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## Relationship between Risk Determinants and Banks' Profitability: Empirical Evidence from Pakistan

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**Abstract:** This paper investigates the response of banks towards their performance in terms of their internal and external risk appetite. The statistics of Government Banks, Commercial banks, Islamic banks, and Islamic-Commercial Banks in Pakistan from 2010-2020 are measured. This study measures the risk-taking of Banks in Pakistan. There are many factors to be considered for the profitability of any business, some are internal factors, and some are external. This paper contributes to the ongoing discussion on the effects of deregulation and liberalization on the performance of the banking sector by examining the relationship between bank performance and efficiency indicators. Meanwhile, the paper makes several attempts to add to the existing literature. I will be taking 4 independent "Inflation, Loan Loss Provision (LLP), Gross Domestic Product (GDP) and Lending rates of interest (LIR)" and 1 dependent variable, "Return on Average Equity", for this study. Examining these specific factors in greater depth can aid in comprehending their impact on banking institution profitability.

**Key Words:** Bank, Loan Loss Provision (LLP), Gross Domestic Product (GDP), Inflation (INF), Lending Interest Rates (LIR) and Return on Average Equity (ROAE)

### JEL Classification:

### Introduction

One of the enabling determinants of bank stability is profitability. Banks can't afford to lose money for an extended period of time and still stay in business. The role of banks is very vital by providing financial intermediation functions which lead to the economy's development (Ralf et al. 2020). Higher wealth transfers to the economy result from more profitable financial institutions, such as banks (Hirose et al., 2019; Kohler. 2013; Maudos & Guevara. 2004; Saunders & Schumacher. 2018). One of the purest types of capital which

banks maintain in firms significantly contributes to the growth of capital, which further leads to capital expansion. As a result, in order to shape the market, authorities are particularly interested in the elements that determine profitability.

The study of the determinants that influence bank profitability can lead to improvements in the banking sector's operations. Policymakers may gain insight into how to improve corporate policies by researching these determinants. Furthermore, in any economic circumstance, the banking

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industry is a momentous foundation of economic growth. It is vital for the government to enact growth-oriented policies. Various studies on bank profitability are carried out all around the world, including in developed and developing business sectors as well as emerging economies. Pakistan lost its "emerging market" designation in 2008 but has since regained it, along with other Asian developing economies such as Malaysia, Thailand, India, and China. In 2016, Pakistan's KSE100 index grew by 46 per cent, which ranked the country to be marked as an apex performing state in the Asian stock exchange market.

### **Background of the Study**

A loan Loss Provision is a cost that is saved for defaulted advances or credits. It is a sum put to the side if the loan defaults. In the economic expansion of the country banking sector has made its part, and it has been recognized very well. As there will be more profit and growth will be earned by the country if there are more efficient bank management systems than inefficient banking management. In this paper, we will be examining factors having an effect on the profitability of the banking sector in Pakistan. To assess the financial stability of the banks, there is a critical contributor known as Loan Loss provision. It has a great reflection upon the Loan portfolio and provision of banks. In the framework of accounting, the provision is only given for the losses which have been incurred by the business. There are no provisions for the future or predictable losses to be incurred.

Basically, agreeing with (R.C. 1974), the worth of a debt issued by a firm relies upon three determinants: a risk-free rate factor, the terms and conditions or restrictions of debt and the possibility of default. Streamlining, in his work (R.C. 1974), shows how the likelihood of default of a firm and, therefore, its credit risks develops with the peril of debt, estimated by its unpredictability, which has, clearly, a stochastic nature. Besides, the worth of the guaranteed instalments on obligation acts like an edge: if at the bonds' expected date, the worth of the resources is under that limit, the

default will happen. Internal (bank-specific) or external determinants can have an impact on profitability (macro-economic). The bank's management can control and regulate the internal determinants. Macroeconomic issues affect all banks equally, and management has no control over how they are affected. Internal determinants, according to Bashir (2003), include factors like the size of a bank, utilization and effective management of the expanses (current and recurrent), capital as well as credit risk. Banks are a type of financial intermediary. A bank is a sort of financial institution that lends money and secures its customers' deposits with cheques. A financial intermediary's job is to make money by selling the goods they've produced. Banks generate interest by selling their obligations. Pakistan's banking system has gone through numerous periods of development. A country's financial system is made up of commercial banks and other monetary foundations, as well as a central bank that controls commercial banks and credit availability.

