

An Analysis of Factors Influencing Interest Rate Spread in the Banking Sector, Empirical Evidence from Ghana

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تحليل العوامل المؤثرة في هامش أسعار الفائدة في القطاع المصرفي: دراسة تطبيقية من غانا



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Abstract:

Objectives: This paper investigates the key drivers of interest rate spreads in the Ghanaian banking sector, using data from 15 commercial banks.

Methods: The study adopts a quantitative research approach based on secondary data. Annual financial reports from the selected banks and economic data from the Bank of Ghana and the Ghana Statistical Service (GSS) served as the primary and secondary sources for the analysis. Structural equation modelling (SEM) was employed to conduct inferential statistical analysis of the quantitative data.

Results: The results indicate that operating costs have a positive and statistically significant effect on interest rate spreads. The findings also show that the prime rate exerts a significant influence on interest rate spreads. However, reserve requirements and industry-specific factors do not significantly affect the determination of interest rate spreads. Additionally, credit risk and liquidity risk were found to be statistically significant under both partial and full correlation analyses. Among the bank-specific variables, overhead costs and operating costs significantly influence interest rate spreads.

Conclusions: The study concludes that banks should collaborate with relevant stakeholders to implement strategies aimed at reducing operating costs, which could ultimately contribute to lower lending rates.

Keywords: Interest Rate; Bank; Loan; Macroeconomic Factors.

الملخص:

الأهداف: تهدف هذه الورقة إلى استقصاء المحددات الرئيسة لفروق أسعار الفائدة في القطاع المصرفي الغاني، وذلك بالاعتماد على بيانات مستمدة من 15 بنكاً تجارياً.

المنهجية: اعتمدت الدراسة المنهج الكمي بالاستناد إلى البيانات الثانوية. واستند التحليل إلى التقارير المالية السنوية للبنوك محل الدراسة، إلى جانب البيانات الاقتصادية الصادرة عن بنك غانا وخدمة الإحصاء الغانية (Ghana Statistical Service [GSS]) بوصفها المصادر الرئيسة للبيانات. كما استُخدم نموذج المعادلات الهيكلية (Structural Equation Modeling [SEM]) لإجراء التحليل الإحصائي الاستدلالي للبيانات الكمية واختبار العلاقات بين متغيرات الدراسة.

النتائج: ظهرت النتائج أن تكاليف التشغيل لها أثر إيجابي وذو دلالة إحصائية على هامش أسعار الفائدة. كما بينت النتائج أن سعر الفائدة الأساسي (Prime Rate) يُمارس تأثيراً معنوياً في تحديد هامش أسعار الفائدة. في المقابل، لم تُظهر متطلبات الاحتياطي الإلزامي والعوامل الخاصة بالقطاع المصرفي تأثيراً ذا دلالة إحصائية في تحديد هامش أسعار الفائدة. علاوةً على ذلك، تبين أن مخاطر الائتمان ومخاطر السيولة تتمتعان بأثر ذي دلالة إحصائية سواء في تحليل الارتباط الجزئي أو تحليل الارتباط الكلي. أما بالنسبة للمتغيرات الخاصة بالبنوك، فقد أظهرت النتائج أن التكاليف الإدارية (Overhead Costs) وتكاليف التشغيل تؤثران تأثيراً معنوياً في تحديد هامش أسعار الفائدة.

الخلاصة: خلصت الدراسة إلى أنه ينبغي على البنوك التعاون مع أصحاب المصلحة المعنيين لتنفيذ استراتيجيات تهدف إلى خفض التكاليف التشغيلية، مما قد يسهم في نهاية المطاف في خفض أسعار الإقراض.

الكلمات المفتاحية: سعر الفائدة؛ البنوك؛ القروض؛ العوامل الاقتصادية الكلية.

