DETERMINANTS OF INTEREST RATE SPREADS OF COMMERCIAL BANKS IN PAKISTAN

Submitted

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CERTIFICATE

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Author's Declaration

I, Mehvish Altaf, declare that my MPhil thesis titled ***'Determinants of Interest Rate Spread of Commercial Banks in Pakistan'*** is entirely my original work. It has not been submitted by me, in full or in part, for any degree at the Pakistan Institute of Development Economics or any other institution within Pakistan or abroad.

If, at any stage, even after completion of my degree, this declaration is found to be incorrect, the university reserves the right to revoke my degree.

Date: November 13,2025

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Abstract

This study investigates the determinants of interest rate spreads (IRS) in Pakistan's commercial banking sector from 2000 to 2023, incorporating bank-specific, industry-specific, and macroeconomic variables within a panel data framework. After conducting several diagnostic and specification tests, the Fixed Effects Model was identified as the most appropriate for controlling unobserved heterogeneity across banks.

The empirical findings reveal that macroeconomic factors, namely GDP growth, inflation, and interest rates—play a significant role in influencing the banking spread. Specifically, higher interest rates are associated with an increase in the spread, whereas GDP growth and inflation exhibit significant negative relationships, indicating that economic expansion and inflationary conditions tend to narrow spreads through competitive adjustments in lending and deposit rates. In contrast, most bank-level and industry-level variables, including systemic importance, non-remunerated deposits, and asset exposure, were not statistically significant in the overall sample, though they became relevant in subgroup analysis. For banks with smaller spreads, systemic importance negatively affects the spread, while for banks with larger spreads, GDP growth and inflation remain key determinants.

These results highlight that Pakistan's persistently high spreads are largely driven by macroeconomic conditions and structural inefficiencies rather than competitive dynamics. The study contributes to the literature by emphasizing the heterogeneous behavior of spreads across bank categories and identifying the dominant role of monetary variables. Policy recommendations include strengthening competition through proactive regulatory oversight, improving inflation and interest rate management by enhancing monetary policy transparency, and promoting financial inclusion to diversify funding sources. Collectively, these measures could foster greater efficiency, reduce spreads, and promote sustainable financial sector development.

Keywords: Spread, GDP Growth, Fixed Effect, Inflation, Interest rate.

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CHAPTER 1

INTRODUCTION

1.1 Background

The efficiency and effectiveness of financial institutions play a significant role in expanding the financial ecosystem and influencing economic growth and stability. Understanding the role and performance of banks in the context of interest rates can help to improve the performance of financial institutions and thus ensure financial stability in the institution's business. Commercial banks generate funds via various deposit products and use these funds for the purpose of providing loans. The difference between loan and deposit rates, called the interest rate spread (IRS)[1], is an important indicator of the performance of commercial banks financial institutions. Banking spread is a proxy of determining efficiency of financial market; hence it needs scrutiny.

At the macro level, the high-interestrate differential affects the financial system because low deposit yields do not affect savings but high financial costs limit investment. This leads to a decr ease in investment, which limits economic growth (Fry,1995, Stiglitz, J.E & Weiss (1981). This challenge is particularly important in developing countries like Pakistan, where ban ks are the main source of financing for the private sector. A wide IRS often exists due to low competition, high operating costs, strict regulations, and increased risk of doing business. Additionally, small borrowers without collateral face higher transaction costs, which in turn leads to higher interest rates. Administrative issues such as inadequate security and infrastructure can also cause costs to be moderated and result in borrowers defaulting on loans (Honohan, P (2004)).

Globally interest rates vary, generally they tend to be lower in developed countries as compared to developed countries. Different in interest rates between countries are mostly due to the characteristic of their financial sector. As Sharma (2018) pointed out, in an economy where com

[1] The rate charged on loans by banks to the private sector is the lending rate while the rate offered on depots by banks is the deposit rate.

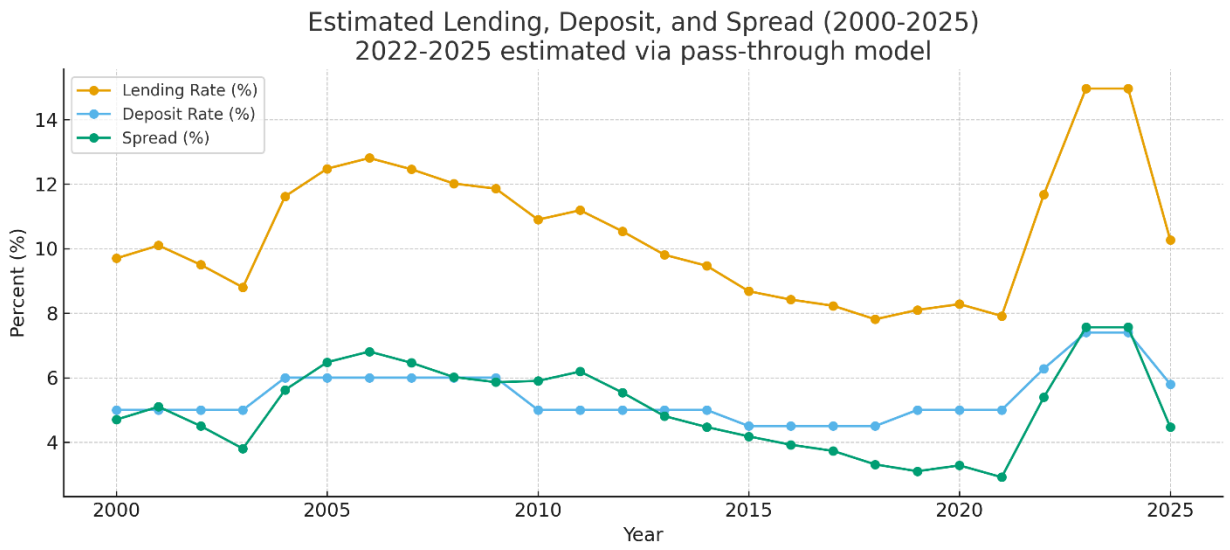
mercial banks are less profitable, average costs are higher, which limits their ability to organize d eposits and distribute them well.

A cross-country analysis by Demirgüç-Kunt and Huizinga (2019) from 80 countries showed that changes in banks' spreads and revenues are driven by many things. These include bank characteristics, macroeconomic variables, bank taxes (explicit and implicit), and insurance policies. Their research found that large banks with higher asset-to-GDP ratios and lower turnover tend to have lower spreads and profits. Furthermore, while foreign banks in developing countries generally have higher interest rates and profits than local banks, the opposite is true in developing countries. For example, in case of bank of America's spreads are analyzed using annual data that includes factors such as default risk, interest rate risk, income risk (measured as the ratio of liquid assets to total assets), debt-to-cash ratio, net ratio, cost of financing, and management performance, the analysis showed that several variables affect the spread, including default risk (measured as the default rate of loans), the risk price associated with default interest, the debt-to-value ratio, and the capital-to-capital ratio (These changes are directly related to the interest rate spread). Conversely, liquidity risk has an inverse relationship with the spread; that is, the higher the liquidity risk, the narrower the spread. Evidence supporting these results can be found in the studies of Angbazo (2017) and Ahmadian and Kyanvnd (2019). A comparison of banks in Central, Eastern and western Europe showed that concentration, operational efficiency, capital adequacy, and risk management are important factors affecting the spread in the these regions, as stated by Ahmadian and Kyanvnd (2017).

Patino and Gutiérrez, 2019; Hasan and Sadat, 2023 highlighted that, in Pakistan, banks are important players in the financial sector and contribute to its efficiency and stability. Therefore, Pakistan provides a convincing case from research point of view related to high interest rate prevailing in the banking sector. The space is marked by wide interest rate spreads and great profitability as it has been observed that high banking spreads were suggestive 'of excess profitability and inefficiency in Pakistani financial markets (SBP reports). Moreover, the Competition Commission of Pakistan (CCP) has claimed that banks are operating like "organized cartel" so that while fixing spreads across products interest rates were being fixed in unison by all due to no real competition. To address these issues, the State Bank of Pakistan (SBP) implemented a minimum rate of return on deposits in May 2008 and it is still valid. These problems lead to the phenomena of high interest rates spread in the banking sector of Pakistan. issue that Therefore,

this research study aims to investigate the determinants of bank interest rates in Pakistan with a focus on the banking sector from 2000 to 2023.

Figure 1:



Source: SBP reports[2]

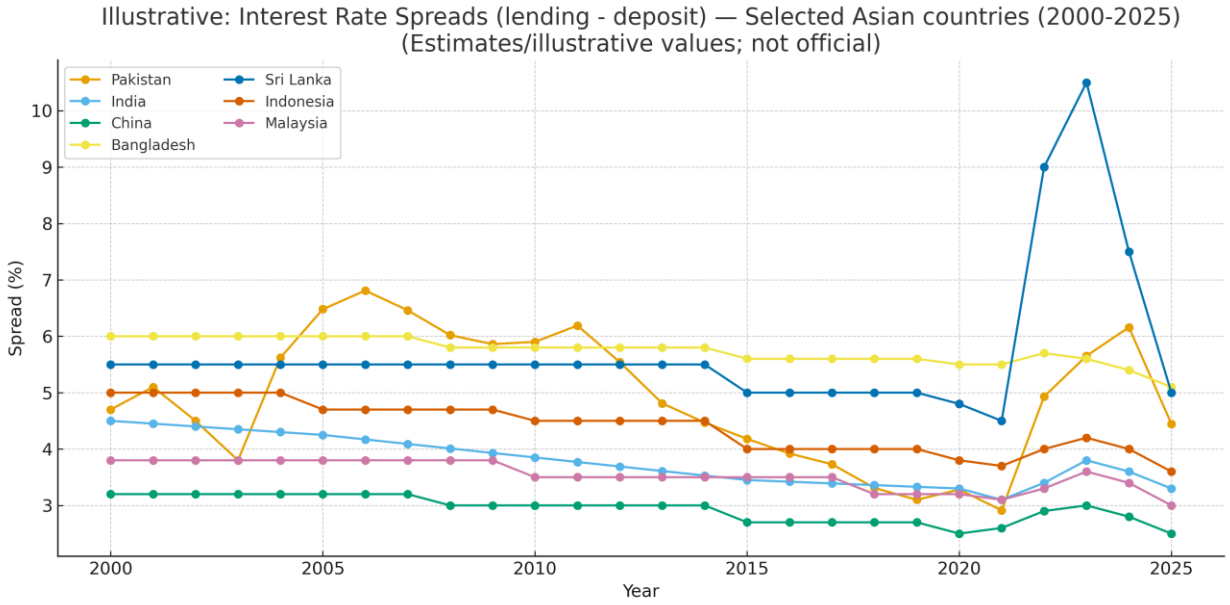
2000 till 2010 was a period of high spread and structural inefficiencies, which is why during this period deposit rates were relatively lower indication of little incentives for savers while lending rates were quite higher due to weak competition, large holdings of government securities and high administrative costs. During 2011 till 2020 gradual narrowing of spread had been observed (i.e. spread declined from more than 6% to about 3% by 2019). This is due to banking sector reforms which caused an improvement in banking sector competition. Financial deeping has been increased. Finally, during this period deposit rates remained at lower end but at the same time deposit rates were also adjusted downward resulting in narrow spread due to ease in policy rate. For the particular year 2020-2021 the spread narrowed further i.e. below 3% (policy rate was 7% in order to support economy due to COVID pandemic).

