



The Impact of Macroeconomic Factors on the Banking Sector's Profitability in Pakistan

Nadia Ayub¹, Bilqees², Mukamil Shah³

¹ MS Scholar, Institute of Management Sciences, Peshawar, Pakistan. Email: nadiaayubarries@gmail.com

² MS Scholar, Institute of Management Sciences, Peshawar, Pakistan. Email: bilqees.ali05@gmail.com

³ Assistant Professor, Institute of Management Sciences, Peshawar, Pakistan.

Email: mukamil.shah@imsciences.edu.pk

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ABSTRACT

This research aims to study and analyze the impact of macroeconomic factor on the banking sector's profitability in Pakistan. Banking sector of Pakistan is the backbone of its economy. The study explains the importance of banking industry of Pakistan and its achievements and evolvement throughout the years. The objective of the study is to examine the macroeconomic factors' influence on the banking sector in Pakistan and to investigate that whether the profitability is only determined by the bank-specific internal factors or if it is also influenced by macroeconomic shocks and factors of the economy. The study is quantitative and secondary data is employed in order to conduct this paper. The sample size is financial data of scheduled banks in Pakistan from the year 2000 to 2022, which is converted in quarter data and 84 observations have been incorporated in the study. "Returns on Assets" (ROA) is selected as dependent variable of this study since it measures profitability of banks. Whereas "Foreign Direct Investment" (FDI), "Exchange rate" (LER), "Inflation" (INF), "GDP growth" (GROWTH), "Liquidity" (LLIQ), "Total Deposits" (LT_DEP) and "Credit's ratio" (CREDIT) of the banks are selected as independent variables. The data for bank specific variables is collected from the websites of "State Bank of Pakistan" (SBP) and "Federal Reserves of Economic Data" (FRED) while the data for macroeconomic variables is derived from the database of "World Bank" and "Macrotrends". For empirical analysis, we have applied "Vector Autoregression" (VAR) model, followed by "Multivariate Granger Causality test", "Impulse Response Function" (IRF) and "Forecast Error Variance Decomposition" (FEVD). The main findings of study reveals that the profitability of Banking sector in Pakistan is more influenced by its own internal factors rather than the external / macroeconomic factors. Amongst macroeconomic variables, "Foreign Direct Investment" (FDI) and "Inflation" (INF) are found to have the significant impact, while "Exchange rate" (LER) and "GDP growth rate" (GROWTH) are found to have insignificant impact on banks' "Return on Assets" (ROA). All the internal factors of our study i.e. "Liquidity" (LLIQ), "Deposits" (LT_DEP) and "Credit ratio" (CREDIT) are found to have significant impact on profitability, which is measured through "Return on Assets" (ROA). In short, the profitability of banking sector in Pakistan is mainly influenced by bank-specific internal factors of the industry. The macroeconomic factors are only 50 percent % affective on the banks' performance.

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Corresponding Author's Email: nadiaayubarries@gmail.com

1. Introduction

The financial Sector plays crucial role in the development and growth of an economy. The stability of financial sector leads to prosperity of the economy as it helps the economy to reach

towards the growth and development. Pakistan has a developing economy and its financial sector plays crucial part in the revenue generation and growth rate of the Gross Domestic Product. The largest fragment of its financial sector is Banking Industry of Pakistan. This paper is associated with the Banking sector of Pakistan and its relation with profitability determining factors. Banking sector is nowadays a lifeline for the modern economies. It is that pillar of the financial sector, which plays significantly its role in economies' functions. A strong and flourished banking system is pretty efficient to mobilize the economy's savings in productive sectors, that may help to develop the all sectors of economy. In Pakistan, banking sector plays a massive role in the development and growth of its economy. *"The banking sector's profitability not only contributes in economy but also the in-stability of financial system and enables the economy to endure with negative & external financial & economical shocks"* Athanasoglou, Brissimis, and Delis (2008).

The internal factors of banking sector significantly influence its profitability. However, some external & macroeconomic factors also play a vital part in influencing banking sector's profitability and affecting financial and banking sector. These macroeconomic factors may include Interest rates set by central authorities, Inflation rate (INF), Foreign Direct Investment (FDI), Gross Domestic Product (GDP) & Exchange Rate (LER). The focus of this study is to explore the impact of external or macroeconomic factors on the banking sector in Pakistan, which directly affects sector's profitability and contribute to the booms or depressions of the same. The Banking sector in Pakistan has gone through many phases since the independence of country in 1947, and it was influenced by both internal / bank specific & external factors which also encompass important macroeconomic factors. These phases are consist of Nationalization phase, privatization phase, and Introduction of Islamic Banking etc. The Nationalization phase of the Banks was started in 1974, after the partition of East Pakistan. The privatization process was started from 1990 which has played notable role in growth of banking sector, as it encouraged private banks to flourish and competitive environment was created that leads to the growth of economy as well. During the late 2000s, Pakistan's banking sector was markedly affected by Global Financial Crisis of 2008.