Citation

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1 Introduction

The banking industry forms the financial backbone of any country, thus the need to ensure the sustainability of such a sector whatever the cost. For this reason, in the wake of the 2008 financial crisis, the United States spared no expense in shoring up its banking sector. The Emergency Economic Stabilization Act of 2008 was thus passed which made a massive sum of US\$ 700 billion available for bailing out ailing financial institutions and jumpstarting the US economy (The Washington Times, 2008). In Ghana, for example, the cost of cleaning up the financial sector was projected to a tune of US\$2.1 (Akolgo, 2022). The former Finance Minister of Ghana, Ken Ofori-Atta, revealed during a 2019 Mid-year Budget Review presentation at Ghana's parliament. This brings into question the means through which banks generate income. Banks primarily generate revenue through the interest rate spread, the difference between what they pay on deposits and what they charge on loans. They also earn fees for various banking services and products. While it may seem like banks create money from nothing when giving out loans, they are actually facilitating the creation of new money through the process of fractional reserve banking. This involves lending out a portion of the deposits they hold, effectively creating new money in the form of loans, while still maintaining enough reserves to cover potential withdrawals. There are three major means by which banks generate income for their operations, namely (i) net interest margin (also known as interest rate spread), (ii) Interchange, and (iii) Fees (Patin, 2016). Other sources of income for banks are commissions and trading income. The interest rate spread is the difference between the interest rate paid on depositors' funds and the interest rate charged on loans given out to borrowers. It is this difference that becomes the bank's spread. Interchange refers to the cash banks make from handling credit and debit card transactions. Each time a debit or credit card is swiped at a store, the store, or vendor, pays an interexchange expense. Meanwhile, the lion's share of cash from the exchange goes to the purchaser's bank – and a little goes to the store owner's bank. Meanwhile, fees are funded by banks charge customers for services rendered, such as real-time SMS notification of transactions. Other examples of bank fees are ATM and overdraft fees (Surge, 2022). In several countries, official control over interest rates is wielded on the basis that all banks or the biggest banks are state-owned. Even when such banks are legally considered as independent entities, the sway of the government over the activities of these financial entities is often powerful, whether exerted on an ongoing basis or only occasionally (Adam et al., 2016; International Monetary Fund, 1983). Moreover, banks in Ghana pay virtually extraordinarily little to no interest on deposits held with them. This allows them to charge high interest rates to borrowers thereby widening interest rate spreads. As a result, the widening gap between deposit and lending rates among banks is becoming commonplace (Obeng, 2017). Businesses and individuals exhibit strong inertia when the macroeconomic conditions in the country such as reduced monetary policy and inflation rates justify a reduction in prices of goods and services. The inertia can stem from various factors, including price stickiness, uncertainty about the permanence of the change, and behavioral biases. This observation leaves one wondering about the possibility of high-interest rate spreads in Ghana being more of a by-product of negative economic behavior such as excessive profiting. The motivation behind this study, therefore, is to find out factors influencing bank interest rate spread in Ghana.

2 Literature Review

According to Defee et al., (2010), good research should be grounded in theory. For this study, the principal-agent theory was adopted because of its appropriateness in explaining the primary research problem under investigation, which is what accounts for the persistently high interest rate spreads (IRS) in Ghana. This tackles the main objective of the study which thrives on investigation of key drivers influencing the IRS prevailing in the Ghanaian banking sector.

2.1 Principal-Agent Theory

The principal-agent theory (also called agency theory) was proposed by Barry Mitnick and Stephen Ross separately and almost simultaneously (Mitnick, 1975; Zogning, 2017). The theory has a broad range of applications such as in law (Banfield, 1975), accounting (Baiman, 1990), strategy (McNally, 2018), economics (Ross, 1973), political science (Mitnick, 1982), sociology (Shapiro, 2015), and finance (Jensen and Meckling, 1976). The preceding is a clear indication of the extensibility of the principal-agent theory, and so the application of the principal-agent theory to the subject matter at hand may not be far-fetched. Mitnick (1975, 1980, 1982), and Kwakye (2010) are examples of studies that have applied the principal-agent theory in their studies. Furthermore, the appropriateness of that theory to this study is demonstrated subsequently. The principal-agent theory deals with situations in which the principal is in the state to induce the agent to perform some task

in the interest of the principal – but not necessarily the agent's (Kim, 2023). The principal-agent theory was used in the study to conceptualize the role of banks as agents for depositors and lenders, and the depositors and lenders as the principal.

The principal-agent theory is built on two assumptions (Waterman and Meier, 1998). Assumption one: that goal conflict exists between principals and agents which implies principals and agents have differing interests. In the context of this study, the goal of the principals (depositors and borrowers) is to obtain the highest possible deposit rates on deposits made to the agent, the bank, and the lowest possible spread on loans borrowed from the bank; with the goal of the agent (the bank) being to maximize its profits by paying lowest possible deposit rates and charging the highest possible spreads on loans (Mensah and Abor, 2012). Assumption two: agents have more information than their principals, which results in information asymmetry between them. Again, per the study, the principals are not privy to the technicalities informing how spreads are charged on loans, but the agent (the bank) is. That situation creates an information asymmetry which the agent can exploit for its benefit. By the tenets of the principal-agent theory, the agent is expected to maximize the interest amount payable to depositors; however, in the scheme of things, financial institutions tend to charge high-interest rate spreads and pay pittance as deposit rates to the suppliers of the funds that the financial institution loaned out in the first place. To be certain, without depositors and borrowers a bank has no business. Agency loss is nil when the agent and the principal truly have shared interests. As the agent's behavior and conduct deviate from the interest of the principal, an increase in agency loss is inevitable (Mangala and Dhanda, 2022). An example of an agent's actions that deviate from the principal is when banks charge high-interest rate spreads on loans and pay tiny sums of money to depositors as deposit rates. Instances, when the agent, the bank in this context, actively carries out actions that are terrible for the principal, high agency loss ensues. As earlier alluded to, in the context of this study, agency losses for the principal are high IRS and tiny deposit rates.

