

Borrowing interest rate dynamics on the financial performance of listed Banks

Andrews Doeh Agblobi¹, Kwame Acheampong², Prince Tetteh³ and Sandra Adjoa Tima⁴

^{1,3,4}Department of Banking & Finance, University of Professional Studies, Accra
P.O Box LG 149.

²Department of Economics Education, University of Education, Winneba
P. O. Box 25, Winneba, Ghana

Corresponding author: Andrews D. Agblobi

Email: a_agblobi@yahoo.com

Tel: 233 543466873

Abstract

This paper investigates the effect of borrowing interest rate on the performance of listed banks. The study used panel data of three sampled banks on the Ghana Stock Exchange from 2007 to 2017. The variables were the monetary policy rate, interbank rate, and customer deposit rate. Return on equity was used as the dependent variable for performance. The findings show an inverse relationship between banks' performance and monetary policy rate, and customer deposit rates. This means an increase in these rates leads to a decrease in banks' performance and vice versa. The findings also show that banks perform well when they borrow among themselves. This implies that, listed banks should borrow more from themselves to maximize their performance.

Keywords: Borrowing rate; Policy Rate; listed Banks; performance; interest rate.

INTRODUCTION

The business of banking includes taking deposits, lending money, providing advisory services, and selling of money market instruments (Corrigan, 2025). The banks play a vital role in the economy as they serve as intermediaries between the surplus spending unit and the deficit spending unit (Dermine, 2017; Ihegboro et al., 2022). The banks through their money market activities, borrow funds from the general public, and among themselves influencing their borrowing interest rates. This practice is very essential for the survival of the banks and the policy makers as the implications of the conduct of monetary policy affects the banks activities (Borio, Disyatat, Juselius, & Rungcharoenkitkul, 2017). Hence, the need to investigate the dynamics of borrowing interest rates and its impacts on the performance of banks. The Central Bank borrow from the commercial banks at an interest rate known as monetary policy rates, the commercial banks borrow among themselves at a rate known as the interbank or overnight rate. The commercial banks also borrow from the general public through their instruments such as time deposits, certificate of deposits and negotiable certificates of deposits that come with a rate of interest to attract customers. In general, when banks borrow from its customers, the bank pays interest to them that eventually become part of the cost to the Bank. The question is what is the effect of the borrowing cost on the performance of the banks.

Around the world today, interest rates in the financial markets have been unstable with the backdrop of high inflation rates in the recent past years. For example, the Bank of England and the Federal Reserve Bank of United States raised their monetary policy rate from 2.25% to 3% and 3% to 3.75% respectively in November 2022 and continued to a pick of 5.25% and 5.38% respectively, among the two major central banks by August 2023. The United Kingdom experienced

its highest ever inflation effects in the past four decades recently. The Bank of Ghana also witnessed a continuous rise in the policy rate from 24.5% to a peak of 30% between October 2022 and August 2023. In Ghana, the policy rate was reduced to 27% in September 2024 and was again increased to 28% beginning 2025. The interest rate has steadily been high for a long period in Ghana (Kwakye, 2010).

The high level of Ghana's interest rate was a source of concern in the country. Even though some level of macroeconomic stability has been achieved in the past, interest rates have generally remained high. Investigating the effect of borrowing rate on the financial performance of listed banks is important to understand the financial sector contributions to the economy. This study contributes to investigate interest rates effect on the bottom-line businesses in an economy especially, the profitability of banks in Ghana.

Several studies on interest rates focused on the lending rates or interest rate spread with limited emphasis on the borrowing rates. The lending rate constitute what the banks charge customers for offering others money to them and that become a source of revenue to the banks. However, the borrowing rate is what the banks pay for the usage of other funds as expense to it. This study fills a gap by investigating the question of how the borrowing effects of the commercial banks from among themselves and the general public, and the central bank borrowing from the banking sector to a large extent impact the banks performance. For instance, Churchill, Kwaning and Ababio (2014); Musah, Anokye and Gakpetor (2018) studied the determinants of bank interest rate spreads in Ghana. The authors specified interest rate spread as the dependent variable and GDP, exchange rate, inflation, policy rate, treasury bill rate, liquidity, overhead cost, loan loss provision and profit margin as independent variables. They found a negative relationship between interest rate spread and Treasury bill rate; as well as a positive relationship of interest rate spread and monetary policy rate. There were few missing issues with the study as they could not define what interest rate spread was and at the same time used lending rate as the dependent variable. The lending rate should instead have a higher value than the interest rate spread which is usually the difference between the borrowing rate and the lending rate. Musah et al. (2018) studied the interest rate spread on the profitability of banks in Ghana. They used secondary data collected from annual reports of commercial banks in Ghana. They established that interest rate spread was positively associated with banks profitability in Ghana contrary to expectations. Thus, to improve profitability, the banks must increase net interest margin to increase interest income and decrease interest expense, that is borrowing rate.