The default risk is an area that has been less explored, particularly when looking at specific risk components. Pakistan is also one of the only countries where all of the major bank categories have not been thoroughly investigated. Financial institutions, and specifically banks, are subject to a number of hazards, the magnitude of which is dependent on the portfolio characteristics of individual banks [IMF \(2000\)](#). The purpose of this study is to determine the severity and importance of individual risk attributes in terms of the performance of government banks, commercial banks, and Islamic banks, Islamic-Commercial Banks in Pakistan.

A healthy banking system in a country refers to increased productivity in the country and is regarded as one of the most vital determinants of economic growth. According to (*Yao & Haris. 2007*) (*Gulzara. 2016*), bank deposits raised by 299 per cent (2,919 to 11,646 BPKR), investments in capital and currency markets, forex, and other financial instruments raised 877 per cent (from 739 to 7236 billion PKR) and advances, such as loans, cash credits, and running finance, grew by 877

per cent (from 739 to 7236 BPKR) (from 739 to 7236 BPKR). Absolute resources increased by 160 per cent (from 3716 to 15,346 BPKR, or 52 per cent of total GDP) and equity augmented by 215 per cent (from 2099 to 5453 BPKR) (from 410 to 1294 BPKR). Despite this, the Pakistani financial framework benefits: ROE decreased by 0.62 per cent (from 15.21 per cent to 14.60 per cent).

In light of this, it is necessary to investigate which elements determine the potential profit of banks in Pakistan, as well as how these aspects affect bank profitability. By examining both helpful and unfavourable variables of a bank's profitability, this research will assist Pakistani bank management and policymakers in achieving greater profit by taking these issues more seriously. Because it is a key source of money, the banking industry is critical to modern trade and commerce. The notion of efficiency has grown more relevant for both non-financial and financial entities, of which banks are a part, as a result of the expanding phenomenon of globalization. The modalities of the banking business have altered drastically in the new millennium compared to earlier millennia (Hussain and Bhatti, 2010).

A few academics have already done comparable work, although they used data from before 2017. In this study, researchers will also look at the COVID-19 effect. The researcher will undertake studies from 2010 until 2020. Risk ratios are used to evaluate a bank's financial health and stability. In a typical corporate lifecycle, such capital surpluses are expected to capture losses from estimated earnings, but there are cases when an abnormal loss occurs that is difficult to compensate for with estimated earnings, necessitating the deployment of extra capital sources. Risk management acts as insurance against predicted losses in this way. However, this does not come at the expense of the banks' excellent profits, as wealth growth is their primary goal. Without profits, attracting investors' attention to invest in their assets becomes practically impossible, which is already difficult in a competitive economy.

In this study, there will be four independent variables: loan loss provision, inflation, GDP and interest rates on loans. The researcher will look at the relationship between these variables and the performance of our bank. Return on Average Equity will be the dependent variable (ROAE).

This study will be useful for investors, auditors, regulators and intermediate authorities. This investigation can likewise be valuable for financial investors to become more acquainted with how much discretion banks have made on the main accounting item. The basic research questions are what is the impact of creating loan loss provisions on a bank's return on average equity? What is the impact of lending rates in Pakistan affecting banks' return on average equity?

There are five sections to the paper. First, as we have been through the introduction and research goals. The second half is devoted to a review of the literature. The third section explains the process. The results are described in Section 4. The conclusion is the last portion.

## Literature Review

[Mhlanga, D. \(2021\)](#) explains that credit risk refers to the risk of loss for the lender. The lender faces the likelihood of losing interest and principle, which might contain a detrimental impact on the bank's cash flow.

[Farkhanda. et al. \(2018\)](#) concluded that credit risk must be treated as a predetermined factor since banks may develop tools/techniques for examining and humanizing the level of credit risk in order to improve their profitability. Banks have a tendency to increase their profits. As a result of validating and valuing the hazardous credit environment. Bank-specific indicators have a greater influence over bank profitability.

[Berrospide \(2021\)](#) explains loan loss provisions (LLP) are a way for a bank to prepare for possible defaults or a reduction in a customer's ability to pay. A loan loss provision is an item on the income statement that is added to loan loss reserves. If a bank's loan loss provision percentage rises, it may indicate that the bank expects more defaults,

putting the bank's profitability at risk. The ratio of loan loss condition to net interest revenue (LLP/NIR) is an asset quality metric that measures how much money a bank has set aside to cover losses over the course of a fiscal year compared to net interest revenue.

