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Determinants of Interest Rate Spreads - A Case of Vietnam

Pham Dang Tuan*, Vo Thi Quy

School of Economics, Finance, and Accounting, International University, Vietnam National University, Ho Chi Minh City, Vietnam

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Abstract:
Commercial banking system is a critical part of the financial sector in terms of mobilizing savings and providing loans to diverse sectors of the economy (Owusu-Antwi et al., 2017). Interest rate spread (IRS) is the difference between a country's lending and deposit rates at commercial banks (Kalsoom & Khurshid, 2016). This reflects the additional borrowing cost associated with intermediation efforts in connecting borrowers with ultimate fund lenders of commercial banks. The intermediation costs involved in deposit mobilization and channeling them into productive users are substantially higher in economies with underdeveloped banking sectors (Jayaraman & Sharma, 2003). IRS in Vietnam has been larger than that in other countries, and the large disparity of IRS persists among commercial banks. Motivated by the situation, we conducted the study to investigate the impact of bank characteristics and macroeconomic factors on IRS of 25 Vietnamese commercial banks listed in Vietnam stock markets from 2008 to 2020. The study also tests the impact of bank characteristics on IRS. We found that cost efficiency (CE) and liquidity risk (LIQ), nonperforming loans, and noninterest expenses impact positively and significantly, while bank size and asset structure (AS) impact negatively and significantly on IRS. The findings contribute insights into the effectiveness of the Vietnamese commercial banking system.

Keywords: interest rate spread, commercial banks, economic factors, bank characteristics.

利差的决定因素——以越南为例

摘要：
商业银行体系是金融部门在动员储蓄和向不同经济部门提供贷款方面的重要组成部分（奥乌苏-安特维等，2017）。利差(国税局)是一个国家商业银行贷款利率和存款利率之间的差异（卡尔苏姆和库希德，2016）。这反映了与商业银行将借款人与最终资金贷方联系起来的中介努力相关的额外借款成本。在

Corresponding Author: Pham Dang Tuan, School of Economics, Finance, and Accounting, International University, Vietnam National University, Ho Chi Minh City, Vietnam; email: tuanbidc@gmail.com

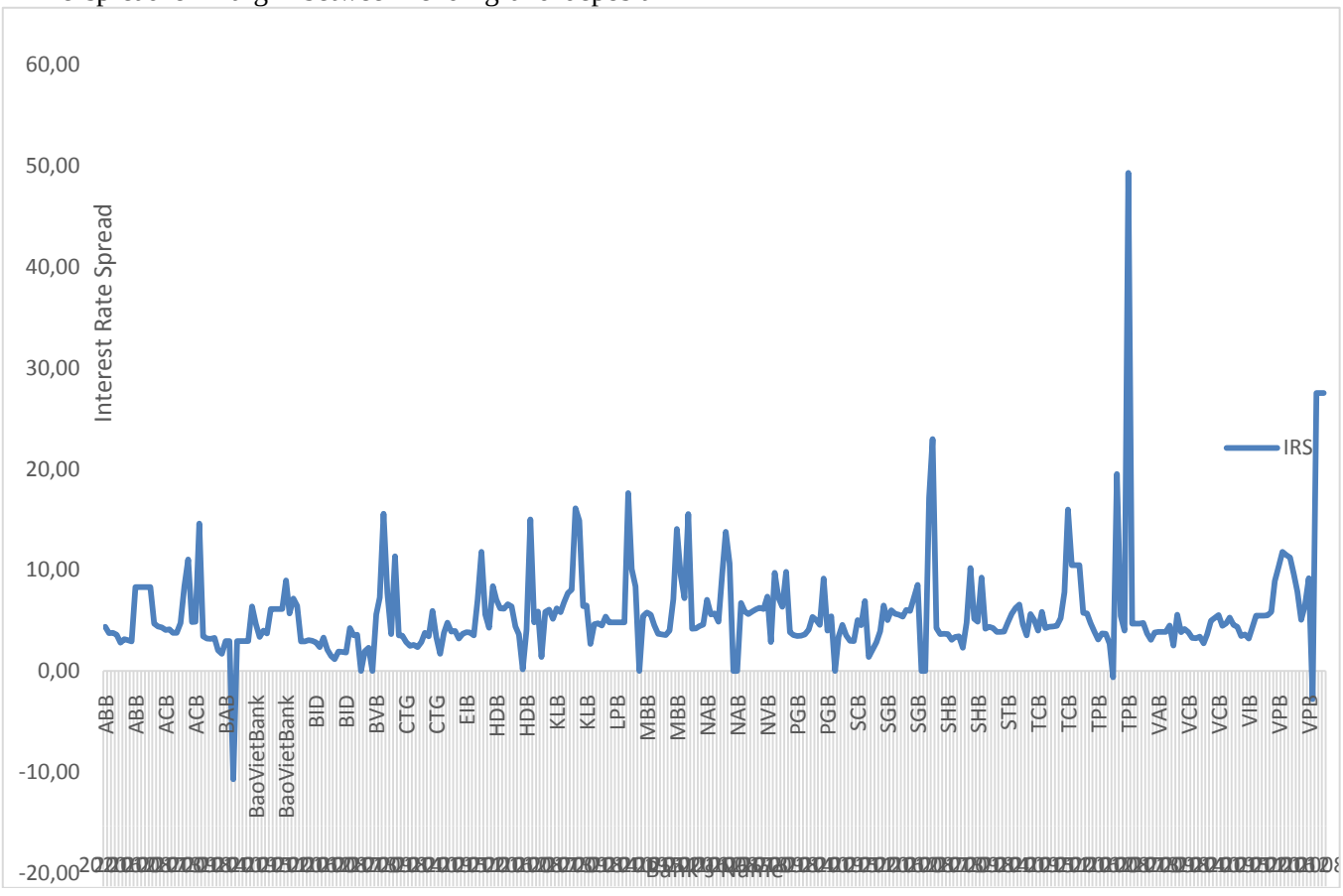
银行业不发达的经济体中，存款动员以及将存款引导至生产性用户所涉及的中介成本要高得多（贾亚拉曼和夏尔马，2003年）。越南的国税局规模一直高于其他国家，而且商业银行之间的国税局仍然存在巨大差异。受此形势的启发，我们进行了研究，调查了2008年至2020年在越南股票市场上市的25家越南商业银行的银行特征和宏观经济因素对国税局的影响。该研究还检验了银行特征对国税局的影响。我们发现，成本效率(CE)和流动性风险(生命质量指数)、不良贷款和非利息支出对国税局产生显着的积极影响，而银行规模和资产结构(作为)对国税局产生显着的负面影响。研究结果有助于深入了解越南商业银行体系的有效性.