A few studies focused on interest rates and performance of banks such as Khan and Sattar (2014); Demircuc-Kunt and Huizinga (1999) examined the impact of interest rate changes on the profitability of four major banks in Pakistan. They used secondary data and employed a time series analysis to conclude that banks profitability is dependent on the monetary policy tool such as interest rates which affects the banks' income. A study on determinants of commercial banks interest margins and profitability was undertaken by Demircuc-Kunt and Huizinga (1999), which encapsulates that banks characteristics and environment impact how the bank performs. Using bank-level data for 80 countries between the period of 1988-1995, the authors found a negative relationship between the customer and short-term funds/total asset and the bank's profitability. They also concluded that banks that depend on deposits as their funding source were less profitable as they incurred high expenses such as branch opening and others. They stressed that banks pass on the high operating cost to their depositors and lenders.

According to Owusu-Antwi, Banerjee and Antwi (2017), the banking sector in Ghana plays a leading role in the financial sector especially, in savings mobilization and credit provision to

various sectors of the economy. The banks remain a core sector of developing countries' economies where the capital markets are relatively weak (Matthew and Laryea, 2012). The central bank through its monetary policy may have a long-lasting impact on the real economy (Borio, Disyatat, Juselius, & Rungcharoenkitkul, 2017). They argued that as the central bank sets the short-term interest rates, it influences the long-term rate that signals to the market players direction of the policy and assets prices.

In 2017 and 2019, several indigenous banks in Ghana were collapsed or consolidated through the withdrawal of their licenses by the Bank of Ghana. The Bank of Ghana cited reasons such as their loan impairments (i.e. non-performing loan), liquidity problems and the failure to meet the minimum capital adequacy requirement. Other reasons provided by the Bank of Ghana for the withdrawal of licenses were related party transactions and poor corporate governance. Given these, fear and panic withdrawals became the order of the day for the banks, and these affected their liquidity position and operations negatively.

The banks in developing countries such as those within sub-Saharan Africa are less efficient despite the competition brought through the liberalization of their activities (Aboagye et al., 2008; Kaltenbrunner, Perez Ruiz, & Okot, 2022). After several years of liberalization and reforms of the financial sector in Ghana, the interest rate continues to be high, making the cost of getting finance expensive (Mensah & Abor, 2014). Interest rates during the pre-reforms era (1987-1998) were administratively controlled by the Bank of Ghana (BOG) and a variety of other controls were also imposed on the asset allocations of the banks. These policies were motivated by two objectives: to raise the level of investment and to keep interest rates low and stable (Gockel & Mensah, 2006). The interest rate has become very challenging in the banking sector and has accordingly received attention in Ghana concerning how it affects banks' performance.

Banks' performance can be measured in many ways that includes return on equity (ROE), return on assets (ROA) and net interest margin (NIM) (Nkegbe & Ustarz, 2015). The interest rate is one of the key determinants of the banks' performance in many economies (Aboagye et al., 2008). In the literature, changes in bank interest rate affect bank performance as it increases the cost of financing and reduces the value of its equity (Bawumia, Belnye, & Ofori, 2005; Obeng & Sakyi, 2017). The borrowing rate is the interest rate that the bank pays to customers. If these rates are high, the earnings of banks will fall. In 2015 and 2016, the borrowing rates paid by banks on its fixed deposits were very high leading to high lending rate and inefficiency in the banking sector (Ghosh, 2015). There is a positive relationship between borrowing rate and lending rate (Borio, Gambacorta, & Hofmann, 2015; Aboagye, Akoena, Antwi-Asare & Gockel, 2008). That is, when borrowing interest rates are high, lending interest rates will also be high. Interest rate changes are due to market forces of supply of and demand for money, competition for loanable funds and macroeconomic fundamentals such as inflation rate, exchange rate, investors expectation and monetary policy. The liquidity preference theory predicts that investors desire lower risk and more flexibility in accessing their funds. Once an investor perceives a borrowing bank inability to pay on time, the investor will demand a premium, hence liquidity premium.

