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Do bank-specific factors drive bank deposits in Ghana?

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ABSTRACT

Using the random effects technique, this paper examines the impact of bank-specific factors on the volume of bank deposits in Ghana for the period 2008 to 2017. Controlling for macroeconomic factors, the results show that profitability, bank size, and liquidity are significant determinants of bank deposit. Macroeconomic instability proxied by inflation also exerts a negative significant impact on bank deposit. The findings further reveal that an increase in banks' capital adequacy level does not essentially translate into deposit. A plausible implication from the findings is that efficient policies geared towards improving bank-specific factors, particularly bank size are essential for deposit attraction.

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1. Introduction

One of the key determinants of a country's economic growth and development is the strength and sustainability of the financial system, made up of a bank-based system in which investment capital is provided and monitored by the banks [1]. Banks serve as intermediaries in mobilizing savers' funds and then lending them to individual/corporate investors. Deposits are undoubtedly the core of commercial banks operations. By definition, bank deposits consist of money placed into commercial banks by customers in order to earn some interest and also for safekeeping. Literature has shown that bank deposit plays a key role in accelerating economic growth, particularly in developing and emerging economies [2–4]. Ghana as a developing country with a relatively underdeveloped capital market is not an exception.

Following the implementation of the Financial Sector Adjustment Program (FINSAP) in 1988 under the Economic Recovery Program in the 1980s, the Ghanaian banking sector has undergone substantial transformation and continues to develop new regulations and guidelines to maintain stability in recent years [5]. The financial sector liberalization policies have also led to an increase in the number of banks in the country. From 28 banks in 2014, the total number of registered banks in Ghana had increased to 34 in 2018 as reported by the Ghana Banking Survey. However, due to the recent bank recapitalization in Ghana, the number of registered banks has been reduced to 23 including domestic and foreign banks according to the 2019 Bank of Ghana list of licenced banks.

The growing number of banks in Ghana has resulted in efficiency and competition in the banking sector. One of the key factors enhancing the efficiency of these banks is their ability to channel mobilized funds into viable projects. In Ghana, banks are the key players of the financial system controlling a greater portion of the investment funds from depositors to corporate and individual borrowers. Most Ghanaian businesses rely heavily on bank loans as a major source of capital, and

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banks' ability to lend largely depends on how much deposits they can generate. Therefore, deposit mobilization is a key activity of all banks. It is however impossible to mobilize deposits without knowing what factors influence it. The question now is, at the bank level, what factors determine bank deposits in Ghana? As this study discusses later, few empirical studies [6–12] have examined the determinants of bank deposits with mixed and inconclusive findings. With reference to Ghana, exceedingly limited studies exist, hence requiring further research. The works of [2] and [13] on the determinants of bank deposit in Ghana are notable. Ngula [2] employed the ordinary least squares (OLS) technique to assess the impact of macroeconomic factors on deposit mobilization in Ghana over the period 1980 to 2010. Findings from the study suggest that money supply, exchange rate, and inflation significantly influence bank deposit while interest rate does not matter in banks deposit mobilization. Also, using the OLS method, Boadi et al. [13] found that interest rate liberalization and gross domestic product (stocktickerGDP) are significant factors in attracting commercial banks deposits. However, apart from the absence of bank-specific factors in their analysis, the use of OLS produces biased results.

To the best of the researchers' knowledge, there is only one relevant study conducted [14] in the context of Ghana examining how bank-specific factors influence banks deposit level. However, his study considered rural and community banks and a short time period (2009–2013). This paper will extend the work of Osei [14] by employing a more recent dataset with focus on commercial banks. It makes two key contributions to literature. First, it presents a relatively pioneering work examining the impact of bank-specific factors on commercial banks deposit in Ghana. Second, the paper models both bank-specific and macro-economic factors influencing commercial banks deposit in a single equation using more recent data. Findings from the random effects analysis show that profitability, bank size, liquidity, and inflation are significant determinants of commercial banks deposit in Ghana. Further evidence shows that banks' maintaining a higher capital adequacy ratio does not essentially translate into deposit.

The rest of the paper is as follows: Section 2 presents the literature review. Section 3 outlines the data and research design. Section 4 presents the results, and Section 5 concludes the paper.