2.2 Conceptual Framework

The concept behind this framework centers on factors influencing interest rate spread. Within a nation, interest rates could differ for various investment opportunities and for similar investment opportunities with varying maturity dates. These several interest rates in an economy are referred to as the structure of interest rates. The hypothesized chief factor being the Macroeconomic Variables, which are proxied by Gross Domestic Product (GDP), Inflation, Exchange Rate, Prime Rate and Treasury Bill Rate. They are then mediated by Bank-specific Factors, Industry Factors and Other Factors. Bank-specific factors include Credit Risk, Liquidity Risk, Return on Assets, Non-interest Income, Overhead Cost, Management Quality, Operating Cost. Industry-specific Factor being Reserve Requirement. Other factors affecting interest rate spread could be the ability of the borrower to pay back the loan as measured by customers' disposable income, reputation of the customer, the country's addressing system, speculation, digitization, a company's track record, debt position of the country, and the money supply system of the country. Therefore, the bank should check and evaluate the creditworthiness of individuals or businesses, using financial statements, credit reports, and other data to determine the risk associated with lending money. Also, international transaction, capital flow and interest rate affect domestic interest rate by influencing the supply of loanable funds. When international interest rates rise above domestic rates, capital outflows occur, causing domestic rates to rise. Conversely, higher domestic rates attract foreign capital, lowering domestic rates.

The conceptual framework for the study is depicted in Figure 1 below.

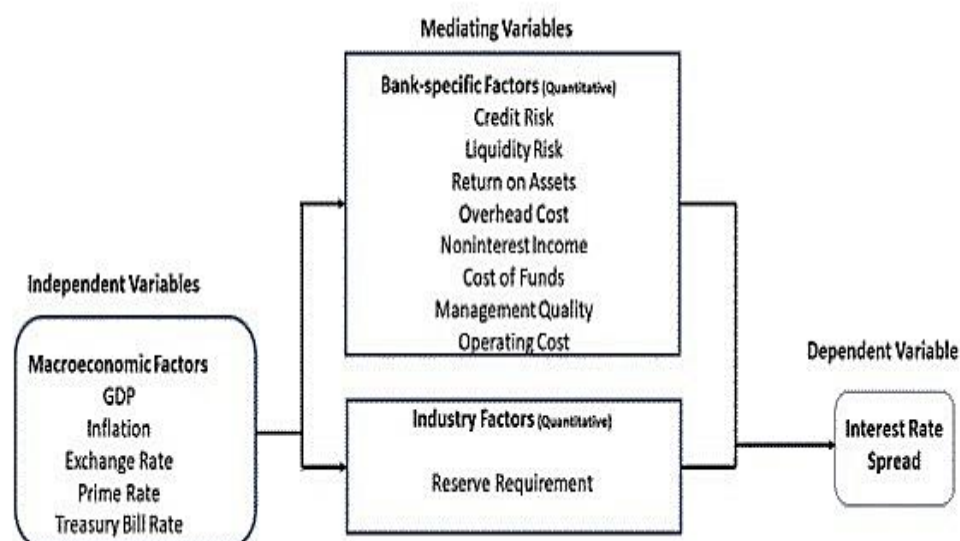


Figure 1: Conceptual Framework

3 Methodology

The study applied a quantitative research approach using secondary data. Annual financial reports from the selected Banks and economic data from Bank of Ghana and Ghana Statistical Service (GSS) served as the major secondary sources of data for this paper. The target population for the quantitative data collection comprised of all the twenty-three (23) universal Commercial Banks in Ghana licensed by the Bank of Ghana. fifteen banks were purposively sampled out of the 23 commercial banks in Ghana based on the criterion that together those fifteen banks control 90.47% of Ghana's financial market by share of industry deposits according to the 2022 Ghana Banking Survey (PricewaterhouseCoopers, 2022). These selected banks were then de-identified and labelled Bank A, Bank B, Bank C, Bank D, Bank E, Bank F, Bank G, Bank H, up to Bank O. The selected banks' financial annual reports from 2012 to 2022 including economic data from Bank of Ghana and Ghana Statistical Service within the same period were used.