1.1. Profitability and Macroeconomic Factors

The Banks' profitability is usually influenced by two types of factor, internal / bank-specific & the macroeconomic factors. Internal determinants are the most important factors of banking sector which determine profitability, however the financial performance of the banks is also impacted by the macroeconomic determinants and their fluctuations. *"The Favorable macroeconomic situations will encourage & stimulate the development as well as growth of banks system whereas on other hand; unfavorable macroeconomic & financial situations might spell doom for the performance of banking industry"* (Olokoyo, Ibhagui, Babajide, & Yinka-Banjo, 2019). Pakistan's banking sector is also sensitive to these macroeconomic factors. The fluctuations of the macroeconomic variables result to impact the performance & profitability of the banking sector. During the late 2000s, Pakistan's banking sector was immensely impacted by global financial crisis, which affected the world economies in the year 2008. One of the major effects was a significant decline in foreign investments & remittances, which impacted the foreign exchange reserves of Pakistan as well as stability of currency i.e. PKR. Consequently, it affected the ability of banks to access external funding and engage in international business, transactions and trade. In addition, the crisis led to decrease the economic growth and raised inflation due to global economic recession. These all outcomes of the crises suggest that the performance and profitability of the sector in Pakistan is not only dependent upon its internal and managerial strategies, but also relies upon the external factors of the economy. Hence, the Research question of this study is to find whether the profitability of banks only depends upon internal factors or is also affected by macroeconomic factors? Consequently the objective of the study is to investigate the impact of Macroeconomic factors on the banking sector's profitability in Pakistan. Alongside the hypothesis i.e. Ho: Banking sector's profitability is not affected by macroeconomic factors.

2. Literature Review

The literature review encompasses studies from both domestic and international sources, offering a comprehensive understanding of various aspects of the banking sector. These studies primarily focus on investigating the influence of macroeconomic & internal/bank specific variables on the performance and profitability of banking sector. Khan, Kauser, and Abbas (2015) investigated connection among the macroeconomic & bank specific variables on performance of Pakistani Banks and revealed that the Capital ratio, Earning per share, Size & GDP have the significant impact on the Banking sector's profitability. Sultan, Ahmed, Ameen, and Singh (2020)

conducted a study & revealed that internal factors such as asset size, assets quality, liquidity & deposits have significant impact on the profitability of Pakistani Banks. However the "capital adequacy ratio" & inflation have a negative impact on Profitability whereas GDP had a positive impact on the efficiency of Banks. Ahmad, E. W., Naveed, M., & Dos Santos, M. J. P. L. (2022) aimed to explore those factors which affects the performance & profitability of banks in Pakistan and the results revealed that profitability of banks is influenced by Financial Development, Size, Inflation & GDP. Gakhar and IMSAR (2019) analyzed relationship between financial performance indicator of Indian banks and macroeconomic variables and analyzed that GDP growth is positively correlated with ROA of banks. Moreover, negative relationship was found between ROA and Dollar rate in terms of Indian Rupee. The pairwise granger-causality-test result showed that "exchange rate" does really granger cause ROA of Indian banks.

Islam, Islam, Soumia, Apon, and Tarin (2022) explored that there was significant correlation between the macroeconomic factors & Banks' profitability in banks of Bangladesh and further discovered significant effects of GDP growth rate & Unemployment on ROA. Gautam and Gautam (2021) focused on the role of macroeconomic determinants on profitability of the commercial banks in Nepal & their results were found insignificant with ROA whereas, "GDP", "Interest rate" and "Inflation" were found to have predicting ability for ROE. Yuan, Gazi, Harymawan, Dhar, and Hossain (2022) discovered that the Debt-to-the-asset ratio, Bank Size, GDP growth rate & inflation have positive impact whereas Loan-to-the-deposit ratio & Deposit-to-asset ratio has negative & significant effect on ROA in South Asian Countries. Jaber and Al-khawaldeh (2014) explored by using Multivariate Regression model, that external factors i.e. Inflation, Stock Market Capitalization and Deposit Money to Total Assets divided by GDP are significantly associated with Commercial Banks' Profitability in Jordan. Asghar (2021) focused on effects of the external factors on Banking Profitability in UK & USA Banking Sector and observed that Savings and GDP have positive correlation whereas Inflation & Money supply have negative correlation with ROA of the USA Banks. Meanwhile, Savings & Inflation have positive correlation whereas GDP & Money Supply have negative correlation with ROA of UK banks. Olokoyo et al. (2019) expressed that Interest rate", "GDP growth rate" and "Trade" are the most essential factors for the banks performance in Nigeria, whereas interest rate had negative impact on the same. The integrated findings from these literature reviews on profitability of the banks in Pakistan & other countries reveal various key points. Internal determinants & Bank-specific internal factors e.g. Total Deposits of the Banks, Liquidity, Asset Composition, Capital Ratio and Bank Size are highlighted as crucial determinants of profitability of banks; while macro-economic/ external factors such as Real interest rates, GDP growth rates and Inflation etc are also found affective on the performance of banks. In short, multiple studies emphasize the significance of both bank-specific / internal & external / macroeconomic factors in influencing banks' profitability.

