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Factors Determing Interest Rate Variations in Ghanaian Banks

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Abstract
This study examined interest rate variations among banks in Ghana. The objective of the study was to estimate the key driving factor(s) that influences interest rate spreads in Ghana. It was also the aim of this study to examine the impact of the 2008/2009 financial crises on this relationship, to know whether ownership (foreign and local banks) differences in this relationship is significant and to know whether age of the bank determines their interest rate spread. The study used an unbalanced panel of all 28 banks from 2000 to 2011. The fixed effect estimation technique was employed throughout the analysis of data. The study found that, for bank specific variables, age of a bank was significant and a positive determinant of net interest margin while ownership structure had a significant negative impact on net interest margin. This suggests that banks that have been in operations in the country for a long time seem to enjoy higher interest margins while generally most of the foreign banks seem to have narrower margins. The size of the banks and the operational cost did not show any significance.The industry variable measured by the HHI of loans showed strong positive impact on net interest margin suggesting that indicates that when advances in loans are concentrated among few banks, they tend to enjoy wider spreads. Moreover, for the macroeconomic variables (Inflation, monetary policy rate and exchange rate) none of them was a significant determinant of banks' net interest margins. The dummy variable for the 2007/2009 banking crises showed a significant negative impact on the interest rate spread of banks in Ghana.

1. Introduction

Financial intermediation plays a crucial role and is considered as an essential element in economic development. Financial intermediation has insinuations for the effective or ineffective organisation of resources that are investible (Hasman, Samartin and van Bommel, 2014). These financial intermediaries accept deposits from units with surpluses and advance them to units in deficit. This intermediary role is undoubtedly very significant in promoting the growth of the economy by supporting economic units to grow and also grow their profitability through loans given out to customers in need (Banerji, Bhattacharya and van Long, 2004). In this light, the Ghanaian banking division which by far is the principal section within the financial sector has never been competitive than as it is today in providing the financial intermediary role; foreign banks are gradually penetrating the industry and increasing customer expectations as well as demands. Hence, increased competition within the banking sector (Adu, Marbuah and Mensah, 2013). Consequently, the price-setting manners of banks to an extent enormously influence both their operational and financial performances.

Lending rate is interest slapped by banks on their customer who access credit facilities from them. This interest rate charged by banks is typically fixed in ways that costs incurred by the bank is covered and profits are made by the bank when such customers attend to their credit facilities given them by the bank (Poghosyan, 2013). Thus, bank spread between a bank's interest earning and expense is very significant in the banking industry. Several economists to a large degree concurs that financial liberalisation facilitates economic development and growth (Bawumia, Belnye and Ofori, 2005; Adu, Marbuah and Mensah, 2013; Poghosyan, 2013).

This understanding, exemplified in the McKinnon-Shaw paradigm, indicates that removal of financial repression disguised as interest rate controls, imposition of credit rationing and credit ceilings, results in significant improvement of growth prospects in an economy (Aghion and Howitt, 2009). This indicates that narrow spreads are mostly indicative of a comparatively economical banking system with low levels of regulatory "taxes" and intermediation costs such as: capital and reserve requirements (Saunders and Schumacher, 2000).

Saunders and Schumacher (2000) points out further that, large spreads may introduce fair degrees of stability for a banking system. This means the banks can add to profitability and capital so as to sequester them from macroeconomic and other systemic shocks. Diamond and Dybvig (1983) pointed out that bank failures carry significant externality and social costs (Diamond and Dybvig, 1983). Besides, in the lack of well-functioning equity markets such as stock exchanges, bank interest spreads and in-house or core profit generation are the only avenues by which banks add to their capital.

After Ghana had liberalised its financial landscape, interest rate spreads were expected to decline to ensure banking efficiency, nonetheless Bawumia et al., (2005) points out that such expectations have not been materialised, although it appears apparent that financial sector liberalisation has not been so long (Bawumia et al., 2005). Most of the banks argue the higher risk in lending which may result from moral hazards and adverse

selection based on information asymmetry resulting in increasing provision for doubtful debts and non-performing loans as well as other conditions like higher cost of capital, higher reserve requirements, higher operational cost and macroeconomic instability (Adu, et al., 2013).