Loan loss provisions are a way for a bank to prepare for possible defaults or reductions in a customer's ability to pay. If a bank's loan loss provision percentage rises, it may indicate that the bank expects more defaults, putting the bank's profitability at risk. As a result, the author anticipates a negative relationship between the LLP/NIR and Banks ROAE.

According to [Johannes De Wet and Toit \(2007\)](#), dissecting the components of Return on Equity (ROE) is one of the most appropriate measures of corporate performance because it combines the components of productivity, competence, and financial leverage. This proportion is generally utilized as a profitability marker which decides the capacity of a bank to use cash contributed by investors to produce benefits.

### **ROAE = Net Income / Avg Stockholders' Equity**

An increase in the general price level is known as Inflation, and it is usually expressed as an annual percentage rate of change. The value of money depreciates as a result of inflation. A 10% increase rate means that the dollar loses value at a 10% annual rate in terms of the goods it can buy. Inflation is defined as a rise in the overall price level of goods and services. When inflation occurs, it means that consumers' and businesses' purchasing power decreases unless revenue grows at the same rate. Inflation erodes the value of your savings. If the rate of inflation is higher than a person's or company's return on investment, there is a net decline in investment. People on fixed incomes are particularly affected by inflation, as their purchasing power erodes over time.

The impact of inflation on bank presentation has received a lot of attention in the literature, owing to inflation's impact on the sources and users of banks' financial resources. Inflation, in particular, has an

impact on how businesses price their products. For example, if businesses anticipate higher general inflation in the future, they may assume they may raise prices without causing a decline in demand for their products (Driver. 2007, Windram. 2009). In this scenario, assuming that predicted inflation equals actual inflation, there will be no reduction in business activity and no negative impact on bank profitability.

A moderate degree of year-over-year inflation, often in the range of 2% to 3%, is thought to be optimal Inflation. Most central banks have identified this target level as one of their monetary policy objectives. Hyperinflation is a term used to describe when prices rise at an exceedingly rapid rate.

According to Perera (2018), the Lending rate is the rate that normally meets up the short and medium-term funding needs of the banking sector. This rate is regularly changing depending on the reliability of borrowers and the purpose of financing. The terms and conditions appended to these rates vary from country to country, restricting their similarity.

GDP is a metric that measures a country's total output as well as the availability of goods and services over time. GDP is calculated regularly and annually on a regular basis. GDP is a measure that will indicate a country's total economic health in the end. Even while it is still widely accepted, it has serious flaws. Alternative equations or criteria for determining economic well-being have been offered by several organizations, and some have been applied ([Saba. et al., 2012](#)).

Kunt & Huizinga (1999) concluded that express economic expansion augments profitability for quite a few countries, according to GDP, in a technical sense, captures upswings and downswings throughout the business cycle. As a result, changes in the overall level of activity are projected to have a direct impact on bank profitability. In most empirical studies, there are two different forms of GDP.

Further, the authors have summarized a variable selection table of research identifying dependent and independent variables. The goal of variable selection is to find all essential

variables with non-vanishing regression coefficients and offer accurate estimations of those coefficients. The study of the elements that influence bank profitability can lead to improvements in the banking sector's operations. Policymakers may gain insight on how to enhance company policies by researching these characteristics.

By focusing like a laser on our evaluation criteria. A critical assessment of a journal article looks for flaws and strengths in the paper's ideas and substance. It provides a description, analysis, and interpretation of the article's worth to readers.

### Critical Review

The concepts and material are summarized and evaluated in this critical review. It expresses a viewpoint foundational to what has already been known about the issue and what we have learned from related research. Reviewing critically demands judgment evidently and critically taking into account both its merits and demerits.

Because our economy is founded on banks, banks face a greater danger of failure.

Bad debts might have a detrimental influence if we don't understand their strength and consequences. Our study "Which risk area is impacting the bank sector the most" can help banks. We won't be able to address the key sector if we don't keep an eye on risk appetite. As a result, this study is critical for a sector that is critical to the economy of our country. We will contribute to the current literature on the issues and risk appetite of this important sector. Limited Pakistani other research has conducted an analysis by taking these 4 variables as an independent variables.