Finally, during 2022 – 2024 spread widening has been observed due to a sharp rise in the policy rate (around 22%) resulting a widening of spread of around 6% reflecting slow upward adjustment in deposit rates while faster rise in lending rates, hence passing the burden of right monetary policy to borrowers. During 2025 policy rate cut towards around 12% reduced both

[2] Using pass through model estimated figures has been given by SBP.

deposit and lending rates leading to a contraction in spread to around 4.5% due to faster lowering of lending rates than deposit rates, indication of a relief for borrowers.

Figure 2:



Source: WDI and regional financial reports

It is evident from above graph that comparing to Pakistan overall the spread trend is stable in major Asian countries. Both China and Malaysia generally have low and stable spreads i.e. 2-3%, while Sri Lanka spiked due to its financial crisis. India and Indonesia are moderate but decling with time.

1.2 Research Problem

The interest rates in Pakistan have been consistently rising (9.73% in 2023 compare to 2.86% in 2015) in the backdrop of rising inflation and economic uncertainties as evident in June 2023, SBP suddenly raised the policy rate to 22% just to secure a deal with international monetary fund (State Bank of Pakistan, MPS report, 2023)[3].

[3] The interest rates in Pakistan have been consistently rising (9.73% in 2023 compare to 2.86% in 2015) in the backdrop of rising inflation and economic uncertainties as evident that in June 2023, SBP suddenly raised the policy rate to 22% just to secure a deal with international monetary fund available at https://www.sbp.org.pk/m_policy/2023/MPS-Jun-2023-Eng-1.pdf?utm_source=chatgpt.com

Banks in Pakistan often prefer lending to the government at exorbitant interest rates that help banks to earn a high spread while on the other side 70% of the government revenues collected by the Federal Board of Revenue (FBR) being utilized to pay interest amount.

High banking spreads[4] create many problems in the financial system e.g. it is an indication of inefficient financial intermediation, weak macroeconomic environment, lack of market competition, high taxation, adverse selection5 (see e.g. Barajas et al 1999, Ansari, 2006, Qayyum and Ahmed, 2007, Akmal and Saleem, 2008, Akhtar, 2010, Burki and Niazi, 2010 and Mathews, 2010). Furthermore, high spreads discourage potential level savings owing to low returns on deposits and at the same time limiting investment activities due to high cost of funding. This is very much relevant for the case of Pakistan where financial systems are bank dominated, role of capital markets is limited, collateral recovery is difficult and primary sources of funding for businesses are banks. Therefore, high banking spreads (currently prevailing in Pakistan) raise important policy issues associated to the development of the financial system therefore there is a dire need to explore the major determinants of banking spread for the case of Pakistan.

1.3 Research Objective

The recent extraordinary banking spreads in Pakistan are the clear evidence of a lack of competition and efficiency of the financial markets of Pakistan. Various studies indicated that many factors affect the banking spread including bank specific characteristics, market dynamics, macroeconomic conditions and regulatory frameworks. Keeping these factors in view the current study's objective is to investigate the major determinants of banking spread based on three categories of factors i.e. banking specific, industry specific and macro economy specific factors.

1.4 Research Questions

This study aims to examine the two important questions related to banking interest spreads in Pakistan.

- What are the major determinants of commercial banking spreads in Pakistan?
- How bank specific, industry specific and macroeconomic factors influence the bank spread?

[4]Banks spread means interest rates on loans

[5]Adverse selection is where riskier profile borrowers are willing to take bets.

1.5 Significance of Research

The current study holds considerable significance in understanding the dynamics of the banking sector's profitability and interest rate policies. By analyzing the interest rate spread over a comprehensive period, this study offers valuable insights into how numerous factors, including economic conditions, regulatory changes, and market competition, affect the viability of banks' profit in Pakistan.

This research contributes to the existing literature on bank spreads in Pakistan in three main ways. First, it examines the share of non-compensated deposits in total deposits to assess how deposit composition affects bank spreads. Second, it recognizes that non-interest income is an important component of overall bank profits and analyzes its role specifically.

Overall, this research offers critical insights that are beneficial for researchers, policymakers, banking professionals, and loan consumers in contributing to the formulation of more effective economic and financial strategies and enhancing the understanding of the banking sector's dynamics in Pakistan.

1.6 Organization of the Study:

The organization of the study which includes fiver chapters, Chapter 1 consists of Introduction where the background of the study, objective of the study, research question, problem statement are discussed. Chapter 2 is about the Literature reviews where background, literature gap , empirical literature are discussed. The chapter 3 consists of Data and Methodology where discussion about the data description, population and sample size, variable measurement, model specification, and estimation techniques. The chapter 4 consists of Result and Discussion and finally chapter five consists of Conclusion and Recommendation.

CHAPTER 2

LITERATURE REVIEW

In the chapter of literature review, a comprehensive overview of the research topic within the existing body of knowledge, highlighting its significance, and demonstrating the academic rigor and relevance of this study has been covered.

2.1 Background

The foundational theoretical model in the banking spread literature was presented by Ho and Saunders (1981). Before their study, the discussion on bank spreads was mostly descriptive. They have developed the first formal theoretical model explaining why banks charge positive spreads. Their model showed that banks acts as risk averse dealers in the loanable funds market, faced a lot of uncertainty regarding timing of deposits inflows and loan demand. Hence, the spread arises as a premium product for bearing risk and at the same time providing liquidity services. The model clearly showed the major determinants of banking spread come under four heads: a) risk aversion of banks b) variance of interest rate uncertainty c) size of bank transactions and d) level of completion in the banking sector.

Ho and Saunders (1981) provided important insights into the determinants of bank spreads by considering financial costs, competition, regulation, risk credit chance, efficiency, and macroeconomics. Funding costs are an important determinant of interest rates, and banks with higher costs of obtaining funds tend to charge higher interest rates to cover these costs. Regulations such as interest rates or floors affect how banks set interest rates and manage income. The study found that credit risk is a major factor, banks with higher credit risk will pay larger spreads to cover losses on bad loans. Furthermore, Ho and Saunders found that banks with higher operating costs also tend to maintain larger spreads. Productivity makes a difference between banks decrease spreads by diminishing their fetched base.

Hence, after the pioneer work of Ho and Saunders research on banking spread shifted from simple descriptive comparisons to microstructural modes grounded in competition, risk and market behavior. Many subsequent studies (including Demirgüç-Kunt & Huizinga, 1999) built conceptually on the Ho-Saunders framework. Demirgüç-Kunt & Huizinga (1999) showed that

operational inefficiency, risk, inflation, and weak institutions all drive high spreads**,** all these factors are directly relevant for countries like Pakistan.

Angbazo's (1997) study further developed the model by incorporating the influence of business models and competition on transmission. He examined how market concentration and competitiveness affect banks' pricing behavior and, on the other hand, their spread. Angbazo's study showed that competition in the market narrows as banks lower interest rates to attract customers. Conversely, in less competitive markets, banks can control spreads more because of reduced competition. This extension highlights the role of the economic system in affecting the spread of banking industry.

Maudo's and Guevara (2004) extended this model by including macroeconomic factors and their effects on banks'spread. They investigated how economic factors such as inflation, economic growth, and monetary policy affect bank lending and deposit income. For example, high inflation or economic instability may be exacerbated as banks adjust interest rates to compensate for uncertainty and risk.

The theoretical advances of Allen (1988), Angbaz (1997), Maudos and Guevara (2004) laid the foundation for many studies on expansion. These extensions provided a comprehensive framework that encompasses a variety of issues, from bank-specific models to business models and macroeconomics. Therefore, current research often builds on these continuous models to analyze transmission across contexts, explore new variables and assess the impact of recent development parameters on the banking and financial environment. The collective work reflects the changing understanding of interest and the continuation of the following model in modern finance research.

2.2 Empirical Literature

Khanal, K. R., and Sharma, A. (2021) analyzed the determinants of interest rates of commercial banks in Nepal and report several key findings. They showed that efficiency and effective risk management are essential for tight control of the pandemic. Banks that operate effectively and manage credit risk and income tend to reduce interest rates by offering better interest rates to customers. Business models also play an important role; high market pressures can lead to more contagion due to reduced competition, while increased competition facilitates contagion. Macroeconomic factors such as economic growth and inflation also affect the spread. Inflation usually expands as banks adjust interest rates to reduce inflation risk, while economic growth can

lead to expansion due to the increased credit demand. Similarly, H. Feroz, A. (2021) provided insight into the link between interest rates and banking performance. He showed a positive relationship between spreads and bank revenue, suggesting that overall spreads generally lead to higher revenue. This is because banks make more profit from expansion by taking advantage of the difference between loan rates and deposit rates.