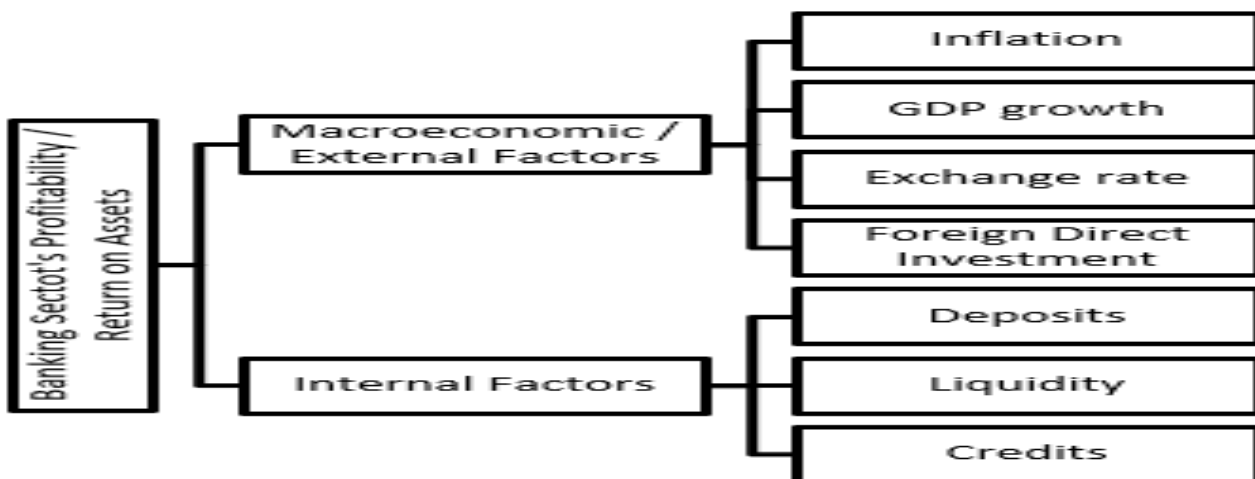
2.1. Research gap / Contribution

From literature review it is evident that banking sector of Pakistan and its profitability & performance is affected by both internal/bank-specific and macroeconomic factors. However, this study has addressed a significant research gap by introducing "Foreign Direct Investment" (FDI) as an independent variable in the context of banking sector in Pakistan. FDI is a variable which is largely overlooked in previous research studies & literature. The inclusion of FDI may help in comprehensive investigation of impact of macro-economic variables on the banking sector's profitability in Pakistan." Hence, the aim of the study is to provide a complete understanding of macroeconomic & bank-specific factors which influence bank's profitability in Pakistan, particularly highlighting the potential role of FDI, besides the other established macro-economic determinants i.e. inflation rate, GDP growth rate as well as exchange rate.

3. Conceptual Framework and Methodology

It is a clear policy that priority of the banks is its Profitability. The theoretical framework of the study emphasizes that profitability of banks, represented by the "Return on Assets" (ROA) is affected by independent variables which encompass both bank-specific and macroeconomic factors like FDI, Inflation rate, GDP Growth Rate, Exchange Rate, Liquidity, Total Deposits, & Credit ratio, reflecting the broad economic environment. This framework anticipates that fluctuations in these macroeconomic factors & bank specific factors affect the banking sector's profitability simultaneously. Fatima, S. (2021) *also stated that "the profitability of banking sector in Pakistan is significantly determined by macro-economic and bank-specific variables"*.