There will be 4 independent variables:

- Loan Loss Provision
- Inflation
- Lending rates of interest
- GDP

We analyzed the association of these variables with our bank's performance. The dependent variable is Return on Average Equity (ROAE). Thereafter, research hypothesis and theoretical framework.

### Theoretical Framework

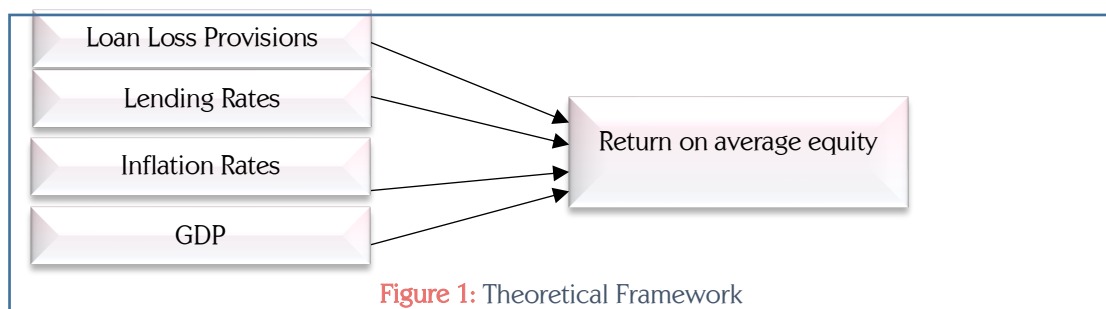


Figure 1: Theoretical Framework

### Summary of Variable Selection

Table 1. Summary of Variables

Variable	Explanation	Measure	Expected nature of a relationship
Dependent ROAE	Return on Average Equity	Profitability	
Independent			

Variable	Explanation	Measure	Expected nature of a relationship
LLP/NIR	Loan Loss Provision to Net Interest Revenue	Amount of loan loss anticipation for the fiscal year	Negative
INF	Inflation		Negative
LRI	Lending Rates of Interest		
GDP	Gross Domestic Product	%age change in GDP Per Capita	Negative

### Hypothesis

H0a: Loan loss provisions have no impact on the bank's ROAE

H0b: Lending rates have no impact on a bank's ROAE

### Econometric Equation

The model which we are using is also adopted by researchers.

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \epsilon_{it}$$

Here,

LLP stands for credit risk proxy;

ROAE stands for returns on average equity;

INF and LIR stand for the control variable vector, used to determine the temporal trend, and are parameters

$i$  is for the number of cross-sections;  $t$  stands for the number of time series, and  $\epsilon$  stands for the error term.

This is panel data analysis, which includes both time-series cross-sectional and final selection of the model depending on the stationarity of the data. With the passage of time, your series of data is having constant mean and variance or not.

### Methodology

This section explains the approaches used in the present research. The four determinants examined in this research article are banks' responses to their performance in terms of internal and external risk appetite. The methods that will be used in the research will be described in this section.

### Type of Study

This research is quantitative in nature which

explains the relationship of variables empirically through numerical data (e.g. Gill et al., 2010). The study also shows the impact of independent variables Loan Loss Provision (LLP), Lending Rates of Interest, GDP and Inflation on the dependent variable Return on Average Equity (ROAE).

In this study, secondary data has been used for the quantitative research by using official statistics and a non-reactive approach. The Deductive Approach has been used for this study.

### Research Approach

This study takes a quantitative process that examines the relationship between variables in order to test objective ideas. Instruments can be used to measure these variables, resulting in numeric data that can be analyzed using statistical methods.

### Study Settings of Research

This research is based on secondary data, where data will be gathered through available statistics of banks to the proper method. For the data collection from the banks, the researcher is using different banks' official websites and acquiring their recent statistics required for the research.

### Data Collection

Information for this exploration gathers from the yearly reports. Yearly reports of the top bank are working in Pakistan remembers for the social occasion of information. Information remembers the time frame from 2010-2020 and is based on a yearly period. We are utilizing unmistakable measurements and co-connection to investigate our exploration discoveries. Internal profitability variables are

acquired from the State Bank of Pakistan's quarterly balance sheets and revenue statements, as well as all full-fledged banks in Pakistan.

### Sampling Procedure

In this study, 15 banks have been chosen to investigate the impact of our independent variables (Loan Loss Provision LLP, Lending Interest Rates LIR, and Inflation) on our dependent variable (Return on Average Equity ROAE). These 15 banks were chosen based on their overall banking assets.