N. Salazar and Barajas, A., R. Steiner (1999), provided insight into the determinants of interest rates in Colombia in relation to the influence of business models, environmental management, and macroeconomic factors. However, limitations of this study, including limited data, static analysis, and narrow focus on traditional patterns, suggest room for further research. Current research has built on these findings by combining current data and exploring multiple variables. Furthermore, the study found that market concentration affects interest rates. The higher the economic level in Colombia, the larger the spread. This suggests that reducing competition among banks can lead to greater profitability. The study demonstrates the role of individual bank characteristics, such as operational efficiency and asset quality, in affecting the spread. Banks with low leverage and high NPLs tend to have higher interest rates. The study found that regulatory policies such as savings and interest rates have an influence on interest rates. Research shows that changes in policy can be broad or narrow depending on their nature. Furthermore, this study showed the impact of inflation on interest rates. Inflation spreads over a wide area as banks adjust interest rates to compensate for the risk and uncertainty associated with inflation. Economic growth also affects interest rates. During economic expansions, banks reduce spreads as credit competition increases, while during recessions, spreads increase as banks attempt to reduce high risk. This study analysis is specific to Colombia, and the findings may not be directly applicable to countries with different financial institutions, environmental governance, or other economic factors. The methods of this study may not fully account for the strength of the banking sector during that period. Spreads are affected by many variables, and static models may miss important changes in the market and banking sector. The study focuses on traditional processes such as business models and macroeconomic variables. However, it has ignored new factors affecting today's world economy such as technological development, globalization, and exchange rate formation. This study did not address the impact of recent policy changes and policy changes that occurred after the study period. Changes in banking regulations and monetary policy in the late 1990s and early 2000s may have had a significant impact on spreads, but this analysis does not account for this. Although the study examines many

aspects of banking, it may not include all variables that affect the spread, such as risk management or the role of financial institutions as non-financial institutions.

Khawaja, M. and M. Din (2007) found critical insights into the determinants of interest rates in Pakistan by focusing on specific banking conditions, industry concentration and macroeconomic variables. However, the limitations of this study, such as limited data, static methods and ignoring recent changes, suggest scope for further research. Future studies can build on these findings by integrating recent data, investigating other influences, and determining the impact of changing parameters on financial and environmental management. - Specific features such as efficiency, cost structure and risk management are important factors in determining transmission. However, this study highlighted the role of macroeconomic factors, including inflation and economic growth, in affecting the pandemic as well. While economic growth affects credit demand and deposit rates, high inflation is widespread as banks adjust interest rates to manage financial risk. The study further found that market concentration in Pakistan's financial sector affects interest rates. The higher the concentration, the less competition and the higher the rate of transmission. This suggests that reduced competition may allow banks to charge advanced loan rates and lower deposit rates. This study investigated the impact of deposits on interest rates. The study found that higher savings can increase banks' financing costs, which in turn can lead to higher interest rates. This study focused on many important factors such as financial efficiency and risk management that directly affect banks' interest rate policy. The author has also analyzed the impact of banks' business operations and competition on spreads, showing how the market affects the banking sector. On the other side, this study did not consider the impact of governance changes and policy changes implemented after the study period. Changes in banking supervision and monetary policy may affect transmission in ways not covered by this study. Although this study provides a good understanding of certain patterns, it may not cover all factors affecting transmission. For example, the role of non-bank financial institutions and new fintech’s may provide additional perspectives on interest rates.

Ochieng, A. and Njeri, K. (2021) examined the macroeconomic variables that affect interest rate spreads in Kenyan financial market. One of the key findings of the study is that inflation has a convinced impact on the interest rate spread. As inflation increases, banks will widen the interest rate spread to offset the decline in currency values and offset the risk associated with borrowing

during inflation. The change helps banks protect their income during the financial crisis. Another important finding is that there is a positive relationship between economic growth and interest rates. The study found that banks tend to increase interest rates during periods of strong economic activity. This tendency is due to increased credit demand and is more significant during economic booms. In addition, this study revealed the impact of central bank policy on interest rates. In particular, changes in central bank interest rates lead to changes in the banking system. Central bank interest rate increases often lead to wider spreads as banks adjust lending and deposit rates accordingly. Exchange rates can also affect transmission. Banks adjust spreads to manage risks related to currency changes and the impact on foreign borrowers. The study explored several key variables in its analysis. Interest rate spread is the primary focus, representing the differentiation between the average rates charged on loans and the average rates paid on deposits. Inflation rate is assessed using the Consumer Price Index (CPI) or similar statistics and economic growth is measured by Gross Domestic Product (GDP) growth rates. The central bank rate is assessed for its influence on overall interest rates in the economy. Lastly, exchange rate volatility is considered, reflecting the fluctuations in the local currency against major foreign currencies.

The extensive analysis of this study gave a strong premise for understanding how various economic variables influence the quality of intrigued within the Kenyan economy. Information impediments shift in terms of exactness and completeness of macroeconomic information, which may influence the unwavering quality of the discoveries. Garca, A. (2022) looked at how low interest rates affect the banking system and examines the role of the deposit market in this change. Given the study's context, the primary concentration is on interest rate spreads, not on the absolute interest rates. Therefore, any mention of the long-run impacts of interest rates should be interpreted within the context of long-run spreads.

One of the most important findings of the study is that low interest rates generally make banks tighter. However, this relationship is affected by deposit concentration in the market. Particularly in economies with large stores, banks can superiorly control the spread indeed with lower interest rate spread due to diminished competition. This recommends that financial models play an imperative part in deciding how banks alter intrigued rates in reaction to macroeconomic changes. This considers employments a few key factors to examine these connections. "The interest rate spread is key in the banking and finance literature, signifying the difference between the returns

on a bank's assets and the interest costs on its liabilities (Angbazo, 1997). Market concentration is typically evaluated through concentration ratios, like the Herfindahl-Hirschman Index (HHI), which systematically measures the extent of market dominance among a small group of large financial institutions (Maudos & Fernández de Guevara, 2004; Allen, 1988). These measures together support the empirical studies on the drivers of spreads and the contestability of the banking market." Private managing an account conditions and macroeconomic markers such as GDP growth and inflation are moreover considered to supply a comprehensive view of the components influencing the spread. A critical contrast is that the study is later, because it centers on cross-sectional information that will not capture the relationship over time.

Furthermore, although the study assessed the effect of the deposit market, it did not consider the impact of technology and managerial approaches on how banks manage spreads in a cost-effective environment. Lastly, the study's focus on a particular locale or division may constrain the generalizability of its discoveries to other settings or broader segments.

Nguyen, T. T., & Tran, Q. T. (2020) explored and clarified how different variables impact bank benefit in Vietnam, with a specific center on the interceding part of intrigued rate spreads. One of the study's critical discoveries is that intrigued rate spreads serve as a pivotal middle person within the relationship between a few determinants and bank benefit. Particularly, the ponder highlights that banks with bigger intrigued rate spreads tend to display higher productivity. This relationship underscores the significance of overseeing intrigued rate spreads to upgrade monetary performance. Key determinants distinguished within incorporate operational effectiveness, resource quality, and bank measure. Operational proficiency is found to be a solid indicator of productivity because it specifically impacts the capacity of banks to oversee costs and optimize income from intrigued rate spreads.The major factors utilized in this investigation envelop intrigued rate spreads, which are analyzed as an intervening factor between other determinants and benefits. Operational proficiency is evaluated through measurements just like the cost-to-income proportion, whereas resource quality is measured utilizing pointers such as non-performing credit proportions. Bank measure is assessed based on add up to resources or value. Macroeconomic factors such as swelling and financial development are too considered to supply a broader setting for understanding bank execution.

Smith, J., & Khan, A. (2023), inspected the relationship between interest spread and the profitability of banks in Pakistan. This examination is basic for understanding how banks oversee their intrigued rate approaches and the consequent impacts on their benefit. The essential autonomous variable is intrigued spread, calculated as the contrast between normal loaning and deposit rates, which has influence survey how changes in this spread influence managing an account productivity. The subordinate variable, bank benefit, is measured utilizing markers such as Return on Resources (ROA) and Return on Value (ROE), giving experiences into how successfully banks utilize their assets to create benefits. To guarantee strong comes about, the consider too consolidates control factors counting bank measure, measured by add up to resources, which makes a difference decide in the event that bigger banks have diverse benefit results compared to littler ones; credit hazard, evaluated utilizing the proportion of non-performing advances to add up to credits, tending to the result of advance defaults on benefit; and operational effectiveness, evaluated by the cost-to-income proportion, which measures how well banks oversee operational costs relative to salary. Numerous other studies found that there is a positive association between interest spread and bank productivity, which demonstrate that higher interest spread for most of parts will extends the benefits. Bigger banks tend to display better productivity due to economies of scale, whereas higher credit chance adversely impacts benefit, underscoring the significance of viable credit administration. Moreover, banks with higher operational effectiveness appear progressed benefit, highlighting the noteworthiness of fetched administration.

Khawaja and Din (2007) used panel data to examine the interest rate spread determinants for Pakistan's commercial banks. The widening spread can be explained by the administrative and other operational costs, the burden of non-performing loans, and the level of market concentration. They suggest profitability in the sector is constrained due to structural inefficiencies and poor competition that limit the profitability of financial reforms. The current study is notable for being one of the first in Pakistan to quantify the spread determinants in a systematic manner and for the numerous contributions ridded in the gaps for the prevailing literature.

Mahmood and Bilal (2010) focused on the determinants of interest rate spreads for Pakistani commercial banks during the period following financial liberalization. The study attributes the persistence of the wide spreads to excessive operational costs, provisioning requirements, and a policy rate weakly correlated with other market interest rates. This study suggests reliance on

spread widening as a means to enhance profitability, rather than operational efficiency, is common. This work is situated more on the policy side of the literature, primarily targeting the State Bank of Pakistan.

Afzal (2012) examined the connection between the interest rate spread and the structure of the banking market using the HHI as a concentration measure. The author argues that as concentration in the banking industry increases, the potential for competition 'softens' and the spread increases. This underscored the profitability 'structural' dimension, since the dominant banks act as 'highway robbers' and use their market power to retain disproportionate excess spreads. This study further reinforces the importance of a 'competition' policy in the efficient intermediation of the 'core' banking activities.

Khan (2011) analyzed the relationship between market concentration, interest rate spread, and the effects of acquisitions and mergers in the period of 1997-2010 in Pakistan. The study suggests that post-acquisition 'consolidation' entrenchment led to dominance of larger banks, which in turn caused larger spreads. It is explained that the mergers and acquisitions caused an efficiency paradox, where consumer welfare loss occurred due to high intermediation costs, increased stability, and efficient scale gain. The author relates spread behavior to structural change in the banking system.

