

An Analysis of Macroeconomic Variables and Interest Rate Spread in Pakistan

Author's Detail:

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Abstract:

The research was carried out to examine the impact of macroeconomic variables on Interest Rate Spread (IRS) in the context of Pakistan. The secondary data from 2000 to 2014 was taken to evaluate the results. After evolving of 8 hypotheses, three out of eight hypotheses were rejected, and 5 were accepted. Simple multiple regression model was used as a statistical tool. The results concluded that model was statistically significant and macroeconomic variables have a significant effect on interest rate spread (IRS). Results also depicted that there is a negative relationship between Interest Rate Spread (IRS) and Domestic Gross Product (GDP), Inflation and lending interest rate (LIR). Moreover, there is a positive relationship between IRS and Risk Premium on Lending (RPL).

Keywords: Interest Rate Spread (IRS), Gross Domestic Product, Lending Interest Rate (LIR), Risk Premium on Lending (RPL).

1. INTRODUCTION

1.1 Background: The term interest rate spread is the difference between deposits and lending rates, *Akinlo and Babatunde (2012)*. Financial intermediation and mobilization of funds are the core functions of the banking business. The banks take deposits from the customers and pay an interest rate on their deposits. The interest rate paid on the deposits is known as "Borrowing Rate." Similarly, when banks provide loaning facility to the borrowers, interest is charged which is commonly known as "Lending Rate." The gap between borrowing and lending rate is called interest rate spread, *Amoako, and Sheriff (2014)*. Usually, banks charge higher lending rates than borrowing to earn decent profits.

This research is vital in a way that how macroeconomic variables affect interest rate spread in Pakistan. Interest rate spread itself is a significant variable which demonstrates the profitability of financial institutions, in particular for the commercial banks. Banks accumulate profit after a difference of what they earn on advances portfolio and what they pay to their depositors on the deposits. Similarly, macroeconomic variables are also far most essential factors to stimulate the economy as a whole. Moreover, if the interest rate spread (IRS) is affected either directly or indirectly, it may influence the profitability of financial institutions. Therefore, it is vital to evaluate and examine the impact of macroeconomic variables on interest rate spread (IRS) in the context of Pakistan.

1.2 Research Problem

Generally, net interest rate spread increases the profitability of the banks and alternatively reduction in it will decrease the bank performance, *Folawewo, and David (2008)*. This research wants to examine whether macroeconomic variables affect interest rate spread or not in the context of Pakistan.

1.3 Research Questions

In this research, the researcher is going to answer the following research questions.

1. Whether macroeconomic variables affect interest rate spread in Pakistan.
2. Is there any relationship between macroeconomic variables and interest rate spread?
3. To what extent macroeconomic variables affect interest rate spread in Pakistan?

1.4 Objectives of the study

The following are the three key objectives of the research.

- To evaluate the relationship between interest rate spread and macroeconomic variables.
- To determine the impact of macroeconomic variables on interest rate spread.
- To examine the effect of major macroeconomic variables on interest rate spread.

Some number of researchers has already been employed by various researchers around the world, but no study has yet been done in Pakistan that evaluates the impact of macroeconomic variables on interest rate spread (IRS) as a whole. It is assumed that there is a direct relationship between macroeconomic variables and Interest Rate Spread (IRS).

2. PREVIOUS STUDIES

One of the key indicators of banking sector effectiveness is to gain high net interest rate spread which is mainly found higher in Africa, Latin America, and Caribbean Countries, but it is also a pervasive idea of many stakeholders that high-interest rate spread are set by the banks to increase the profitability, *Folawewo, and David (2008)*. The bank interest rate spread was used as a dependent variable, while macro determinants and market determinants were used as independent variables. Annual data from International Financial Statistics for the year 1988-2003 was used as a data set. Around 33 countries were being used. Descriptive statistics was used to analyze the data. The correlation matrix was used to evaluate the relationship between the variables. Correlation coefficient also indicated that there is no multicollinearity problem in the estimations. All variables were at stationary at average level. The study concluded that major macroeconomic variables played very vital role in defining variation in Interest Rate Spread.

High-interest rate spreads tend to discourage the savers and limiting the funds available to investors, *Akinlo and Babatunde (2012)*. The panel data of 12 commercial banks for the period 1986-2007 was used to analyze the results. The result demonstrated that cash reserve requirement, average loans to average total deposit, remuneration to total asset and gross domestic product have a positive effect on interest rate spread. Moreover, non-interest income to average total assets, treasury certificate and development stocks have a negative relationship with interest rate spread.