Nchor and Darkwah (2015) argued that interest rate determines the overall financial health of a country, and it affects inflation and exchange rates. They indicated that in the short run, a percentage point increase in the nominal interest rate decreases the Ghana cedi by 0.98%. Thus, high-interest rate harms the economic growth in Ghana.

Interest charged on financial assets signifies a price. This price is usually a percentage of the original amount which is generally termed as the interest rate (Rudebusch, 2002). Even though a higher price may suggest producers will be motivated to produce more because they can make a high profit (i.e. law of supply), it is rather the exact opposite with interest rate (Allen, Barlevy, &

Gale, 2022). With interest rate, high-interest charges signify inefficiency or potentially high default risk (Asiama & Amoah, 2018). High-interest rate implies a high cost of funds which discourages new investment, lower the drive for business expansion, and eventually business shut down. Borio, Gambacorta, and Hofmann (2015) finds that the impact of interest rates on banks performance is large when the interest rates are low. Whereas, on one hand, high-interest rate motivates those with surplus funds to save, on the other hand, it discourages those with deficit funds to borrow because it is expensive.

Towards the end of 2016 and early part of 2017, most indigenous Banks in Ghana were borrowing from firms such as pension funds, insurance companies and individuals as high as 40%. Some Banks such as UniBank, GN Bank and Beige Bank were offering extraordinarily high-interest rates for their money market instruments of 182 Days Fixed Deposit. This high price of borrowing by the indigenous Banks resulted in a serious liquidity problems such that the Banks became cash-strapped and debt distressed (Diaz & Pauchet, 2022). The Banks could not honour customers' withdrawal request which eventually led to the revocation of their licenses by the Bank of Ghana. The rest of the paper is structured as follows. In Section 2, we explain the methodology used for the study and presented the results in Section 3 while Section 4 concludes with policy implications.

METHODOLOGY

Empirical model specification

The performance of banks was specified as a function of its borrowing interest rate in equation (1) as follows:

$$ROE_{it} = f(CDR_{it}, MPR_{it}, IBR_{it}) \quad (1)$$

That is, ROE_{it} is the return on equity which measures the performance of bank i at time t , as a function of the borrowing interest rate which is categorized into three variables such as Customer Deposit Rate (CDR), Monetary policy rate (MPR) and Interbank rate (IBR) which forms the price banks pay to acquire these money market funds. This function is re-written in a multiple regression form as expressed in equation (2) as follows:

$$Y_{it} = \beta_0 + \beta_1 CDR_{it} + \beta_2 MPR_{it} + \beta_3 IBR_{it} + \inf l_{it} + e_{it} \quad (2)$$

where, Y_{it} represents return on equity (ROE) during the period t ; β_0 is a constant while $\beta_1, \beta_2, \dots, \beta_n$ represent the coefficient for each of the independent variables that are the parameters to be estimated; CDR_{it} is customer deposit rate (i.e. 12 months' time deposits or money market instrument); MPR_{it} represents monetary policy rate during the period t ; IBR_{it} is the interbank rate during the period t and e_{it} designates the model error term; t is the time period from 2007 to 2017; and i represents the individual listed banks used for the study. The $\inf l_{it}$ represents inflation rate which is used as a control variable.

Dependent variable

The bank's performance was measured by profitability index. Profitability was defined as the extent to which a bank's activity yields financial gain to its shareholders. It was measured as net profit divided by shareholder's equity. Banks profit by receiving more money than what they pay as expenses. The main component of a banks profit comes from the fees that it charges for its services and the interest that it receives on its loan assets (Borio et al., 2017). The study used return on Equity (ROE) to represent bank profitability as it measures the rate of return that the owners of

common stock of banks receive on their shareholdings. The return on equity evaluates the bank strength and efficiency as well as the long-term maximization of shareholders' worth.

Independent variables

The study used the borrowing interest rate as the independent variable. The borrowing interest rate was divided into Customer Deposit rate (i.e. 12 month-time deposit rate), Monetary policy rate, and interbank rate. The customer deposit rate was an interest-bearing bank deposit held by a bank's customer for a fixed term. The monetary policy rate was the rate of interest paid by the Bank of Ghana when borrowing from other banks. Interbank rate was the rate of interest charged when banks borrow from among themselves, especially to shore up their reserve requirement with the central bank.