关键词：利差、商业银行、经济因素、银行特征。

1. Introduction

Interest rate spread (IRS) is the difference between the lending rate and the deposit rate of a bank (Robinson, 2002). IRS may be impacted by the market microstructure of the banking sector and the policy environment. Ho and Saunders (1981) separated IRS into two types: pure and actual. The pure spread is affected by microstructure factors such as a bank's risk management, the number of credit transactions, interest rate elasticity, and interest rate fluctuation. The actual spread including the pure spread, in addition to the above factors, is also affected by macroeconomic factors such as monetary and fiscal policy actions. According to Ho and Saunders (1981), the research on IRS is one of the dealership models in which commercial banks are intermediaries who obtain deposits from the public and give loans to customers. Banks are uncertain about the behavior of depositors and borrowers in capital transactions; thus, they are exposed to inventory risk, and as a result, banks must seek a positive IRS to be compensated through IRS.

The spread or margin between lending and deposit interest rates is a key variable in the financial system. It reflects the additional cost of borrowing related to intermediation activities performed by banks in linking borrowers with the ultimate fund lenders. A high IRS may stem from a low depositing interest rate and/or a high lending interest rate, which reduces saving and borrowing transactions, resulting in the limitation of fund flows from savers to users in the economy. It reflects the efficiency of the financial sector as a competitive environment. The nature and efficiency of the financial markets have been found to be the major reasons causing differences in IRS among countries across the world. In economies with weak financial sectors, the intermediation costs involved in deposit mobilization and channeling them into productive uses are much larger (Jayaraman & Sharma, 2003). In a market-oriented economy with an underdeveloped financial system such as Vietnam, the role of intermediaries connecting lenders and borrowers of commercial banks is critical. The IRS is very different among Vietnamese commercial banks; the IRS of big banks is smaller than that of small ones (Figure 1).



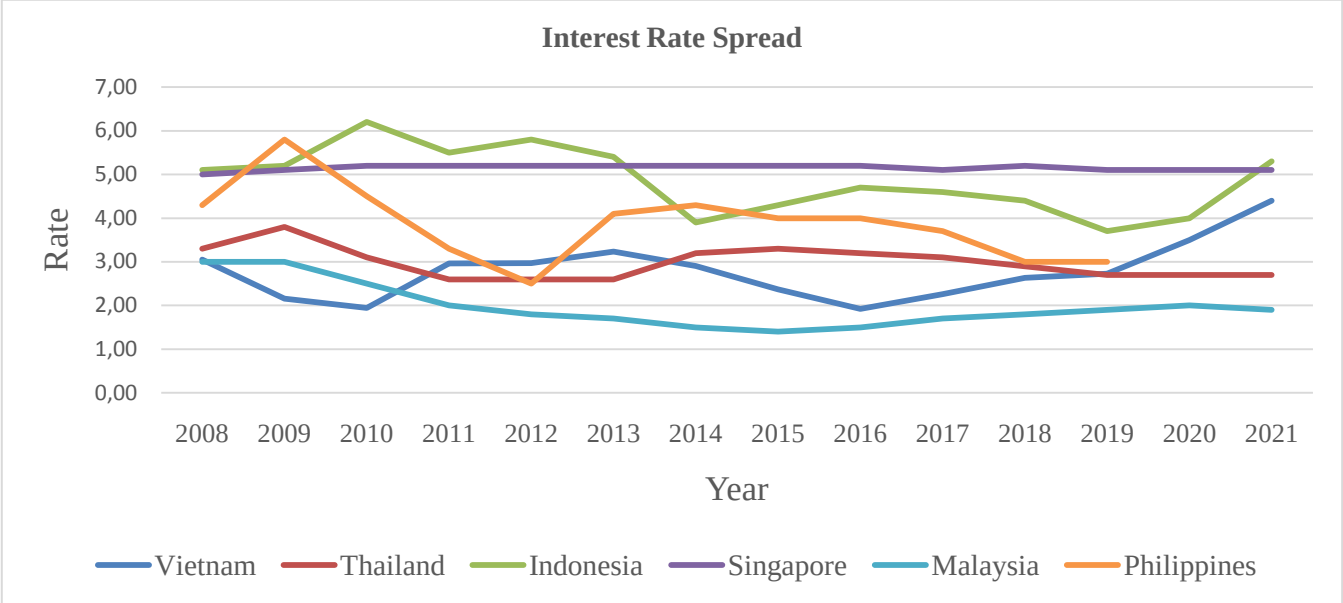


Figure 1. Interest rate spreads of Vietnamese commercial banks from 2008 to 2020

The statistics indicated that the average IRS of 25 Vietnamese commercial banks from 2008 to 2020 is about 5.593%. It is very high compared to that in ASEAN-5 countries (Table 1). IRS is one of the measures used to assess the efficiency of commercial banks and plays an important role in determining the direction and magnitude of economic growth, employment level, and general price stability (Ngugi & Kabubo, 1998). There have been many studies on the determinants of IRS in different economies. In Vietnam, however, most studies focused on the determinants of net interest margin and profitability of Vietnamese commercial banks (Nguyen et al., 2018; Pham & Tran, 2019). An obvious problem is that if commercial banks can reduce the IRS by increasing deposit rates and reducing lending rates and still achieve target profits, they will improve their competitive position in the banking sector. To be able to determine an appropriate IRS, bankers need to know what factors increase or decrease the IRS. There has not been a study in Vietnam to date that examines the factors affecting the IRS of commercial banks. Therefore, we conducted the study to investigate the impact of bank-specific and economic factors on IRS. The study may provide scientifically sound guidelines for bank managers in Vietnam and empirical evidence supporting related theories in emerging market countries such as Vietnam.

