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The Statistical Association between Macroeconomic Indicators and the Performance of Commercial Banks in Pakistan

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Abstract

The banking industry of Pakistan is growing over years and it is playing a dynamic role in enabling the business environment in the country. The idea is Constructed on the fact, that there is a substantial impact of commercial banks (CB) on the economic advancement of the country. in response, the macro dynamics of an economy also influence the very existence of Banking and its footprints on the economy. Banks are operating to smooth out the transaction process in the economy to cause ease for doing daily life business. It is important to investigate that the changes in the macroeconomic factors of a country can have serious implications for the profitability dynamics of these banks. This paper examines the cost-effectiveness of CBs in Pakistan for the duration of (2006 to 2018), against the variations in the macroeconomy. The study is based on Panel data assessment methods, to examine the effects of foremost external factors i.e. Exchange rate, GDP, Interest rate, and Money supply on the profitability of CBS in Pakistan. This study uses Return on Assets (ROA) and Return on Equity (ROE) to measure the profitability of banks in Pakistan. The study uses a random effect model and the outcomes of this study demonstrate that, in the case of Pakistani CBS, the impact of selected macroeconomic factors is almost negligible to determine a bank's profitability except for only one factor, that is the money supply, which expresses a progressive influence on banks' profitability in Pakistan.

Keywords: Exchange rate, ROA, Interest rate, ROE, Inflation rate, and Money supply

JEL Classification: B26, G21, G32

1. Introduction

Every organized economy has a financial system, that is comprised of Financial institutions, banks, and regulatory authorities, which under certain conditions allows the interchange and transfer of funds concerning lenders, borrowers, and investors to assist the process of business and individual transactions. The financial system can be also described as an organizational setup that exchanges and transfers, and facilitate the excess funds from individual to individual and from individual to organization with surpluses to those with deficits or for investment purposes. It is consisting of legal structure, financial instruments, and institutions and individuals dealing with the flow of funds. It operates at the domestic level and global levels. Moreover, it comprises closely related goods and services, complex markets, and financial institutions that intend to facilitate and provide proper, efficient, and regular relationships between depositors and investors. In the system, the functions of financial institutions such as banks are very important to manage to generate positive returns. Their basic role is to assist and channel the funds from surplus into deficit economic entities.

The essential and critical instrument in fulfilling the pioneer function is to guide the flow of scarce essential financial resources to invest for higher interest rates and to gain the highest return. According to Akard (1992) a well-organized monetary structure is not only critical for the local mobilization of capital, but it also serves as a source for the acquisition of viable leads for capital. It is significantly supportive of the utilization of resources through proper channels that can be counted in the national income. The financial system is there to improve the efficiency of intermediation by exploring and expanding the information and reducing the monitoring cost and transaction costs which increases the margin of profits for all the stakeholders.

The modern financial system creates investment opportunities and promotes the investment cycle. It also provides good business opportunities, enables trading, monitors the performance of authorized managers, accumulates savings, and provides the opportunity to effectively interchange goods and services. The most efficient functions are the allocation of capital resources, channelizing human capital efficiencies, and accumulating physical capital with fast technological progress for the development of sustained economic growth Al-Malkawi et al. (2012). After its independence, Pakistan has attempted notable efforts for the development of commercial banking sectors in the country, to increase the efficiency of monetary policy.

The Pakistani financial system is measured as an essential part of macroeconomic policy. From time to time policymakers have done financial reforms for the effective mobilization of funds and to increase domestic savings. From 1947 up to the 1980s, Pakistan focused on necessary infrastructure and introduced new reforms to support different macroeconomic factors policy. In the early period of independence, the financial sector remained seriously controlled under certain government interventions. The monetary policy was introduced for the direct allocation of credit. At the initial stage equity market and bond market were virtually nonexistent and the money market was underdeveloped. The new commercial banks of Pakistan often have to offer loans to priority sectors and were concerned with the borrowing firm's profitability. From the 1970s to the 1980s the macroeconomic condition of the country was unstable due to economic crises conditions as well as political conditions. The government of Pakistan introduced policies to overcome the financial system difficulties and increased the country's economic growth.