3.1 Mode of computation of bank-specific factors

Data gathered from the selected banks' financial statements were used to compute the following bank specific factors: liquidity risk, return on assets, management quality, overhead cost, operating cost, credit risk, non-interest income, and cost of funds. The bank specific factors were computed as follows: Credit risk was computed as the ratio of non-performing loans to total loans or advances. Liquidity risk was determined as the ratio of liquid assets to deposits and short-term funding. Return on assets was calculated as the ratio of net profit to total assets. Overhead cost was obtained as the ratio of administrative expenses and employees' salaries to total assets. Non-interest income was computed as the ratio of non-interest income to total assets, while cost of funds was calculated as the ratio of interest on deposits to total deposits. The operating cost variable was measured as the ratio of operating cost to total net operating income. Management quality was proxied by the ratio of operating cost to revenue.

3.2 Interest rate spread measurement

This study considers various interest rates are not isolated figures; rather, they form a structured system (term structure of interest rates), or "yield curve," where different rates are closely related based on maturity, risk, and liquidity. This structure connects short-term policy rates set by central banks to long-term market rates, with all rates moving together to reflect economic conditions. As of early 2026, the structure of interest rates in Ghana is experiencing a significant downward trend, driven by rapid disinflation and a easing of monetary policy by the Bank of Ghana. There is a very strong, direct, and, in some cases, formulaic relationship among these rates, where the central bank's policy decision heavily influences commercial bank lending and savings rates (JoyBusiness, 2026).

In basic terms, interest rates at which borrowers receive loans are a product of both interest rates paid on bank deposits and the interest rate spread which constitutes a bank's profit on the loan advanced. The interest rate paid on bank deposit, also known as deposit rate, is the amount of money banks pay to depositors for

making use of their savings as loans. However, the interest rate spread is the interest rate gap between bank loan rate and the bank deposit rate. Generally, banks measure their interest rate as the difference between lending and deposit rates. Mathematically, interest rate spreads are expressed as follows:

$$\text{Interest rate spread} = \frac{\text{Interest earned on loans}}{\text{Average loans}} - \frac{\text{Interest paid on deposits}}{\text{Average deposits}} \quad (1)$$

Equation (1) is generally known as the narrow definition of interest rate spreads.

$$\text{Interest rate spread} = \frac{\text{Interest earned}}{\text{Average interest bearing assets}} - \frac{\text{Interest paid}}{\text{Average interest bearing liabilities}} \quad (2)$$

$$\text{Int. rate spread} = \frac{\text{Interest earned} + \text{commission earned}}{\text{Average interest bearing assets}} - \frac{\text{Interest paid}}{\text{Average interest bearing liabilities}} \quad (3)$$

$$\text{Int. rate spread} = \frac{\text{Interest earned} - \text{Interest paid}}{\text{Average assets}} \quad (4)$$

Equations (2) to (4) are considered broad definitions.

$$\text{Int. rate spread} = \text{Net Interest Margin} = \frac{\text{Net Interest Income}}{\text{Total assets}} \quad (5)$$

Equation (5) was adopted for this paper. This equation is rooted in accounting equating interest rate spread to net interest margins computed from the firm's income statement.

3.3 Structural equation modelling and justification for use

Structural equation modelling (SEM) was the inferential statistics used to analyze the quantitative secondary data. SEM is generally used in the social sciences, particularly in the investigation of causal influences (Novikova and Hall, 2013; Zhao et al., 2019) involving mediating variables. When compared with multivariate procedures such as multiple regressions, structural equation modelling is a much more effective alternative that takes into consideration the correlated independents, multiple latent independents, and measurement error (Byrne, 2001). It could be justified that SEM is most suitable for verifying whether a particular proposed theoretical or conceptual framework/model is valid or not; which aspects or paths are valid and which are not (Gopinath, 2014). According to Novikova and Hall (2013), in testing fully developed models, SEM is used as a theoretical or conceptual model, which can be examined for a fit of the observed data. It was observed that SEM is primarily confirmatory though containing exploratory elements, thereby increasing the likelihood that researchers will use SEM to ascertain the validity of a model.

Secondly, it is the considered view of the researchers that interest rate spread determination is not a simple process but the product of complex interactions involving a dynamic web of several cause-and-effect relationships between and among the various factors observed in the literature to influence interest rate spread determination. Considering that, SEM became the most appropriate analytical technique capable of simultaneously determining whether the several cause-and-effect relationships were valid or not. SEM makes it possible to translate complex interactions into a network of directional paths connecting variables which are then appraised against multivariate data (Zhang et al., 2023). Thirdly, SEM allows the categorical appraisal of measurement error, which is not the case for the traditional multivariate techniques. Lastly, the conceptual model proposed in Figure 1 to explain interest rate spread determination in Ghana is a causal model; that model necessitates the use of SEM since SEM is frequently associated with causal modelling. The test was conducted at a significant level of 5%, and the method used for the SEM was the maximum likelihood method. Based on the results of the SEM, the conceptual framework was evaluated and modified. The modified conceptual framework was then assessed using the statistical significance of coefficients, measures of fit, and interpretation. This study recognizes that capital flows, specifically into emerging market economies (EMEs) such as Ghana, are driven by a combination of "push" factors (external, global forces) and "pull" factors (internal, domestic forces). Push factors include low interest rates in developed economies, high global liquidity, and low risk aversion (VIX), while pull factors include high domestic growth, better institutional quality, and higher domestic interest rates (Kang et al. 2019).