Thus, banks in Ghana still charge higher interest rate on loans despite the favourable macroeconomic conditions like decreasing inflation rates and lower policy rates. The high price of loans in Ghana obviously limits access to capital and inhibits economic growth. These consequences of banking sector inefficiencies have stimulated copious deliberations in emerging countries about determinants of a banking sector's spread in interest rate (Bawumia, 2010). In light of the increasing interest rates charged on loans compared to those offered on deposits, these interest rates vary among most universal banks in the country. In practice, almost all banks have quite a lot of lending rates and more than a few deposit rates in accordance to the diverse liability and asset products available. So the obvious question still remains: how do we explain the rates that most universal banks in Ghana pay on loans and charge on deposits in Ghana? This study tries to provide empirical evidence in this direction.

2. Materials and Methods

2.1 Study Area and Source of Data

The scope of the research was limited to the banking sector of Ghana.
In all, 28 banks were used in the study (a list of the banks used are provided in Appendix A).

2.2 SOURCES OF DATA

The study resorted to the use of secondary data. Secondary data was gathered from the financial statements of the various banks and the Bank of Ghana covering a period of 12 years, from 2000-2011.

This study uses a quantitative method approach. In this regard, quantitative time series and cross sectional data were gathered from the Bank of Ghana website and the Ghana Stock Exchange. The population of the study is banks listed on the Ghana Stock Exchange. Panel regression analysis was used to analyse data. On the basis of the findings from the regression analysis, relationships existing among the variables are observed and examined to determine if there are significant conclusion among the variables.

2.3 DATA ANALYSIS PLAN

The data gathered was analysed using STATA 12.0. These were analysed into tables for interpretations. The following analyses were used to analyse the secondary data:

3.1 Quantitative Analysis

The quantitative analysis was done first by performing descriptive statistics in other to describe the characteristics of the variables used and to check the statistical conclusion validity by first looking for violation of the assumption underlying the statistical techniques used to address the research hypotheses. The study then conducted correlation analysis and panel regression analysis.

3.2 Correlation Analysis

The study employed the Pearson Correlation Analysis to measure the magnitude in associations among the variables. Correlation analysis measures relationships between two items. The resulting value which is the "correlation coefficient" indicates the extent to which the variables move together; i.e. whether the variables are directly or indirectly associated. Correlation analysis does not makes any priori hypothesis as to if a variable has negative effects or otherwise on another; rather, it assesses the magnitude of linear relationship between two variables with the resulting sign giving an indication of whether relationships among the variables are positive or negative. Correlation between two variables (X_1, X_2) is measured as:

$$r_{X1,X2} = \frac{\sum_{i=1}^{m} Z_{1i}Z_{2i}}{m} = \frac{\sum_{i=1}^{m}(X_{1i}-\bar{X}_1)(X_{2i}-\bar{X}_2)}{\sqrt{\sum_{i=1}^{m}(X_{1i}-\bar{X}_1)^2(X_{2i}-\bar{X}_2)^2}} \quad \ldots\ldots\ldots\ldots \text{Eqn. (1)}$$

Where σ denotes the standard deviation of $\bar{X}$, m denotes the sample size, X denotes the series of the variable under consideration.

3.3 Regression analysis

From literature various variables have been identified as determinants of banks net interest margin. Hence the study used a panel regression model. Explanations to the model is outlined below.

Dependent Variable in the Regression Model

NIM: The yearly net interest margin which is an accounting return of the banks calculated as:

$\frac{\text{Interest received} - \text{interest paid out}}{\text{Total Assets}}$. As posited by Aboagye et al. (2010), this measure is one of the easiest ways to estimate interest spread/net interest margin from bank income statements. This proxy has weaknesses, nonetheless, as Brock and Rojas-Suarez noted, it overlooks fees and commissions that are likely to increase loan costs borne by borrowers and minimise interest gains to be made by depositors. Furthermore, including all forms of assets (indirectly all liabilities), the consequential measure is likely to digress from a bank's marginal revenues and marginal costs.