Ghana is considered as one of the large country regarding high-interest rate spread. The study of interest rate spread is also vital regarding asset and liability management. Reserve requirement, Treasury bill rates, discount rate, inflation, Government borrowing and economic growth were the variables being used. Time series data for the period 1990 to 2010 was used for the study, *Garr and Coleman (2013)*. The results indicated that Government Security and Government borrowing also have a significant relationship with interest rate spread (IRS). Government borrowing had a negative correlation with interest rate spread (IRS). *Barajas, Steiner, and Salazar (1999)*, in their research paper, discussed that significant variables of the financial system are the difference between interest rates on deposits and interest rates on advances. If the difference is high, then it faces huge hindrance towards development and expansion of financial intermediation system, since it discourages saver and investor. The paper examined the high spread in Colombian banking sector for over two decades. Market power, real loans, real wage rate and nonperforming loans (NPLs) were variables used in the research. The panel data techniques with the help of single equation specification were used. The results indicated that real wage has a high correlation with scale variable (Real loans) which was not significant when the size variable is excluded, wages became significant. The study concluded and found a positive relationship between loan quality and the spread. *Nampewo (2012)*, in his research paper, examined the major causes of continuous large Interest Rate Spread in Uganda's banking industry with the help of co-integration test.

Collins and Wanjan (2011), in his research paper, examined the relationship between interest rate spread and nonperforming loans. The research conducted a detailed study of 43 commercial banks working in Kenya. The study found that Interest Rate Spread has a significant impact on growth and development on the economy. Interest rate spread tells how effectively banks render their role towards saving mobilization. If interest rate spreads are high, it means they may be harmful to the economic growth, *Grenade (2007)*. Variation in interest rate spread also occurs due to change in money supply, demand and deviation in the main macroeconomic variables such as monetary policy. The study examined the short-term and long-term relationship for policy recommendations that will benefit to all stakeholders.

The study used autoregressive distributed lag (ARDL) Cointegration and Vector Error Correction Analysis (VEC). The research found a short-term and long-term relationship between macroeconomic variables and interest rate spread in Ghana. The interest rate spread is affected by the bank's macroeconomic variables. There is an essential relationship between interest rate spread and banking industry efficiency. The inefficient banking system might lead the higher cost of intermediation, *Kaakunga (2014)*. Panel data and OLS techniques were used to evaluate the bank-specific variables affecting interest rate spread. The results indicated that fixed effect model is appropriate for net interest margin in Namibia. The interest rate is a

significant factor that influences the economic prosperity. The interest rate is very essential in a way that it stimulates monetary policy and subsequently affects the economy, *Nduatiirungu.P (2013)*. The sample of 43 commercial banks in Kenya was employed. Secondary data of two years from 2011 to 2012 was covered. The simple regression along with ANOVA test was applied to find the significance. The research demonstrated a strong positive relationship between financial performances of commercial banks with interest rate.

The banks in Kenya charge high-risk premium to cover the anticipated default risk. The significant variation in interest rate spread might affect the macroeconomic variables such as monetary and fiscal policy, *Ngugi (2001)*. High-interest rates spread in Bangladesh are having the major concern to policy makers and regulators. The economists are seriously concerned with the increasing trends of concern spread, *Aferoze (2013)*. The secondary data for the period from 1974-2011 was received from the annual report. Granger Causality test was applied to check the results. Brazilian Central Bank showed reservations for the significant level of bank interest rate margin. The purpose of the study was to examine the primary determinants of bank interest margin in Brazil by using an econometric approach. The research concluded that high default level and high operating costs are the two main reasons of high bank interest margin. Panel data techniques were employed to address main determinants of macro and micro economic factors, *Afmasieff, Lhacer, and Nakane, (2002)*. The interest rate keeps a large number of deviation and therefore known as a vital source of risk for asset investment. The interest rate is very volatile for both economic and financial market. The objective of the study was to evaluate the link between real estate market returns and macroeconomic factors, *Xu. Y (2010)*.

3. HYPOTHESES OF THE RESEARCH

Based on the previous studies, the following hypotheses are evolved.

H₁: There is a negative relationship between interest rate spread (IRS) gross saving percent of GDP.

H₂: There is a negative relationship between interest rate spread (IRS) and inflation.

H₃: There is a positive relationship between interest rate spread (IRS) and Gross Domestic Product (GDP).

H₄: There is a positive relationship between interest rate spread (IRS) and Risk Premium on Lending.

H₅: There is a negative relationship between interest rate spread (IRS) and real interest rate.

H₆: There is a negative relationship between interest rate spread (IRS) and deposit interest rates.

H₇: There is a positive relationship between interest rate spread (IRS) and lending interest rates.

H₈: Macroeconomic variables significantly affect interest rate spread (IRS).