The key purpose of these policy reforms was better allocations of financial resources, exploring the level playing field for financial institutions and financial markets for introducing a competitive environment, exchange rates and credit risk management, etc. The reforms suggest that the main goal is to shrink the additional cost associated with borrowing on domestic debts. The other objective was to boost the private sector credit expansion. The policies of SBP are very much adjustable to other registered commercial banks in Pakistan. Anwar (2011) found that banking structure reforms in Pakistan were introduced to address the issues like interest rate fluctuations, privatization of government sector banks, and decline of profits in commercial banks. In 2002 Islamic banking system was introduced in Pakistan and registered with the Karachi Stock exchange (Pakistan Stock Exchange). Economy of Pakistan (2012) report points out that large-size banks are relatively robust to macroeconomic factors fluctuations as compared to small banks. The reason for this is the bounce-back capacity of large banks due to high reserves. Cost-effectiveness is demarcated by Flood & Rose (1999). which is measured by the deduction of tax on the return on assets and equity. The study further debated that multiple peripheral dynamics can disturb the cost-effectiveness fractions of the banking industry.

The studies of Staikouras & Wood (2004) found that there exists a considerable association between macroeconomic indicators and the banking sector. However, as per the available literature and established knowledge, only a few studies including the studies of [Ali, et al. (2011); (Gul, et al. (2011)] papers have covered a short time, which if expanded to a large time, can reveal some new outcomes for policy suggestions. On the other hand, in the case of Pakistan, the utmost of the preceding readings has checked the impact of fundamental/internal/banks specific factors on its profitability. This paper intends to identify the key external fundamentals that have control over the enactment of banks directly or indirectly. The study attempts to explore the statistical association

between bank-specific performance indicators and Macroeconomy, which can help policymakers to comprehend the dynamics of the microeconomic agents and the influencing macro components.

This paper is an extension of the work, which has already explored this area of research but with a small sample, as per the knowledge of the authors, authors of this study have not yet found a paper in the case of Pakistan, with a large sample size that has studied and reviewed the relationship between CBS and these important components of the economy with large data set and comprehended it for easy understanding of readers and policy thinkers. The extension of the sample size will help us to validate the results found by the previous studies. Most of the studies have debated this issue in short time dynamics and the current study is striking up a debate over a longer time to see if the findings of previous studies hold up to Pakistan's financial system or if it reveals a new insight into the existing debate on banking economics. To see whether the finding of these studies holds, this paper attempts the hypothesis tests with a large data set.

The current paper puts hypotheses on board to test, which theoretically can be stated as; there is no statistical association between Return on assets and macroeconomic indicators, including GDP, Inflation, Interest Rate, Exchange Rate, and Money Supply. This is the broader version of our hypothesis but specifically, each of the variables will take its direction suggested by the economic theory. However, econometrically the hypothesis of the current study can cover all the variables in a single line with the specification and it is based on the assumption selected econometric model. the individual unobserved heterogeneity is uncorrelated with the independent variables. This study is interested to reject this hypothesis and thus attempts to investigate the statistical association between return on assets and GDP, Inflation, Interest Rate, Exchange Rate, and Money Supply. This study attempts to explore answers to the question. Is there exist a statistical association between Micro indicators and Macro Indicators, in the case of the banking sector of Pakistan?

This study is organized as follows: section one covers the introduction, the objectives of the paper, and the significance of the paper; section two focuses on the literature review; section three is about the research methodology; section four covers data analysis, results, and discussion. Finally, section five presents the conclusion and policy debate.

2. Review of Literature

There are tons of studies are available on this specific area of research, that have explored the association between the banking industry and its association with the macroeconomy. Based on the argument that this research is carried out in Pakistan, starting from the evidence of Pakistan. During the worldwide financial crisis, a study published by Aburime (2009) examined the link between macroeconomic dynamics on banks' performance, and at the same time Pasiouras & Kosmrdou (2007) and Sufian (2009) conducted studies found there is a statistically significant correlation between interest, inflation, and bank profitability.