2. Literature review

2.1. Theoretical underpinnings

Banks are dependent on depositor's money as a source of funds. Keynesian theory of demand for money postulates that there are three main motives for holding money: transactions, precautionary and investment. Banks offer three types of deposit (demand, savings and time deposits) to cater for these motives. Demand deposit also known as the current account is intended for those who require money for transaction purposes. That is, individuals who need money for household expenditures, and also businesses requiring money to carry out their daily transactions. The savings account is the second type of deposit, which addresses the needs of individuals who want to save and earn income at the same time. Savings account depositors hold money for precautionary reasons while being simultaneously induced by their motives for investment. The precautionary motive for holding money refers to the desire of individuals to maintain cash balances to cater for unforeseen contingencies. Time (fixed) deposit is the final form of deposit offered by banks to customers to cater for their investment motives. It is provided to customers who normally have idle funds and are looking for better returns on their money.

From the perspective of depositors, there are three main theories related to savings behaviour: the traditional models of the life-cycle hypothesis [15]; the permanent income hypothesis [16]; and the buffer-stock theory [17,18]. The life-cycle savings behaviour model predicts that consumption depends on lifetime income expectations in a given period, implying that people save to smooth consumption over time. Therefore, since income tends to fluctuate systematically over a person's life, saving behaviour is determined by the stage of one's life cycle in which they become net savers during their working years and dissavers during retirement.

The permanent-income hypothesis predicts that higher future income reduces current saving. It distinguishes between permanent income and temporary income. Temporary income changes are met by consumption smoothing whereby part of today's income windfall is saved to sustain higher spending tomorrow. On the other hand, permanent income changes do not justify current savings since more can be consumed now and in the future.

The buffer-stock theory of saving argues that individuals hold assets with the primary motive of shielding their consumption against unpredictable income fluctuations. The theory assumes that consumers become both impatient and prudence when they face important income uncertainty. They are impatient because they resort to borrowing against future income in order to meet current consumptions, and they are also prudent because they have precautionary motives. To avert the dangers of income fluctuations in the future as well as ensure smooth consumption pattern, consumers are compelled to set aside precautionary reserves by minimizing current consumption in order to save against contingent occurrences. This therefore makes saving rate to be pro-cycle, meaning that individuals tend to save more when incomes are higher in order to smoothen consumption in bad times.

2.2. Empirical review of related literature

Although there is vast literature on individuals' savings behaviour, research on the determinants of bank deposit is scanty. Banks deposit determinants are generally classified as micro and macroeconomic factors. While the microeconomic

determinants are bank and individual-specific, the macroeconomic factors that drive bank deposit are related to an economy's general macroeconomic fundamentals. The empirical literature as outlined below, have examined the determinants of savings and banks deposit level in different contexts using these factors.

Loayza et al. [19] empirically analysed the policy and nonpolicy factors influencing private savings across the world using a sample of 150 developed and developing countries for the period 1965–1994. Evidence from the generalized method of moments (GMM) analysis showed that real per capita income and inflation positively influence private savings. Dependency ratio and financial liberalization on the other were found to be largely detrimental to private saving rates.

Sarantis and Stewart [20] examined the long-run determinants of aggregate private saving rates in a dynamic panel of OECD countries during the post Second World War period. Applying the panel cointegration tests, which allow for heterogeneity in parameters and dynamics across countries, the study found that demographic factors and credit constraints significantly influence savings behaviour in majority of OECD countries. They also found that greater financial liberalization and integration minimize liquidity constraints, thus leading to lower savings.

Cohn and Kolluri [21] investigated the long-run relationship between real per capita household saving and the real rate of interest, government saving, and social security contributions in the G-7 countries covering the period 1960–1999. Using the vector error-correction model, their results indicated that savings react positively to interest rate, but negatively to government savings and social security contributions.

Hondroyiannis [22] employed the cointegration approach in assessing the long and short-run determinants of aggregate private savings in Greece over the period 1961–2000. The empirical evidence showed that in the long run savings function is sensitive to fertility changes, old dependency ratio, real interest rate, liquidity, and public finance.