Independent variables in the Regression Model

The study used bank-specific elements that include: size; credit risk; age; and management efficiency of all the banks. The study also includes the banking industry structure to capture industry effect. In addition, we investigate whether changes macroeconomic indicators (monetary policy rate and) inflation have a significant impact on bank spread.

Size

Bank size is often considered an important determinant of its NIM. As in most studies in banking (Athanasoglou, et al., 2008; Demirguc-Kunt & Huizinga, 1999), we also include the size of the bank measures as the natural log of total assets, as an indicator of size to test the efficient market hypothesis or existence of economies of scale. If economies of scale are important, then we should expect spreads to fall with increasing market shares. On the hand, the existence of monopoly power would make interest spreads to widen.

Age

The study includes the age of the bank measures as the natural log of the number of years in existence of the bank. It is hypothesized that the longer the bank has been in existence in the country, the more probable it may have monopoly power hence a positive relationship with spread.

Management Efficiency (MGT)

The quality of bank management affects profitability. We gauge the quality of bank management by computing the ratio of a bank's administrative expenses to total revenue (MGMT) which as one indicator of the operational cost of the bank. The variable administrative costs incurred to generate a unit of revenue. Increases in this variable should have a positive impact on NIM this is because banks would normally pass on any increase in this cost onto the consumers hence an increase in spread.

Ownership (OWN)

The study includes ownership structure of the bank, thus whether it is a foreign owned bank or not to test its effect on the bank's spread. This is a dummy variable taking the value of 1 if the bank is foreign owned or 0 if otherwise. It is normally hypothesized that foreign owned banks perform better than local banks because these banks normally have improved technology that allows them operate well. Hence we expect a positive relationship between ownership and NIM.

Competition

Literature records that wide-ranging interest rate spreads are likely to persist if structures within banking industries remain relatively unchanged. Investigations on market structures in the banking industry and behaviour of the banks have comprised several techniques. One of such techniques is the Herfindahl-Hirschman index (HHI). The Herfindahl-Hirschman index (HHI) is used as a measure of concentration in a market, i.e. the level to which a small number of banks control large market shares in relation of total assets, total loans or total deposits. It is computed as the aggregate of the squares of the market shares of each bank in the market in relation to the market's total assets, total deposits or total loans. Market shares are calculated as a bank's total assets or deposits or loans expressed as a ratio to the respective industry aggregate. This study used the market share in terms of total loans. A higher HHI indicates concentration in lending among few banks in the industry.

Adding up to the bank and industry-specific elements, macroeconomic elements were also considered. Granted that rates are determined by anticipated inflation and money supply, the following macroeconomic indicators were included in the model for this study.

Inflation (INF)

The study includes inflation measured as the annual consumer price index (INF). The inclusion of inflation allows to determine likely impacts the cost of doing business in an economy is, and the expectation of this study is that it should vary directly with with NIM.

Monetary Policy Rate (MPR)

Experts indicate that most central banks consider lending rate in setting their own lending rates. Hence, central banks' monetary policy rate (MPR) are pointers of monetary policy.

Exchange Rate (EX)

Exchange rate volatility for each year is calculated as the exchange rate of the Ghana Cedis against the US$. Because increased macroeconomic instability heightens the risk faced by commercial banks, EX is expected to be positively correlated with NIM, as the banking sector increases its spreads to protect against the increased

risk.

Model Specification

The general regression specification model is given as:

$$Y_{it} = \alpha_o + \beta X_{it} + \varepsilon_{it} \quad \text{…….. Eqn. (2)}$$

The subscript i denotes the cross-sectional dimension whiles the t represents the time series dimension. The left hand variable Y_{it} stands for the dependent variable in the model, which is banks' NIM. X_{it} contains a set of independent variables in the estimation model (SIZE, AGE, MGT, credit, OWN, HHI, MPR, EX and INF) , it is taken to be constant overtime *t* and specific to the individual cross-sectional unit. α_0 is given as the constant and β is taken as the coefficient.