4. RESEARCH METHODOLOGY

The literature provided different models for macroeconomic variables which affect interest rate spread (IRS). There is no single model explained the impact of macroeconomic variables on interest rate spread (IRS) and could not evaluate the relationship between macroeconomic variables and interest rate spread (IRS) in Pakistan.

Model Specification: We have used the determinants from previous studies to guide our choice of independent variables. Previous studies considered determinants of interest rate spread and the impact of interest rate spread (IRS) in the world, but we have taken macroeconomic variables into account to examine the impact in the context of Pakistan. Our model is based on multiple regression model depicted below.

$$Y = \beta_0 + \beta_1 X_i + \epsilon_i$$

$$IRS = \beta_0 + \beta_1 GSGDP + \beta_2 INF + \beta_3 GDP + \beta_4 RPL + \beta_5 RIR + \beta_6 DIR + \beta_7 LIR + \epsilon_i$$



Table No: 1 Variables and Predicted Relationship

Variables	Full Name of Variable	Predicted Relationship
Dependent		
IRS	Interest Rate Spread	
Independent Variable		
GSGDP	Gross Saving in % of Gross Domestic Product	Negative (-)
INF	Inflation	Negative (-)
GDP	Gross Domestic Product	Positive (+)
RPL	Risk Premium on Lending	Positive (+)
RIR	Real Interest Rate	Negative (-)
DIR	Deposit Interest Rate	Negative (-)
LIR	Lending Interest Rate	Positive (+)

4.1 Sample and Data Selection

The primary objective of this research was to examine the impact of macroeconomic variables on interest rate spread (IRS) in Pakistan. Time series data of 15 years starting from 2000 to 2015 was taken as a sample. The secondary data from World Bank was employed. Data was analyzed by using SPSS and EVIEWS. Hypotheses were tested at ($\alpha = 0.05$) level of significance (0.95 confidence level).

Table No: 2 Hypotheses and Statistical Tools to be used

Hypotheses	Statistical Tools	Rationale for Choice of the Test
H_1	Pearson Correlation	It measures the association between the variables.
H_2	Pearson Correlation	-----do-----
H_3	Pearson Correlation	-----do-----
H_4	Pearson Correlation	-----do-----
H_5	Pearson Correlation	-----do-----
H_6	Pearson Correlation	-----do-----
H_7	Pearson Correlation	-----do-----
H_8	Regression	Regression model evaluate the Impact of one variable on another

5. EMPIRICAL RESULTS, FINDINGS, AND DISCUSSION

Table No: 3 Augmented Dickey-Fuller (ADF) test Statistics

Variable	t-Statistics	Prob. Values	Difference Level
IRS	-0.319668	0.8988	At Level
	-3.109577	0.0554	1 st Difference
GDP	- 3.178237	0.0474	At Level
GSGDP	- 1.498055	0.5051	At Level
	- 2.632654	0.1116	1 st Difference
	-4.981013	0.0026	2 nd Difference
INF	-1.859058	0.3397	At Level
	-4.653172	0.0037	1 st Difference
LIR	-2.950602	0.0710	At Level
RIR	-4.419458	0.0048	At Level
RPL	-1.800046	0.3650	At Level
	-3.723698	0.0193	1 st Difference
DIR	-1.074475	0.6942	At Level
	-2.810947	0.0836	1 st Difference

Augmented Dickey-Fuller (ADF) test is more efficient than Dickey-Fuller test. This test is used to identify whether the data is stationary or not, *Gujarati (2003)*. ADF test was run and observed that independent variable Interest rate spread is non-stationary at the level and stationary at the 1st difference. Dependent Variable Gross Domestic Product (GDP), Lending Interest Rate (LIR) and Real Interest rate (RIR) seem stationary at level. Moreover, dependent variables Risk Premium on Lending (RPL), Deposit Interest Rate (DIR) and Inflation (INF) are non-stationary at the level and stationary at the 1st difference. Furthermore, dependent variable Gross Saving percentage of GDP (GSGDP) is non-stationary at the level and 1st difference but stationary at the 2nd difference.

5.1 Regression Test Results

Table No: 4 Descriptive Statistics

R-Value	R-Square	Adjusted R-Square	Durbin-Watson	F-Statistics	Sig.Value
.911	.829	.658	2.655	4.855	0.027

The above results give us the insight that how well our overall model fits. The first measure is *R-square*. The results of *R-square* shows that there is 82.9% observed variability in the dependent variable explained by independent variables. The remaining deviations are explained by some other factors which are other than the variables selected for this research or which is beyond the scope of my research. The *adjusted R-square* measures the portion of total deviation of dependent variable explained by independent variables. Moreover, F-Statistics and probability values show that the model is significant. Durbin-Watson test results are justified enough to stand out that there is no autocorrelation. Hence the findings are related with the findings of *Aferoze (2013)*.

