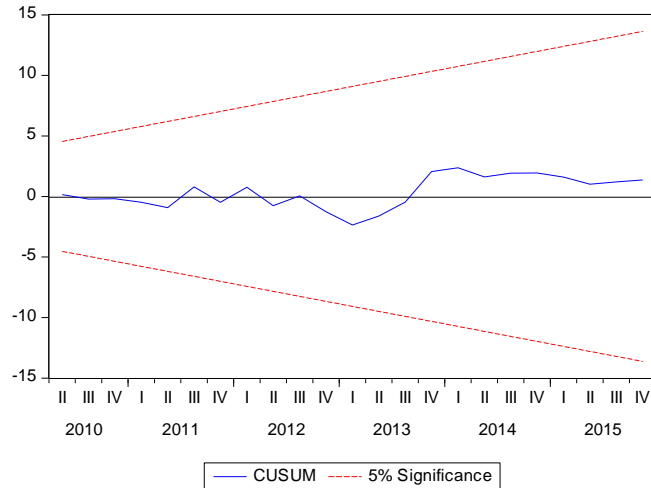


Figure 2

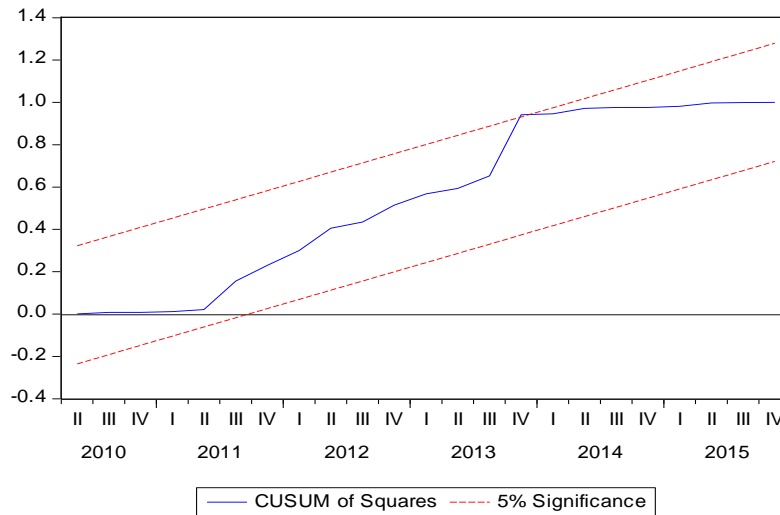


Figure 3

Unit Root Test

The results of unit root test is shown in the table below:

Table 2. The Results of Unit Root Test

| Variables | ADF Value | Statistical | Mackinnon Critical Value at 5% | Remark |
|-----------|-----------|-------------|--------------------------------|--------|
| LGDP | -8.350140 | | -2.945842 | I(1) |
| HHIL | -8.874258 | | -2.941145 | I(1) |
| LGDP_C | -6.116539 | | -2.963972 | I(1) |
| LR | -7.803119 | | -2.943427 | I(1) |
| SAV | -5.366700 | | -2.948404 | I(1) |
| C_GDP | -4.036210 | | -2.948404 | I(2) |

Author's Computation

It was observed that five of the variables are integrated of order one, that is, stationary at first difference while the remaining two are integrated of order two based on their critical

values when compared with the calculated statistical value. The implication of these results is that if the variables were not of the same order; OLS estimate would produce spurious result. Hence, there is the need to test for cointegration.

Cointegration Test Results

After establishing the stationarity of the data, Johansen co-integration tests were used to explore any possibility of long run relationship among the variables. This involved testing from the number of co-integrating vectors.

The maximum Eigen-value and the trace test from this technique were used to establish the number of co-integrating vectors. The results of the co-integration tests show that there are at most four co-integrating equations.

Table 3

Date: 11/23/16 Time: 20:48
 Sample (adjusted): 2006Q3 2015Q4
 Included observations: 38 after adjustments
 Trend assumption: Linear deterministic trend
 Series: LGDP HHIL LGDP_C LR SAV C_GDP
 Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

| Hypothesized | Trace | 0.05 | | |
|--------------|------------|-----------|----------------|---------|
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.** |
| None * | 0.877818 | 191.7102 | 95.75366 | 0.0000 |
| At most 1 * | 0.690889 | 111.8249 | 69.81889 | 0.0000 |
| At most 2 * | 0.578152 | 67.21078 | 47.85613 | 0.0003 |
| At most 3 * | 0.401426 | 34.41260 | 29.79707 | 0.0137 |
| At most 4 | 0.324173 | 14.91082 | 15.49471 | 0.0611 |
| At most 5 | 0.000572 | 0.021734 | 3.841466 | 0.8827 |

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Eviews.7 Computation

Result of the Link between Bank Competition and Economic Growth in Rwanda

Table 1 shows the result of the relationship between bank competition and economic growth in Rwanda. According to Engle and Granger (1987), if cointegration exists between non-stationary variables, then an error correction representation exists for these variables. Given the fact that the variables of the economic growth equation are co-integrated, the next step is the estimation of the short-run dynamics within a vector error correction model (VECM) in order to capture the speed of adjustment to equilibrium in the case of any shock to any of the independent variables.

Before the estimation of the VEC, lag length was selected using the Akaike Information Criteria.

Vector Error Correction Model Results

VECM is negative and significant as it is shown in table 3 found in the appendices and 70.32% of disequilibrium in short-run is corrected quarterly. In addition VECM shows that bank competition (Herfindahl Hirschmann Index, lending interest rate) and macroeconomic indicators (GDP per capita, Savings, Credit to GDP) are significant and positively related to economic growth. This means that competition and macroeconomic indicators will positively and negatively affect economic growth. The R-squared expresses the best fit of the model which is about 0.812723. It means that the independent variables in the model explain about 81% of the total variations in economic growth.

CONCLUSION

The study applied vector error correction mechanism to examine the influence of bank competition on economic growth in Rwanda for the period 2006-2015. It was discovered that a long run relationship exist between bank competition where some indicators have been used such as HHI in loans, lending interest rate and economic growth based on the result of the co-integration test.

This finding is consistent with the theoretical prediction that higher bank competition results, on average, in a lower cost of borrowing to firms. The result equally supports the opinion of Cetorelli and Gambera (2001) that higher level of competition in banking will assist in the development of lending relationships, which leads to the firms' growth and economic growth in general. Based on these empirical findings, the study suggested that strengthening the competitiveness and efficiency of the financial sector would lead to improved economic growth.

Finally, the efficiency related to financial lending system could be sound better whenever the banks and borrowers engage a deep negotiation on the cost of borrowing, hence there is an increase in loans distribution that can lead to the economic growth, ceteris paribus. The limitation of this study is the use of HHI as a measure of competition. This alone cannot provide a good indication of competitive behavior which may have significant impact on the result of the analysis. Further studies in this area can explore another measure of competition like Boone index on economic growth which may confirm the result of this study.

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