The study employs a fixed effects panel data model which allows for differing intercepts across the banks, but assumes that these effects are fixed over time. It is often said that the random effects model is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a fixed effect model is more plausible when the entities in the sample effectively constitute the entire population (for instance, when the sample comprises all of the stocks traded on a particular exchange). Because the study sampled all banks in Ghana, it is appropriate to employ the fixed effect rather than the random effects model.

The following model is estimated:

$$NIM_{it} = \alpha_0 + \beta_1 SIZE_{it} + \beta_2 AGE_{it} + \beta_3 OWN_i + \beta_4 MGT_{it} + \beta_5 HHI_{it} + \beta_6 INF_t + \beta_7 MPR_t + \beta_8 EX_t + \mu_i + \varepsilon_{it}$$

…….. Eqn. (3)

Where, all variables are as defined above. α_0 is the intercept term while $\beta_{1\text{-}9}$ are the coefficients of the independent variables. μ_i is the bank fixed effects while ε_{it} is the idiosyncratic error term.

It is the regression function which examines the relationship between the independent variable and the dependent variable. It is the value for the regression equation to predict the variances in dependent variable from the independent variables. This means that if any of the coefficients is negative, the predictor or independent variable affects dependent variable negatively; one unit increase in independent variable will decrease the dependent variable by the coefficient amount. In the same way, if any of the beta coefficients is positive, the dependent variable increases by the coefficient amount. b_0 is the constant value which dependent variable predicted to have when independent variables equal to zero (i.e. if $\beta_{1's}$ are 0 then $NIM_{it} = \alpha_0$).

3.4 Diagnostic Tests

Regression diagnostics are statistical procedures to assess the validity of a model in any of a number of different ways for a regression analysis (Everitt, 2002). Dodge (2003) indicates that a regression diagnostic is an exploration of the underlying statistical assumptions; and examination of a regression equation's model structure and predictions (Stock & Watson, 2007). Dodge (2003) emphasises that a regression diagnostics can either take the form of graphical results; an informal quantitative results; or a formal statistical hypotheses testing. In this study, an informal quantitative results is obtained from the outputs generated along with the corresponding interpretations. For simplicity, the diagnostics to be carried out include: normality test; test for heteroscedasticity and autocorrelation in the variables.

Test for Heteroscedasticity

Heteroscedasticity is the situation in which the variance of a regression error term μ_t, conditional on the explanatory variables, is not constant (Stock & Watson, 2007). Simply put, for the regression analysis to make meaningful predictions, the variance of the error term must be constant, implying homoscedasticity (Brooks, 2008). To test for heteroscedasticity in the specification above, White's Test is carried out. White's general test for heteroscedasticity in the view of Wooldridge (2002) is one of the best approaches to detect heteroscedasticity, owing to the reasons that it makes few assumptions about the form of the heteroscedasticity. To test for heteroscedasticity in this study, the implied hypothesis is given as:

$$H_0: Disturbance\ term\ is\ not\ constant\ (heteroskedastic)$$
$$H_1: Disturbance\ term\ is\ constant\ (homoskedastic)$$

In this hypothesis testing, if the χ^2 test statistic from the auxiliary regression that is generated is greater than the corresponding χ^2 value from the statistical table, then the null hypothesis that the disturbance is heteroskedastic is rejected.

Test for Normality

The classical linear model assumes that the error (or dependent variable) has a normal distribution, conditional

on the explanatory variables (Wooldridge, 2002). For this assumption, the Sharpiro–Wilk normality test tends to be more appropriate. The Sharpiro–Wilk test formalises this assumption by testing the residuals for normality (Brooks, 2008). The basic idea behind the Sharpiro–Wilk test is that the normal distribution (with any mean or variance) has a skewness coefficient equal to zero (0), and a kurtosis coefficient equal to three (3). To test for normality in the disturbance term for the specification above, the implied hypothesis is given as:

$$H_0: Disturbance\ term\ is\ Normally\ Distributed$$
$$H_1: Disturbance\ term\ is\ not\ Normally\ Distributed$$