Haron et al. [6] analysed the determinants of commercial banks deposit in Malaysia applying the cointegration analytical technique. The result suggests that bank deposit is positively influenced by GDP, money supply, interest rates, and bank profitability. However, return on deposit and inflation rate have a negative influence on bank deposit.

Kasri and Kassim [23] examined the drivers of Islamic banks savings level in Indonesia using the Vector Autoregressive and its associated Impulse Response Function analysis over the period 2000–2007. Results from their regression estimation depict that conventional interest rate and the real rate of return are important factors influencing Islamic banks' savings.

Finger and Hesse [7] empirically assessed the factors influencing commercial banks deposit demand in Lebanon. They found that at the macro level, economic activity, interest rate differentials, and general prices explain demand for deposits. In terms of microeconomic factors, bank-specific factors such as bank risk, liquidity buffers, interest rate, and loan exposure significantly influence deposit.

Employing the vector error correction model, Abduh et al. [11] assessed the effect of crisis and macroeconomic factors on Islamic banks deposit in Malaysia for the period 2000–2010. The findings presented show that inflation, base lending rate, and industrial productivity index have a negative impact on bank deposits.

By using the ordinary least squares regression technique, Onwumere et al. [24] examined the impact of interest rate liberalization on savings and investment in Nigeria over the period 1976–1999. The empirical results show negative insignificant effect of interest rate liberalization on savings. The study also posits that interest rate has a negative impact on investment though significantly.

Ngula [2] used the OLS technique to identify the factors determining banks' deposit mobilization in Ghana for the period 1980 and 2010. The findings establish that bank deposit mobilization in Ghana is significantly driven by exchange rate, inflation rate and money supply (M2). However, deposit interest rate is weak in attracting bank deposit.

Nathanael and Eriemo [9] study in Nigeria examined how macroeconomic factors influence bank deposit. Evidence from the vector error correction model concludes that interest rate and general price level are important factors influencing bank deposit in Nigeria. The study also establishes that there exists a long-run relationship between these variables and bank deposit. Similarly, in Nigeria, Ojeaga and Odejimi [10] quartile regression estimates show that interest rate has a positive significant effect on bank deposit.

In Zimbabwe, Mashamba et al. [25] investigated the relationship between interest rate on deposit mobilization over the period 2000–2006. By developing an ordinary least squares model, the regression estimates show that interest rate has a positive significant effect on banks deposit mobilization in Zimbabwe. The study recommends an increase in interest rate to boost bank deposit.

Larbi-Siaw and Lawer [26] applied the co-integration analysis to examine the determinants of bank deposits in Ghana. The results reveal that in the short run, inflation and growth in money supply adversely influence bank deposit. On the other hand, monetary policy rate in the short run impacts positively on deposit. The study further shows that in the long run bank deposit is positively driven by growth in money supply and negatively driven by inflation and interest rate.

Relying on macroeconomic factors, Boadi et al. [13] assessed the determinants of bank deposits in Ghana with focusing on interest rate liberalization. By using the ordinary least square (OLS) estimation technique, the study shows that interest rate liberalization and gross domestic product (GDP) are significant factors determining bank deposits.

Employing data from 137 rural and community banks in Ghana, Osei [14] assessed the determinants of rural banks deposit mobilization in Ghana over the period 2009–2013. His results from the panel least regression suggest that liquidity risk, credit risk, and bank size significantly influence rural banks deposit level.

Hassan and Makinde [8] examined the effect of interest rate on commercial banks deposit in Nigeria over the period 2003–2013. The study used interest rate and GDP as independent variables. Applying the ordinary least square method, the findings reveal that a negative relationship exists between interest rate and commercial banks deposit in Nigeria.

Table 1

Description of variables.