In the context of Pakistan story was not different, for instance, the study of Kanwal & Nadeem (2013) investigated the relationship between banks, profit (using Return on assets and Return on Equity as profit proxies), and macroeconomic determinants factors (i.e. GDP, Inflation, Interest rate). The study used a data set of CBs over multiple time points for Pakistan. As per the findings of the paper, the inflation rate has a significant and adverse association with ROA. Another highlight from this study is that the GDP has a positive but inconsequential power to cause variation in ROA, which points to some other important reasons that may affect the cost-effectiveness of CBs in Pakistan.

To dig out for further influencing reasons, the review adds the study of Gul et al. (2011) to the debate, which stated the relationship between banks' performance and macroeconomic external factors exists. The study used panel data from 2002 to 2012 for the effects of the financial performance of CBs in Kenya. The study explored that GDP, inflation rate, broad money supply, and interest rate have a positive and significant effect while the exchange rate has a negative but statistically insignificant influence on ROA.

The same results have been found by Gul et al. (2011) for the GDP and Inflation. Both macroeconomic factors have a direct and significant relationship with ROA. If the expected general inflation rate is high in the future, they consider that they will increase their interest rate. Then

anticipated inflation will be equivalent to the real inflation rate and results show a positive effect on banks' performance with no decline in business activities Solovjova (2011). Furthermore, Riaz & Mehar (2014) used panel data for a time period of 2006 to 2010. The study analyzed the profitability of listed CBs in the context of changing macro dynamics in Pakistan. The study established that there is a positive and significant association between GDP and ROA and ROE, however, the interest rate is negative but insignificantly associated with the effectiveness of CBS. On contrary.

The study of Sharma & Mani (2012) investigated the relationship between banks' profitability and macroeconomic external factors, using panel data from 2006 to 2012 and the study found an insignificant connection between external factors and ROA. Additionally, the study by Zeitun (2012) found that macroeconomic external factors influence banks' performance. This cross-sectional data found that the inflation rate has a negative and significant association with banks' performance ratios. Bashir (2003) examined the results of anticipated inflation and unanticipated inflation for the performance of banks'. The impact of anticipated inflation is mostly positive while the unanticipated inflation effect is negative toward the profitability of banks. The output of anticipated inflation is positive because the banks' have an opportunity to adjust the inflation rate and gain profit on the base of the adjusted inflation rate. As a result, the revenue trends improve (increase) as compared to the total cost.

Adding up to the debate a study by Kipngetich (2011) conducted in Kenya, found a positive and significant relationship between interest rates and banking performance. CBS has the authority to fix and adjust the interest rate according to the bank's policy under the guidelines of the central bank for the financial year. A recent study before COVID19, conducted by Pacini et al (2017) examined the association between macroeconomic factors and the performance of financial firms in the United Kingdom. A significant sample of data was collected top hundred firms' data from 2000 to 2014. The results show that GDP has a positive impact on financial firm performance. Concerning methods, if the literature is explored, it can be seen that back in the 90s a study by Demirguc & Huizinga (1999) applied a linear regression model for the data analysis to come up with empirical results for CBS. The data is collected data of different (eighty) countries from the different regions for various banks' The results found that macroeconomic variables have a positive but insignificant relationship with banks' profitability because some countries are stable and some are economically weak with lower capacity to absorb economic shocks.

Another study by Naceur & Goaied (2008) used panel data for the top stable deposit banks in Tunisia. The study found that there is an insignificant impact of external determinants (GDP and Interest) on the performance of Tunisia banks. Moving across the Globe, an additional study by Saad & Moussawi (2012) from Lebanon investigated the association between inflation rates and the profitability of CBS with the backup of Panel data for the period of 2000-2010. The results show that inflation rates do not affect profitability while credit risk affects the profitability of commercial banks earning in Lebanon.