Test for Autocorrelation

For a classical linear regression model, it is assumed that there are no patterns in the errors. That is to say, $Cov\ (\mu_i, \mu_j) = 0; for\ i \neq j$. If there are patterns in the residuals from a model, then they are auto-correlated. In this study, the Breusch-Godfrey (BG) test is employed to test for autocorrelation in the residuals of the disturbance terms. To test for autocorrelation in this study, the implied hypothesis is given as:

$$H_0: \hat{\rho} = 0$$
$$H_1: \hat{\rho} \neq 0$$

Where $\hat{\rho}$ is the estimated correlation coefficient of the disturbance term with dependent variable in the estimated model. The Breusch-Godfrey (BG) test is given in a more general rth order autocorrelation as:

$$\mu_t = \rho_1\mu_{t-1} + \rho_2\mu_{t-2} + \rho_3\mu_{t-3} + \cdots + \rho_r\mu_{t-r} + \nu_t, \nu_t \sim \mathbb{N}(0, \sigma_\nu^2) \quad \text{..... Equation (3)}$$

If the F-statistic from the auxiliary regression above has a P-value greater than the significant level considered, then reject the null hypothesis and conclude there is evidence of autocorrelation (Brooks, 2008).

4.1 Summary Statistics of the Variables under the Study

Table 1 below shows the descriptive statistics of the research variables. The minimum and the maximum values of the variables were the characteristics of the sample were reported in detail in the method section of the previous chapter. Also, the mean scores of the data were assessed as accurate with the maximum possible scores for each variable indicated in table 3 below.

Table 3: Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max	SWILK
NIM	245	0.0690	0.0248	0.0173	0.1575	3.834***
SIZE	245	18.9990	1.4019	13.6891	21.6483	4.034***
AGE	238	2.6162	1.0995	0.0000	4.5539	3.763***
MGT	245	0.1635	0.1786	0.0145	2.0559	10.771***
HHI	245	0.1002	0.0362	0.0537	0.1878	5.824***
INF	245	0.1618	0.0673	0.0900	0.3300	6.856***
MPR	245	0.1776	0.0466	0.1250	0.2700	6.418***
EX	245	1.0575	0.2948	0.5449	1.5119	6.609***

Source: Computations from research data, 2014. NB: *** Significance at 1% level.

Table 3 above depicts an average spread (NIM) over the period of 6.9% and management efficiency ratio of 16.35 %. The measure of concentration, the Hirschman–Herfindahl Index (HHI) of loan concentration which measures the concentration of lending among banks for loan customers as 0.1002, indicates that lending is diversified within the banking industry, hence a competitive banking industry. Average inflation and monetary policy rate over the period were 16.18% and 17.76% respectively. Average exchange rate was GH¢ 1.0575/US$. The Sharpiro–Wilk (SWILK) statistics indicates that all the variables are not normally distributed at 1%.

4.2 CORRELATION ANALYSIS

The correlation analysis was used to examine the relationships that exist between the dependent variable (NIM) and the independent variables (SIZE, AGE, OWN, HHI, CRISES, INF, EX, MPR). Table 4 below shows a significant positive relationship between all the independent variables (SIZE, AGE, OWN, HHI, CRISES, INF, EX, MPR) and spread of the bank (NIM). While increases in SIZE, AGE, HHI, INF, MPR leads to increase in the net interest margins of banks in Ghana, OWN, CRISES and EX rather leads to narrower margins.

Table 4: Correlation Matrix

	NIM	SIZE	AGE	OWN	MGT	HHI	INF	MPR	EX	CRISES
NIM	1									
SIZE	0.11**	1								
AGE	0.46**	0.56**	1							
OWN	-0.12*	0.02	-0.17**	1						
MGT	0.01	0.06	-0.04	0.05	1					
HHI	0.32**	-0.57**	0.09	-0.13	-0.16*	1				
INF	0.27**	-0.39**	0.07	-0.11	-0.14	0.79**	1			
MPR	0.30**	-0.51**	0.09	-0.13	-0.17*	0.90**	0.84**	1		
EX	-0.22**	0.58**	-0.05	0.11	0.16*	-0.87**	-0.51**	-0.69**	1	
CRISES	-0.24**	0.21**	-0.07	0.08	0.02	-0.23**	-0.02	-0.20**	0.19**	1

Source: Computations from research data, 2014. NB: ** Significance at 1% level**.** *correlation is significant at the 5% level.