Figure 1



The "Return on Asset"(ROA) is selected to represent profitability of banks as dependent variables. Whereas the Bank's internal & macroeconomic factors are considered explanatory variables. Definitions of selected variables are mentioned below:

3.1. Banks' Return on Assets(ROA)

is the ratio that indicates the profitability of banks, to its total asset. According to Khrawish (2011), "ROA is that ratio whichever represents the profitability of a bank. The formula to measure "Return on Assets" of the Banks is:

$$ROA = \frac{Net\ Profit\ after\ the\ Tax}{Total\ Assets} * 100$$

3.2. GDP Growth rate (GROWTH)

Gross Domestic Product aka GDP is final value of entire goods & the services produced within a one year in a country. A growth in GDP rate improves the borrowing & lending activities of the economy, which contributes to enhance the earning potential of banking sector which increases its profitability. Rehman, Z.-, Khan, S. A., Khan, A., & Rahman, A. (2018), also found significant effect of GDP growth rate on the banks profitability in Pakistan.

3.3. Inflation rate (INF)

The continuous rise in Consumer Price Index & the general price levels of goods & services in a country is called inflation, which leads to decrease the value of money. Inflation may affect the profits of banking sector, since it could reduce the real value of interest rates & loans, which results to reduce the profits. "M. Ali (2015)" stated that Inflation has a positive influence on ROA, indicating its notable impact on profitability.

3.4. Exchange rate (LER)

It is the rate at which the value of one country's currency is exchanged for another country's currency, which affects international commerce. It impacts the profits of banks by impacting the foreign currency assets & liabilities, which leads to affect international transactions and increases credit risks. Noorani (2020) stated that the exchange rate has negatively significant impact on the Profitability of banking sector.

3.5. Foreign direct investment (FDI)

The investments of individuals, businesses, or entities in foreign companies, gaining its ownership or control is called FDI. It affects profitability of banks by introducing new capital, bringing advanced technologies & exposure to foreign exchange. "Nwanji et al. (2020)" have found significant and positive co-relation between Profits of Banks & FDI.

3.6. Liquidity (LLIQ)

Liquidity of banks refers to its ability of quickly converting their assets into cash, in order to meet short-term financial obligations without causing disruptions. Liquidity has the positive impacts on profits of banks since it encourages customer trust & smooth operations. "Sultan et

al. (2020)" stated that the banks' liquidity levels indicate a positive indication of maintaining liquid assets, which lead to effective cash management.

3.7. Total Deposits (LT_DEP)

Bank deposits are the total funds that are placed by entities and individuals in bank accounts. Deposits are the major source of banking sector for lending funds and credit circulation in economy. The interests and revenues are earned on these loans which are the sources of profitability of banks. *Sultan et al. (2020) reported that Deposits are main source of profits and have positive impact on profitability of banks.*

3.8. Credit ratio (CREDIT)

The credit ratio of the banks refers to the proportion of total loans and credits that are lent as compared to its total deposits and capital. It directly impacts the profitability of banks by influencing interest income earned from the loans. *Ramchandani and Jethwani (2017) stated that "credit ratio to deposits" of banks plays a major role in determining the Interest Income relative to their Total Assets.*

3.9. Model Specification / Analytical Model

The dependent variable of this study is profitability of Scheduled Banks in Pakistan, which is measured by the "Return-on-Assets" (ROA), whereas the explanatory variables contain both internal & macroeconomic variables.

The proposed independent variables for the model include:

ROA = Return on Assets (Profitability)

FDI= Foreign Direct Investment (USD Billions)

LER: Log of Exchange rate (USD to PKR)

INF: Inflation rate (Annual percentage change ratio)

GROWTH: GDP growth rate (Annual percentage change ratio)

LLIQ: Log of Liquidity (Millions PKR)

LT_DEP: Log of Total Deposits (Millions PKR)

CREDIT = Credit ratio (Millions PKR)

The Vector Autoregression VAR analysis technique is employed to conduct the study and the "Augmented Dicky-Fuller test" (ADF) is employed to check the stationarity of the collected data. The data of Exchange rate (LER), Liquidity (LLIQ), and Total Deposits (LT_DEP) are considered after taking the logarithm of their values. Taking the logarithm of data helps to reduce large series, which makes data more interpretable, decreases the skewness, & helps in linear modeling. The VAR model is suitable for our study since it is multivariate in nature, and adjusts the analysis of dynamic relationships that exists between the dependent variable i.e. ROA & independent variables which includes both internal and macroeconomic variables. The model is best at capturing time-lagged values of variables, which offers complete understanding in how does the change in the explanatory variables influence the profitability of banks. However, the traditional regression models merely analysis the static relationships amongst the variables, which may not analyze the evolving nature of macroeconomic interactions effectively.

3.10. Unit Root Test

The Augmented-Dickey-Fuller (ADF) test is employed to check out stationarity of data and to inspect the presence of unit root in this data of the study. It indicates that the data has constant mean, variance as well as constant autocorrelation with time.