Ishaq (2022) conducted another empirical study on the relationship between interest spreads and the profitability of the banking sector in Pakistan. The study employed time series econometric techniques and concluded that spreads have a significant and positive impact on profitability measures such as return on assets and return on equity. The findings reinforce the assertion that, in the context of a declining macroeconomic scenario, the banks in Pakistan rationally depend on widened interest spreads to preserve profitability.

Despite differences in time period and methodology, Yao (2018) also focused on net interest margins (as a measure of spreads) and the profitability of banks in Pakistan. Yao concluded that the bank-specific variables (size, capitalization, and quality of assets) and the profitability of banks, as well as the macroeconomic variables (economic growth and inflation) have a significant impact on spreads and profitability. This illustrates the importance of internal resource management as well as external factors.

CHAPTER 3

RESEARCH METHODOLOGY

Chapter 3 of the current study presents the theoretical framework and details the methodology employed. It also provides information on key elements such as the study's target population, sample size, data collection sources, estimation method, variables under investigation, and the econometric model utilized in this research study.

3.1 Data Description

This research has used secondary data. All bank related information has been collected from annual reports of the banks while the information on macroeconomic indicators have been collected from the world Development Indicator (WDI), Economic Survey of Pakistan and the State Bank of Pakistan. The data for this study has covered the time period from 2000 to 2023.

3.2 Population and Sample Size

The banking sector in Pakistan is categorized into five main categories: public sector banks, specialized banks, local private banks, Islamic banks and foreign banks (for details see Table 1).

Table 1: Structure of Banking Sector of Pakistan

Public Sectors Bank	
1. First Women Bank Limited	2. National Bank of Pakistan
3. Sindh Bank Limited	4. The Bank of Punjab
5. The Bank of Khyber	
Specialized Banks	
1. Punjab Provincial Cooperative Bank Limited	2. SME Bank Limited
3. SME Bank Limited	4. Zarai Tarqiati Bank Limited
Local Private Banks	
1. Habib Bank Limited	2. MCB Bank Limited
3. United Bank Limited	4. Bank Al-Falah Limited
5. Samba Bank Limited	6. Allied Bank limited
7. SILKBANK Limited	8. Bank Al-Habib Limited
9. Askari Bank Limited	10. JS Bank Limited
11. Habib Metropolitan Bank Limited	12. Summit Bank Limited
13. Soneri Bank Limited	14. Standard Chartered Bank (Pakistan) Limited
Islamic Banks	
1. Al-Baraka Bank	2. Dubai Islamic Bank Pakistan

3.	Meezan Bank Limited	4.	MCB Islamic Bank Limited
5.	Bank Islami Pakistan Limited	6.	Faysal Bank Limited
Foreign Banks			
1.	Industrial & Commercial Bank of China	2.	Bank of China Limited
3.	Citi Bank N.A	4.	Deutsche Bank AG

Source: State Bank of Pakistan

The current study considered all Pakistani banks depending on data availability. This research has analyze the effects of several bank-specific, industry-specific, and macroeconomic factors on their interest rate spreads. Bank level information also shows that the Pakistani banking industry has traditionally been dominated by the five largest banks by asset size[6]. However, analyzing the whole banking industry has given a comprehensive view of banks operations, asset size impact and liquidity ratio.

3.3 Variables Description

Banks' spreads are influenced by several factors, which can be classified into three main categories based on past literature review (See table 2). The variables under these three categories are listed below.

1. **Bank-specific factors (BSF**): Bank Specific Factors (BSFs) are financial risk, management fees, composition of bank assets and liabilities, and non-core services provided by banks.
2. **Industry-specific indicators (ISI):** which are precisely the degree of competition, regulatory and supervisory requirements (e.g. minimum capital, cash reserves and statutory reserve requirements, etc.) The same regulatory and supervisory environment applies to Pakistan.
3. **Macroeconomic indicators (MEI):** These including real GDP growth, inflation and interest rate.

[6] These five include **United Bank Limited (UBL), National Bank of Pakistan (NBP)**, **Habib Bank Limited (HBL)**, **Meezan Bank and Muslim Commercial Bank (MCB).**

Table 2: Selected Variables Description

Variables	Categories	Sources	Frequency
Bank Specific	Bank Spread	Bank annual report	yearly
	Share of non-interest in total income	Bank annual report	yearly
	Share of non-remunerative deposits	Bank annual report	yearly
Industry Specific	Admin. expense to total expense	Bank annual report/SBP	yearly
	Herfindahl Index	WDI	yearly
Macroeconomic	GDP growth (annual %)	WDI	yearly
	Inflation	WDI	yearly
	Interest rate	WDI	yearly

3.3 Variables Measurement

Interest Rate Spread refers to the difference between the interest rates charged by banks on loans and the interest rates paid on deposits. It is a key indicator of a bank's profitability and the cost of borrowing in the economy and has been used as the dependent variable for the current study.

The interest rate spread can be calculated using the following formula:

Interest Rate Spread= $\gamma L - \gamma D$

γL : Interest rate on loans (the rate charged by banks for lending).

γD: Interest rate on deposits (the rate paid by banks to depositors).

In this study "weighted average banking spread" which is a financial metric used in the banking industry to measure the profitability of a bank's lending activities has been used. It reflects the weighted average difference between the interest income earned from loans and the interest expense paid on deposits.

1. Bank-specific factors (BSF)

Bank-specific factors refer to internal characteristics and business attributes of individual banks. These factors can have a significant impact on how banks set interest rates on loans and deposits, which can affect their profitability and competitiveness. Following are the key bank specific factors.

Cost structure: A bank's operating expenses, including overhead, labor, and technology investments, can affect the cost of loans and deposit payments. If a bank has high operating costs, it may charge higher rates on its loans to maintain profitability, which may widen spreads.

Asset quality: The proportion of non-performing loans and overall credit risk can affect a bank's willingness to lend and the rate it offers. Higher risk often requires higher spreads to offset potential losses. A bank with a high proportion of non-performing loans may increase its lending rates to offset expected losses, widening spreads again.

Sources of Funding: The composition of a bank's funding (whether it relies more on retail deposits, wholesale funds, or interbank lending) can affect its cost of funds and the interest rates it offers.

Market Power: Banks with greater market power or less competition can have higher spreads because they can set prices without significant competitive pressure. A bank with less competition can maintain higher spreads by setting rates without significant pressure to lower rates.

Profitability: Higher profitability allows a bank to offer more competitive rates; lower profitability can lead to higher spreads as the bank tries to maintain its margins.

Regulatory Compliance Costs: Regulatory compliance can affect how a bank prices its products, which can increase its operating costs.

Management Efficiency: A bank's management efficiency can affect its cost structure and interest rate spreads, which can affect its operating efficiency.

Product Mix: The variety of financial products offered, and the risk profile of those products can affect a bank's overall profitability and pricing strategy.

These bank-specific factors are important in determining bank spreads because they directly affect the cost of lending and deposit prices. Overall, understanding these bank-specific factors can help analysts and policymakers assess the dynamics of bank spreads and their implications for financial stability and economic growth.

2. **Industry-specific indicators (ISI)**

Industry specific factors affect bank spreads for several reasons, primarily related to competitive dynamics, regulatory environment and general economic conditions in the banking sector. Industry factors that affect bank interest rate spreads, including the Herfindahl index and related administrative and general expenses, can have a significant impact on how banks operate and price their financial products. Following are the key industry specific factors.

a) **Administrative and General Expenses:** This ratio measures the ratio of administrative expenses to total expenses. High administrative expenses can indicate inefficiency or a need for better resource management. When administrative expenses rise, banks may raise interest rates to maintain profitability, which can widen interest rate spreads. Banks that manage their administrative costs effectively can offer more competitive rates on loans and deposits, which can lower spreads. If higher administrative costs lead to better customer service or technology investments, banks can justify higher spreads through improved service.

- **Regulatory Compliance:** Compliance requirements often increase administrative costs, which can require higher interest rates to cover the costs. The Herfindahl Index measures market concentration and is calculated by squaring and summing the market shares of all banks in an industry. A higher index indicates a more concentrated market. In a concentrated market (high Herfindahl index), a small number of banks may dominate. This can give them greater control over pricing, potentially leading to higher interest rate spreads. Low and high Herfindahl index indicates competitive behavior and consumer choice respectively.

- **Competitive behavior**: In a less concentrated market (low Herfindahl index), competition is typically greater, leading banks to lower interest rates and narrower spreads. In a concentrated market, major banks may be under less pressure to manage risk effectively, which can lead to higher spreads when considering potential losses.
- **Consumer Choice:** A high Herfindahl index restricts consumer choice, reducing competitive pressure and allowing banks to maintain higher spreads. Resume Both administrative costs relative to total costs and the Herfindahl index are important industry factors that can affect banks' interest rate spreads. High administrative costs can lead to wider spreads as they must cover costs, while market concentration, as indicated by the Herfindahl index, can indicate competitive behavior that affects pricing strategies. Understanding these factors can help analyze the dynamics of bank spreads and overall market efficiency

3. **Macroeconomic indicators (MEI)**

Macroeconomic indicators such as GDP, inflation, and interest rates play a significant role in influencing bank rate spreads. Here is how each indicator affects the spread:

1. **Gross Domestic Product (GDP)**:

A rising GDP indicates a healthy economy, which increases the demand for credit as businesses expand and consumers spend more. This increased demand can cause banks to raise lending rates, potentially widening interest rate spreads. Following two decisions i.e. credit and investment decisions are linked with the GDP levels of the economy.

Credit Decisions : During periods of strong economic growth, borrowers tend to be viewed as less risky, which can cause banks to lower their lending rates. On the other hand, when the economy is in a recession, credit risk perception increases, which causes banks to raise interest rates to hedge against potential defaults, which widens spreads.

Investment decisions: Higher GDP growth may allow banks to engage in more aggressive lending, which may affect their pricing strategies and the overall competitive environment.

2. Inflation:

Higher inflation leads to higher nominal interest rates as lenders seek to maintain purchasing power. Banks may widen spreads to protect against inflation risk. Following two effects on inflation may occur in an economy.