Table 1. Interest rate spreads in Vietnam and ASEAN-5 countries (The World Bank Group, 2023)

No.	Interest rate Spread/Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Vietnam	3.05	2.16	1.94	2.96	2.97	3.23	2.91	2.37	1.93	2.26	2.63	2.73	3.50	4.40
2	Thailand	3.30	3.80	3.10	2.60	2.60	2.60	3.20	3.30	3.20	3.10	2.90	2.70	2.70	2.70
3	Indonesia	5.10	5.20	6.20	5.50	5.80	5.40	3.90	4.30	4.70	4.60	4.40	3.70	4.00	5.30
4	Singapore	5.00	5.10	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.10	5.20	5.10	5.10	5.10
5	Malaysia	3.00	3.00	2.50	2.00	1.80	1.70	1.50	1.40	1.50	1.70	1.80	1.90	2.00	1.90
6	Philippines	4.30	5.80	4.50	3.30	2.50	4.10	4.30	4.00	4.00	3.70	3.00	3.00		

The study was conducted to investigate the determinants of Vietnamese banks' IRS based on the framework model proposed by Ho and Saunders (1981) and then developed by Fofack (2016) and Tarus and Manyala (2018). The remaining sections are literature review, data collection and analysis, research findings, and discussion and recommendation.

2. Literature Review

Interest rate spread is defined as the difference between the lending rate of a bank and the deposit rate of a bank (Robinson, 2002). There are two types of IRS: pure and actual (Ho & Saunders, 1981). The study investigates the actual IRS, which is the difference between average bank lending rates and average bank depositing rates or equal (interest gained from loans/total loans) minus (interest paid to deposits/total deposits). IRS may be impacted by both microstructure and macroeconomic factors such as bank specifics, interest rate fluctuation, and monetary supply. Were and Wambua (2014) investigated the determinants of IRS in Kenya's banking sector and found bank specifics explaining significant IRS. Bank size, credit risk, and operating costs positively impact IRS. Almarzoqi and Naceur (2015) examined the determinants of bank interest margins in the Caucasus and Central Asia (CCA), including Armenia, Azerbaijan, Georgia, Kazakhstan, Tajikistan, and Uzbekistan, from 1998 to 2013. The study used the dealership model developed by Ho and Saunders (1981) to assess the extent to which IRS in the CCA relates to bank-specific variables and macroeconomic factors. The study found that IRS is affected by operating costs. Tarus and Manyala (2018) conducted a study on the same issue in Sub-Saharan African countries and found that operating costs and bank concentration have a positive and significant effect on IRS.

Bank size (BS) is expressed by the bank's total asset value. The fact that big banks are better placed than small banks in harnessing economies of scale in transactions to enjoy a higher level of profits. It is expected that big banks are associated with low IRS because of economies of scale and the ability to invest in technology that would enhance efficiency. Were and Wambua (2014) found a positive relationship between BS and IRS; however, Tarus and Manyala (2018) investigated the determinants of IRS in 20 Sub-Saharan African countries for ten years (2003–2012) and found that BS has a significant negative impact on the IRS.

Liquidity risk is the risk of incurring losses resulting from the inability to meet payment obligations in a timely manner when they become due or from being unable to do so at a sustainable cost. It is computed as total liquid assets/total assets. The unit of LIQ is expressed in %. High liquidity risk ratios result in the loss of opportunity costs and lower interest income from these liquid assets. Al Shubiri and Jamil (2017) studied the factors determining IRS of commercial banks for the period 2008-2014 in Oman and found that the liquidity risk ratio has a significant negative impact on the IRS.

A loan is considered a non-performing loan (NPL) or a non-performing asset because the borrower is unlikely to repay the loan as a debt obligation. The asset is no longer generating income for the bank. Hussain et al. (2019) studied the impact of NPL on IRS of ten Pakistani commercial banks from 2010 to 2017 and found that NPL has a positive influence on IRS.

The ownership structure of commercial banks should be considered in studies on the determinants of IRS because different shareholders have disparate interests, and they would have different impacts on bank behaviors to gain their desirable benefits. Jensen and Meckling (1976) stated that ownership structure influences operating behaviors because it defines residual claims and the owners' motivations. Ownership types in the banking industry are classified in several ways. In this study, we classified Vietnamese commercial banks into two groups: state- and non-state–owned. For "social" view, state-owned banks can help to overcome market failures, take advantage of externalities, and promote socially desirable welfare-enhancing investments (Atkinson & Stiglitz, 1980). For "agency" view, however, the agency costs associated with a government bureaucracy (e.g., the conflict of interests between the government and the bureaucrats designated to manage stated-owned banks) can give rise to operational inefficiencies and capital misallocation (Banerjee, 1997; Hart et al., 1997).

Fumey and Doku (2016) used data collected from annual bank balance sheets and revenue statements to investigate determinants of IRS in Ghana's post-regulatory banking system from 2000 to 2014 and found that operating costs, bad debt, and liquidity reserve requirements are major elements driving Ghana's high interest rate spread.