4.3 REGRESSION ANALYSIS: DEPENDENT VARIABLE (NIM)

This section examines the relationship between the dependent variable (net interest margin) and. the dependent variables (SIZE, AGE, OWN, HHI, CRISES, INF, EX, MPR). This helped to measure how the independent variables influence the changes in bank spread.

From Table 5 below, the null hypothesis that the bank fixed effects are jointly zero (H0:ηi = 0) strongly rejected at the 1% significance level for the full sample, vindicating the use of the fixed effects panel approach and suggesting that the base levels of the dependent variables differ. Thus, this indicates the usefulness of the fixed effects panel model that allows for bank heterogeneity.

Table 5: Estimated Regression Coefficients

Variable	Coefficient	t-stats	P-value
SIZE	-0.0037	-1.12	0.264
AGE	0.0143	2.56	0.011
OWN	-0.0297	-3.03	0.003
MGT	0.001	0.16	0.872
HHI	0.3188	2.47	0.014
INF	0.0192	0.56	0.576
MPR	-0.107	-1.76	0.08
EX	0.0172	1.63	0.104
CRISES	-0.0067	-2.58	0.011
Intercept	0.0856	1.49	0.136

R-sq within= 0.2324
F(9,202) = 6.79; Prob >F = 0.0000
F test that all u_i=0: F(26, 202)= 8.10 Prob. > F = 0.0000

Source: Computations from research data, 2014. NB: ** Significance at 1% level**.** *correlation is significant at the 5% level

4.4.1 Bank-Specific Variables

The results in Table 5 above indicate a negative impact (Coeff. = -0.0037, P-value = 0.264) of the size (SIZE) of the bank on net interest margin even though the impact is not significant at any reasonable level. Thus while it could have been postulated that larger banks may enjoy monopoly power to increase their margins, the results rather would support the economies of scale which indicate spreads to fall with increasing market shares (Athanasoglou et al., 2008; Demirguc-Kunt & Huizinga, 1999).

Again, the study finds strong evidence to support the assertion that older banks (AGE) enjoy some form of monopoly power hence a positive (Coeff. = 0.0143, P-value = 0.011) impact of age on net interest margin. This was significant at the 5% level. This indicates that banks that have been in existence in the country for a long time enjoy wider spreads while newer banks may have narrower spreads.

The ownership variable (OWN) that checked the influence of ownership (thus, foreign owned or local owned) on the net interest income of banks showed significant negative results (Coeff = 0.0297, P-value= 0.003). This indicate that foreign owned banks in Ghana tend to have narrower spreads while local banks in Ghana enjoy wider spreads. Thus, while it may be asserted that foreign bank may have improved technology hence allowing them to operate well and result in increased margin, the argument may also be made in the sense that local banks are familiar or knowledgeable about the system in the country and may reach out more to the people in the community. Moreover, as most of the foreign banks trooped into the country for the past few years, their market share in terms of giving out loans and taking in deposits may be small.

On management efficiency (MGT), while it is reasonable to expect that a bank with high staff and administrative expenses will pass these on to consumers in the form of wide margins, especially if the banking environment is not competitive, the study finds no significant impact (Coeff. = 0.001, P-value =0.872) of quality of management on net interest margin.

4.4.2 Industry Specific Variables

The Herfindahl-Hirschman index (HHI) which is viewed as a measure of concentration — the extent to which a few banks dominate market shares in respect of total loans showed a big and significant positive (Coeff = 0.3188, P-value = 0.014) impact on net interest margin. This indicated that bank concentration has a bigger impact on NIM. A higher HHI indicates concentration in lending among few banks in the industry. A concentrated banking industry indicates that most of the industry's lending is concentrated among few banks, enabling them to have access to more information on borrowers. This mitigates the problem of adverse selection and moral hazard leading to low loan default rate. The results show that, when advances in loans are concentrated among few banks, they tend to enjoy wider spreads. This is because where banks have monopolistic power they tend to set higher lending rate compared to the expense they make on their interest payments.

