Antecedents and Consequences of Interest Rate Spread: Case of Pakistan

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ABSTRACT

Interest rate spread plays a crucial role in the monetary policies of the government and has a substantial impact on the economy. This article examines the bank-specific determinants of interest rate spread which include capital adequacy ratio, non-performing loans, and overhead expenses. To analyze the impact of Interest Rate Spread (IRS) on the economy, specifically, change in GDP growth rate, change in the inflation rate, change in industrial growth rate, change in foreign exchange reserves, and change in the stock market index, while ROA, ROE, and NIM are used as profitability measures of the banking sector. Data from 2011-2020 is collected and analyzed through a linear regression model, which gives significant results as twenty-two out of twenty-four hypotheses are accepted. These results will help policymakers to better formulate monetary policies and will provide the basis for new insight into IRS.

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1.   Introduction

Banks are central financial pillars of an economy. They play a vital role in circulation, management and utilization of finance and financial instruments. Economic growth of economies depends upon the transitional role of these financial intermediaries as stated by (Anbar & Alper, 2011). Efficient performance of these institutions saves a financial setup from shocks and vulnerabilities. Key indicators of their performance are return on assets ROA, return on equity ROE and net interest margin NIM as discussed by Zeitun (2012), while these factors depend upon certain functions of banks. These tasks are of wide variety, but two major categories are there. These are interest activities and non-interest activities. Interest income generates major portion of profit and depends upon many factors such as policies of government, international trade, and financial policies of the government. These factors are usually not in control of bankers. Banks add their margin depending upon their expenses, certain policies and then offer the rate to customers. Here, bank specific factors will be discussed as determinants of interest rate spread. Major expenses include overhead expenses, the capital adequacy ratio, and the ratio of non-performing loans in that area (Umar & Sun, 2016; Zeng, 2012). According to Ekananda (2017), banks are the institutes which are responsible to bear the losses incurred due to bad debts, and the ratio varies. Hence, it is important to explore and discuss determinants of interest rate spread.

Interest rate spread basically has two components: lending spread and borrowing spread. It hereby means only risk premium factor of the lending and borrowing rate. Although higher spreads result in higher income, but it also leads to low industrial growth and other economic factors. As it demotivates potential investors (Beck & Hesse, 2009). Especially in

developing countries like Pakistan it is necessary to balance these forces so that entrepreneurs grow and make the economy profitable among competitors. Moreover, interest rate spread shows the additional costs which banks have to bear the intermediation costs, risks involved in the transactions, opportunity costs, and many more outlays (SBP, 2006). A high interest rate usually prevails in developing countries and developed countries avail the benefits of lower margins. Certain reasons are there such as high inflation rate, the monopoly of few banks, volatile political system, and higher risks (Mujeri & Islam, 2008).

As banks are vibrant components in economic growth, it is crucial to study, whether banks are improving the economy or not (Saymeh & Orabi, 2013). Important economic growth indicators are percentage change in GDP growth rate, percentage change in inflation rate, percentage change in current account balance, percentage change in foreign exchange reserves, percentage change in stock market index and percentage change in industrial growth rate (Jagirani, Zaidi, & Tahir, 2017; Khawaja & Din, 2007; Maiga, 2017).

Main objectives of the study are to explore the determinants of interest rate spread IRS, bank specific determinants, and the influence of IRS on the economy and firm performance. Further, why is interest rate spread higher? As in Pakistan, interest rate is high, creating troublesome situation for both industrialists and entrepreneurs to expand and start existing or new business. It is one of the main obstacles in industrial growth (Khawaja & Din, 2007). Banks explain their profitability as to expand their business and to provide facilities to even remote areas, in this regard the higher interest rate must participate in economic growth and profitability of the banking sector. Banks are earning higher profits, the annual profit of some banks reaches billions of rupees, which can contribute to the development of economy, hence, becoming effective. Although, it is used in bank expansion and upgradation of technology, yet it must have its involvement in economic growth and firm performance. Reduced spreads help investors to invest more and grow more. It ultimately leads towards industrial growth of the economy. Moreover, people save more money rather consuming it as they get suitable returns from banks.