Money supply is the total amount of money in circulation, including money kept by people, money in the banking system, and nonbanking agencies and businesses. Money supply proxied by M2 is a broader classification of money supply and is an important factor in forecasting economic issues such as inflation. The Central Bank uses the M2 money supply as a tool to conduct desirable monetary policy and adjust market interest rates. Fumey and Doku (2016) studied the determinants of IRS in Ghana's post-regulatory banking system from 2000 to 2014 and found that prime rate and liquidity reserve requirements are major predictors of greater spreads; inflation and treasury bill rates were found to have a significant influence on broad spreads from a macroeconomic perspective. Aigbovo and Osifo (2015) confirmed that bidirectional causality exists between financial development (M2/GDP) and IRS. Nampewo (2012) investigated the causes of the continuously large IRS in Uganda's banking sector from 1995 to 2010 and found a negative relationship between the M2/GDP ratio and IRS. Akinlo and Owoyemi (2012) investigated the factors influencing IRS of 12 commercial banks in Nigeria from 1986 to 2007. This concludes that the factors influencing IRS are cash reserve requirements and relationships between average loans and average total deposits and between compensation and total assets. However, the research discovered that the ratio of non-interest income to average total assets, treasury certificates, and development stock show a negative correlation with the interest rate spread.

Based on the above empirical evidence, we developed the following hypotheses:

H1: There is a positive relationship between cost efficiency and interest rate spreads.

H2: There is a negative relationship between the capital adequacy ratio and interest rate spreads.

H3: There is a relationship between bank size and interest rate spreads.

H4: There is a negative relationship between state ownership and interest rate spreads.

H5: There is a positive relationship between non-performing loans and interest rate spreads.

H6: There is a negative relationship between the provision of bad and doubtful debts and interest rate spreads.

H7: There is a negative relationship between asset structure and interest rate spreads.

H8: There is a positive relationship between liquidity risk and interest rate spreads.

H9: There is a positive relationship between non-interest expense and interest rate spreads.

H10: There is a negative relationship between money supply (M2) and interest rate spreads.

H11: There is a relationship between economic conditions and interest rate spreads.

3. Model Specification and Variable Calculations

To test the research hypotheses above, the panel regression analysis model was used. To gain effective regression coefficients, the weaknesses of panel data were diagnosed and fixed with the appropriate econometric model. The specific model used in this research is shown as follows:

$$IRS_{it} = \alpha_0 + \beta_1 CE_{it} + \beta_2 CAR_{it} + \beta_3 BS_{it} + \beta_4 OWS_{it} + \beta_5 NPL_{it} + \beta_6 PL_{it} + \beta_7 AS_{it} + \beta_8 LIQ_{it} + \beta_9 NIE_{it} + \beta_{10} M2_{it} + \beta_{11} EC_{it} + \varepsilon_{it}$$

where the subscript *i* denotes bank, while *t* denotes year; α, β, ε are the intercept, the regression coefficient, and the error term, respectively. The variable calculation is presented in Table 2.

Table 2. Variable definitions (Synthesized by the authors)

No.	Variables	Symbol	Calculation	Expected sign
Dependent variable				
1	Interest Rate Spread	IRS	Interest gained from loans/total loans minus interest paid to deposits/total deposits	
Independent variable				
2	Cost Efficiency	CE	Total net operating income/operating expenses	+
3	Capital Adequacy Ratio	CAR	Equity/risk-weighted asset	-
4	Bank Size	BS	Log of a bank's total assets	+/-
5	Liquidity Risk	LIQ	Deposits/liabilities	+
6	Non-Performing Loan	NPL	Total NPL amount/total loans, past due receivables, overdue, and doubtful to total loans	+
7	Provision of Bad and Doubtful Debts	PL	Total loan loss provision/total loans	-
8	Asset Structure	AS	Loans/total assets	-
9	Non-Interest Expense	NIE	Non-interest expense/asset	+
10	Ownership Structure	OWS	1: State owned banks 0: Private-owned banks	-
11	Money Supply	M2	M2/year	-
12	Economic Conditions	EC	1: from 2008 to 2014, crisis period. 0: from 2015 to 2020, recovery period	+/-

4. Data Collection and Analysis

The data were collected and synthesized from the websites of 25 commercial banks listed in Appendix 1, the website of State Bank of Vietnam (SBV), General Statistics Office (GSO), and Vietstock.vn. The research sample included the big four commercial banks (Vietcmobank, BIDV, Vietinbank, and Agribank) and 21 established private commercial banks in Vietnam. The market share of these 25 banks is greater than 70% of the commercial banking system in Vietnam; therefore, the ability to generalize research results is high.

4.1. Statistical Description

Table 3 presents the descriptive statistics for all variables in the research model with bank-specific data collected from 25 Vietnamese commercial banks for 13 years from 2008 to 2020. The statistics indicate that the average IRS of 25 Vietnamese commercial banks is about 5.593 percent with a standard deviation of 3.778 percent. Its volatility is larger than that of commercial banks in ASEAN-5 countries for the same period (Table 1).

Table 3. The statistical descriptive variables (Calculated by the authors)

No.	Variables	Mean	Min	Max	Std. Dev.
1	Interest rate spread (IRS)	5.593	-2.779	27.518	3.778
2	Cost Efficiency (CE)	0.553	-1.061	2.939	0.439
3	Capital Adequacy Ratio (CAR)	14.774	2.000	286.00	16.604
4	Bank Size (BS)	32.081	28.514	34.955	1.318
5	Non-Performing Loan (NPL)	3.828	0	300.642	20.631
6	Provision of Bad and Doubtful Debts (PL)	0.012	0	0.039	0.005
7	Asset Structure (AS)	0.575	0.114	0.830	0.122
8	Liquidity Risk (LIQ)	0.190	0.015	0.994	0.118
9	Non-Interest Expense (NIE)	0.009	-0.002	1.002	0.056
10	Log Money Supply (M2)	15.689	15.210	16.060	0.262
11	Economic Conditions (EC)	0.581	0	1	0.494
12	Ownership Structure (OWS)	0.12	0	1	0.325

5. Results

5.1. Correlation Analysis

The correlation analysis shows that the independent variables are correlated with the dependent variable at 1% significance level except for CAR and EC variables. Almost all independent variables have a negative relationship with IRS, except for the CE and CAR (Table 4). There is no correlation coefficient higher than 0.7.