Effect on loans: If inflation rises, the central bank may raise interest rates to control it. Expectations of such action may cause banks to adjust their lending rates upward, which may affect spreads.

Effect on deposits: Inflation erodes the real value of money, which may cause banks to offer higher rates on deposits to attract customers, which may affect overall spreads.

3. Interest rates Central bank policy:

Changes in the benchmark interest rate set by the central bank have a direct effect on the rates that banks offer on loans and deposits. When the central bank raises interest rates, banks tend to follow suit, as deposit rates lag lending rates, which tends to widen spreads. Following two effects appear due to interest rates changes.

Cost of funds: Rising interest rates increase banks' cost of funds, which raises lending rates. If deposit rates do not rise at the same rate, spreads widen.

Yield curve dynamics: The shape of the yield curve (the difference between short-term and long-term rates) can affect banks' lending strategies. A steeper yield curve can widen spreads, as banks borrow at lower short-term rates and lend at higher long-term rates.

3.4 Model Specification

The study has analyzed panel data to investigate the determinants of interest rate spreads in commercial banks. Panel data combines cross-sectional data (data of different banks) with time series data (data over multiple periods), allowing for a more comprehensive analysis of dynamic relationships over time.

3.5 Estimation Technique

The analysis has employed statistical techniques suitable for panel data, such as fixed effects or random effects models, to account for both time variant and time-invariant effects.

3.5.1 Pooled Ordinary Least Squares (Pooled OLS):

Pooled Ordinary Least Squares (Pooled OLS) is a method used in regression analysis to estimate the parameters of a linear model when data from different cross-sectional units and time periods are pooled together. This approach assumes that the relationship between the dependent variable and the independent variables is the same across all units and time periods.

$$SP_{it} = \alpha_0 + \alpha_1 logsii_{it} + \alpha_2 logsnr_{it} + \alpha_3 logaex_{it} + \alpha_3 Hi_{it} + \alpha_5 gdp_{it} + \alpha_6 inf_{it} + \alpha_7 IR_{it} + \epsilon_{it}$$

3.5.2 The Fixed Effects Method

The fixed effect method allows the unobserved individual effects that are correlated with the included variables. This formulation of the model assumes that differences across groups can be captured in differences in the constant term. Constant term for each cross-section is treated as unknown parameter to be estimated. In the fixed effects model the constant is treated as country specific. This means that the model allows for different constants for each country. So, the model can be written as:

$$SP_{it} = \alpha_i + \alpha_1 logsii_{it} + \alpha_2 logsnr_{it} + \alpha_3 logaex_{it} + \alpha_3 Hi_{it} + \alpha_5 gdp_{it} + \alpha_6 inf_{it} + \alpha_7 IR_{it} + \epsilon_{it}$$

3.5.3 The Random Effect Method

An alternative method of estimation is the random effects model. The difference between the fixed effects and the random effects model is that the latter takes the constants for each country not as fixed, but as random parameters. If the individual effects are strictly uncorrelated with the regressors, then it might be appropriate to model the individual specific constant terms as randomly distributed across countries. Hence the variability of the constant for each country can be expressed as:

$$\alpha_i = \alpha + \eta_i$$

Where ηi is standard random variable with zero mean. The Random effect model therefore takes the following form:

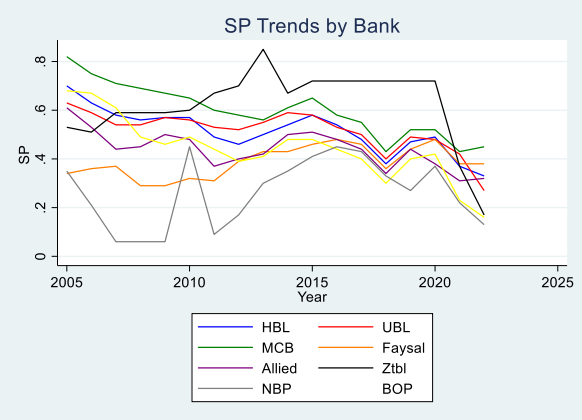
$$SP_{it} = \alpha + \alpha_1 logsii_{it} + \alpha_2 logsnr_{it} + \alpha_3 logaex_{it} + \alpha_3 Hi_{it} + \alpha_5 gdp_{it} + \alpha_6 inf_{it} + \alpha_7 IR_{it} + (\epsilon_{it} + \eta_{it})$$

CHAPTER 4:

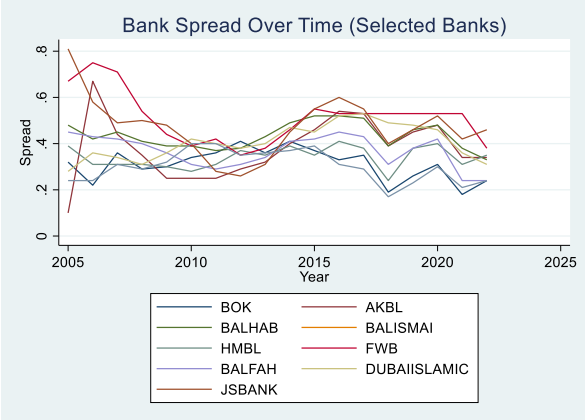
RESULTS DISCUSSION

Data Visualization of Bank Spread for All Banks Over the time:

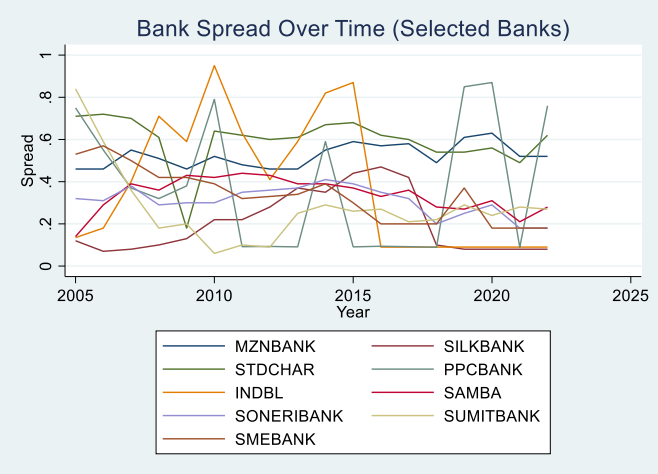
Figure 2: Spread Trends by Banks



Panel A: Figure 4-1 Bank Spread over the time for different Banks



Panel B: Figure 4-2 Bank Spread over the time for different Banks



Panel C: Figure 4-3 Bank Spread over the time for different Banks

Figure 4.1 shows the trends in the spreads of the major commercial banks such as HBL, MCB, UBL, Allied, NBP, Faysal, BOP, and ZTBL from 2005–2022. The figure shows that all major banks had spreads between 0.4 and 0.6, with a steady decline becoming clearer from 2015 onward due to rising competition and regulatory pressure. Within the group, ZTBL repeatedly has the widest spreads, reaching over 0.8 in 2012–2015, which indicates its niche agricultural lending book bearing higher risks and operating costs. HBL, MCB, UBL, and Allied hugged the sector

average, indicating moderate stability owing to their size, branding, and scale economies. NBP, however more unstable in the initial years, trended closer towards the industry average from 2015 onwards, indicating better portfolio management and stability. Faysal Bank and BOP showed lower spreads, frequently between 0.3–0.4, reflecting more competitive pricing and tighter margins. In general, the table reflects important heterogeneity between large banks with specialized institutions such as ZTBL retaining structurally wider spreads and others tending towards more competitive levels.

Figure 4.2 charts mid-sized and Islamic bank spread patterns like those of Askari, Bank of Khyber, JS Bank, Dubai Islamic, Al Baraka, and so on. Contrary to the case of large banks, this segment saw more volatility, though their spreads tended to stay in the 0.3–0.5 bracket. Mid-range conventional banks like Askari, JS, and Bank of Khyber exhibited volatility but reflected a movement towards decreased spreads after 2015, aligned with the competitive pressure mounted by the big banks. Islamic banks like Dubai Islamic and Al Baraka initially exhibited volatile and at times higher spreads in 2005–2010, a time when Islamic banking was in its nascent stage in Pakistan. With time, their spreads corresponded to traditional peers once regulation frameworks had become established and customer bases were large. Smaller niche banks, like First Women Bank, generally had spreads below 0.3, based on scale limitations and restricted market power. The chart illustrates that Islamic and mid-tier banks at first parted ways with the industry trend, but structural reforms and consolidation through regulation slowly inducted them into the general banking sector with spreads being near the average.

Spread Patterns of foreign and specialized banks such as Standard Chartered, Samba, Soneri, Summit, Silkbank, SME Bank, and PPCB is given in Figure 4.3. Foreign banks like Standard Chartered and Samba tended to have medium spreads of 0.4 to 0.6, although they showed cyclical behavior in tandem with macroeconomic developments. Their capacity to deal with niche client bases under differentiated products served to underpin somewhat higher spreads compared to mid-tier local peers. Conversely, small specialized banks like Silkbank, SME Bank, and PPCB showed extremely volatile spreads with strong spikes above 0.8 and falls below 0.2, due to their thin balance sheets, focused portfolios, and increased vulnerability to credit risk. Summit Bank and Industrial Bank were at the lower end, typically with spreads of 0.2–0.4, reflecting restricted capability to obtain higher margins. This number highlights that foreign banks maintain margins

by niche positioning, whereas small domestic banks are unstable owing to structural weaknesses and are thus prone to macroeconomic shocks.

4.1 Summary Statistic:

Table 3 Summary Statistics of all Variable for Whole data

Variable	Obs	Mean	Std. Dev.	Min	Max
Sp	486	.412	.167	.06	.95
Hi	459	.057	.013	.046	.089
Gdpg	486	4.049	2.062	-1.274	7.277
Inf	486	9.616	4.749	2.529	20.286
Ir	459	2.956	2.315	-1.711	7.761
Logsii	468	14.578	1.842	4.615	17.46
Logaex	469	15.373	1.568	6.911	18.52

The descriptive statistics provide valuable insights into the economic and financial forces underlying the data. Banking spreads are on average 0.41, implying that banks can sustain a moderate spread between lending and deposit rates. Nevertheless, the large dispersion across institutions and years is a pointer to the fact that spreads react to both institutional policies and macroeconomic circumstances. Individual banks tend to keep spreads wider consistently, perhaps due to superior market power or extension into riskier segments, or others keep them narrower, due to competitive pricing or superior operating efficiency. Spreads change over time in conformity with macroeconomic circumstances—constricting when there is high GDP growth and credit risks are lower, and expanding when there is weakness in the economy and banks are subject to higher default risk.