2.   Literature Review

While interest rate spread has a key role in financial decision making, there is significant research available on the subject matter, but no literature is there concerning determinants of interest rate spread and its impact upon economy. Here is the theoretical framework supporting underlying research model.

Economic growth is negatively related to NPL ratio as higher NPL ratio lowers down lending activities while the reduction in NPL leads to revitalize the credit flow, increases economic activity, and boosts up the output, as Balgova, Nies, and Plekhanov (2016), stated in their paper regarding economic impact of NPL reduction. Ekananda (2017), explained the inter-dependent relationship of NPL and macroeconomic indicators. Ghosh (2015) stated NPL, responsible for certain economic crises and banking failures.

H1a & b: Non-performing loans has a significant positive relationship with lending and borrowing spread

Interest rate spread is sometimes used as the way to determine intermediation efficiency i.e., cost reduction, expenses regarding managing loans and deposits etc., (Beck & Hesse, 2009; Hussain, Khalil, & Nawaz, 2013). They named these costs as frictional forces which can affect the interest rate spreads or gaps significantly. These costs include all the processes involved in depositing and lending activities, operating costs, administration costs and other expenses to drive the channel (Dbouk & Kryzanowski, 2010; Emmanuelle, 2003; Hussain, Rafique, Khalil, & Nawaz, 2013). Higher margins can be caused by higher overhead expenses.

H2a & b: Overhead expenses positively affect lending spread and borrowing spread

Ahmad, Gul, and Saeed (2010), conducted research to study the relationship of the high interest rate with stock market capitalization, and they measured interest rate by using KIBOR, repo and interbank lending rate. Improved CAR enhances trust of stakeholders and

investors in the bank by increasing its creditworthiness (Rostami, 2015; Saleem, Hussain, & Ibraheem, 2020).

H3a & b: Capital adequacy ratio has a strong positive relationship with lending spread and borrowing spread

Smith stated that inflation affects the lending and borrowing rates if monetary shocks affect these rates differently. Mondal, 2016, studied the relationship of GDP growth rate, inflation rate, the IRS and NPL, as these are the strong indicators of economic growth. NPL is closely related to IRS, and it affects the economy as it has an interdependent relationship with monetary policy.

H4a & b: Lending and borrowing spread positively affect change in GDP growth rate
H5a & b: Lending and borrowing spread have a strong positive influence on percentage change in inflation rate

Demirgüç-Kunt and Levine (2004), described various factors regarding higher lending rates and concluded that when lenders must deal in the uncertain environment or in the sectors where risk factor is high, they keep their interest rate and margin high, moreover, loan loss provisions and higher liquidity ratio tend to decrease the profitability low (Hameed, Hussain, Marri, & Bhatti, 2021).

H6a & b: Lending and borrowing spread positively impact percentage change in current account balance
H7a & b: Lending and borrowing spread have a positive impact on percentage change in foreign exchange reserve

Waqas, Fatima, Khan, and Arif (2017) studies relationship of interest rate with certain variables such as GDP, inflation rate, real exchange rate and unemployment rate. Ahmad et al. (2010) stated that higher interest rate causes stock market capitalization to expand.

H8a & b: Lending and borrowing spread have a positive relationship with percentage change in stock market index
H9a & b: Lending and borrowing spread positively affect percentage change in industrial growth rate

Rachman, Kadarusman, Anggriono, and Setiadi (2018) directed a study to ascertain the relationship of NPL and profitability of banks including credit growth and used net interest margin NIM as profitability indicator. Zeb and Bashir (2016), stated bank size, ownership, liquidity management, capitalization and interest rate risk as important variables to study NIM. They also included GDP growth rate and inflation rate as economic indicators. They stated ROA, ROE and NIM as most important profitability indicators in banking sector.