4.4.3 Macroeconomic Factors

While one would have expected inflation (INF) to impact net interest margin significantly, showing show that inflationary changes, informs commercial banks to widen the spread between lending and deposit rates in periods of frequent increases in inflation, the impact was not significant at any reasonable level (Coeff. = 0.0192, 0.576).

On the other hand, monetary policy rate (MPR) set by the bank of Ghana has a negative impact (Coeff. = -0.107, P-value = 0.08) on banks' net interest margin. This impact however was not significant. The results would indicate that when the central bank increases its lending rate of banks, the interest spread of the banks reduces and a reduction in the central bank lending rate increase banks' net interest margin. This may be because banks have not passed on the full amount of increases in the central bank lending rate to borrowers.

Exchange rate showed a positive but insignificant (Coeff. = 0.0172, P-value = 0.104) impact on net interest margin. This indicates that depreciation of the cedi does not increase bank's net interest margin significantly. Thus, either the banks do not feel the cedi depreciation much or they do not transfer much of the depreciation onto the consumers. This may also result from the dollar denominated assets and liabilities. Where the banks lend more of their loans are in the local currency with small portion of their liabilities in foreign denominated currency (dollar), banks may not feel the impact of the depreciation much to transfer to the consumers. Besides where most of the loans are denominated in Cedis, it is difficult to pass any depreciation of the Ghana Cedis against foreign currency onto consumers.

One main variable of interest here is the impact of the 2007/2009 financial crises on net interest margins of banks. The results shows a significant negative impact (Coeff. = 0.0172, P-value = 0.011) of the banking crises (crises) on net interest margins on banks. This shows that in the presence of banking crises, bank's experience narrower margins. This may result from increase default interest payments on loans advanced while the banks incur fixed interest expenses. Thus, the 2007/2009 banking crises had a significant negative impact on net interest margins of banks in Ghana.

5.0 Conclusion

The main goal of the study was to examine the variations of interest rates among banks in Ghana. In this regard, the study examined the determinants of the various interest rate spreads of banks as measured by the net interest margin. Specifically the study examined how bank specific, industry specific and macroeconomic specific variables determine these interest rate spreads. Special emphasis was placed on how ownership structure of banks (foreign owned or locally owned), the age of banks and the impact of the 2007/2009 global banking crises influences banks' interest rate spreads as this has not been examined in the Ghanaian contest. The study found that, for the bank specific variables, the age of the bank was a significant positive determinant of net interest margin while ownership structure had a significant negative impact on net interest margin. The size of the banks and the operational did not show any significance. The industry variable measured by the HHI of loans showed strong positive impact on net interest margin. Moreover, for the macroeconomic variables (Inflation, monetary policy rate and exchange rate) none of them as a significant determinant of banks' net interest margins. The dummy variable for the 2007/2009 banking crises showed a significant negative impact on the interest rate spread of banks in Ghana.

References

1. Aboagye, A.Q.Q., Akoena, S.K., Antwi-Asare, T.O., & Gockel, F.A. (2008). Explaining Interest Rate Spreads in Ghana. *African Development Review, 20*, 378-399.
2. Abor, J. (2004). Internationalisation and Financing Options of Ghanaian SMEs. *ACTA Commercii, 4*,