Table 4. Correlation matrix (Calculated by the authors)

	IRS	CE	CAR	BS	NPL	PL	AS
IRS	1.0000						
CE	0.2733***						
CAR	0.0446	0.0524	1.0000				
BS	-0.2600***	0.0043	-0.3557***	1.0000			
NPL	-0.0650***	-0.10475***	-0.0329	-0.0880	1.0000		
PL	-0.1326**	-0.0110	-0.1337**	0.3481***	-0.0383	1.0000	
AS	-0.3520***	-0.1945***	-0.2437***	0.3654***	0.0554	0.1124**	1.0000
LIQ	0.3455***	0.3669***	0.4665***	-0.4552***	-0.0566	-0.1963***	-0.6278***
NIE	-0.0013	-0.0276	-0.0157	0.0435	-0.0069	0.0606	0.0260
LogM2	-0.3090***	-0.3441***	-0.2106***	0.5064***	-0.1403**	0.0294	0.3970***
OWS	-0.2306***	0.0834	-0.1044*	0.5567***	-0.0375	0.3832***	0.3340***
EC	-0.0117	0.0425	0.0222	-0.0026	-0.0740	-0.0248	0.0102

To test multicollinearity in the dataset, a VIF test was carried out and the results are shown in Table 5. It can be concluded that the multicollinearity does not exist due to VIF values lower than 10 (Hair et al., 2010).

Table 5. VIF test (Results from Stata)

No.	Variables	VIF	1/VIF
1	BS	3.01	0.332472
2	LIQ	2.77	0.361063
3	LogM2	2.23	0.447612
4	OWS	2.23	0.448089
5	AS	2.09	0.478396
6	CE	1.38	0.723733
7	CAR	1.36	0.734351
8	PL	1.27	0.789991
9	NPL	1.07	0.937708
10	NIE	1.05	0.952969
11	EC	1.02	0.983265
Mean VIF		1.77	

5.2. Hypothesis Test

To gain effective regression coefficients in testing research hypotheses with panel data, a good fit econometric model should be identified. The first step was running regression with Pooled OLS; in the second step, Wooldridge's and White's tests were applied to figure out autocorrelation and heteroskedasticity issues; in the third step, the Hausman test was conducted for FEM or REM specification. The heteroskedasticity and autocorrelation issues in the two models can make the research models' findings suspect and unreliable. Finally, general least squares (GLS) were used to solve these issues (Wooldridge, 2002). Table 6 shows the regression results.

Table 6. OLS, FEM, REM, and FGLS results (Stata)

Variables	Pooled OLS	FEM	REM	FGLS
CE	1.297***	0.600	0.765	0.696**
	[2.60]	[1.20]	[1.57]	[1.97]
CAR	-0.0292**	-0.0269**	-0.0310**	-0.0227
	[-2.23]	[-2.09]	[-2.54]	[-1.63]
BS	0.0479	1.156*	0.456	0.251
	[0.20]	[1.86]	[1.15]	[1.19]
NPL	-0.0148	-0.00761	-0.00792	-0.00468
	[-1.58]	[-0.84]	[-0.90]	[-1.28]
PL	-21.66	-28.71	-21.10	-33.62
	[-0.52]	[-0.64]	[-0.49]	[-1.63]
AS	-3.236	-6.576***	-5.774**	-8.586***
	[-1.46]	[-2.75]	[-2.52]	[-5.21]
LIQ	5.635**	7.303***	7.122***	7.145***
	[2.14]	[2.79]	[2.80]	[4.28]
NIE	1.579	0.993	1.021	1.899*
	[0.46]	[0.32]	[0.33]	[1.77]
LogM2	-2.501**	-4.632**	-3.007**	-0.944
	[-2.36]	[-2.57]	[-2.32]	[-1.34]
OWS	-2.400***	.	-2.866*	-1.317**
	[-2.81]	.	[-1.89]	[-2.26]
ECD	-0.270	-0.251	-0.253	0.136
	[-0.71]	[-0.75]	[-0.76]	[0.64]
_cons	44.55***	44.16***	40.92***	15.84*
	[3.20]	[3.16]	[3.11]	[1.91]
Number of obs	325	325	325	325
Number of groups	25	25	25	25
Prob > F/Prob > chi2	0.0000	0.0000	0.0000	0.0000
R-sq	0.239	0.260	0.2556	
White's test	0.0010			
Wooldridge's test	0.0002		0.0002	

Continuation of Table 6

Hausman's test	0.1919
The Breusch and Pagan Lagrangian test	0.0000

Note: t statistics in brackets * p < 0.1, ** p < 0.05, *** p < 0.01

Cost efficiency (CE) positively impacts IRS at the significance level of 5%, or Hypothesis 1 is accepted. Capital adequacy ratio (CAR) impacts the IRS negatively but insignificantly, or Hypothesis 2 is not accepted. Bank size (BS), nonperforming loans (NPL), and the provision of bad and doubtful debts (PL) negatively but insignificantly impact the IRS. In other words, Hypotheses 3, 5, and 6 are not accepted. The asset structure (AS) negatively impacts the IRS at the significance level of 1 percent, or Hypothesis 7 is accepted. These findings are consistent with those by Fofack (2016), Agapova and McNulty (2016). Liquidity risk (LIQ) positively impacts the IRS at the significance level of 1 percent, or Hypothesis 8 is accepted. Non-interest expense (NIE) has a positive impact on the IRS at the significance level of 10 percent, or Hypothesis 9 is accepted. Ownership structure (OWS) has a negative impact on the IRS at the significance level of 5 percent, or Hypothesis 4 is accepted. Money supply (M2) and economic conditions (EC) have no significant impact on the IRS, or Hypotheses 10 and 11 are not accepted. These findings are consistent with those by Fumey and Doku (2016), Anjom (2021).