4 Findings

4.1 Partial and Full Correlation

Partial correlation measures the correlation between a dependent variable, and an independent variable, while holding the other independent and mediating variables that have influence on the dependent variable, constant. The foregoing contrasts with full correlation in that in full correlation, the variations in independent variables, that is to say other independent and mediating variables are not held constant with respect to the dependent variable. The results of the partial and full correlations are presented in Tables 1.

Table 1: Comparison of Partial and Full Correlations between Macroeconomic factors and Interest Rate Spreads

Variable	Interest Rate Spreads			
	Partial Corr.		Full Corr.	
	R (part)	p-value	R (full)	p-value
Prime rate	0.8553	0.0201	0.1477	0.6647
Treasury bill rate	0.1980	0.6703	0.6286	0.0384
Exchange rate	0.5236	0.0490	0.1874	0.7548
Inflation	0.6598	0.0513	0.8227	0.0296
GDP	0.3166	0.4891	0.5305	0.0560

Table 1 shows a comparison of partial and full correlations between macroeconomic factors and interest rate spread. Most countries primarily decide interest rates administratively, typically through statutorily enforced ceilings or floors on lending and deposit rates. This paper investigated the key drivers of interest rate spreads in the Ghanaian banking sector, using data from 15 commercial banks. The study applied a quantitative research approach using secondary data. Annual financial reports from the selected banks and economic data from the Bank of Ghana and the Ghana Statistical Service (GSS) served as the primary and secondary sources for this paper.

Structural equation modelling (SEM) was used to perform the inferential statistic to analyze the quantitative secondary data. The results showed that operating costs had a significant influence on the interest rate spread, and this influence was positive and significant. Also, the study noted the prime rate exhibited significant influence on interest rate spreads. However, reserve requirements and industry factors did not influence interest rate spread determination. Overhead cost and operating cost were the bank-specific factors that significantly influenced the interest rate spread. This study posits that banks must collaborate with stakeholders and explore ways to control operating costs. In this way, interest rates can be lowered.

Used by banks which lend to customers with good credit. Congruently, exchange rate has a significant effect on interest rates (both partial and full correlations). The results indicate that full correlation between impact of Treasury bill rate, inflation and GDP on interest rate spreads is positive and statistically significant with p-values of 0.0384, 0.0296 and 0.0560 respectively. These macroeconomic determinants significantly influence the interest rate spreads in the banking sector.

Table 2: Comparison of Partial and Full Correlations between Mediating Variables and Interest Rate Spreads.

Variable	Interest Rate Spreads			
	Partial Corr.		Full Corr.	
	R (part)	p-value	R (full)	p-value
Reserve requirement	0.8389	0.0299	0.3023	0.7372
Credit risk	0.9260	0.0324	0.7193	0.0269
Liquidity risk	0.6391	0.0406	0.5515	0.0516
Return on assets	0.6726	0.0560	0.1067	0.7547
Overhead cost	-0.5356	0.6402	0.7325	0.0244
Non-interest income	0.1462	0.9066	0.5898	0.0561
Cost of funds	0.5750	0.0582	-0.4329	0.1835
Operating cost	0.6802	0.5238	0.7736	0.0052
Management quality	0.6936	0.0440	-0.4605	0.1540

Meanwhile, Table 2 compares partial and full correlations between mediating variables and interest rate spreads. The results revealed that credit risk and liquidity risk were statistically significant for both partial and full correlations with interest rate spreads. Overhead cost was found to be partially correlated and significant with interest rate spreads. Full correlation indicated a positive and significant relationship between reserve requirements and interest rate spreads. The fact that the full correlation between operating cost and interest rate spread is positive and highly significant ($R = 0.7736$; $p = 0.0052$) reveals that operating cost cannot be removed

from the model without significantly affecting the validity of the conceptual framework. The influence of variations in other exploratory factors on the fluctuations of the operating cost and other variables of research interest cannot be taken for granted.

4.2 Bank-Specific Factors Influencing Interest Rate Spread

Using the estimated coefficients obtained from the SEM analysis, many of the paths were found to be either statistically significant or highly statistically significant. That is because the coefficients of those paths in the structural model had p -values less than 0.05 and so were regarded as statistically significant and thus accepted.