Table: 5 Pearson Correlation

		Correlations							
		IRS	GDP	GSGDP	INF	LIR	RIR	RPL	DIR
IRS	Pearson Correlation	1	-.026	.063	-.020	-.210	-.544'	.025	-.369
	Sig. (2-tailed)		.926	.823	.942	.454	.036	.929	.176
	N	15	15	15	15	15	15	15	15
GDP	Pearson Correlation	-.026	1	.549'	-.374	-.380	.092	.323	-.735''
	Sig. (2-tailed)	.926		.034	.169	.163	.744	.240	.002
	N	15	15	15	15	15	15	15	15
GSGDP	Pearson Correlation	.063	.549'	1	-.595'	-.634'	.051	.636'	-.658''
	Sig. (2-tailed)	.823	.034		.019	.011	.856	.011	.008
	N	15	15	15	15	15	15	15	15
INF	Pearson Correlation	-.020	-.374	-.595'	1	.772''	-.127	-.722''	.495
	Sig. (2-tailed)	.942	.169	.019		.001	.652	.002	.060
	N	15	15	15	15	15	15	15	15
LIR	Pearson Correlation	-.210	-.380	-.634'	.772''	1	-.015	-.823''	.799''
	Sig. (2-tailed)	.454	.163	.011	.001		.958	.000	.000
	N	15	15	15	15	15	15	15	15
RIR	Pearson Correlation	-.544'	.092	.051	-.127	-.015	1	.112	.046
	Sig. (2-tailed)	.036	.744	.856	.652	.958		.690	.870
	N	15	15	15	15	15	15	15	15
RPL	Pearson Correlation	.025	.323	.636'	-.722''	-.823''	.112	1	-.652''
	Sig. (2-tailed)	.929	.240	.011	.002	.000	.690		.008
	N	15	15	15	15	15	15	15	15
DIR	Pearson Correlation	-.369	-.735''	-.658''	.495	.799''	.046	-.652''	1
	Sig. (2-tailed)	.176	.002	.008	.060	.000	.870	.008	
	N	15	15	15	15	15	15	15	15
*. Correlation is significant at the 0.05 level (2-tailed).									
**. Correlation is significant at the 0.01 level (2-tailed).									

Results of Pearson correlation between dependent and independent variables reflect that there is a weak negative relationship between Interest Rate Spread (IRS) and Gross Domestic Product (GDP), inflation and lending interest rate (LIR). Moreover, there is a negative relationship between Interest Rate Spread (IRS) and Real Interest Rate (RIR) and Deposit Interest Rate (DIR). Furthermore, there is a weak positive correlation between IRS and Risk Premium on Lending (RPL) and the strong positive correlation between IRS and Gross Saving on GDP (GSGDP). The results also reflected that variables are not highly correlated therefore there is no problem of multicollinearity. The same findings collaborate with those of, *Falawewo and David (2008)*.

Table No: 6 Hypotheses Testing

NO.	Hypotheses	Results
H_1	There is negative relationship between interest rate spread (IRS) gross saving percent of GDP.	Rejected
H_2	There is negative relationship between interest rate spread (IRS) and inflation.	Accepted
H_3	There is positive relationship between interest rate spread (IRS) and Gross Domestic Product (GDP).	Rejected
H_4	There is positive relationship between interest rate spread (IRS) and Risk Premium on Lending.	Accepted
H_5	There is negative relationship between interest rate spread (IRS) and real interest rate.	Accepted
H_6	There is negative relationship between interest rate spread (IRS) and deposit interest rates.	Accepted
H_7	There is positive relationship between interest rate spread (IRS) and lending interest rates.	Rejected
H_8	Macroeconomic variables significantly affect interest rate spread (IRS).	Accepted

6. CONCLUSIONS AND RECOMMENDATION

Interest rate spread is one of the most important considerations for commercial banks working around the world. This research focused on the impact of macroeconomic variables on the interest rate spread in the context of Pakistan. Results demonstrated that macroeconomic variables have significant impact on interest rate spread which means when important macroeconomic variables such as (GDP, Inflation, Real Interest Rate, Gross Saving, etc.) fluctuates from recession to peak and peak to recession, it will lead to varying interest rate spread as well and keeping the performance of banking industry from bottom to top and top to bottom respectively.

An optimal position of the economy is very essential for the banking industry to flourish. When major macroeconomic variables increase, it will lead to support net interest rate to increase.

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