Many studies like Alper & Anber (2011) examined the significant relationship between GDP and ROE. GDP shows a negative and insignificant influence on ROA. The same result was found by Kanwal & Nadeem (2013) GDP and ROE are negatively significant to each other due to customer choice and profit. Customers lack information about the loan and investments which is why it leads to negative and insignificant relationships with each other. The results of macroeconomic determinants are inverse to banks' profitability in the case of Pakistan due to fluctuations in the inflation rate and the insignificant amount of saving ratio. Furthermore, the studies by Ali et al (2011) and Gul et al (2011) explored the association between banks' performance factors and macroeconomic factors. These papers have used short panel data for listed CBS in Pakistan from 2000 to 2009. A positive and significant affiliation between external factors and the performance of CBS was established by these both studies.

Demetriades & Hussein (1996) investigated that financial fund is the main and leading macroeconomic in the progression of economic growth in the country or other financial performance firms. Thus they have further explored the causality for bi-directional in the majority of the countries but in some areas, the development of the financial system follows the strong economic growth in

the country. Luintal & Khan (1999) collected data from ten different developing countries from different regions and found the causality effect between the development of the financial system and output growth is bi-directed in the sample selected countries.

Rajan & Zingalas (1996) found the results for the importance of financial development process growth. The paper's results show that it needs to focus on the financial structure and sources of company finance. They have concluded the financial sector facilitates and provide an opportunity to improve the growth of the corporate sector. Masood & Ashraf (2012) investigated the association between banks specific and macroeconomic factors. They have used panel data for twenty-five Islamic banks of twelve different Islamic countries for the paper duration of 2006-2010. They found that Real Gross Domestic Products (RGDP) harms ROA and a positive significant impact on ROE. The other bank-specific variables (operating efficiency, deposits, and liquidity) have a negative insignificant impact on Islamic banks' profitability for the 12 different Islamic banks. Moore & Craigwell (2000) explored the relationship between CBS 'determinants over the financial spread for 1990. They have found that GDP, market power, and provision for loan losses have a significant influence on banks' spread (i.e. bank's performance ratios).

Mwanza (2007) explored the association between bank profit and exchange rate and found that exchange rate and banks profitability are negatively related to each other because a higher level of exchange rate leads to lower performance in CBS. Ali et al. (2011) found a relationship between the factors affecting the profitability of Islamic banks in Jordan. Authors have used a multiple linear regression model for panel data from 2005 to 2009. The result shows that GDP, Inflation rates, exchange rates, and other internal factors have a positive and significant association with ROE. The study by Amidu & Wolfe (2008) explored the relationship between money supply and economic support factors in Ghana for the period of 1998-2004. The monetary policy affects the money supply. They have found that money supply and the country's economic support significantly affect the banks' lending rate (i.e. bank's behavior). Moreover, the results show that the inflation rate negatively and insignificantly affects the banks' lending rates in Ghana.

Zaheer & Farooq (2014) explored the affiliation between seven macroeconomic risk factors and the return of textile and banking sectors. They applied Generalized Autoregressive Conditional Heteroskedasticity (GARCH) method for the period of 1998 to 2008. The results show that money supply, exchange rate, and other macroeconomic factors have a positive and statistically significant impact on the returns of the textile and banking sectors. Siaw & Lawer (2015) used a co-integrated approach for the determinants of bank deposits in the short run and long run in Ghana. They have found that in the short run, inflation rate and money supply show a positive effect while inflation shows a negative effect in long run.

Khrawish (2011) examined the association between external determinants and internal determinants of commercial banks. They found that the exchange rate has a positive and statistically significant connection with commercial banks but a negative and insignificant association with growth rate and inflation rate towards ROA. Goddard et al (2004) examined that the relationship of GDP is positive and significant with bank's profits and stable GDP gives the profitable opportunity to banks

Bourke (1989) indicated that inflation has a negative and significant association with bank profitability because if anticipated inflation occurred then banks will deal with proper strategy according to the situation and will adjust to the anticipated inflation rate. Wong & Joshi (2015) explored the relationship between GDP and inflation, they show a positive and significant effect on Return on Assets (ROA), and the same results were shown by Alper & Anber (2011) for the external factors toward the profitability of banks.