H10a & b: Lending and borrowing spread have a positive impact on net interest margin.
H11a & b: Lending and borrowing spread have a significant positive relationship with return on assets
H12a & b: Lending and borrowing spread have a positive relationship with return on equity

3. Methodology

Main variable of study is interest rate spread, split into two parts: lending and borrowing spread. IRS is used as the abbreviation of interest rate spread. Lending and borrowing both spreads are the rates minus KIBOR rate. That only risk premium and base rate are included and KIBOR is deducted. Determinants of interest rate spread include overhead expenses, CAR and NPL. Overhead expenses consist of administration expenses, salaries, utilities, etc., hence, non-interest expenses from the balance sheet are included. CAR and NPL both are given in annual reports of the banks.

Non-performing loans or NPL as defined by Zeng are the problem loans, their maturity date is expired at least 90 days before they are declared as non-performing loans, their interest and principal amount both are outstanding and now classified as bad debts in books of accounts (BIS, 2006).

Capital adequacy ratio or CAR measures risk-weighted assets with respect to risk-weighted credit coverage, its two tiers indicate risk covering ability and losses during liquidation (Musah, Anokye, & Gakpetor, 2018).

Percentage change in GDP growth rate, industrial growth rate here means growth rate or profitability growth rate of banking sector. Stock exchange rate included change in stock exchange points on the annual basis. Change in current account balance is percentage change in current account balance of Pakistan during the considered years.

As the difference between lending spread and borrowing spread was constant and stationarity occurred. Due to the reason, weighted lending spread and weighted borrowing spread on the asset basis was taken. As the values are large, so, the natural log of both values is taken to avoid any risk.

Annual reports of all 33 banks are taken into consideration for bank specific variables while for economic indicators official economic websites are accounted. Time duration is from January 2011 to December 2020.

4.   Research model
This model represents the determinants of interest rate spread i.e., NPL, Overhead expenses and CAR, while interest rate spread is split into two components, lending spread, and borrowing spread. The impact of IRS is studied on economic variables which are percentage change in GDP growth rate, percentage change in inflation rate, percentage change in current account balance, percentage change in foreign exchange reserves, %age change in stock market index and %age change in industrial growth rate. Whereas profitability indicators of banking sector discussed are NIM, ROA and ROE.

Figure 1: Antecedents and precedents of interest rate spread
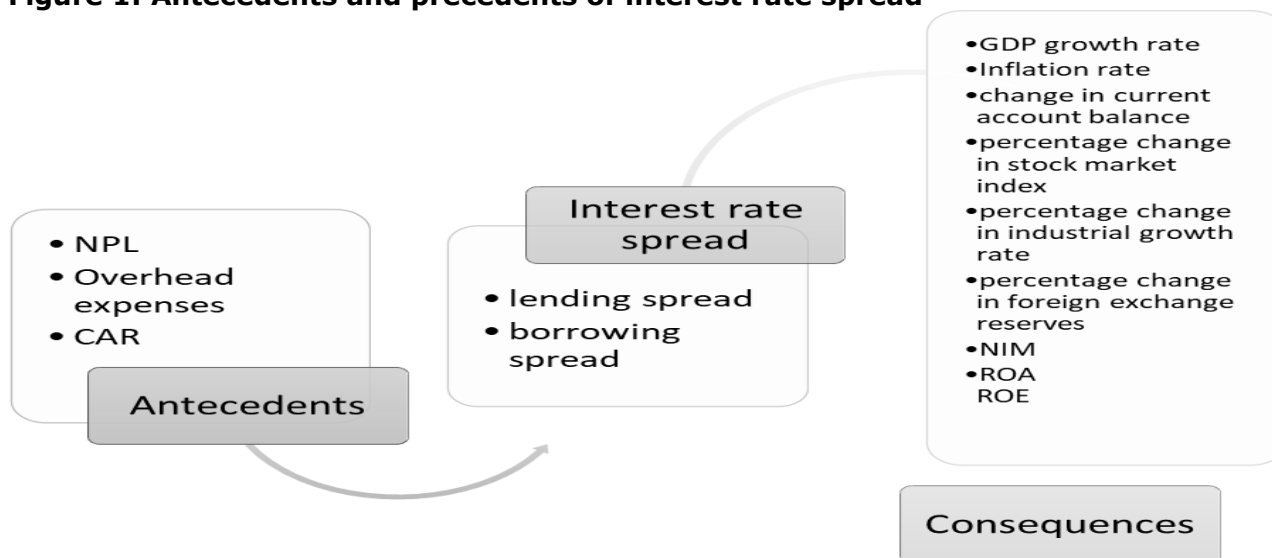
5.   Descriptive Analysis
In descriptive statistics, main data analyzing techniques used are min., max., and mean of the values and standard deviation of data sets. These are explained further.