6. Discussion

The primary goal of any commercial bank is to improve bank efficiency, which is driven by the optimal use of its assets and liabilities, which have a close relationship with its interest rate spreads. This study provided empirical results showing that bank-specific factors play a significant role in explaining the change in interest rate spreads of Vietnamese commercial banks in the period from 2008 to 2020. The study confirmed that cost efficiency (CE), asset structure (AS), liquidity risk (LIQ), and ownership (OWS) are important drivers of interest rate spreads in Vietnam.

CE is calculated by dividing total net operating income by operating expenses. An increase in net operating income or decrease in operating expenses will improve CE. The higher increase in net operating income compared to the increase in operating expenses also drives the increase in CE. Commercial banks' operating income and expenses have a close relationship with borrowing and lending rates offered by them. A positive relationship between CE and IRS implies that interest-bearing income accounts for a large proportion of operating income of selected banks. This assertion is confirmed by the negative relationship between AS and IRS and the positive relationship between LIQ and IRS found in this study. Our findings demonstrated the inefficiency of Vietnamese financial markets. The research findings also confirmed that the four big banks have lower IRS than the other banks. In sum, our research findings contributed empirical evidence to confirm the role of IRS as an indicator measuring the efficiency of financial markets from the theoretical perspective.

Commercial banks may benefit from high IRS. To gain higher IRS, a bank may offer high lending rates to cover its interest expenses, non-interest expenses, and compensate for its liquidity risk. High IRS may improve a bank's interest income; however, it reflects inefficiency in its operation. Low IRS may benefit borrowers and depositors. In countries with a weak financial system, IRS is usually high because businesses rely on borrowing from banks to finance their business operations. Lowering IRS by offering lower lending rates and reducing non-interest expenses will benefit borrowers and support economic growth.

7. Limitations and Future Studies

Although this study provided empirical evidence on the influence of banking characteristics on the IRS, the research sample excluded unlisted commercial banks, and income diversity was not considered in a relationship with IRS. Therefore, further research should modify the research model with the role of income diversity of commercial banks and diversify the research sample.

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Appendix 1. List of banks used in this study

No.	Bank Name	Abbreviation
1	An Binh Commercial Joint Stock Bank	ABB
2	Asia Commercial Joint Stock Bank	ACB
3	BAC A Commercial Joint Stock Bank	BAB
4	Bao Viet Joint Stock Commercial Bank	BaoVietBank
5	Joint Stock Commercial Bank for Investment and Development of Vietnam	BIDV
6	Bao Viet Joint Stock Commercial Bank	BVB
7	Vietnam Joint Stock Commercial Bank of Industry and Trade	CTG
8	Vietnam Export Import Commercial Joint Stock	EIB
9	Ho Chi Minh City Development Joint Stock Commercial Bank	HDB
10	Kien Long Commercial Joint Stock Bank	KLB
11	LienViet Commercial Joint Stock Bank	LPB
12	Military Commercial Joint Stock Bank	MBB

Continuation of Appendix 1		
13	Nam A Commercial Joint Stock Bank	NAB
14	National Citizen Bank	NVB
15	Petrolimex Group Commercial Joint Stock Bank	PGB
16	Sai Gon Commercial Joint Stock Bank	SCB
17	Saigon Bank for Industry & Trade	SGB
18	Saigon-Hanoi Commercial Joint Stock Bank	SHB
19	Saigon Thuong Tin Commercial Joint Stock Bank	STB
20	Vietnam Technological and Commercial Joint Stock Bank	TCB
21	TienPhong Commercial Joint Stock Bank	TPB
22	Viet A Commercial Joint Stock Bank	VAB
23	Joint Stock Commercial Bank for Foreign Trade of Vietnam	VCB
24	Vietnam International Commercial Joint Stock Bank	VIB
25	Vietnam Commercial Joint Stock Bank for Private Enterprise	VPB

References

[1] AGAPOVA, A., & MCNULTY, J.E. (2016). Interest rate spreads and banking system efficiency: General considerations with an application to the transition economies of Central and Eastern Europe. *International Review of Financial Analysis,* 47, 154–165. https://doi.org/10.1016/j.irfa.2016.07.004

[2] AIGBOVO, O., & OSIFO, O. (2015). The determinants of interest rate spreads in Nigerian banking sector: evidence from macroeconomic factors. *Redeemer's University Journal of Management and Social Sciences,* 3(1), 24-38. Retrieved from https://www.researchgate.net/publication/322924254_THE_DETERMINANTS_OF_INTEREST_RATE_SPREADS_IN_NIGERIAN_BANKING_SECTOR_EVIDENCE_FROM_MACROECONOMIC_FACTORS

[3] AKINLO, A.E., & OWOYEMI, B.O. (2012). The determinants of interest rate spreads in Nigeria: An empirical investigation. *Modern Economy,* 3(7), 837-845. https://doi.org/10.4236/me.2012.37107

[4] ALMARZOQI, R., & NACEUR, S.B. (2015). *Determinants of Bank Interest Margins in the Caucasus and Central Asia*. International Monetary Fund. https://doi.org/10.5089/9781484342817.001

[5] AL SHUBIRI, F.N., & JAMIL, S.A. (2017). Assessing the determinants of interest rate spread of commercial banks in Oman: An empirical investigation. *European Research Studies Journal*, 20(2), 90–108. https://doi.org/10.35808/ersj/630

[6] ANJOM, W. (2021). An Empirical Study on the Factors Affecting the Interest Rate Spread of Listed Conventional Commercial Banks of Bangladesh. *European Journal of Business and Management Research*, 6(5), 192–199. https://doi.org/10.24018/ejbmr.2021.6.5.1086

[7] ATKINSON, A.B., & STIGLITZ, J.E. (1980). *Lectures on Public Economics*. London: McGraw Hill.