Saksovona & Solovjova (2011) explored the relationship between internal determinants toward external determinants during the period of economic crises. GDP has a positive but inflation harm ROA. Bilal et al (2013) investigated the association between banks' specific factors in the listed CBS of Pakistan. They used panel data from 2007 to 2011. They found that the external determinant i.e. inflation rate has a positive and significant impact on ROA and ROE. The results show that there is a positive influence on new business and industry production growth rate. It indicates the rise in production increases the productivity of banks in a country.

Ally (2014) explored the relationship between banks' profitability and external macroeconomic factors (e.g. GDP, inflation, interest rate). The GDP coefficient is positive and statistically significant. There is a direct association between GDP and banks' profitability. When the GDP growth trend is positive then the effect on banks is positive and when the GDP growth trend is negative the effect on banks' profitability is negative in Tanzania. Furthermore, the results show that the economy in Tanzania has a higher level of fluctuations but tends to achieve the improvement targets in some macroeconomic factors. The positive impact of GDP on banks' profitability has been supported by the studies of [Athanaoglou & Staikauras (2006); Ally (2014); Naceur, & Goaied (2008); Flamini, et al (2009); Khan et al. (2022)].

Ally (2014) found that inflation has a negative but insignificant impact on the return of Tanzania banks. The main reason is to point out that it occurred due to an unanticipated inflation rate and so not able to the hidden part of changes occurring in the economic factors. These results are also acknowledged by Khrawish (2011), Saksonova & Salovjove (2011), Naceur, & Goaied (2008) and Kunt & Huizinga (1999) that the inflation rate has a negative and insignificant impact on the returns of banks.

Saeed & Akhter (2012) explore the relationship between macroeconomic determinants on the returns of banks in Pakistan. A minor influence of macroeconomic factors on the performance of listed CBS in Pakistan is evident. Money supply has a negative and insignificant influence on banks' profitability. Interest rates and exchange rates have positive but insignificant associations with the return of banks.

Muwanza (2007) supported the studies and they found that a higher level of exchange rate leads to lower performance of CBS. Maigua & Mauni (2016) examined the relationship between exchange rates and the performance of banks in Kenya. The results show that the exchange rate has an inverse relationship with CBS performance and so there exists a negative and insignificant relationship between exchange rates and banks' returns. A study by Iftikhar et al. (2022) investigates the same problem in the context of the business cycle. The diverse findings of studies all across the world at different points in time have motivated authors to reproduce this paper on the same issue with a large data set.

3. Data and Methodology

In Pakistan, there are in total of 30 conventional banks CBS which include 22 privatized local banks, 5 public specialized banks, and 4 foreign banks. This paper takes a sample of 16 banks out of 22 with a total of 31 banks, especially excluding the foreign and specialized public banks. The data on macroeconomic variables including the rate of Inflation, Current Exchange rate, Gross Domestic Product (GDP), and Money supply are in use commencing the State Bank of Pakistan and the World Development Indicator (WDI). Furthermore, the data on internal factors of bank-specific variables are taken from consolidated annual reports of the bank (Balance sheets and Income statements) of the respective banks included in this research work. The bank-specific variables used here are ROA & ROE.

3.1. Important Variables of the Study

The construction of variables has been explained in Table 3.1

Table 3.1: Construction of Variables

Variables	Definition	Source

Return on Asset (ROA)	For considering the marginal efficiency and financial performance of banks, ROA is considered a good indicator. It shows how efficient and competent the management of banks is in allocating assets to generate profit $\text{ROAi, t} = \frac{Net\ Income}{Total\ Assets}$	Annual Report
Return on Equity (ROE)	ROE measures the return rate on common stockholders' equity. It measures the efficiency of banks at making profits from each unit of equity holders. It is calculated as; $\text{ROEi, t} = \frac{Net\ Income}{Total\ equity}$	Annual Report
Inflation rate	The data on the Inflation rate is cast-off to detect the overall increase in Consumer Price Index (CPI) for all services and goods. It is calculated as; $\text{INF}_i = \frac{CPI_2 - CPI_1}{CPI_1} * 100$	WDI
Real Effective Exchange Rate (REER)	REER is the ratio of the nominal effective exchange rate and the index of cost or price deflator.	SBP
Real Gross Domestic Product (GDP) growth	It is used as a broad measure of the Business cycle	SBP
Real Interest Rate	A real interest rate is a lending interest rate adjusted to inflation	SBP
Broad Money Supply	It is money in the form of notes or the form of coins or deposits in banks or other institutions	WDI