While analyzing different variables, it showed different values such as for NPL, 729 is the minimum integer, maximum is 171812612, and mean indicates 1996391.37, while std. deviation is 26262986.522. On the other hand, overhead expenses show -14090605 as minimum integer, 194826000 as maximum integer, 10375557.86 as mean and 16174371.02 as std. deviation. Minimum, maximum, mean and standard deviation values for CAR are -107.95, 1139.33, 24.19 and 68.00 respectively.

Data for weighted spread(lending) depicts 17.08 as minimum, 24.46 as maximum, 21.25 as mean and 1.59 as std. deviation, while these values for weighted borrowing spread has 17.00 as minimum, 24.42 as maximum, 21.19 as mean and 1.59 as standard deviation.

Table 1: Descriptives for all variables

Variables	Mean value	S. Dev.	Min	Max	Number of Observations
NIM	3.366031	1.752513	-5.55986	10.06096	316
ROA	3.167266	1.733947	-5.567148	9.994127	345
ROE	36.67087	47.20461	-29.66996	842.0477	345
CAR	24.19977	68.00533	-107.95	1139.33	333
NPL	1.96e+07	2.63e+07	729	1.72e+08	330
Overhead Expenses	1.04e+07	1.62e+07	-1.41e+07	1.95e+08	346
Logwls	21.25449	1.593724	17.08388	24.46074	346
Logwbs	21.19808	1.595199	17.00306	24.42283	346
GDP growth rate	3.560909	1.982325	-0.4	5.836	363
Inflation rate	7.608182	3.355255	2.86	13.66	363
Change in current account balance	-208.9473	658.5771	-2276.64	147.33	363
Change in stock market index	17.22273	22.77398	-15.34	49.43	363
Change in industrial growth rate	-62.28717	249.2331	-805.7866	87.04128	330
Change in foreign exchange reserve	-9.195151	37.7324	-78.9042	46.52268	330

In data set of percentage change in GDP growth rate, -4.00, 5.836, 3.56 and 1.98 are serving as minimum, maximum, mean and std. deviation values respectively. 2.86 as minimum, 13.66 as maximum, 7.61 as mean and 3.36 as std. deviation are representing values for percentage change in inflation rate. For percentage change in current account balance, these are -2276.64 (minimum), 147.33 (maximum), -208.94 (mean value) and for std. deviation it is 658.5771. -15.34 as minimum integer, 49.43 as maximum, 17.22 as mean and 22.78 as standard deviation are the data analysis results for percentage change in stock market index.

Percentage change in industrial growth rate has these values; -805.79 as minimum, 87.04 as maximum, -62.29 for mean and 249.33 for standard deviation. 78.90 is minimum value for percentage change in foreign exchange reserve, while 46.52 is maximum value, 9.19 ia mean and 37.73 is standard deviation.

Min. integer for net interest margin is -5.5, max. is 10.06, mean is 3.37 and std. deviation is 1.76. Minimum, maximum, mean and standard deviation values for ROA are -0.57, 9.95, 3.16 and 1.73. -29.67 is minimum value for ROE, 842.05 is maximum integer, 36.67 is mean and 47.20 is standard deviation value.

6. Regression analysis

To examine the relationship between CAR, NPL, overhead expenses and lending spread, regression analysis is performed which contains fixed, random and Hausman test. Coefficients including beta have very small value. Significance levels vary with respect to the hypothesis i.e., for CAR and NPL, it is significant but much more significant for overhead expenses in both fixed and random effects. R square is 0.5586. Here chi square has -2.77 value which means random effect is more suitable hence, executed.