### Sample Selection

This study used convenient sampling; financial statements served as data sources. The sampling was based on banks' total assets size. 15 commercial banks are taken in a sample, which includes;

- National Bank of Pakistan
- Bank of Punjab
- Sindh Bank
- Bank of Khyber
- Askari Bank,
- Allied Bank Limited
- Bank Alfalah,

- Bank Al Habib
- Faysal Bank
- Habib Bank Limited
- Habib Metropolitan Bank
- J.S. Bank
- Samba Bank Limited
- Silk bank Limited
- Standard Chartered Pakistan

### Time Horizon

The sample period is 10 years, i.e. 2010-2020.

### Data Analysis Technique

STATA is used to calculate the results. This process is also showing whether a specific parameter has a favourable or negative impact on profitability.

### Data Result/Analysis and Findings

The data were analyzed using STATA. Data normality and heteroscedasticity (unequal variance) were discovered first. Using regression with bootstrapping, the researchers looked at the effects of lending interest rates, loan loss provisions, GDP per capita growth, and inflation rate on ROAE.

## Descriptive Statistics & Distribution of Data

Table 2. Summary Statistics

	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
ROAE	.122	.095	-0.627	.25	-4.05	29.248
Inflation	.077	.034	0.025	.129	-.053	1.679
LLP	1.065	7.406	-0.960	82.25	9.501	97.432
GDP per capita	7.14	.111	6.890	7.3	-.54	3.113
LendingInterestRate	.113	.021	0.082	.144	-.061	1.697

Table 3 summarizes the dependent and independent variables in detail. As these summary statistics have a description, it provides a summary of each variable, which includes the Mean, Standard deviation, Kurtosis, Skewness, and the minimum and maximum value of each research variable. Kurtosis and Skewness metrics have been used to explain the distribution of both independent and dependent variables. A

typical normal distribution has a kurtosis of three, making it mesokurtic. An augmented kurtosis ( $>3$ ) refers to a narrow "bell" with a high peak, whereas a lowered kurtosis ( $<3$ ) refers to a broadening of the peak and "thickening" of the tails. Leptokurtic refers to kurtosis larger than 3, whereas leptokurtic refers to kurtosis less than 3.

The mean ROAE of the banks in this study is 0.122, with a standard deviation of 0.095.

Banks have a maximum ROAE of 0.25 and the lowest ROAE of -0.627. The skewness score is negative 4.05 because of the higher kurtosis value, suggesting that it is skewed to the left and exhibiting a high peak narrow bell shape. Whereas inflation has a mean of 0.077, a standard deviation of 0.034, a maximum of 0.129, and a minimum of 0.025, inflation is lightly left-skewed with a broad peak and thick tails as indicated by its kurtosis score of less than 3.

The mean LLP of the banks in this study is 1.065 higher than ROAE and Inflation, with a standard deviation of 7.406, which is larger than the standard deviation of any other variable. The maximum LLP for banks is 82.25, while the lowest LLP is -0.960. Because of the maximum kurtosis value, suggesting that it is skewed to the right and demonstrating a high peak narrow bell shape, the skewness score is

positive with a magnitude of 9.501, indicating that it is skewed to the right.

Whereas GDP per capita has the highest mean of 7.14 among all other variables, the standard deviation of 0.111, a maximum of 7.3, and a minimum of 6.890, as these maximum and minimum values indicate, GDP per capita has a little variance, it is slightly left-skewed with a normal peak and tails, as indicated by its kurtosis score of almost equal to 3.

Lastly, the banks in this study have a mean LIR of 0.113 and a standard deviation of 0.021. It has a maximum value of 0.144 and a minimum value of 0.082, showing that there isn't much variation because the state decides. The skewness score is negative, with a magnitude of 0.061, indicating that it is skewed to the left. The kurtosis value is 1.697, which is substantially lower than 3, indicating thick tails and a broad shape.

### Correlation

**Table 3.** Correlation

Variables	1	2	3	4	5
(1) ROAE	1.000				
(2) Inflation	-0.121 (0.138)	1.000			
(3) LLP	0.016 (0.848)	-0.105 (0.178)	1.000		
(4) GDPperCapita	0.067 (0.412)	-0.835 (0.000)	0.101 (0.196)	1.000	
(5) LendingInterestRates	-0.091 (0.264)	0.868 (0.000)	-0.129 (0.098)	-0.863 (0.000)	1.000

The relationship between ROAE and inflation is negative, with a magnitude of 0.121 that is statistically significant (i.e. P 0.05). The LLP and GDP have a positive correlation magnitude with ROAE, with the LLP with ROAE being

positive with a magnitude of 0.016 and the GDP per capita with ROAE being positive with a value of 0.067. LIR, on the other hand, has a negative value of -0.091, indicating that LIR and ROAE have a negative correlation.