3.2. Model Specification

The following models are used in this research work

Model 1

$$\text{ROA}_{i,t}=\alpha_1+\beta_1\text{MS}_{i,t-1}+\beta_2\text{GDPG}_t+\beta_3\text{INF}_t+\beta_4\text{INT}_t+\beta_5\text{REER}_t+e_{i,t} \quad \text{....(Eq.1)}$$

Model 2

$$\text{ROE}_{i,t}=\alpha_1+\beta_1\text{MS}_{i,t-1}+\beta_2\text{GDPG}_t+\beta_3\text{INF}_t+\beta_4\text{INT}_t+\beta_5\text{REER}_t+e_{i,t} \quad \text{..... (Eq.2)}$$

Where,

ROA: Return on assets respectively to banks

ROE: Return on equity respectively to banks

MS_t: Broad money supply for the bank at a time (t).

GDPG_t: Annual growth of real gross domestic product at a time (t).

INF_t: Annual inflation rate (i.e. CPI proxy) at a time (t).

REER_t : Real effective exchange rate at a time (t).

INT_t : Real Interest rate for a bank at a time (t)

$e_{i,t}$: the composite error $(e_{i,t} = a_i + u_{i,t})$

The unobserved bank-specific effect and the idiosyncratic error are represented by a_i and $u_{i,t}$respectively.

The nature of the data used in this paper is panel data. The panel data is also termed longitudinal data. It is two-dimensional and involves measurement over a period that has multiple observations spreading over a wide range of phenomena over multiple periods for the same organizations. Panel data are used because it removes the problem of recognition/identification. Presently it is widely used

across economic fields solely because of its growing popularity in different spheres of research work. The reason panel data is more accepted is that it escalates the observation number and helps in controlling factors that cannot be calculated or observed like different types of practices in different firms or banks, or variables that tend to alter over periods but not across individual units. Further, this type of data allows a degree of freedom which minimizes the issue of multicollinearity and thus increases the efficiency of estimates (Hsiao, 2007). There are two kinds of panel data sets which are named "Balanced" and "Un-Balanced". The former contains each observation across each period, which means no observations are missed during the process while the latter contains some missing values for some factor variables across different periods.

3.3. Estimation Technique

Based on data characteristics, the correct model is specified to avoid the econometric limitations of the regression model, which does not fit the data. While dealing with panel data, the first step is to decide whether to run a regression with fixed effects or random effects. To opt for the appropriate effect, the Hausman test has been run which favors the random effect model for the estimation of final results on given data. The random effect Model is used in econometrics for panel data analysis when one supposes that there are no fixed effects. It is also termed a special case of a fixed effect model.

In this kind of model, the intercept is sometimes denoted as is supposed to be drawn randomly from a population with a single constant mean. The meaning of this statement is that the researchers use Random Effect Model when the sample taken from the population is large and we take the data values randomly to represent our regression analysis. As this research work uses some fixed amount of total banks so it was preferred to choose Random Effect Model as a representative model. The study has explained the meanings of the results in the following section.

4. Results and Discussions

This section of the study is to visualize the results with meaningful interpretations, which starts from the description of important statistics for selected variables to understand the data and present the status of data in aggregations and classifications.