Table 3: Decomposition of Influence of Bank-specific Factors on Interest rate spreads into Total Effects

Total Effects						
Structural Model	Observed Information Matrix (OIM)					
	Coef.	Std. Err.	Z	P>z	[95% Conf. Interval]	
int_RS						
credit_risk	5.6853	0.0068	0.3500	0.000*	-168.1266	116.7560
liq_risk	1.7946	2.1273	1.6200	0.1050	-3.0946	32.6838
roa	0.9400	0.7060	1.3300	0.1830	-0.4436	2.3237
overhead_c	4.5878	2.1809	2.1000	0.035*	-8.8622	-0.3133
non_interest	3.1332	7.9820	0.4900	0.6240	-129.3083	215.5747
mgt_qual	-0.1980	0.2977	-0.6700	0.5060	-0.7814	0.3855
cost_funds	8.2294	4.5855	0.1700	0.8680	-88.9565	105.4152
operatn_cst	0.4903	0.1593	3.0800	0.002*	0.1780	0.8026
credit_risk						
prime_rate	0.0009	0.0014	0.6400	0.5250	-0.0019	0.0037
tbill_rate	-0.0002	0.0009	-0.2500	0.8000	-0.0019	0.0015
exch_rate	0.0023	0.0035	0.6600	0.5100	-0.0045	0.0091
inflation	0.0006	0.0010	0.5400	0.5880	-0.0014	0.0025
gdp	-0.0019	0.0011	-1.6600	0.0960	-0.0041	0.0003
liq_risk						
prime_rate	0.0344	0.0085	4.0600	0.000*	0.0178	0.0510
tbill_rate	-0.0098	0.0051	-1.9100	0.0570	-0.0198	0.0003
exch_rate	-0.0421	0.0204	-2.0600	0.039*	-0.0822	-0.0021
inflation	-0.0291	0.0060	-4.8700	0.000*	-0.0408	-0.0174
gdp	-0.0106	0.0066	-1.5900	0.1110	-0.0236	0.0024
roa						
prime_rate	0.0271	0.0356	0.7600	0.4470	-0.0427	0.0969
tbill_rate	-0.0198	0.0216	-0.9200	0.3590	-0.0621	0.0225
exch_rate	0.0344	0.0859	0.4000	0.6890	-0.1339	0.2027
inflation	0.0035	0.0251	0.1400	0.8880	-0.0457	0.0528
gdp	0.0103	0.0279	0.3700	0.7120	-0.0444	0.0650
overhead_c						
prime_rate	0.0687	0.0311	2.2100	0.027*	0.0077	0.1297
tbill_rate	-0.0015	0.0188	-0.0800	0.9380	-0.0384	0.0355
exch_rate	-0.1881	0.0750	-2.5100	0.012*	-0.3352	-0.0410
inflation	-0.0694	0.0220	-3.1600	0.002*	-0.1124	-0.0263
gdp	-0.0180	0.0244	-0.7400	0.4610	-0.0658	0.0298
non_interest						
prime_rate	-0.0007	0.0005	-1.3500	0.1770	-0.0017	0.0003
tbill_rate	0.0014	0.0003	4.3800	0.000*	0.0008	0.0020
exch_rate	0.0002	0.0013	0.1600	0.8700	-0.0023	0.0027
inflation	-0.0004	0.0004	-1.0300	0.3030	-0.0011	0.0003
gdp	0.0004	0.0004	0.9500	0.3410	-0.0004	0.0012
mgt_qual						
prime_rate	-0.3004	0.0391	-7.6800	0.000*	-0.3771	-0.2237
tbill_rate	-0.0953	0.0237	-4.0200	0.000*	-0.1417	-0.0489
exch_rate	-0.1847	0.0943	-1.9600	0.0500	-0.3696	0.0001
inflation	0.4729	0.0276	17.1500	0.000*	0.4189	0.5270
gdp	-0.0317	0.0306	-1.0400	0.3010	-0.0918	0.0283

cost_funds						
prime_rate	-0.0035	0.0012	-2.9700	0.003*	-0.0058	-0.0012
tbill_rate	0.0004	0.0007	0.5300	0.5950	-0.0010	0.0018
exch_rate	0.0025	0.0028	0.8800	0.3790	-0.0030	0.0080
inflation	0.0036	0.0008	4.4000	0.000*	0.0020	0.0052
gdp	-0.0010	0.0009	-1.1400	0.2530	-0.0028	0.0007
operatn_cst						
prime_rate	1.0923	0.3358	3.2500	0.001*	0.4340	1.7505
tbill_rate	-0.1204	0.2033	-0.5900	0.5540	-0.5189	0.2781
exch_rate	-1.4327	0.8095	-1.7700	0.0770	-3.0192	0.1539
inflation	-0.3725	0.2368	-1.5700	0.1160	-0.8365	0.0916
gdp	0.1475	0.2630	0.5600	0.5750	-0.3681	0.6630

*Significance ($p < 0.05$).