60-72.
3. Adu, G., Marbuah, G., & Mensah, J.T. (2013). Financial development and Economic Growth in Ghana: Does the measure of Financial Development matter? *Review of Development Finance, 3*, 192-203.
4. Aghion, P., & Howitt , P. (2009). *The Economics of Growth.* Cambridge: MITPress.
5. Amidu, M. (2006). The Link between Monetary Policy and Banks' Lending Behaviour: The Ghanaian Case. *Banks and Bank Systems, 1*(4).
6. Andrieş, A. M. (2009). What Role Have Banks in Financial Crises? Review of Economic and Business Studies (REBS), (3), 149-159.
7. Angbazo, L. (1997). Commercial bank Net Interest Margins, Default Risk, Interest-Rate Risk, and Off-Balance Sheet Banking. *Journal of Banking and Finance, 21*, 55–87.
8. Banerji, S., Bhattacharya, J., & van Long, N. (2004). Can Financial Intermediation induce Endogenous Fluctuations. *Journal of Economic Dynamics & Control, 28*, 2215-2238.
9. Bank of Ghana Act, 2002. Act 612.
10. Bank of Ghana, 1992. Annual Report and Accounts. Accra.
11. Bank of Ghana, 2011. Financial Stability Reports, Monetary Policy Report, No. 5, Vol. 5. http://bog.gov.gh/privatecontent/Research/Financial%20Stability%20Report-October%202011-final%20-%20r.pdf
12. Barajas, A, Steiner, R & Salazar, N (1999). Interest Rate Spreads in Banking in Colombia, 1974–96. *IMF Staff Papers,* 46, 196–224.
13. Bawumia, M. (2010). *Monetary Policy and Financial Sector Reform in Africa:Ghana's Experience.* Accra, Ghana: Combert Impressions Ghana Ltd.
14. Bawumia, M., Belnye, F. & Ofori, M.E. (2005). The Determinants of Bank Interest Spreads in Ghana: An Empirical Analysis of Panel Data. *Bank of Ghana Working Paper Wp/BOG-2005/09*, Accra.
15. Berger, A.N., Udell, G.F. (1992). Some evidence on the empirical significance of credit rationing. *Journal of Political Economy,* 100 (5), 1047–1077.
16. Berlin, M., & Mester, L.J. (1999). Deposits and relationship lending. *Review of Financial Studies*, 12 (3), 579–607.
17. Boot, A.W.A., & Thakor, A.V. (1993). Self-interested bank regulation, *American Economic Review* 83, 206-212
18. Brock, P. & Rojas-Suárez, L. (2000). Understanding the Behaviour of Bank Spreads in Latin America. *Journal of Development Economics*, 71(2), 291-299.
19. Buchs, T., & Mathisen, J. (2005). Competition and Efficiency in Banking: Behavioral Evidence from Ghana. *International Monetary Fund., IMF Working Paper 05/17.*
20. Caprio, G. Jr (1996). *Banking on financial reform? A case of sensitive dependence on initial conditions*. In G. Caprio, Jr, I. Atiyas and W, J. Hanson, eds., *Financial Reform: Theory and Experience*. New York: Cambridge University Press.
21. Chirwa, E. W. & Mlachila, M. (2004). Financial reforms and Interest Rate Spreads in the Commercial Banking System in Malawi. *IMF Staff Papers*, 51(1), 96—122.
22. Cho, Y. J. (1988). The effect of financial liberalization on the efficiency of credit allocation: Some evidence from South Korea. *Journal of Development Economics*, 29.

Appendix A
APPENDIX

LIST OF BANKS AND SAMPLE YEARS

Bank	**Year**
ABL	2000-2004
Agricultural Development Bank	2000-2011
Bank of Africa	2005-2010
Bank of Baroda	2008-2011
Banque Sahelo Saharienne Pour	2008-2011
Barclays Bank	2000-2011
CAL Bank	2000-2011
Energy Bank	2011
Fidelity Bank	2006-2011
First Atlantic Merchant Bank	2000-2011
Ghana Commercial Bank	2000-2011
Guarantee Trust Bank	2006-2011
HFC Bank	2003-2011
Intercontinental Bank Ghana	2006-2011
International Commercial Bank	2000-2011
Merchant Bank	2000-2011
National Investment Bank	2000-2011
Prudential Bank	2000-2011
SG.SSB	2000-2011
Stanbic Bank Ghana	2002-2011
Standard Chartered Bank	2000-2011
The Trust Bank	2000-2011
Uni Bank	2001-2011
United Bank for Africa	2005-2011
UT Bank	2009-2011
Zenith Bank	2005-2011