Sampling, Data Source and Data Type

Three banks out of the five listed were sampled on the Ghana Stock Exchange for the study due to listing timing issue of others. The sampling considered indigenous bank partly owned by the Government of Ghana, indigenous bank that was privately owned and an expatriate bank. That is GCB bank Ltd, CalBank Ghana Ltd and Ecobank Ghana Ltd were purposively sampled. The GCB bank and Ecobank Ghana were the two largest banks in the country by assets size. The annual financial statements of the sampled banks from 2007 to 2017 were obtained from the banks, Ghana Stock Exchange, and Bank of Ghana and African Financials websites. The type of data collected were the twelve months' time deposit rates, monetary policy rate and interbank rates and that yielded a total of 33 observations for panel studies. The panel data was employed to obtain more information from the number of banks selected and to establish a connection between borrowing interest rate and the banks performance.

Estimation Strategy

The study employed two estimation strategies, the ordinary least square method and the panel fully modified ordinary least square method. The OLS was used due to the time series nature of the data various data and also been continuous variables. The Panel Fully Modified Ordinary Least square method (FMOLS) was employed as a much superior estimation strategy compared to the ordinary least method for time series data. For example, the FMOLS overcomes the problem of endogeneity of the inputs and also provides useful robustness properties for estimates of cointegration and long-run impact analysis (Kheifets & Phillips, 2021).

RESULTS AND DISCUSSIONS

Descriptive statistics and correlation analysis

Table 1 shows the descriptive statistics on mean, standard deviation, minimum and maximum values. A mean value of 0.158 representing 15.8%, for the return on equity. This means that 15.8% of the profit after tax of the banks were made up of their shareholders' equity. The results also show that the minimum return on equity of the banks was -0.458. This indicates that some of the banks had losses while the maximum value of 0.521 representing 52.1% showing a high profit after tax to their shareholder's equity. The results in Table 1 also show Monetary Policy Rate mean of 0.421 representing 42.1% that suggests that on average banks policy rate was 42% and maximum and minimum values of 0.971 and 0.211 representing 97% and 21% respectively. The interbank rate means of 0.432 representing 43.2% and it ranges from 0.000 to 1. This suggests the level of rate charged among the banks. The Customer deposit rate was 0.237 representing 23.7%, with its

maximum and minimum values ranging from 0.073 to 0.211. The result indicates that the level of borrowing by the banks from the general public through 12 months' time deposit was high.

Table 1. Descriptive Statistics

Variables	Mean	Std. Deviation	Minimum	Maximum
ROE (performance of the banks)	0.158	0.425	-0.458	0.521
Monetary policy rate	0.421	0.054	0.211	0.917
Interbank rate	0.432	0.503	0.000	1.000
Customer deposit rate	0.237	0.103	0.073	0.211

Source: Author's estimates.

Table 2 depicts the Pearson correlation between the variables used in the study. A higher positive correlation shows a strong relationship with each other while the lower one shows the variable are hardly related to each other. The result indicates a good, positive and significant relationship between performance and interbank rate with the R-squared of 0.506 at $p=0.026$. This means that an increase in interbank rate will cause performance to also increase and vice-versa. Table 2 also shows a good, significant but negative relation between performance and policy rate of central bank with (R) of -0.453 at $p=0.016$ and, level of public deposit with R-square of -0.494 at $p=0.009$. This indicates that the higher these independent variables, the lower the performance of the banks.

Table 2. Correlation of Analysis between ROE and the other variables

Variables	Statistics	ROE(Performance)	Monetary Policy Rate	Interbank rate	Customer Deposit rate
Monetary Policy Rate	Pearson correlation	-0.453*	1		
	Sig. (2- tailed)	0.016			
Interbank rate	Pearson correlation	0.506*	0.483*	1	
	Sig. (2- tailed)	0.026	0.036		
Customer Deposit rate	Pearson correlation	-0.494**	-0.369*	0.399*	1
	Sig. (2- tailed)	0.009	0.135	0.607	
	N	33	33	33	33

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Source: Author's estimates.