Variables	Acronym	Explanation	Sources of data
Bank Deposit	BD	Total deposits (demand and time deposits) in commercial banks	Banks Annual Reports, Ghana Stock Exchange
Profitability	ROA	Net income to total assets	Banks Annual Reports, Ghana Stock Exchange
Bank Size	BSIZE	Natural logarithm of total assets	Banks Annual Reports, Ghana Stock Exchange
Capital Adequacy	CA	Ratio of equity to total assets	Banks Annual Reports, Ghana Stock Exchange
Liquidity	LIQ	Ratio of liquid assets to deposits	Banks Annual Reports, Ghana Stock Exchange
Monetary Policy Rate	MPR	Monetary policy rate set by the central bank	Central Bank of Ghana
Inflation	INF	Consumer Prices (annual %)	Central Bank of Ghana

In a comparative study, Mushtaq and Siddiqui [12] assessed the impact of interest rate on bank deposits in Islamic and Non-Islamic countries. Using a dataset spanning 1999–2014 from 23 Islamic and 23 Non-Islamic economies, the research relied on panel ARDL (Auto-regressive Distributed Lag) as an estimation technique. The ARDL results show that interest rate has no impact on bank deposit in Islamic economies, whereas in Non-Islamic countries interest rate and bank deposit level exhibit a positive relationship.

Ferrouhi [27] examined the determinants of bank deposit in Morocco using bank-specific and macroeconomic factors. Applying the OLS analysis on a panel data covering 2003–2014, the findings evidenced that bank size, bank funding, interest rate on deposit and unemployment explain deposit behaviour.

Using annual data of banks and other financial institutions in Pakistan, Raza et al. [28] analysed the effect of interest rate on savings and bank deposit from the period 2002 to 2016. Results from the OLS regression analysis suggested that interest rate has a positive significant effect on bank deposit.

From the extensive literature review, studies on the determinants of bank deposit have been based on macroeconomic variables to explain banks deposit level with few considering microeconomic factors especially bank-specific variables. In the context of Ghana, scanty literature exists. Even with the limited literature in Ghana, only the work of Osei [14] which dwelled on rural banks, has considered bank-specific variables as drivers of bank deposit. This paper thus seeks to address the literature gap by investigating the impact of bank-specific factors on commercial banks deposit mobilization while controlling for macroeconomic factors.

3. Methodology

3.1. Sample and data

The paper uses bank level and macroeconomic data spanning 2008–2017. Four bank-specific and two macroeconomic factors are used to estimate the determinants of bank deposit in Ghana. The study considered the recently recapitalized banks in Ghana. Out of 20 sampled recapitalized banks, 11 banks are included in the study. The selected banks consist of four local banks and seven foreign banks, and are chosen based on data availability for the period considered. Data are gleaned from the annual financial statements of the selected banks and the Central Bank of Ghana.

3.2. Model specification and variables

Based on empirical findings, the functional model below is specified for this study:

$$\ln BD = f(\text{ROA}, \text{BSIZE}, \text{CA}, \text{LIQ}, \text{MPR}, \text{INF}) \tag{1}$$

where BD is total deposits; ROA represents bank profitability; BSIZE denotes bank size; CA is capital adequacy; LIQ represents banks liquidity level; MPR is the monetary policy rate set by the central bank; and INF is the rate of inflation. Table 1 provides the full description of each variable and their respective data sources.

Following the works of [13] and [29], the model for this study is precisely specified as follows:

$$\ln BD_{it} = \alpha_0 + \beta_1 \text{ROA}_{it} + \beta_2 \text{BSIZE}_{it} + \beta_3 \text{CA}_{it} + \beta_4 \text{LIQ}_{it} + \beta_5 \text{MPR}_t + \beta_6 \text{INF}_t + \varepsilon_{it} \tag{2}$$

where the proxies of all the variables are previously specified except ε , which is the error time. t represents the sample period and i denotes individual banks. α_0 refers to the intercept and β_1 to β_6 are the coefficients. Bank deposit is in natural logarithm.

3.3. Estimation method

The developed model in Eq. (2) is based on the ordinary least squares (OLS), which considers all the observations for all the time periods as a single sample. The OLS model ignores the panel nature of data and assumes that ε_{it} has no serial correlation. Panel data however, may have group effects, time effects, or both effects. These can either be fixed or random effects.

Table 2
Descriptive statistics.