3.11. Vector Auto Regression Model

The Vector Autoregression Model (VAR) is a statistical tool that is used in econometrics for analysis of Panel data and Time series data. It is a multivariate time series model and is used for regressing the lagged values of its dependent variable, and on the lagged-values of other independent variables of the system. It examines the dynamic relationship among multiple variables which are interdependent on one another. VAR is a useful technique for forecasting and understanding the behavior of multiple interrelated variables. The following tests are reported in the VAR study:

- The Granger-causality statistics.

- The Impulse response functions.
- The Forecast error decompositions.

4. Empirical Analysis & Interpretation

4.1. Descriptive Statistics

Table 1: Descriptive Statistics

| | ROA | FDI | LER | INF | GROWTH | LLIQ | LT_DEP | CREDIT |
|--------------|-------|--------|--------|---------|--------|--------|--------|----------|
| Mean | 0.83 | 2.09 | 1.93 | 7.96 | 4.09 | 6.29 | 6.71 | 60.64 |
| Median | 1.12 | 1.93 | 1.93 | 7.83 | 4.33 | 6.28 | 6.73 | 63.43 |
| Maximum | 2.34 | 5.59 | 2.21 | 20.29 | 7.55 | 6.95 | 7.32 | 82.49 |
| Minimum | -1.45 | 0.31 | 1.73 | 2.53 | -1.27 | 5.54 | 6.08 | 45.10 |
| Std. Dev. | 0.85 | 1.35 | 0.15 | 4.05 | 1.76 | 0.43 | 0.36 | 11.82 |
| Skewness | -1.25 | 1.18 | 0.38 | 0.73 | -0.39 | -0.04 | -0.14 | 0.06 |
| Kurtosis | 3.51 | 3.90 | 2.04 | 3.18 | 3.08 | 1.64 | 1.88 | 1.44 |
| Jarque-Bera | 23.08 | 22.78 | 5.30 | 7.58 | 2.21 | 6.61 | 4.72 | 8.69 |
| Probability | 0.00 | 0.00 | 0.07 | 0.02 | 0.33 | 0.04 | 0.09 | 0.01 |
| Sum | 70.22 | 177.67 | 164.13 | 676.69 | 347.60 | 534.86 | 570.54 | 5154.28 |
| Sum Sq. Dev. | 60.42 | 153.59 | 1.77 | 1375.63 | 261.64 | 15.26 | 10.71 | 11729.52 |
| Observations | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 |

Table 1 elaborates the descriptive statistics revealed through Vector Autoregression Model Analysis. It shows the Mean, Median, Standard Deviation, Skewness and Kurtosis of data. According to these results, FDI, LER, INF and CREDIT are positively skewed holding the value 1.18, 0.38, 0.73 and 0.06 respectively, whereas ROA, GROWTH, LLIQ and LT_DEP are negatively skewed with the value -1.25, -0.39, -0.04 and -0.14 respectively. Moreover, all the dependent and independent variables have positive kurtosis. Similarly, the mean value of "Return on Assets" (ROA) is 0.83, median is 1.12 & standard deviation is 0.85. The mean value of FDI is 2.09, median is 1.93 and standard deviation is 1.35. The mean and median value of LER is 1.93, & standard deviation is 0.15. The mean & median values of INF are 7.96 & 7.83, whereas standard deviation is 0.73. The mean of GROWTH is 4.09, median is 4.33 & standard deviation is 1.76. The mean & median of LLIQ are 6.29 & 6.28, whereas standard deviation is 0.43. The mean value of LT_DEP is 6.71, median is 6.73, and standard deviation is 0.36. Lastly, mean & median values of CREDIT are 60.64 & 63.43 with 11.82 standard deviation respectively.

The skewness shows the asymmetry of our variables and collected data. We can see from table that ROA, GDP growth, Liquidity of banks and Total deposits are negatively skewed which indicates that the data for these variables are longer tailed to the left and the most values for these variables lies to the right side of the mean value. Whereas, FDI, Exchange rate, Inflation and Credits are positively skewed along with right-tale, so the most data values lies on the left side of the mean. Moreover, ROA, FDI, Inflation and GDP growth have a positive kurtosis, which implies that data for these variables have sharper peak. Similarly, Exchange rate, Liquidity, Deposits and Credits have a flat peak and they have negative kurtosis. Now progressing towards Jarque-Bera test results, it is a test to check the distribution on variables and data that whether it is normally distributed or otherwise. The table report that ROA, FDI, INF, GROWTH, LLIQ and CREDIT are normally distributed. Whereas, LER and LT_DEP are normally distributed at 10% significance level.