4.1. Descriptive Statistics of Variables

The below table (Table 4.1) shows the important descriptive statistics including the mean maximum and minimum values of the macroeconomic variables included in this paper. The last row of the table shows that 208 observations are taken for each variable. The first column indicates the names of included variables. The second column indicates the average values of the variables where the variable with the largest mean value is the Real Effective Exchange rate (105.37) followed by the second large mean value of the exchange rate (104.22) and the value shown in the table as a mean of return on asset is (83.87).

Table 4.1: Descriptive Summary of Macroeconomic Variable for Full Sample

Variables	Mean	Std.Dev	Min	Max
GDP Growth	4.163077	1.484302	1.61	6.18
Inflation	8.868462	4.803153	2.53	20.29
Interest rate	2.347692	4.719237	-6.77	8.32
Money Supply	15.34385	8.573171	6.52	42.91
Real Effective Exchange rate	105.3715	8.227453	95.27	121.49
Return on Asset (ROA)	83.87981	45.98719	1	167
Return on Equity (ROE)	104.226	59.84385	1	207
N	208			

Source: Author's computation

The variables with the lowest average values are money supply (15.34) followed by inflation (8.86) and GDP (4.16). The variable having a minimum mean value is the interest rate (2.34). The third column of the table discusses the standard deviation. The lowest standard deviation is GDP (1.48) followed by the interest rate (4.71) and then the inflation rate (4.80). The other two variables exchange rate (8.22) and money supply (8.57). In the dependent variables, the highest standard deviation is ROE (59.84) and followed by ROA (45.98).

4.2. Random Effect Model Results

Table 4.2: Random Effect Model with ROA as the Dependent Variable

Variables	Coefficient	Std Err	P value
GDP	-2.544936	2.932191	0.385
Inflation	-1.08328	1.140355	0.342
Interest Rate	-0.017585	0.6177149	0.981
Exchange Rate	0.2193202	0.4205067	0.602
Money Supply	0.8026256	0.3378234	0.018
Cons	68.69078	56.7985	0.227
Sigma_u	38.298826		
Sigma_e	26.506867		
Rho	0.67612729		
No of Observation	208		
R-sq	0.0224		

Source: Author's computation

The above table shows that ROA is a dependent variable on which the independent variables are regressed over the random effect model. The first independent variable is GDP and the value of the coefficient shows that a single unit variation in GDP will lead to a change in the dependent variable by 2.54 units. But with a negative sign, which implies an inverse relationship. However, the coefficient and p-value indicate that there is no established statistical relationship between GDP and ROA. Inflation and interest rate also have a negative but insignificant relationship with the dependent variable ROA.

The former with a coefficient of -1.08 and the latter with a coefficient of -0.01. The p-values of inflation and interest rate are 0.34 and 0.98 respectively. Whereas the exchange rate has a positive and insignificant relationship with ROA. The measurement value of the exchange rate is exactly 0.21 and the p-value is greater than 0.05, which is also not a significant case. Only the variable that is important and statistically significant. As it shows that Money supply has a positive and significant relationship with ROA with a coefficient of 0.80 and p-value of 0.01. this means variation in money supply leads to variation in banking profitability, especially Return on assets increase with the increase in the money supply.

Table 4.3 shows a relationship between the return on equity and Gross domestic product, inflation, interest rate, and exchange rate. A negative relationship exists between return on equity and previously mentioned independent variables. Only the money supply has a positive relationship with ROE which means that an increase in the money supply in the economy will increase the ROE of the banking sectors of Pakistan. Gross domestic product has a coefficient of -1.02 and a p-value of 0.87 which shows a negative and insignificant relationship with ROE. Inflation has a coefficient of -2.15 and a p-value of 0.39 which is a negative and insignificant relationship with ROE.

Return on equity also has a negative and insignificant relationship with interest rate and exchange rate with coefficients of -0.80 and -0.62 and p values of 0.55 and 0.50 respectively. Money supply has a positive but insignificant relationship with ROE with a coefficient of 0.03 and a p-value acceding 0.05. These results line up with previously published work of researchers such as [Demirguc et al. (1999); Sufian, et al. (2008) Mayer, et al. (2021); Sufian (2009); Alper & Anber (2011); Sharma & Mani

(2012)] which indicates that not always, the money supply has significant implications for banking profitability. It can be also because indicators like Return on assets are isolated from the influence of monetary policy.