[8] BANERJEE, A. (1997). A theory of misgovernance. *Quarterly Journal of Economics*, 112(4), 1289–1332. https://doi.org/10.1162/003355300555484

[9] FOFACK, A.D. (2016). The Determinants of Interest Rate Spread: Empirical Evidence from the Central African Economic and Monetary Community. *Journal of Economics and International Finance*, 8(6), 66–78. https://doi.org/10.5897/JEIF2016.0759

[10] FUMEY, A., & DOKU, I. (2016). Interest Rate Spread in Ghana's Banking Sector: 2000-2014. *Annals of Management Sciences*, 5(1), 37-54. https://doi.org/10.24048/ams5.no1/2016/37-54

[11] HAIR, J.F., BLACK, W.C., BABIN, B.J., ANDERSON, R.E., & TATHAM, R.L. (2010). *Multivariate Data Analysis.* 7th ed. New York: Pearson.

[12] HART, O., SHLEIFER, A., & VISHNY, R.W. (1997). The Proper Scope of Government: Theory and an Application to Prisons. *The Quarterly Journal of Economics*, 112, 1127-1161. https://doi.org/10.1162/003355300555448

[13] HO, T.S.Y., & SAUNDERS, A. (1981). The Determinants of Bank Interest Margins: Theory and Empirical Evidence. *The Journal of Financial and Quantitative Analysis*, 16(4), 581–600. https://doi.org/10.2307/2330377

[14] HUSSAIN, A., REHMAN, A., & REHMAN, S.U. (2019). Determinants of the Interest Rate Spread in Commercial Banks of Pakistan. *NUML International Journal of Business & Management*, 14(2), 30–42. Retrieved from https://nijbm.numl.edu.pk/index.php/BM/issue/view/38/Determinants%20of%20the%20Interest%20Rate%20Spread%20in%20Commercial%20Banks%20of%20Pakistan

[15] JAYARAMAN, T.K., & SHARMA, R. (2003). Determinants of Interest Rate Spread in the Latin America. *Journal of Development Economics*, 71(2), 291-299.

[16] JENSEN, M.C., & MECKLING, W.H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Capital Structure. *Journal of Financial Economics*, 3(4), 305-360. https://doi.org/10.1016/0304-405X(76)90026-X

[17] KALSOOM, A., & KHURSHID, M.K. (2016). A Review of Impact of Interest Rate Spread on Profitability. *Research Journal of Finance and Accounting*, 7(11), 23-26. Retrieved from https://www.iiste.org/Journals/index.php/RJFA/articl

e/view/31497
[18] NAMPEWO, D. (2012). What Drives Interest Rate Spreads in Uganda's Banking Sector? *International Journal of Economics and Finance,* 5(1), 76–85. https://doi.org/10.5539/ijef.v5n1p76
[19] NGUGI, R.W., & KABUBO, J.W. (1998). *Financial sector reforms and interest rate liberalization: the Kenya experience.* Nairobi: African Economic Research Consortium. Retrieved from https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/2232/RP%2072.pdf?sequence=1&isAllowed=y
[20] NGUYEN, T., TRIPLE, D., & NGO, T. (2018). Operational Efficiency of Bank Loans and Deposits: A Case Study of Vietnamese Banking System. *International Journal of Financial Studies,* 6(1), 14. https://doi.org/10.3390/ijfs6010014
[21] OWUSU-ANTWI, G., BANERJEE, R., & ANTWI, J. (2017). Interest Rate Spread on Bank Profitability: The Case of Ghanaian Banks. *Journal of Accounting, Business and Finance Research,* 1(1), 34-45. http://dx.doi.org/10.20448/2002.11.34.45
[22] PHAM, H., & TRAN, H. (2019). Board and corporate social responsibility disclosure of multinational corporations. *Multinational Business Review*, 27(1), 77-98. https://doi.org/10.1108/MBR-11-2017-0084
[23] ROBINSON, J.W. (2002). *Commercial Bank Interest Rate Spreads in Jamaica: Measurement, Trends and Prospects.* Retrieved from https://boj.org.jm/uploads/pdf/papers_pamphlets/papers_pamphlets_commercial_bank_interest_rate_spreads_in_jamaica.pdf
[24] TARUS, D.K., & MANYALA, P.O. (2018). What determines bank interest rate spread? Evidence from Sub-Saharan Africa. *African Journal of Economic and Management Studies,* 9(3), 335–348. https://doi.org/10.1108/AJEMS-05-2017-0094
[25] THE WORLD BANK GROUP. (2023). Retrieved from https://www.worldbank.org/en/home
[26] WERE, M., & WAMBUA, J. (2014). What factors drive interest rate spread of commercial banks? Empirical evidence from Kenya. *Review of Development Finance,* 4(2), 73–82. https://doi.org/10.1016/j.rdf.2014.05.005
[27] WOOLDRIDGE, J.M. (2002). *Econometric Analysis of Cross Section and Panel Data.* Cambridge: The MIT Press.