Panel unit root and normality test

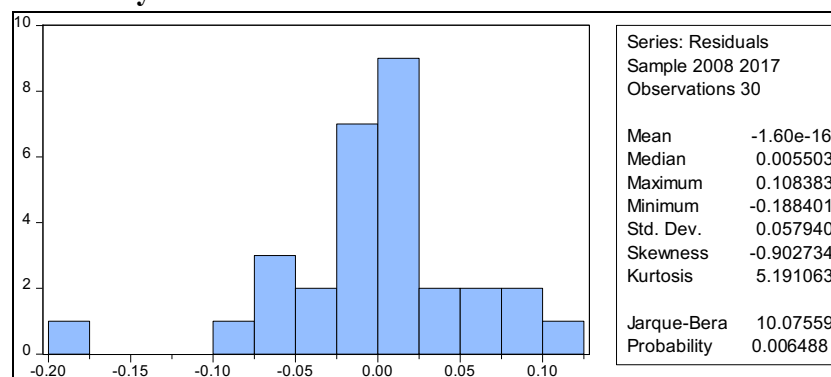
The panel unit root test results are presented in Table 3. The findings show that they are stationary in first difference. This indicate that there is a long-run relationship among the variables. This further confirms that there is co-integration relationship among the variables. Therefore, we can conduct panel analysis.

Table 3. Panel unit root tests

Method	Statistic	Prob	Cross Section	Obs
Breitung t-stat	-4.15403	0.0000	3	18
PP-Fisher Chi-square	40.1173	0.0000	3	24

The diagnostic test that were conducted on the residuals show that there is normal distribution as illustrated in Figure 1.

Normality test



Model summary and ANOVA

Table 4 shows R- squares of 0.585, indicating that 58.5% of the total variation in performance of the banks was accounted for by the corresponding change in the policy rate, interbank rate and the public deposits. The table 4 also indicates that the data is perfect for assuming the population's limitation as the value was significant at $P < 0.001$. It indicates that the regression relationship was significant in predicting how policy rate by the central bank, interbank rates and the level of public deposit influence the performance of the banks.

Table 4. Model summary and ANOVA

Model	R	R Squares	Adjusted.R Squares	Std.Error of The Estimate	
	0.765 ^a	0.585	0.506	0.20605	
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1.257	4	0.314	7.405	0.001 ^b
Residual	0.892	21	0.042		
Total	2.149	25			

a. Dependent Variable: ROE

b. Predictors: Monetary policy rate, interbank rate and Customer deposit rate

Source: Authors' calculations.

Results of OLS regression analysis

Table 5 presents the results of borrowing interest rate and banks financial performance. The table 5 establishes that interbank rates have a positive relationship with the financial performance of banks with a p -value of 0.001. With a coefficient of 0.415, a unit increase in interbank rate leads to a 41.5% increase in bank performance. Among all the variables in the regression, the interbank rate has the highest effect on banks performance. The findings was consistent with Borio et al., 2017 that found a positive relationship between interest rate structure and banks profitability, especially, interbank rate and performance.

The results also show that customer deposit rate has a negative but significant effect on the performance of the banks with a p -value of 0.002. The coefficient of -0.135, shows that a unit increase in 12 months' time deposit from the public will lead to a 13.5% reduction in bank performance. This finding attest that the commercial banks were borrowing at high interest rate were running at high operation cost that might have affected their liquidity situation. Hence, liquidity premium theory. The results also affirms Demirguc-Kunt and Huizinga (1999) that banks that have high borrowing cost were less profitable.

The policy rate by the central bank has a negative but significant effect on the performance of the banks with a p -value of 0.002. The coefficient of -0.098, depicts that a unit increase in policy rate from the Bank of Ghana will lead to a 9.8% reduction in bank performance. The finding suggests that the rate charged on borrowing by the central bank have a statistically significant effect on the banks' performance.

Table 5. Results of OLS regression analysis

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.932	0.964		2.003	0.058
Customer deposit rate	-0.135	0.108	-0.190	-1.244	0.002
Monetary policy rate	-0.098	0.062	-0.257	-1.586	0.002
Interbank rate	0.415	0.103	0.611	4.023	0.001

a. Dependent Variable: return on equity.

Source: Authors' calculations.

The findings of the listed banks with data between 2007 and 2017 showed that there is a positive relationship between bank's performance and interbank rates and negative relationship between bank performance and policy rate and customer deposit rate of the banks sampled. The study revealed that a high interest paid on customer deposit reduces income earned by commercial banks and eventually affects the financial performance of the listed banks.

Results of FMOLS regression analysis

Table 6 presents the FMOLS regression analysis results. The findings show that in the long-run, monetary policy rate has a negative effect on the profitability of the selected banks in Ghana. In

fact, borrowing by the central bank from the commercial banks is a monetary policy tool to control inflation and money supply in the economy. The results indicate that a 1 percent increase in the monetary policy rate would decrease the banks performance by negative -2.7 percent. An increment in the policy rate may encourage the commercial banks to place their money with the the central bank and slows economic activities. These results affirm Nchar and Darkwah (2015) that high interest rate harms the economy and the banks as businesses in the economy.