The Herfindahl index, while fairly low overall, varies little, indicating gradual and structural development over time rather than short-run cyclical fluctuations. This trend suggests that banking innovation and capacity building evolve continuously over years but vary modestly across banks, reflecting institutional diversity. GDP growth, by contrast, varies more widely, from decline to rapid growth. This boom-and-bust process offers a central context for banking industry performance, with healthy economic activity helping to underpin loan demand and profitability, and recessions testing margins and asset quality.

Inflation is characterized by a fairly high mean and large swings, becoming double-digit in a number of years. This volatility adds to uncertainty, leading banks to raise spreads as an inflation risk hedge. Likewise, interest rates exhibit steep variation throughout the sample, with some years

featuring negative interest rates as an indicator of highly accommodative policy conditions. This heterogeneity in monetary conditions directly affects funding costs and therefore the spread behavior of banks in different years.

The sectoral indicators Herfindahl index also differ significantly between banks and through time. Industrial finance predominates, having more investment than agriculture, but the variation means that some banks are more active in industrial credit, and others are connected to foreign competitiveness by agricultural exports. Annual patterns imply that banking spreads are not just a result of macroeconomic cycles, but also of sectoral changes in credit allocation and trade performance.

In general, bank-by-bank and year-by-year descriptive analysis emphasizes that spreads are not flat but influenced by a mix of institutional conduct, macroeconomic cycles, and sectoral interdependencies. This view is consistent with the need to examine both the cross-sectional variation among banks and the time-series variation across years in the case of investigating the determinants of bank spreads.

Table 4 Tabulation of bank

	mean_sp	sd_sp	min_sp	max_sp
ALBK	.381	.133	.1	.67
ASKBL	.367	.069	.24	.45
Allied	.44	.078	.31	.61
BALFAH	.407	.075	.28	.53
BALHAB	.433	.057	.33	.52
BALISMAI	.476	.089	.4	.81
BOK	.311	.069	.18	.41
BOP	.262	.141	.06	.45
DUBAIISLAMIC	.473	.128	.26	.81
FWB	.512	.113	.35	.75
Faysal	.387	.063	.29	.48
HBL	.513	.093	.33	.7
HMBL	.341	.047	.24	.41
INDBL	.384	.317	.09	.95
JSBANK	.301	.069	.17	.4
MCB	.598	.108	.43	.82
MZNBANK	.523	.056	.46	.63
NBP	.442	.132	.16	.68
PPCBANK	.387	.312	.089	.87
SAMBA	.338	.082	.14	.44
SILKBANK	.205	.145	.07	.47
SMEBANK	.334	.126	.18	.57

SONERIBANK	.308	.069	.18	.41
STDCHAR	.595	.121	.18	.72
SUMITBANK	.278	.182	.06	.84
UBL	.516	.084	.27	.63
ZTBL	.62	.156	.17	.85

Analyzing the data visually shows the enormous difference in spreads among the banks on an average basis, as well as on the basis of variability. This difference carries important economic significance. Large chartered institutions such as ZTBL, MCB, Standard, as well as other banks like MZN, UBL, HBL and FWB have shown a consistent average of high spreads above 0.50 which is economically and financially considered stronger market dominance, having more borrowers, and having less customer demand elasticity. On the other hand, institutions like BOP, SUMIT Bank, JS, Soneri, BOK, Silk Bank have exhibited a lot more narrower spreads hovering on average below 0.30, which on average correlates with a high degree of competition, having weaker market power, or basing their strategies on other earning avenues such as fees instead of interest. The economic interpretation of variable spreads is also important. For instance, the banks INDBL, PPC Bank, SUMIT Bank and ZTBL have high spreads which suggest less risk and more fluctuation in the stabilizing costs, structure and exposure of risks. Other banks such as HMBL, Faysal Bank and BALHAB have lower spreads which suggest more risk, steady earnings, and lower fluctuation in pricing strategies.

Such widespread ranges, for instance, record SUMIT Bank and ZTBL's moves from significantly low (0.06–0.17) to significantly high (0.82–0.85) signals and suggest either proficient dexterity in macroeconomic shocks—or total naivety to volatility in funding costs and credit risk. On the whole, these suggest considerable and multi-faceted differences in bank conduct that resonate also in bank competition, systemic financial stability, and the way monetary policy is transmitted through the bank's lending activities.

Table 5 ***Summary statistics: by(year)***

year	mean	sd	min	max
2005	.489	.237	.1	.84
2006	.462	.189	.07	.75
2007	.443	.16	.06	.71
2008	.408	.163	.06	.71
2009	.387	.149	.06	.67
2010	.447	.182	.06	.95
2011	.38	.156	.09	.67
2012	.376	.136	.09	.7
2013	.414	.139	.091	.85
2014	.478	.12	.29	.82
2015	.477	.155	.091	.87
2016	.441	.153	.09	.72
2017	.424	.151	.09	.72
2018	.335	.153	.089	.72
2019	.416	.17	.08	.85
2020	.425	.174	.08	.87
2021	.306	.13	.08	.53
2022	.315	.157	.08	.76

Every year, bank spreads and their significance is measured and studied over time patterns. Bank spreads are the differences between the interest the bank pays and the interest they charge. Average spreads is the interest and Bank is the lender. Bank spreads were high averaging 0.49, second only to 2005. In that year, the bank spreads crashing to 0.39, clearly bank and lending losses margins, reflecting monetary easing. Increased and more bank competition and high credit risk worsen the margins. Recovery is slowing easing in 210. In that year bank spreads were 0.45 and in the year, 2014 and 2015, 0. Finland, Spreads in that year were above 0.47. Macroeconomic conditions and tighter bank credit risk supported recovery. In the years after 2015, bank spreads started falling to 0.33 in 2018 and an even lower historic bank margin of 0.31 in 2021. These years are the COVID years, Pandemic and policy low interest rate years. These years are also 2020. Standard deviations 2005, 2010, 2015, 2019, and 2020, high numbers as evidence, show divergent bank pricing to macro-financial shocks, wide and aggressive collapsed spread margins.

4.2 Correlation Analysis:

Table 6 Correlation Matrix between the variables for whole data

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) sp	1.000						
(2) hi	0.062	1.000					
(3) gdpg	-0.024	0.281	1.000				
(4) inf	-0.064	0.060	-0.506	1.000			
(5) ir	0.151	-0.144	0.371	-0.555	1.000		
(6) logsii	0.253	-0.151	-0.006	-0.133	0.018	1.000	
(7) logaex	0.182	-0.224	-0.026	-0.147	0.002	0.849	1.000

The correlation matrix shows mostly weak linear relationships between the variables. The highest positive relationship is between logsii (log of Share of interest income in total income) and logaex (log of Admin. expense to total expense)(0.849), and it suggests that industry-investing sectors have corresponding agricultural exports. There are moderate negative correlations between inf (inflation) and both gdpg (-0.506) and ir (interest rate) (-0.555), which indicate higher inflation is linked to lower GDP growth and lower interest rates. There is moderate correlation between sp (Spread) and logsii (0.253) and logaex (0.182), indicating a weak association between sectoral performance and investment or export measures. The other correlations are mostly weak or close to zero, reflecting weak direct linear relationships between the variables.

4.3 Summary Statistic and Correlation for Group 1 and 2

To understand how spreads affect the behavior of different banks, a subsection of the sample was extracted according to a median cut-off point of 43 percent. Banks with a spread of under 43 percent were assigned to Group 1 and banks with a spread of over 43 percent were assigned to Group 2. A dummy variable was developed to classify the two groups, where Group 1 was marked with a 0 and Group 2 with a 1. The intent of this differentiation is to analyze the determinants of spreads and the possible effects on profitability across banks with lower and higher spreads. The establishment of this differentiation focuses on the analysis of heterogeneity in banking behavior, as it enables the examination of the implications of differentiating spreads on profitability. In this way, the analysis offers insights on the operational uniformity of banks across different spread levels.

4.3.1 for Group 1:

Table 7 Summary Statistic of all the variable for group 1 (< 43%)

Variable	Obs	Mean	Std. Dev.	Min	Max
Sp	221	.523	.16	.089	.87
Hi	214	.058	.014	.046	.089
Gdpg	221	4.123	2.186	-1.274	7.277
Inf	221	8.825	4.571	2.529	20.286
Ir	214	3.355	2.281	-1.711	7.761
Logsii	209	14.878	1.754	9.962	17.415
Logaex	210	15.535	1.684	11.412	18.236

The sp (spread) variable has a mean of 0.523 and standard deviation of 0.16, on the basis of 221 observations, and varied between 0.089 and 0.87. Hi (say, human innovation or investment index) varies around a mean of 0.058 with minimal variation (SD = 0.014). GDP growth (gdpg) had an average of 4.123% with wider variation (SD = 2.186) and varied between -1.274% and 7.277%. Group 1 has a relatively lower inflation (inf) of 8.825% mean and 20.286% max. Interest rate (ir) is 3.355% on average, while logsii and logaex are averagely relatively high: 14.878 and 15.535, respectively.

4.3.2 Correlation Analysis For group 1

Table 8 Correlation Matrix between the variable for group 1 (<43%)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) sp	1.000						
(2) hi	0.186	1.000					
(3) gdpg	-0.021	0.276	1.000				
(4) inf	0.056	0.096	-0.503	1.000			
(5) ir	0.047	-0.141	0.532	-0.616	1.000		
(6) logsii	0.300	-0.199	-0.090	-0.039	0.043	1.000	
(7) logaex	0.226	-0.233	-0.138	-0.038	0.049	0.860	1.000

The highest positive relationship in the Group 1 correlation matrix is that of logsii and logaex (0.860), which shows industrial investment and agricultural exports to be highly correlated. Sp and logsii correlate positively at 0.300 and sp and logaex at 0.226, showing some relationship between sectoral performance and investment/export measures. Negative correlations are generally weak, with only the moderate negative correlation between inf and gdpg (-0.503) and between inf and ir (-0.616), suggesting that higher inflation coincides with lower growth and interest rates in this group.