The results of this study in terms of the variable-specific association are supported by many papers, where Inflation rate, interest rate, and exchange rate results are supported by Kanwal & Nadeem (2012) and Gul et al. (2011) and money supply results are supported by Saeed & Akhter (2012). These studies' results are aligned with the findings of this paper.

Table 4.3: Random Effect Model with ROE as the Dependent Variable

Variables	Coefficient	Std Err	P value
GDP	-1.020454	6.490088	0.875
Inflation	-2.154097	2.524052	0.393
Interest Rate	-0.8057558	1.367245	0.556
Exchange Rate	-0.6211628	0.9307463	0.505
Money Supply	0.037771	0.7477357	0.962
Cons	194.3733	123.9685	0.117
Sigma_u	14.120779		
Sigma_e	58.670094		
Rho	0.05475552		
No of Observation	208		
R-sq	0.096		

Source: Author's computation

Money supply has a positive and significant relationship with ROA because if banks engage in loans to corporations, it will have an increasing impact on money supply as liquidity is injected into the economy and generate positive cash flows. Then in times of positive economic activity, these cash flows can rise and therefore the bank's income. Therefore, we see a positive significant impact of money supply on banks' ROA. Exchange rates have a positive and insignificant relationship because most commercial banks in the economy do not hold foreign assets or deal in foreign currency reserves. Therefore, income is not dependent on exchange rate fluctuations.

Money supply positive but insignificant relationship with banks' performance. Banks live in the same expectations climate as firms and households so all their decision is dependent on each other's actions. In the normal course of business, banks are looking to finance corporations to get control of capital assets to generate output to pay back the commitments on loans. This increases the corporations' well as banks' credibility in the market. In modern capitalist finance banks and corporations are listed on the stock exchange. Corporations' performance is directly tied to the state of confidence and the state of the credit determined by the banks if those are good banks engage in more and more financing and earns back more, they will increase the number of loans and also increase the money supply. This improves the bank's share prices on the exchange and is an alternative to net income that is earned from its operations.

5. Conclusions and Policy Implications

The banking industry is associated with the economic growth of a country. Different internal and external determinants influence the success of listed CBS in Pakistan. In this paper, only external determinants were considered. There are five external macroeconomic factors are used i.e. GDP, Inflation, interest rate, and exchange these variables aim of these variables is to investigate their impact on the profitability of CBS in Pakistan. ROA and ROE are internal factors used as proxies for the profitability of listed commercial banks. After analyzing thirteen years (2006 to 2018)

panel data of sixteen listed commercial banks with a total number of 208 observations. As per the findings of this paper, the selected five macroeconomic factors have not contributed noticeably toward the performance of listed CBS. Mostly, the performance variables are negatively and insignificantly correlated with the selected macroeconomic variables which means that banks' profitability mostly depends on other influencing factors, most likely internal or bank-specific factors as indicated by the low value of R square.

This paper is limited to the financial performance measured through the ROA and ROE. This paper covers thirteen years of sixteen commercial banks. The future paper may cover the long-term period and other internal and external variables of commercial, Islamic banks, and microfinance banks. This is will add up to the existing debate.

As per the finding of this paper, macroeconomic factors are not the main contributors towards the profit of Pakistani commercial banks, therefore the stakeholders (financial managers, individual investors, regulators, etc.) should focus more on bank-specific factors such as corporate governance, number of branches, female directors, taxation, auditing, etc. However, the money supply exhibits an influencing impression on the banking sector which should be considered for policy outcomes. It is can be incorporated into policy debates during the money supply meetings in the finance division.

6. Limitations of the Study

The end date of the data is 2018 because of certain limitations on the consistency of data for selected banks and abnormality caused by a global Covid 19 shock. The model specification could be explained more through theory but due to space issues, we confined it to the general forms of panel regression analysis. This study can be extended by solving the issues of endogeneity, by using the GMM approach to the same data sets.

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Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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