### Regression

**Table 4.** Regression

Variable	Coeff:	Std. Error	t-Statistic	Prob.
GDP_PER_CAPITA	-0.056110	0.049463	-1.134394	0.2587
INFLATION	-0.384803	0.178554	-2.155111	0.0330
LENDING_INTEREST_RATES	0.562271	0.271133	2.073783	0.0401
LLP	-1.07E-05	0.000300	-0.035858	0.9715
C	0.531578	0.363366	1.462929	0.1459

The R-square score for this model's weighted regression statistics interpretations is 0.645, which means that this study model explains 64.5 per cent of the data set. The Durbin-Watson coefficient in this is 2.729, which is more than 2, indicating a negative correlation between the residuals. The model is statistically significant, with an F-value of 47.2 and a P-value of around zero.

The coefficient value of -0.056 suggests that bank ROAE and GDP per capita have a negative association. The coefficient value of -0.0385 clearly shows that the banks' ROAE and the country's inflation rate have a negative relationship. There is a positive association between Lending Interest Rates (LIR) and Banks' ROAE, according to its coefficient value of 0.562. There is a negative association between banks' ROAE and their Loan Loss Provisions, as the negative coefficient value of -1.07 clearly demonstrates (LLP). The coefficient of the constant is 0.531.

### Fitted Regression Equation

In statistics, a regression equation is used to see whether there is an association between variables. The research regression equation is as follows:

$$ROAE = \beta_0(0.5315) - \beta_1 0.056*(GDP) - \beta_2 0.384*(Inf) + \beta_3 0.5622*(LIR) - \beta_4 1.07*(LLP) + \epsilon$$

Where,

ROAE = Return on average equity;

GDP = Gross Domestic Product;

Inf = Inflation rate;

LIR = Lending Interest Rates;

And the last term is LLP is the Loan Loss Provision.

### Discussion and Conclusion

With a focus on banks in Pakistan, the present research investigates the impact and relationship of credit risk management on profitability. Data has been taken from 15 banks' official pages, government websites and the WDI. It intended to see if there was a positive or negative association between credit risk management and profitability. Further, we tried to measure from four

different external and internal perspectives: inflation, GDP, lending interest rates, and LLP.

This research examined the factors that affect profitability in the Pakistani banking industry. For the fiscal year beginning in 2010 and ending in 2020, the profitability model was employed. Multiple regression analysis is a method for analyzing the correlations between the dependent variable (bank profitability) and independent internal factors (LLP plus independent macroeconomic variables like GDP growth and inflation rate, and lending interest rates). Stationarity tests were also used to identify any non-stationary variables that would require additional statistical analysis or adjustments before being included in a time-series study.

As there are three negatives (Betas) in this study: inflation, GDP per capita, and LLP, all three factors have a negative impact on Pakistani banks' ROAE. Because this study used data from the majority of Pakistan's banks (15 banks), it's impossible to say whether the interpretation would vary greatly if all of the banks were included (there are 22 total banks, excluding small microfinance windows). While Lending Interest Rates have a positive (Beta) impact on the ROAE of Pakistani banks, this can be taken as a positive change in bank profitability if the government raises lending interest rates.

This study also proves that there is a clear negative and positive association between the LLP (Loan Loss Provisions) and ROAE, Inflation and ROAE, LIR (Lending Interest Rates) and Banks ROAE, and GDP (Gross Domestic Product) and ROAE by studying the correlation table and its statistics. According to the correlation results, LIR has a modest negative association with banks' ROAE, but the regression equation of this study clearly demonstrates a positive relationship between these two variables. The COVID-19 outbreak caused damage to the economy, especially the banking industry.

These results were compared to a multivariate regression using ROAE as a dependent variable and the other four variables as independent variables using a simple linear regression model in STATA.

Negative tendencies in the relationship between non-performing loans and profitability authenticate the research hypothesis, with only LIR showing a positive relationship for measures of ROAE.

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