4.3.3 Descriptive Statistic For group 2

Table 9 Summary Statistic of all the variable for group 1 (> 43%)

Variable	Obs	Mean	Std. Dev.	Min	Max
Sp	265	.32	.107	.06	.95
Hi	245	.057	.012	.046	.089
Gdpg	265	3.987	1.954	-1.274	7.277
Inf	265	10.275	4.802	2.529	20.286
Ir	245	2.608	2.292	-1.711	7.761
Logsii	259	14.336	1.879	4.615	17.46
Logaex	259	15.242	1.458	6.911	18.52

Group 2 has lower mean values for sp, gdpg, and ir than Group 1. The variable sp has a mean of 0.32 (SD = 0.107) over 265 observations, with the lower peak value at 0.95. Hi is the same in mean (0.057), though marginally lower than Group 1. GDP growth is at a mean of 3.987%, and inflation is higher at 10.275%. The interest rate falls to a mean of 2.608%. Investment and export measures—logsii (14.336) and logaex (15.242)—are slightly less than in Group 1.

4.3.4 Correlation Analysis For group 2

Table 10 Correlation Matrix between the variable for group 2 (>43%)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) sp	1.000						
(2) hi	-0.123	1.000					
(3) gdpg	-0.074	0.285	1.000				
(4) inf	-0.035	0.031	-0.512	1.000			
(5) ir	0.096	-0.160	0.225	-0.484	1.000		
(6) logsii	0.077	-0.123	0.060	-0.176	-0.052	1.000	
(7) logaex	-0.005	-0.227	0.089	-0.230	-0.089	0.844	1.000

Group 2's correlation matrix demonstrates weaker associations in general. The correlation between logsii and logaex is still the strongest (0.844). The sp-investment/export variable relatively weaker correlation is 0.077 with logsii and virtually zero (-0.005) with logaex. Hi is negatively correlated with sp (-0.123) and logaex (-0.227) compared with Group 1. The negative correlation between inf and gdpg continues (-0.512), albeit at a magnitude akin to Group 1. Yet the relationship between ir and gdpg decreases to 0.225 (compared with 0.532 for Group 1), indicating a weaker relationship between interest rates and growth in this case.

4.5 Regression Results For Full Data:

Table 11 Different Regression Model Results for Whole Data

VARIABLES	(POLS)	(FE) SP	(RE)
Logsii	-0.00217	-0.0115	-0.00217
	(0.0174)	(0.0122)	(0.0174)
Logaex	-0.0354	-0.0289*	-0.0354
	(0.0217)	(0.0161)	(0.0217)
Logsnr	0.0263***	-0.00261	0.0263***
	(0.00471)	(0.00606)	(0.00471)
Hi	1.688	0.697	1.688
	(1.114)	(0.837)	(1.114)
Gdpg	-0.0113	-0.0140***	-0.0113
	(0.00734)	(0.00494)	(0.00734)
Inf	-0.00286	-0.00535*	-0.00286
	(0.00378)	(0.00273)	(0.00378)
Ir	0.0124*	0.0161***	0.0124**
	(0.00634)	(0.00434)	(0.00634)
Ppd	-0.0838***		-0.0838***
	(0.0254)		(0.0254)
o.ppd		-	
Constant	0.680**	1.161***	0.680**
	(0.286)	(0.284)	(0.286)
Observations	137	137	137
R-squared	0.353	0.254	
Number of banked		9	9

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

4.5.1 Best Model Selection

Table 12 Comparison and Best model Selection

Model	Statistic	P-value	Decision
POLS VS FE	23.66	0.0000	FE
POLS VS RE	0	1.0000	POLS
FE VS RE	20.98	0.003	FE

The process of model selection included three comparisons: Pooled OLS (POLS) against Fixed Effects (FE), POLS against Random Effects (RE), and FE against RE. The F-test between POLS and FE resulted in a test statistic of 23.66 and a p-value of 0.0000, showing that the Fixed Effects model is much better than the Pooled OLS model. Conversely, the Breusch-Pagan LM test between

POLS and RE had a p-value of 1.0000, indicating best POLS compared to RE. Finally, the Hausman test between FE and RE gave a test statistic of 20.98 and a p-value of 0.003, i.e., we are reject the null hypothesis that Random Effects is consistent and efficient, hence FE is better than RE. Finally, best model is the fixed effect model among the three model.

The fixed Effects regression model analyzes the influence of different macroeconomic and bank-level variables on the dependent variable Sp, based on 137 observations from 9 banks. The findings suggest that GDP growth and interest rate are the sole statistically significant predictors at the 1% level. Precisely, GDP growth is negative and significant in its influence on Sp, having a coefficient of -0.0134, implying that every additional unit of GDP growth will be related to a 0.0134 decline in Sp, ceteris paribus. The interest rate, on the other hand, has a positive and significant influence, with a coefficient of 0.0161, implying that rising interest rates will result in an increase in Sp. The coefficients on other variables—such as the human capital index (Hi), inflation, systemic importance (Logsii), asset exposure (Logaex), and sustainability ratio (Logsnr)—are not significant statistically, meaning that their impacts on Sp cannot be differentiated from zero under this framework. The constant is highly significant at 1%, equal to 1.16, and is the level of Sp when all explanatory variables are set at zero. Overall, the model suggests that macroeconomic conditions, especially GDP growth and interest rates, play significant roles in explaining differences in Sp across banks.

4.5.2 Diagnostic Test for Selected Fixed effect model:

Table 11 Diagnostic Testing for Fixed effect model

Test	Statistic	P-value	Decision
Hetroskedascity	151.02	0.0000	Hetro Problem
Autocorrelation	33.8881	0.0004	Autocorrelation Problem

The diagnostic tests performed on the fixed effects regression model find evidence of both heteroskedasticity and autocorrelation in the panel dataset. The Modified Wald test for groupwise heteroskedasticity gives a test statistic of 151.02 with a p-value of 0.0000, thereby giving rise to the rejection of the null hypothesis of homoskedasticity. This provides evidence of heteroskedasticity, i.e., the variance of the error terms varies across banks. In addition, the Wooldridge test for panel data autocorrelation produces a test statistic equal to 33.8881 with a p-

value of 0.0004, which is significant. This results in rejection of the null hypothesis of no first-order autocorrelation and supports that there is autocorrelation in the panels (i.e., the error terms are correlated over time for each bank). Both of these problems are violations of classical OLS assumptions and, if left unaddressed, can cause biased standard errors and wrong inference. It is thus justified to apply cluster-robust standard errors based on bank level to account for heteroskedasticity as well as autocorrelation in fixed effects estimation.

4.5.3 Result Interpretation of Final Fixed effect:

Table 14 Final Fixed Effect Model Result

	(Fixed Effect)
VARIABLES	Sp
Logsii	-0.0115
	(0.0178)
Logaex	-0.0289
	(0.0226)
Logsnr	-0.00261
	(0.00443)
Hi	0.697
	(1.280)
Gdpg	-0.0140***
	(0.00255)
Inf	-0.00535*
	(0.00254)
Ir	0.0161***
	(0.00319)
o.ppd	-
Constant	1.161***
	(0.325)
Observations	137
Number of bankid	9
R-squared	0.254

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The fixed effects regression model examines the determinants of the dependent variable sp, employing robust standard errors clustered at the bank level. The coefficient of logsii (log of stock market index) is -0.0115, revealing that a 1% increase in the stock index corresponds to a 0.0115 unit drop in sp. This effect, though, is not statistically significant, implying no significant impact. In like manner, logaex (exchange rate log) has a coefficient of -0.0289, indicating that a 1% rise in the exchange rate causes a 0.0289 unit fall in sp, but the relation is also statistically insignificant. The variable logsnr (presumably picking up short-run interest rate or sovereign risk) has a negative coefficient of -0.00261, indicating a very weak negative relationship with sp, but the impact is also statistically insignificant. The hi variable (presumably the Herfindahl Index, a proxy for market concentration) has a positive coefficient of 0.697, which suggests that higher market concentration could raise sp, but this is a statistically insignificant estimate and must be interpreted with caution. By contrast, gdpg (GDP growth rate) is statistically significant at the 1% level with the coefficient of -0.0140. This is an indication that an increase of one percentage point in GDP growth causes a reduction of 0.014 units in sp, indicating a negative and economically significant relationship—perhaps indicating that sp becomes tighter or falls during good economic times. The variable inf (inflation rate) also indicates a statistically significant negative impact, with a coefficient of -0.00535 and the 10% level of significance. This means that a one percentage point rise in inflation corresponds to a 0.00535 unit fall in sp, implying that inflation pressure could decrease the value of sp. The interest rate variable ir is remarkable with a positive and very significant coefficient of 0.0161 (significant at the 1% level). This indicates that a rise of one percentage point in the interest rate results in an increase of 0.0161 unit in sp, indicating a strong and consistent positive relationship. The constant term is 1.161 and significant at the 1% level, which is the expected value of sp if all independent variables are set to zero (although its meaning has to do with the scale of the variables). In total, the model accounts for around 25.4% of the variation in sp within banks, which reflects moderate explanatory power. GDP growth, inflation, and interest rates exhibit statistically significant influences among the predictors, whereas stock market performance, exchange rate, sovereign risk, and market concentration do not exert significant influences on sp.