Fixed and random effect coefficients for CAR, NPL, overhead expenses and borrowing spread depict extremely low numerical values. Beta value has same pattern as of coefficients. While significance level is considerable for CAR and NPL. For overhead expenses, significance value is perfectly high showing a strong relationship between both variables. R square is 0.5550. Chi square is -2.86 which shows that random effect is suitable for these variables hence, executed.

Table 1: Combined regression results

Sr.	R^2	Chi^2	Effect	T	B	Sig.	Results
H1a	0.5586	-2.77	Random	1.95	6.77e-09	0.002	Accepted
H1b	0.5550	-2.86	Random	1.95	6.91e-09	0.002	Accepted
H2a	0.5586	-2.77	Random	6.27	2.65e-08	0.000	Accepted
H2b	0.5550	-2.86	Random	6.00	2.58e-08	0.000	Accepted
H3a	0.5586	-2.77	Random	-2.45	-0.0045843	0.007	Accepted
H3b	0.5550	-2.86	Random	-2.43	-0.00462	0.007	Accepted
H4a	0.0655	13.00	Fixed	6.60	42.38013	0.000	Accepted
H4b	0.0655	13.00	Fixed	-6.78	-43.1619	0.000	Accepted
H5a	0.1057	42.10	Fixed	-13.49	-128.6674	0.000	Accepted
H5b	0.1057	42.10	Fixed	13.38	126.5568	0.000	Accepted
H6a	0.0074	21.74	Fixed	3.65	8285.924	0.000	Accepted
H6b	0.0074	21.74	Fixed	-3.52	-7926.226	0.000	Accepted
H7a	0.0185	0.11	Random	2.27	344.5433	0.015	Accepted
H7b	0.0185	0.11	Random	-2.29	-342.7258	0.015	Accepted
H8a	0.0068	37.78	Fixed	-3.10	-240.492	0.002	Accepted
H8b	0.0068	37.78	Fixed	2.92	224.3874	0.004	Accepted
H9a	0.0594	70.55	Fixed	5.95	4835.689	0.000	Accepted
H9b	0.0594	70.55	Fixed	-6.29	-5056.595	0.000	Accepted
H10a	0.0035	7.92	Fixed	-2.29	-9.520865	0.023	Accepted
H10b	0.0035	7.92	Fixed	2.21	9.10386	0.028	Accepted
H11a	0.0043	6.85	Fixed	-2.05	-7.780918	0.041	Accepted
H11b	0.0043	6.85	Fixed	1.97	7.431599	0.050	Accepted

In fixed and random effects, coefficients provide better value as they show a negative relation and dependency of lending spread with NIM but a positive relationship with borrowing spread. Significance level is high in fixed effect but slightly lowers down in random effect. Chi square shows 7.92 value; hence the fixed effect is executed. Moreover, R square is 0.0035.

Fixed and random effects show that lending spread has negative relationship with ROA while borrowing spread has positive relationship which is depicted by coefficient values. Beta also repeats the pattern. In fixed and random effect borrowing spread shows no significance with ROA. Lending spread is also insignificant according to random effect but has improved value in fixed effect. Chi square is 6.85 hence, fixed effect is performed. R square is 0.0043.

Coefficients in fixed and random effects depict strong relationship between these variables. Direction of relationship varies as lending spread has positive impact and borrowing spread has negative relationship with ROE. Significance level also shows an insignificant relationship between all these variables. Chi square has 0.07 value hence, random effect is performed. R square is 0.0195.

Coefficients in fixed and random effects show strong values but the direction of relationship vary. Such that lending spread has positive relationship with GDP growth rate while borrowing spread has negative relationship. There is a perfectly significant relationship between all three variables. Chi square is 13.00 which shows that fixed effect is performed. R square is 0.0655.

Coefficients in both effects demonstrate strong relationship of lending and borrowing spread with inflation rate. Inflation rate has negative relationship with lending spread while it has positive relationship with borrowing spread. Both have a significant relationship with inflation rate. Chi square is 42.10, describing that fixed effect is performed. R square is 0.1057.