From the table above, it can be observed that none of the bank-specific factors vis-à-vis credit risk (coeff = -25.68528; $p = 0.724$), return on asset (coeff = 0.9400408; $p = 0.183$), non-interest income (coeff = 43.13317; $p = 0.624$), management quality (coeff = -0.1979616; $p = 0.506$), and cost of funds (coeff = 8.229396; $p = 0.868$) had significant influence on the interest rate spread, with the exception of the overhead cost (coeff = -4.587775; $p = 0.035$) and operating cost (coeff = 0.4903; $p = 0.002$). Liquidity risk was significantly influenced by the prime rate (coeff = 0.0344244; $p = 0.000$), exchange rate (coeff = -0.0421435; $p = 0.039$) and inflation (coeff = -0.0291291; $p = 0.000$). Liquidity risk was significantly negatively influenced by the exchange rate and inflation, whereas it was significantly positively influenced by the prime rate. Overhead cost registered a significant influence on the interest rate spread and this influence was negative (coeff = -4.587775; $p = 0.035$). Overhead cost was significantly influenced by the prime rate (coeff = 0.0687082; $p = 0.027$), exchange rate (coeff = 0.0687082; $p = 0.027$) and inflation (coeff = -0.0693659; $p = 0.002$).

Overhead cost was significantly negatively influenced by the exchange rate and inflation, whereas it was significantly positively influenced by the prime rate. Non-interest income was significantly positively influenced by treasury bill rates (coeff = 0.001387; $p = 0.000$). Management quality was significantly influenced by the prime rate (coeff = -0.3003881; $p = 0.000$), treasury bill rate (coeff = -0.0952969; $p = 0.000$) and inflation (coeff = 0.4729495; $p = 0.000$). Management quality was significantly negatively influenced by treasury bill rate and prime rate, while being significantly positively influenced by inflation. The cost of funds was significantly influenced by the prime rate (coeff = -0.0034762; $p = 0.003$) and inflation (coeff = 0.0036257; $p = 0.000$). Cost of funds was significantly negatively influenced by prime rate, while cost of funds was significantly positively influenced by inflation. Operating cost had a positive and significant influence on the interest rate spread (coeff = 0.4903; $p = 0.002$). The operating cost was significantly influenced by the prime rate (coeff = 1.092264; $p = 0.001$) and the influence was positive.

Table 4: Summary Statistics on selected Macroeconomic factors, 2008 -2018

Descriptive stats	Prime rate (%)	T-bill rate (%)	Int. rate spread (%)	Exchange rate (GHS per USD)	Inflation rate (%)	GDP (%)
Mean	18.117	18.903	15.779	2.542	13.436	7.264
Standard Error	1.229	1.546	0.480	0.423	1.136	1.262
Median	17.667	18.678	15.478	1.995	13.700	7.900
Mode	#N/A	14.114	15.478	#N/A	#N/A	7.900
Standard Deviation	4.075	5.129	1.592	1.403	3.769	4.184
Sample Variance	16.604	26.303	2.533	1.968	14.205	17.507
Kurtosis	-0.391	-1.460	-0.142	-1.786	-1.454	2.914
Skewness	0.729	-0.173	0.036	0.352	0.142	1.300
Range	13.000	14.698	5.269	3.651	10.800	15.200
Minimum	12.917	10.684	12.949	0.950	8.500	2.200
Maximum	25.917	25.382	18.218	4.601	19.300	17.400
Sum	199.292	207.936	173.569	27.966	147.800	79.900
Count	11.000	11.000	11.000	11.000	11.000	11.000

The prime rate measures the rate set by the Central Bank of Ghana. The mean of the prime rate of the Bank of Ghana from 2008 to 2018 was 18.117% (Table 4), suggesting the prime rates of the Bank of Ghana fluctuated around this figure from 2008 to 2018 exhibiting a standard deviation of 4.075%. The median value for the prime rate was 17.667%. For the period, 2008 to 2018, the maximum and minimum prime rate was 25.917% and 12.917% respectively. The range of the prime rate for that period was 13%, an indication of the wild swinging nature of Ghana's prime rate and the consequent vulnerability of most businesses during that period. Skewness was 0.729, implying prime rate distribution for the period under investigation was positively skewed and kurtosis was observed to be -0.391. This refers to the rate of the 91-day treasury bill. The mean of the 91-day treasury bill rate was 18.903%, slightly higher than the prime rate of 18.119%, suggesting the behaviour of the 91-day treasury bill rate was similar to that of the prime rate. The median 91-day treasury bill rate was 18.678% and the mode was 14.114% (Table 13), indicating that the treasury bill rate occurred most frequently at a rate of 14.114% from 2008 to 2018.