Variables	Mean	Std. Dev.	Min.	Max.
InBD	13.878	0.946	11.35	15.75
ROA	0.043	0.028	-0.047	0.093
BSIZE	14.283	0.885	12.07	16.08
CA	0.146	0.041	0.044	0.309
LIQ	0.645	0.262	0.23	1.66
MPR	18.45	4.444	12.50	26.00
INF	13.647	3.900	7.126	19.251

A fixed effects model assumes differences in intercepts across groups or time periods. In the fixed effects model (where the subscript i denotes the individual bank and t refers to the time period), the intercept α is different for each bank and is subscripted by i :

$$Y_{it} = \alpha_i + \beta X_{it} + \varepsilon_{it} \quad (3)$$

A random effects model explores differences in error variances. In the random-effects model the intercept α is assumed to consist of a deterministic component ($\bar{\alpha}$) and a random component u_i , which is assumed to be distributed according to a normal distribution (i.e. $\alpha = \bar{\alpha} + u_i$). Therefore the model is expressed as:

$$Y_{it} = \bar{\alpha} + \beta X_{it} + u_i + \varepsilon_{it} \quad (4)$$

In order to establish which model is appropriate for the equation estimation, the Hausman [30] test will be performed. The rationale of the Hausman is that the random effects estimates are used unless it is been rejected by the Hausman test. A rejection using the Hausman test means that the key assumption underlying random effects is false, and therefore estimates from the fixed effects are used [31]. If the test statistic of the Hausman test is significant at 5% level, the fixed effects estimator is preferred, and the random effects model is assumed to be inconsistent.

4. Results and discussion

4.1. Descriptive statistics

Table 2 provides a summary of the descriptive statistics of the variables used in the study. This shows the average, standard deviation, minimum and maximum values of each variable. Bank deposit has an average growth of 13.9% over the study period with a maximum and minimum growth rate of 15.8% and 11.4% respectively. Profitability (ROA), given as the ratio of net income to total assets, registers a mean value of 0.043 indicating a return on assets of 4.3 %. Bank size (the natural logarithm of total assets) has a mean of 14.28%, suggesting that Ghanaian banks are relatively small in size. The mean capital adequacy ratio is 14.6%, signifying that on average, the sampled banks have capital adequacy ratio above the 2017 Basel III's 8% requirement. The average liquidity value is 0.645 ranging from a minimum of 0.23 to a maximum of 1.66. The maximum liquidity value of 1.66 shows that some of the banks considered are able to fully cover their short-term obligations. Regarding the macroeconomic factors, monetary policy rate by the Bank of Ghana and inflation rate have estimated mean values of 18.45% and 13.6% respectively.

4.2. Correlation and multicollinearity analysis

The Pearson correlation analysis is shown in Table 3. This is computed to establish the correlation between the independent variables. The maximum correlation coefficient is 0.702. According to Kennedy [32], explanatory variables with coefficients above 0.80 show the existence of multicollinearity. The correlation matrix indicates that weak correlation exists among the independent variables signifying the absence of multicollinearity. For more reliable analysis, the study performed multicollinearity diagnostics using both variance inflation factor (VIF) and tolerance tests. As posited by Gujarati [33], any variable with a VIF above 10 and tolerance value below 0.10 is assumed to indicate a potential multicollinearity problem. The results show that VIF values and the tolerance estimates are within the acceptable limits. The maximum VIF value is 4.25 and the lowest tolerance value is 0.235 suggesting that there are no multicollinearity problems among the explanatory variables.

4.3. Results of model estimation

In Table 4, the relationship between bank deposit and the independent variables is examined using the traditional panel models (pooled OLS, fixed effects and random effects). The high R^2 values in the models indicate that most of the variations in bank deposit can be explained by the explanatory variables included in the study. The result of the Hausman test is > 0.05 (i.e. not significant), and for the Breusch-Pagan (LM) test, it is < 0.05 (i.e. significant) suggesting that the random effects model is preferred.

Table 3

Correlation matrix and variance inflation factor.

Variables	ROA	BSIZE	CA	LIQ	MPR	INF	VIF	Tolerance
ROA	1.000						1.46	0.686
BSIZE	0.297***	1.000					2.47	0.404
CA	0.416***	0.003	1.000				1.36	0.734
LIQ	-0.123	-0.321***	0.069	1.000			1.16	0.865
MPR	-0.013	0.520***	0.049	-0.039	1.000		4.25	0.235
INF	-0.169*	0.033	-0.099	0.140	0.702***	1.000	3.01	0.332

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.**Table 4**

Regression results.