参考文：

[1] AGAPOVA, A., & MCNULTY, J.E. (2016)。利率利差和银行体系效率：适用于中欧和东欧转型经济体的一般考虑因素。国际金融分析评论，47，154-165。https://doi.org/10.1016/j.irfa.2016.07.004
[2] AIGBOVO, O. 和 OSIFO, O. (2015)。尼日利亚银行业利差的决定因素：来自宏观经济因素的证据。《救世主大学管理与社会科学杂志》， 3(1), 24-38。摘自https://www.researchgate.net/publication/322924254_THE_DETERMINANTS_OF_INTEREST_RATE_SPREADS_IN_NIGERIAN_BANKING_SECTOR_EVIDENCE_FROM_MACROECONOMIC_FACTORS
[3] AKINLO, A.E. 和 OWOYEMI, B.O.（2012）。尼日利亚利差的决定因素：实证调查。现代经济， 3(7), 837-845。https://doi.org/10.4236/me.2012.37107
[4] ALMARZOQI, R., & NACEUR, S.B.（2015）。高加索和中亚银行利差的决定因素。国际货币基金组织。https://doi.org/10.5089/9781484342817.001
[5] AL SHUBIRI, F.N. 和 JAMIL, S.A. (2017)。评估阿曼商业银行利差的决定因素：实证调查。欧洲研究杂志， 20(2), 90–108。https://doi.org/10.35808/ersj/630
[6]ANJOM, W.（2021）。孟加拉国上市传统商业银行利差影响因素实证研究。欧洲商业与管理研究杂志， 6(5), 192–199。https://doi.org/10.24018/ejbmr.2021.6.5.1086
[7] A.B. 阿特金森和 J.E. 斯蒂格利茨 (1980)。公共经济学讲座。伦敦：麦格劳山。
[8]班纳吉，A.（1997）。治理不当的理论。经济学季刊， 112(4), 1289–1332。https://doi.org/10.1162/003355300555484
[9]福法克，公元（2016）。利率利差的决定因素：来自中部非洲经济和货币共同体的经验证据。经济学与国际金融杂志， 8(6), 66–78。https://doi.org/10.5897/JEIF2016.0759
[10] FUMEY, A. 和 DOKU, I. (2016)。加纳银行业的利差：2000-2014年。管理科学年鉴， 5(1), 37-54。https://doi.org/10.24048/ams5.no1/2016/37-54
[11] HAIR, J.F.、BLACK, W.C.、BABIN, B.J.、ANDERSON, R.E. 和 TATHAM, R.L. (2010)。多变量数据分析。第7版。纽约：皮尔逊。
[12] HART, O.、SHLEIFER, A. 和 VISHNY, R.W. (1997)。政府的适当范围：理论及其在监狱中的应用。经济学季刊， 112, 1127-1161。https://doi.org/10.1162/003355300555448
[13] HO, T.S.Y., & SAUNDERS, A. (1981)。银行利差的决定因素：理论和经验证据。金融与定量分析杂志， 16(4), 581–600。https://doi.org/10.2307/2330377
[14] 侯赛因，A.，雷曼，A.，&雷曼，S.U.（2019）。巴基斯坦商业银行利差的决定因素。NUML国际商业与管理杂志， 14(2), 30–42。检索自https://nijbm.numl.edu.pk/index.php/BM/issue/view/38/Determinants%20of%20the%20Int

erest%20Rate%20Spread%20in%20Commercial%20Banks%20of%20Pakistan

[15] JAYARAMAN, T.K., & SHARMA, R. (2003)。拉丁美洲利差的决定因素。发展经济学杂志，71(2), 291-299。

[16] JENSEN, M.C. 和 MECKLING, W.H.（1976）。公司理论：管理行为、代理成本和资本结构。金融经济学杂志， 3(4), 305-360。https://doi.org/10.1016/0304-405X(76)90026-X

[17] KALSOOM, A., & KHURSHID, M.K.（2016）。利差对盈利能力影响的回顾。财务与会计研究杂志， 7(11), 23-26。检索自https://www.iiste.org/Journals/index.php/RJFA/article/view/31497

[18] 南佩沃，D. (2012)。是什么推动了乌干达银行业的利差？国际经济与金融杂志， 5(1), 76–85。https://doi.org/10.5539/ijef.v5n1p76

[19] NGUGI, R.W., & KABUBO, J.W.（1998）。金融部门改革和利率自由化：肯尼亚的经验。内罗毕：非洲经济研究联盟。检索自https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/2232/RP%2072.pdf?sequence=1&isAllowed=y

[20] NGUYEN, T.、TRIPLE, D. 和 NGO, T. (2018)。银行贷款和存款的运营效率：越南银行系统案例研究。国际金融研究杂志， 6(1), 14。https://doi.org/10.3390/ijfs6010014

[21] OWUSU-ANTWI, G.、BANERJEE, R. 和 ANTWI, J. (2017)。利率差对银行盈利能力的影响：加纳银行的案例。会计、商业和金融研究杂志， 1(1), 34-45。http://dx.doi.org/10.20448/2002.11.34.45

[22] PHAM, H. 和 TRAN, H. (2019)。跨国公司的董事会和企业社会责任披露。《跨国商业评论》， 27(1), 77-98。https://doi.org/10.1108/MBR-11-2017-0084

[23] 罗宾逊，J.W.（2002）。牙买加商业银行利差：衡量、趋势和前景。摘自https://boj.org.jm/uploads/pdf/papers_pamphlets/papers_pamphlets_commercial_bank_interest_rate_spreads_in_jamaica.pdf

[24] TARUS, D.K., & MANYALA, P.O.（2018）。银行利差由什么决定？来自撒哈拉以南非洲的证据。非洲经济与管理研究杂志，9(3), 335–348。https://doi.org/10.1108/AJEMS-05-2017-0094

[25]世界银行集团。（2023）。摘自https://www.worldbank.org/en/home

[26] WERE, M. 和 WAMBUA, J. (2014)。影响商业银行利差的因素有哪些？来自肯尼亚的经验证据。发展金融评论， 4(2), 73–82。https://doi.org/10.1016/j.rdf.2014.05.005

[27] 伍德德里奇，J.M. (2002)。横截面和面板数据的计量经济学分析。剑桥：麻省理工学院出版社。