4.2. Unit Root Test

Table 2: Unit Root Test Results

| Variables | Level | | First Difference | | I() |
|---------------------------|-------|---------|------------------|---------|------|
| | Lag | P-Value | Lag | P-Value | |
| Return on Assets | 5 | 0.11 | 4 | 0.05 | I(1) |
| Foreign Direct Investment | 1 | 0.04 | --- | --- | I(0) |
| LER | 1 | 0.96 | 0 | 0.06 | I(1) |
| INF | 9 | 0.14 | 4 | 0.04 | I(1) |
| GROWTH | 9 | 0.04 | --- | --- | I(0) |
| LLIQ | 5 | 0.92 | 4 | 0.02 | I(1) |
| LT_DEP | 5 | 0.80 | 4 | 0.05 | I(1) |
| CREDIT | 1 | 0.48 | 0 | 0.03 | I(1) |

If the data of study is non-stationary, it indicates that the statistical properties of the collected data are changing over times i.e. mean and variance of the concerned data are not constant for macroeconomic and bank-specific variables. In this case, the statistical properties

of the same are changing over time. So, the results of our econometric model i.e. VAR will be not reliable and it will fail to predict the future values of collected data. However, we can trust the data if it is stationary overtime, since it indicates that the pattern of variables is uniform and the results will be more reliable. Hence, the paper has used the "Augmented Dicky-Fuller test" (ADF) in order to test the Unit Root or stationarity of data. Table 2 reports the findings of Unit root test conducted for the data of the study. The results reveal that ROA is stationary at 1st difference, since the p-value is 0.11 at levels which exceeds the 5% threshold for significance. Whereas at first difference the P-value of ROA is 0.05 which indicates that ROA is stationary at 1st difference and indicates that ROA is integrated of the order I (1). Likewise, the FDI is stationary at levels whereas the LER, INF, LLIQ, CREDIT and LT_DEP are stationary at its 1st difference & integrated of the order I (1). Moreover, GROWTH is stationary at levels and the order of integration for this variable is I (0). Taking its 1st difference in case of non-stationary data, helps to remove trends and stabilize the data which makes it stationary.

4.3. VAR Granger Causality / AKA Block Exogeneity Wald Tests

Table 3: VAR Granger-Causality / Block-Exogeneity Wald Tests

| Excluded | Chi-sq | df | Prob. |
|---------------------------|--------|----|-------|
| Foreign Direct Investment | 10.406 | 2 | 0.005 |
| LER | 2.556 | 2 | 0.279 |
| INF | 14.048 | 2 | 0.001 |
| GROWTH | 2.616 | 2 | 0.270 |
| LLIQ | 4.850 | 2 | 0.088 |
| LT_DEP | 9.022 | 2 | 0.011 |
| CREDIT | 16.208 | 2 | 0.000 |
| All | | 15 | 0.000 |

Dependent variable: Return on Assets

Table 3 presents the findings of "VAR Granger-Causality test also known as Block Exogeneity Wald Tests" in order to study and inspect the impact of macroeconomic variables on banks' profitability i.e. ROA. The results in table report that the macroeconomic variables, FDI & Inflation (INF) have a statistically significant impact on ROA, since their p-value is 0.05 & 0.01 respectively, which are equal to and less than 5% percent. It means that changes in these variables i.e. "FDI" and "Inflation" have a meaningful and notable impact on ROA. Whereas the exchange rate (LER), and GDP Growth are statistically insignificant with ROA for the reason that p-value of the same variables is more than 5% i.e. 0.279 and 0.270 respectively, which indicates that they does not explain or predict the behavior of dependent variable. Similarly, prob-value of Liquidity (LLIQ) is 0.088 which implies that it is statistically significant at 10% of level of significance on ROA. However, Deposits (LT_DEP) and CREDIT are statistically significant on ROA with the p-value 0.011 and 0.000 respectively. Results of the table indicate that internal factors are more affective on ROA as compared to macroeconomic factors. All the macroeconomic and bank specific variables have a positive impact on Return on Assets (ROA) since all the values of variables for chi-square test are positive. Moreover, Foreign Direct Investment, Inflation, Deposits and Credits have a greater impact on banking sector's profitability in Pakistan with the value of 10.4, 14.48, 9.02 and 16.2 respectively. This indicates that even a little change in these independent variables leads to positively affect the profitability & performance of Banks in Pakistan. Overall, the findings of the test suggest that internal factors i.e. Liquidity, Deposits, and Credit, have a more prominent impact on Return on Assets, as compared to macroeconomic factors of the study which include FDI, Inflation, Exchange Rate, and GDP Growth.