Change in current account balance has a strong coefficient value in fixed and random effects performed in regression analysis. Lending spread denotes positive relationship while borrowing spread shows a negative association with change in current account balance. Beta portrays the same form of relationship. Both have a significant association with percentage change in current account balance. Chi square has value equal to 21.74 hence, fixed effect is performed. R square is 0.0074

Fixed and random effects showed strong coefficient values, but direction of relationship differs as lending spread has negative while borrowing spread has positive relationship with change in stock market index. Both have a significant relationship in fixed effect but insignificant relationship in random effect. Chi square is 37.78 describing fixed effect is performed. R square is 0.0068.

Coefficients in fixed and random effect have strong values but direction varies as lending spread has positive relationship while borrowing spread has negative relationship. Beta value also show the same pattern of relationship. Both has a significant relationship with change in industrial growth rate. Chi square has value 70.55 which means that fixed effect is performed. R square is 0.0594.

7. Conclusion

The article scrutinizes the relationship of interest rate spread with vital economic indicators and industry specific profitability scales. It also sightsees the major bank specific determinants of interest rate spread. As interest rate spread has a substantial role in major financial decisions and economic policies. Industries have to measure cost benefit analysis for financing decisions and selecting sources of funds. Most of the firms use bank loans for the purpose and they face hurdles when this cost arises from a certain limit. Opportunity cost to utilize these increases, as bank can invest in rather than paying high interest. But they have to adjust in the scenario due to certain market conditions. The article uses data of last 10 years from all 33 commercial   Pakistani banks and economic variables to determine the importance of each variable.

Owusu-Ankamah and Sakyi (2021) found non-performing loans has a negative relationship with interest rate spread. Mondal found a significant relationship between NPL, IRS and GDP growth rate, while she found insignificant relationship with inflation rate. On the other hand, Waqas et al. (2017) found insignificant relationship between all these variables including real exchange rate and unemployment rate. Ahmad et al. (2010) concluded that higher interest rate leads to more stock market capitalization. They argued their different results are due to the reason those previous researchers held their studies in developed countries while their work was related to Pakistan, which is a developing country. Hence, macroeconomic conditions vary.

Beck and Hesse (2009) found overhead costs and ROA positively related to interest rate margins. They found inflation rate and GDP growth rate positively related to spreads while change in exchange rate as negatively correlated. The data analyzing method (standard linear regression) exhibited that non-performing loan sources minor modification in IRS. While overhead expenses root a noteworthy change in both spreads. CAR depicts a vigorous influence in varying spread. As banks usually intensify their spreads to avail additional profits and attempt to reduce the expenditures, generally including overhead, non-interest and interest expenditures, hereafter, results in increased net interest margin, ROE and ROA. Jefferis, Kasekende, Rubatsimbira, and Ntungire (2020) indicates straight association between IRS and return on equity, furthermore, non-performing loan was considered as the causing factor of IRS and concluded a positive association for IRS and non-performing loans

Interest rate spread shows significant effect on percentage change in GDP growth rate while backing as well as solidifying the drive for the research. Percentage change in the values of current account balance undergoes major change due to both spreads. Percentage change in stock market index significantly impacts these spreads and they have a strong relationship with percentage change in industrial growth rate. Percentage change in foreign exchange reserves significantly modify due to lending and borrowing spread. Lending and borrowing both

spreads have a strong impact on NIM. Return on asset ROA and return on equity ROE both experience small changes due to lending spread and borrowing spread.

Zeb and Bashir (2016) concluded that there is a significant relationship between NIM and interest rate risk but there is no significant relationship among NIM, GDP and inflation rate specifically in case of Pakistan.

The study is significantly important for all stake holders including government, banking sector heads, policy makers, customers of banking sector and even an ordinary man. As interest rate spread shows a significant relationship with GDP growth rate of the economy. It shows a strong relationship with inflation rate and stock market index. All these are important indicators of economic growth and as they are dependent upon interest rate, so, policy makers such as state bank of Pakistan, government of Pakistan and banking sector heads must keep their efforts high to lessen interest rate spread. This will result in industrial growth, increase in GDP, high stock market index, and less inflation rate. People will tend towards investments and savings which will ultimately benefit the economy. That benefit will be much greater and long lasting than increasing interest rate supply. It will initiate development phase in Pakistan which will help to survive in this highly competitive globe.

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