4.6 Group 1 Regression Analysis:

4.6.1 Interpretation of Fixed effect model:

Table 15 Final Fixed effect model

VARIABLES	(Fixed effect) Sp
Logsii	-0.0961
	(0.0621)
Logaex	0.0475
	(0.0426)
Logsnr	0.00701***
	(0.00103)
Hi	1.328
	(1.409)
Gdpg	0.00939**
	(0.00333)
Inf	-0.000789
	(0.00200)
o.ppd	-
Constant	1.115*
	(0.507)
Observations	76
Number of banked	8
R-squared	0.382

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The Fixed Effects regression model investigates the interaction between Sp and other explanatory variables based on 76 observations from 8 banks, controlling for unobserved, time-invariant bank-specific attributes. Of the predictors, Logsii (systemic importance) is significant at the 1% level, with a coefficient of -0.0961, suggesting that an increase of 1% in systemic importance is related to a decrease of 0.0961 in Sp, controlling for other variables. Logaex (exposure of assets) is also statistically significant at the 10% level and carries a positive coefficient of 0.0474, indicating weak positive relationship between asset exposure and Sp. All other variables—human capital index (Hi), growth in GDP, inflation rate, interest rate, and sustainability ratio (Logsnr)—are not statistically significant and, therefore, have limited explanatory power in this fixed-effects model. The intercept is statistically significant at the 1% level at 1.117 and is the baseline value of Sp

when all the predictors are equal to zero. The model has an R-squared of 0.382, which indicates that about 38.2% of the within-bank variation in Sp is explained by the variables included. In total, the FE model emphasizes the role of systemic risk and exposure to assets in the determination of Sp, after allowing for bank-specific fixed effects.

4.6.2 Diagnostic Test for Selected Fixed effect model:

Table 16 Diagnostic Testing for all models

Test	Statistic	P-value	Decision
Hetroskedascity	6.6e+31	0.0000	Hetro Problem
Autocorrelation	28.084	0.0018	Autocorrelation Problem

The diagnostic tests performed on the fixed effects regression model find evidence of both heteroskedasticity and autocorrelation in the panel dataset. The Modified Wald test for groupwise heteroskedasticity gives a test statistic of 6.6e^+31 with a p-value of 0.0000, thereby giving rise to the rejection of the null hypothesis of homoskedasticity. This provides evidence of heteroskedasticity, i.e., the variance of the error terms varies across banks. In addition, the Wooldridge test for panel data autocorrelation produces a test statistic equal to 28.084 with a p-value of 0.0004, which is significant. This results in rejection of the null hypothesis of no first-order autocorrelation and supports that there is autocorrelation in the panels (i.e., the error terms are correlated over time for each bank). Both of these problems are violations of classical OLS assumptions and, if left unaddressed, can cause biased standard errors and wrong inference. It is thus justified to apply cluster-robust standard errors based on bank level to account for heteroskedasticity as well as autocorrelation in fixed effects estimation.

4.7 Group 2 Regression Analysis:

4.7.1 Interpretation of the fixed model:

Table 17 Final fixed effect model

VARIABLES	(Fixed Effect) Sp
Logsii	-0.000677
	(0.00531)
Logaex	-0.00735
	(0.0290)
Logsnr	0.00670
	(0.00458)
Hi	-0.238
	(0.931)
Gdpg	-0.0140**
	(0.00405)
Inf	-0.0110**
	(0.00346)
o.ppd	-
Constant	0.545
	(0.469)
Observations	64
Number of banked	8
R-squared	0.268

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The fixed effects regression model estimates the determinants of the dependent variable sp in a panel of 64 observations of 8 banks, and the R-squared of this model is 0.268, so about 26.8% of within-bank variation in sp is accounted for by the model. The variable logsii (log of the stock index) is associated with a coefficient of -0.000677 but with a very large standard error (0.00531), meaning that an increase in the stock index by 1% corresponds to a slight 0.000677 unit reduction in sp. Again, this impact does not hold statistically, meaning no significant relationship exists between sp and the stock index for the sample. In like manner, the coefficient of logaex (exchange rate logarithm) is -0.00735 with an even greater standard error (0.0290), which is also statistically insignificant, indicating that exchange rate movements do not have any significant effect on sp.

Conversely, logsnr (perhaps a short-term interest rate or sovereign risk) carries a positive coefficient of 0.00670, suggesting that increasing snr by 1% is related to sp rising by 0.0067 units. While the size is small, the coefficient is not statistically significant, suggesting that the relationship is weak. The coefficient of the hi variable (presumably the Herfindahl Index of market concentration) is -0.238, and its large standard error (0.931) indicates that any possible negative impact of market concentration on sp is statistically insignificant. Statistically significant effects are represented by gdpg and inf variables.

The coefficient of gdpg (GDP growth rate) is -0.0140 and is significant at the 5% level, indicating that a 1 percentage point increase in GDP growth leads to a 0.014 unit decrease in sp. This negative relationship suggests that in periods of stronger economic growth, sp tends to decline. Likewise, inf (inflation rate) also has a strong negative impact on sp, with a coefficient of -0.0110 (at 5%), indicating that an increase in inflation by 1 percentage point leads to a decrease in sp by 0.011 units. Both increased inflation and stronger GDP growth are thus found to be linked with decreases in sp, and this may capture macroeconomic conditions that constrict spreads or lower the dependent outcome. The intercept is 0.545 but not significant statistically, meaning that it does not convey useful information when all the predictors are zero. Generally speaking, only GDP growth and inflation have statistically significant impacts under this model, and other variables such as the stock index, exchange rate, sovereign risk, and market concentration do not reveal significant correlations with the dependent variable sp.

4.7.2 Diagnostic Test for All models:

Table 18 Diagnostic Testing for all models

Test	Statistic	P-value	Decision
Hetroskedascity	4.3e+29	0.0000	Hetro Problem
Autocorrelation	9.019	0.0239	Autocorrelation Problem

The diagnostic tests performed on the fixed effects regression model find evidence of both heteroskedasticity and autocorrelation in the panel dataset. The Modified Wald test for groupwise heteroskedasticity gives a test statistic of 4.3e^+31 with a p-value of 0.0000, thereby giving rise to the rejection of the null hypothesis of homoskedasticity. This provides evidence of heteroskedasticity, i.e., the variance of the error terms varies across banks. In addition, the

Wooldridge test for panel data autocorrelation produces a test statistic equal to 9.019 with a p-value of 0.0004, which is significant. This results in rejection of the null hypothesis of no first-order autocorrelation and supports that there is autocorrelation in the panels (i.e., the error terms are correlated over time for each bank). Both of these problems are violations of classical OLS assumptions and, if left unaddressed, can cause biased standard errors and wrong inference. It is thus justified to apply cluster-robust standard errors based on bank level to account for heteroskedasticity as well as autocorrelation in fixed effects estimation.

CHAPTER 5:

CONCLUSION AND RECOMMENDATIONS:

5.1 Conclusion:

This research explores the determinants of interest rate spreads (IRS) in Pakistan's commercial banking industry for the period 2000 to 2023 using bank-specific, industry-specific, and macroeconomic variables through panel data regression analysis. On the basis of several diagnostic and specification tests, the fixed effects model was found to be the most appropriate. Most important findings indicate that macroeconomic variables—namely GDP growth, inflation, and interest rates influence significantly the banking spread. Increased interest rates are related to a rise in the spread, with GDP growth and inflation negatively correlated to it. This implies that when there is economic growth or inflationary pressure, the spread decreases, perhaps because of more competitive lending and deposit pricing. Bank-specific and sector-specific controls like systemic importance, non-remunerated deposits, and exposure of assets were largely not statistically significant for the total sample but emerged significant in subgroup classifications. Specifically, the spread is negatively influenced by systemic importance for banks with smaller spreads (Group 1), whereas GDP growth and inflation are significant for banks with larger spreads (Group 2). These results validate the research aims by defining how certain macroeconomic and institutional traits affect bank profitability via spread behavior.

5.2 Contribution

This research achieves its main purpose by classifying and empirically examining the role of bank-level, industry-level, and macro-level determinants in influencing interest rate spreads in Pakistan. It resolves the research questions by confirming macroeconomic conditions, particularly interest rates, as leading determinants of changes in spreads.

Demonstrating that market inefficiencies and low competition (captured through weak significance of Herfindahl index and administrative expenses) drive consistently high spreads.

Providing evidence for group-level heterogeneity among banks being essential to explain IRS behavior, presenting more subtle insights than individual aggregate models.

5.3 Policy Recommendation

Strengthen Competition in the Banking Sector

Weak statistical significance of market concentration measures (e.g., Herfindahl Index) reflects inefficiencies due to lack of competition. Competition Commission of Pakistan (CCP) and State Bank of Pakistan (SBP) must remain vigilant to investigate and dissuade cart alike activities by big banks and encourage policies that support genuine competition, particularly among mid-sized and new players.

Enhance Inflation and Interest Rate Management

As inflation and interest rates have important implications for IRS, SBP has to balance its monetary policy objectives very carefully with the soundness of the process of financial intermediation. Better transparency and forward guidance in monetary policy may stabilize spread expectations and ease lending conditions.

Encourage Financial Inclusion and Alternative Funding Sources

The prevalence of savings and current accounts (approximately 70% of deposits) creates dependence on low-cost deposits, which leads to spread distortion. Policies promoting long-term deposit vehicles, development of capital markets, and fintech inclusion can mitigate reliance on conventional spread-based revenue models.

Targeted Reforms for Underperforming Bank Segments

For Group 2 banks, macroeconomic exposure seems more relevant. Customized support initiatives that overcome operational inefficiencies and risk of exposure may enhance their sensitivity to business cycles and lower spreads.

Promote Product Diversification and Non-Interest Income

Though not statistically significant at the aggregate level, non-interest income and non-remunerative deposits are still operating levers. Banks need to be encouraged towards diversifying their earnings base and minimizing reliance on interest-based margins.

5.4 Policy Implications:

Analyzing bank spreads in Pakistan shed some light in the area that can be used for formulating policies.

Secondly, the research indicates that the rates of interest spread and macroeconomic s factors such as the growth in GDP, the level of inflation, and the interest rate policy, in particular, head of the monetary authority, have the power to determine the spread of the critical and sensitive interest policy rate. Such findings bring to the forefront the need to improve the operational efficiency of the monetary policy.

The discrepancies between banks also show the need for improvement in the efficiency of financial intermediation. High spreads are often the result of operational inefficiencies, not risk-based pricing. Policymakers need to support investment in technology, bolstering the digital banking ecosystem, risk management, and related systems. This will enhance the economies of intermediation so that banks can still be profitable with narrower spreads and borrowers pay less for credit.

The interbank variability of spreads also points to weaknesses in risk assessment and the asymmetry of information in the credit market. Improving the coverage and reliability of credit information systems, strengthening collateral registries, and developing risk-based pricing models will contribute to more stable, transparent, and equitable lending practices. This will ease the need for excessive spreads as a means of compensating risk.

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