The empirical results for the interbank interest rate have a positive relationship between interbank rate and bank performance. The positive relationship between the interbank rate and the performance can be explained by the fact that the banks can negotiate a better interest rate with its counterpart compares to the regulator and this may lead to a lower borrowing rate that may impact positively on the bank performance. This affirms Borio at et (2015). The long-run coefficient result shows that a 1 percent increase in the interbank interest rate will raise banks performance by 17.37%. This is statistically significant at 1 percent level.

The empirical evidence shows that inflation have a positive effect on banks performance. Indeed, the coefficient of inflation indicates that an increase of 1 percent will increase banks performance by 0.019 percent in the long-run. The positive relationship of inflation and banks performance can be explained by the readiness of the banks to incorporate inflationary changes to its interest rates charges instantaneously resulting in higher interest income. The banks undertake such steps to mitigate against the loss of value of its monetary assets. This shows that if inflation increase, the banks rates may go up to accommodate the inflationary pressure on the interest rates.

Table 6. Results of FMOLS regression analysis

Variable	Coefficient	Standard error	t - Statistics	Prob.
Customer Deposit	-0.083828	0.199012	-0.42122	0.6800
Monetary Policy	-2.749043	0.920012	-2.98805	0.0098
Interbank	17.37001	0.703317	24.69728	0.0000
Inflation	0.01873	0.000663	28.26808	0.0000
Customer Deposit_2	-0.266366	1.022676	-0.26046	0.7983
Monetary Policy_2	15.33932	2.179566	7.037787	0.0000
Interbank_2	-55.43069	2.120796	-26.13674	0.0000

Dependent Variable: Return on Equity. R-square 0.7297; Obs 33.

Source: Author's calculations

CONCLUSION

The objective of the paper was to investigate the effect of borrowing interest rate on the financial performance of Banks for a panel of three listed commercial banks on the Ghana Stock Exchange, namely GCB, Ecobank and CalBank for the period of 2007 to 2017. Two different estimation strategies were employed for the analyses, OLS and FMOLS. The findings of OLS model show that all the variables were statistically significant in explaining the performance of the banks. The policy rate was negatively related to the performance of the banks at a coefficient negative -0.098. The interbank rates were positively related to bank's performance at the coefficient of 0.415. Furthermore, there was a negative relationship between bank's performance and the public

deposits at a coefficient negative -0.135. From the findings of the OLS model, the interbank rate has the highest effects on bank performance of 41.5%.

The results of the FMOLS regressions in Table 6 attests that the long-run coefficient of interest rate is more effective. The long-run coefficient has a greater impact of -2.74% compare to the OLS regression results of negative -0.098 of the policy rate on bank performance. The findings also show that although FMOLS and OLS have a negative relationship, the FMOLS long-run coefficient of monetary policy have a higher negative impact compare to the OLS results. The findings for the customer deposits was mixed with OLS regression results as it was statistically significant at 5% while FMOLS was not.

Finally, the findings of the descriptive statistics and econometric analysis shows a contribution to literature of the long-run effect of borrowing rate on performance of the banks in Ghana. These results are also useful to other financial institutions. The study provides significant contributions to existing knowledge as it offers guidance to policy and decision-makers in developing detailed policies on borrowing interest rates that improve the banking sector and enhances its performance. Indeed, many existing studies have focused on lending rate or interest rate spread with limited studies on borrowing rates. Also, the study helps stakeholders in the banking sector to make informed decisions regarding the impact of borrowing rates on their performance. The findings from this paper provide a unique contribution to literature as being among the first to focus on borrowing interest rate and its effect on banks performance in Ghana.

Policy implication

As policy implication, the central bank through its monetary policy operations is geared towards price stability and stable macroeconomic fundamental, however, on a hind side the policies action affects the real sector through the banks. Therefore, we recommend that the central bank should weigh its influence on the long-term operations of the banks as it embark on its mandate to maintain price stability. Policy makers such as the Bank of Ghana should be cautious in the manner in which it increases the policy rate as it has negative effect on commercial banks profitability.

Limitation of study

Due to the unsettled nature of the banking sector, it would be appropriate to repeat this investigation after some years and build up the relationship between borrowing interest rates and performance of banks.

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