Variables	Pooled OLS	Random effects	Fixed effects
ROA	-1.140** (0.484)	-1.069** (0.506)	-1.207** (0.553)
BSIZE	0.994*** (0.020)	0.969*** (0.024)	0.934*** (0.028)
CA	-0.060 (0.318)	0.131 (0.327)	0.405 (0.350)
LIQ	-0.594*** (0.046)	-0.569*** (0.054)	-0.529*** (0.065)
MPR	0.003 (0.005)	0.008 (0.005)	0.015** (0.006)
INF	-0.008 (0.005)	-0.012** (0.005)	-0.017*** (0.006)
C	0.176 (0.271)	0.440 (0.313)	0.835** (0.367)
R ²	0.986	0.984	0.989
Adjusted R ²	0.985	0.983	0.988
Breusch-Pagan test λ^2 [Prob. > λ^2]		5.83[0.008]	
Hausman test χ^2 [Prob. > χ^2]			7.90[0.245]
Observations	110	110	110
Number of Banks	11	11	11

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors in parentheses.

From the random effects estimation, the results show that profitability (ROA) is negatively related to bank deposit, suggesting that higher bank profits which signal bank soundness do not attract deposits. That is, an increase in bank profitability is likely to trigger a decline in deposit. Profitability however is statistically significant at 5% level. This evidence is inconsistent with Haron [6] who found a positive nexus between profitability and bank deposit.

Bank size (BSIZE), defined as the logarithm of total assets has a positive and significant (at 1% level) impact on bank deposit. This indicates that larger banks with economies of scale and a larger branch network are more efficient in mobilizing deposits than smaller banks. This result is in line with the findings of [14].

Capital adequacy (CA) and bank deposit are negatively and insignificantly related. This implies that highly capitalized banks rely less on bank deposit for their operations, and may discline on efforts to mobilize deposits.

The liquidity ratio (LIQ) which assesses banks' ability to meet their short-term financial obligations has a negative and highly significant (at 1% level) effect on bank deposit. This indicates that a percentage increase in banks liquidity ratio causes a decline in banks deposit level.

Similar to the findings of [26], monetary policy rate (MPR) by the central bank shows a positive insignificant effect on bank deposit. That is, increasing monetary policy rate leads to higher deposits. The plausible implication is that as the central raises MPR, commercial banks also increase the lending rate on loans, and may pay higher interest to customers who are willing to make their funds available.

The coefficient of inflation (INF) is negative and significant (at 5% level), suggesting that an increase in inflation rate reduces bank deposit. The rationale is that in a high inflationary environment, people spend more on goods and services and therefore less is left for savings. The result of a negative association between inflation and bank deposit is consistent with previous findings [2,6,11,26].

5. Conclusion and recommendations

Deposit mobilization is a key activity of commercial banks which is essential for their survival. Hence, it is important to identify the key factors affecting it. In quest of this, the present study examines the impact of bank-specific factors on banks deposit mobilization in Ghana. Specifically, the paper investigates the relationship between profitability, bank size, capital adequacy, liquidity ratio and the volume of bank deposit, while considering the role of monetary policy rate and

inflation. Results from the random effects model show that bank profitability, bank size, liquidity ratio, and inflation are significant factors determining bank deposit. Meanwhile, capital adequacy and monetary policy have insignificant effect on the volume of deposit.

The findings suggest that efficient policies geared towards improving profitability, bank size, and liquidity are essential for bank deposits. Given that high inflation is disincentive to banks volume of deposit, it is necessary for policy makers to implement stringent measure in checking inflation.

The study highlights some interesting areas for further research efforts. First, only listed banks are considered. Unlisted banks may be included to better comprehend the factors influencing the volume of bank deposit in Ghana. Second, this study used only secondary data. A qualitative study or a combination of quantitative and qualitative approaches may produce more detailed and comprehensive findings. Finally, further research may critically examine other microeconomic factors influencing deposit. In particular, beyond the bank-specific factors, it is important to examine how socioeconomic traits of individuals affect the decision to make deposit.

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