The standard deviation for the 91-day treasury bill rate was 5.129%, again higher than that of the prime rate by a little above 1%. The range of the treasury bill rate was 14.698%, signaling the swinging nature of a tightening and loosening of liquidity within the banking sector between 2008 and 2018. The highest and lowest rate recorded for the 91-day treasury bill during the period under investigation was 25.382 % and 10.684 % respectively. A range of 14.698% was observed. The 91-day treasury bill exhibited a negatively skewed distribution as evinced by a skewness of -0.173. Kurtosis was found to be -1.460. This refers to the average exchange rate of the Ghana cedis per year. The mean exchange rate was determined to be 2.542 GHS per USD with a standard deviation of GHS1.403. The maximum exchange rate observed for the Ghanaian currency between 2008 and 2018 was GHS4.601 and the minimum was GHS 0.950. The skewness for the exchange rate was found to be 0.352; the positive value showed that the distribution of exchange rates in Ghana was positively skewed. The inflation rate measures the general changes in the prices of goods and services. The mean of the inflation rate from 2008 to 2018 was 13.436% (Table 13), suggesting inflation rates fluctuated around this figure from 2008 to 2018 exhibiting a standard deviation of 3.769. The median value for the inflation rate was 13.7% (Table 13). For the period, 2008 to 2018, the maximum and minimum inflation rate was 19.3% and 8.50% respectively. The range of the inflation rate for that period was 10.8 %, an indication of the wild swinging nature of Ghana's inflation rate and the resultant vulnerability of most businesses during that period. Skewness was 0.142, implying inflation rate distribution for the period under investigation was positively skewed and kurtosis was observed to be -0.391.

5 Discussion

The operating cost had a significant influence on the interest rate spread and this influence was positive and significant. This thus implies that increasing the operating cost of banks causes interest rate spreads of banks to significantly increase. This finding is confirmed by other studies. Nassar, Martinez and Pineda (2014) examined the determinants of Banks interest rate spread in Honduras from 1998 to 2013. The finding revealed that operating cost was the most important driver of banks' interest rate spread. It has been observed that operating costs accounted for 38% of interest rate spread of banks in Colombia before the liberalization of the financial sector while being responsible for 45% of the interest rate spread post-liberalization (Barajas et al., 1996). Meanwhile, in Latin America, Brock and Suarez (2000) observed that high operating costs raise spreads. According to Rani and Mago (2023), one of the principal sources of operating costs is the branch networks of banks. As such, it is reasonable that those banks with more branches may have higher operating costs which may translate to higher bank spreads. From the results, it was found that the industry factor represented by the reserve requirement (an industry factor) did not influence the interest rate spread. Furthermore, it was also observed that the exchange rate registered a significant positive influence on the reserve requirement, meaning that the exchange rate of the Ghana Cedi per USD significantly increases the reserve requirement. Conversely, the reserve requirement of banks in Ghana is significantly susceptible to exchange rate volatilities of the Ghana Cedis. None of the macroeconomic factors – treasury bill rate, exchange rate, inflation and GDP recorded any significant influence on the interest rate spread, apart from the prime rate. The finding that GDP had no influence on the interest rate spread converged with the finding by Batrancea et al., (2022) that spreads are not significantly sensitive to GDP.

6 Conclusions

The prime rate was found to exert a significant positive influence on operating costs, with the operating cost wielding a significant positive direct influence on interest rate spreads. The finding of the results of the structural equation modelling did show that the causal relationship between macroeconomic factors and interest rate spread was mediated primarily by the operating cost of banks. This finding shows that although banks have no control over macroeconomic factors, they do however have considerable control over their operating cost, a bank-specific factor. This thus implies that banks have some measure of power in mitigating the influence of macroeconomic factors on the IRS they charge customers, despite not being willing to admit this to be so. This power is primarily through effectively managing operating costs. The foregoing has implications for the use of the principal-Agent Theory underlying this study, where the bank is the 'Agent' and the customer the 'Principal'.

The bank as the 'Agent' has the responsibility of maximizing value for the principal (the customer) by ensuring that customers pay the most competitive IRS on the market. And the way they can do this, per the findings of the study, is by lowering operating costs. It is recommended banks should take the necessary internal measures to guard against external shocks from the macro environment as bank-specific factors tend to be most significantly affected by changes in the macroeconomic factors of the country. Since reserve requirement has no direct significant influence on interest rate spread determination, banks should endeavor not to be sidetracked by it when computing the interest rate spreads to charge on loans. As the operating cost of banks was found to be the singular most important direct driver of interest rate spreads in Ghana, it is strongly recommended that banks, in collaboration with stakeholders, explore ways by which the operating costs of banks can be mitigated. In this way, interest rates can be lowered.

7 References

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