In Forecast error Variance Decomposition (FEVD) of ROA, there are 100 % variations. The results reveal that the greater percentage of variation for ROA is its own self, which indicates that ROA is the most important factor to explain itself and depends upon its own shocks and its own lagged values. In table 4, among the macroeconomic variables, only FDI is significantly increased over time for ten quarters, which reveals that amongst the macroeconomic variables, FDI is the most important factor that explains and predicts ROA. However, amid the internal factors, the most important variable is Liquidity (LLIQ) which explains the behavior of ROA since it has the most increasing percentage over time amongst other internal factors. After Liquidity, CREDIT is the 2nd most important factor to explain ROA. In Short-run, the small changes and fluctuations during the initial stages in FEVD does not cause great impact on ROA, but in Long-run it can be thoroughly seen that FDI, Liquidity (LLIQ) and Credits have significant impact on ROA since the FEVD values of these variables are 6.29%, 13.44% and 9.22% respectively and

these variables can predict and explain ROA, although the ROA is mainly explained by its own lagged value and past performance since it demonstrates 64.07% of variation over ten quarters. Whereas the remaining variables i.e. Exchange rate (LER), Inflation (INF), GDP growth (GROWTH) and Deposits (LT_DEP) have a minimum impact on ROA with the variation percentage of 1.82, 1.03, 1.26 and 2.88 respectively. Eventually we can say that ROA itself is the most important factor to explain the profitability & performance of banking sector in Pakistan in long-run. Moreover, amidst independent variables, the macro-economic variable i.e. FDI and internal factors have significance on ROA and these variables have ability to explain and predict ROA.

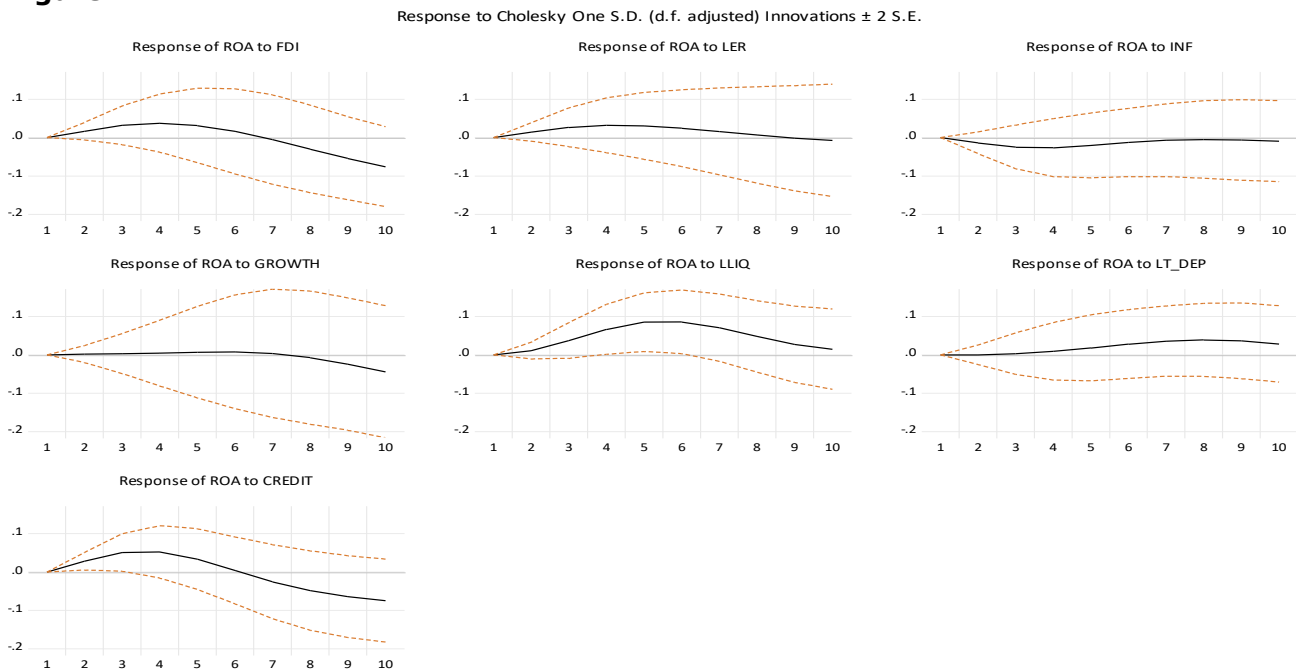
4.4. Forecast error Variance decomposition of ROA

Table 4: Forecast error Variance-decomposition of Return on Assets (ROA)

| \ | S.E. | Return on Assets | Foreign Direct Investment | LER | INF | GROWTH | LLIQ | LT_DEP | CREDIT |
|----|------|------------------|---------------------------|------|------|--------|-------|--------|--------|
| 1 | 0.12 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0.23 | 96.87 | 0.55 | 0.42 | 0.36 | 0.01 | 0.24 | 0.00 | 1.55 |
| 3 | 0.31 | 91.59 | 1.40 | 1.00 | 0.82 | 0.02 | 1.60 | 0.01 | 3.57 |
| 4 | 0.36 | 86.12 | 2.07 | 1.50 | 1.09 | 0.03 | 4.50 | 0.07 | 4.61 |
| 5 | 0.40 | 81.41 | 2.36 | 1.85 | 1.17 | 0.05 | 8.33 | 0.28 | 4.56 |
| 6 | 0.42 | 77.74 | 2.30 | 2.03 | 1.16 | 0.09 | 11.81 | 0.71 | 4.16 |
| 7 | 0.43 | 74.86 | 2.21 | 2.07 | 1.13 | 0.09 | 13.97 | 1.37 | 4.30 |
| 8 | 0.44 | 72.08 | 2.58 | 2.02 | 1.09 | 0.11 | 14.65 | 2.12 | 5.36 |
| 9 | 0.45 | 68.60 | 3.89 | 1.92 | 1.06 | 0.39 | 14.31 | 2.68 | 7.14 |
| 10 | 0.46 | 64.07 | 6.29 | 1.82 | 1.03 | 1.26 | 13.44 | 2.88 | 9.22 |

4.5. Impulsive Response Function

Figure 2



The above graph shows IRF for the VAR model which includes all the variables of this study along with their confidence bands. The graph demonstrates the effects of one (01) standard deviation shock in variables to the ROA over the time of ten quarters. The response of ROA to the change in FDI and inflation is expansionary which indicates that the profitability of the banks in Pakistan is enhanced due to the change in Foreign Direct Investment. The response of ROA to internal factors including Liquidity, Deposits, and Credits; implies that the profitability increases during the initial stages over time and decreases afterward due to the change in internal factors.

5. Results and Discussion

The findings and results of this study are now compared with the work executed in previous literature that whether the results of our this study correspond with the outcomes of literature studies or not. We have found from this study that FDI is significant on ROA in Pakistani banks. Nwanji et al. (2020) also reported that FDI has a significant impact on "Deposit banks" in Nigeria. According to the results of our study, Inflation (INF) is found to have significant impact upon ROA. However, the literature found mixed reviews about the correlation of Inflation & ROA. Jaber and Al-khawaldeh (2014) also stated that Inflation has the significant impact on profitability of banks in Jordan. "Asghar, M. (2021)" said that Inflation is negatively correlated with ROA in

USA banks whereas positively correlated with ROA in banks in UK. Yuan et al. (2022) expressed positive impact of Inflation on ROA in Commercial banks of south Asian countries. Similarly, M. Ali (2015) revealed the positive impact of Inflation upon ROA in Banks of Pakistan. We have found that the GDP growth (GROWTH) has insignificant impact upon ROA of this study. While amid the studies carried in literature, according to Islam et al. (2022) GDP was significant on ROA in Banks of Bangladesh. Yuan et al. (2022) revealed that the GDP growth has positive & significant impact upon ROA in South Asian countries' commercial banks. In our results, the Exchange rate (LER) is insignificant with ROA. However, as stated by Noorani (2020) Exchange rate is negatively significant on ROE in Pakistani Banks. Whereas Kiganda (2014) reported insignificant impact of the "Exchange rate" upon the Banks' profitability in Kenya. Progressing towards profitability determining internal factors, all the internal factors of our study have significant impact upon the profitability of banking sector of Pakistan which includes Liquidity (LLIQ), Deposits (LT_DEP) and Credits ratio (CREDIT) of the Banks. According to Jeris (2021) Deposits have positive impact upon both ROE and ROA in Banks of Bangladesh. R. A. Ali (2021) revealed that Deposits show positive impact on Banks' performance in Pakistan. M. Ali (2015) found negative impact of Liquidity & positive impact of Deposits on ROA in Banks of Pakistan. Similarly, Sultan et al. (2020) stated that deposits & liquidity have the significant impact upon profitability of Pakistani Banks. Ramchandani and Jethwani (2017) reported that credit-to-deposit ratio has a negatively significant impact on ROA of the commercial banks in India. The overall results have mixed reviews from the literature. The difference between the results of several studies is due to the different Economic and Geographical cultures of the countries as well as different sample sizes & time period.

6. Conclusion and Recommendations

The key findings of our study, using VAR analysis test reveals that amid the macroeconomic factors, only "FDI" and "Inflation rate" (INF) are significant on ROA i.e. profitability. "Exchange rate" (LER) and "GDP growth" (GROWTH) are found to be in-significant on "Returns on Asset" (ROA). Whereas, all the internal variables including Liquidity (LLIQ), Deposits (LT_DEP) and Credits (CREDIT) are found to have the significant impact upon ROA. Moreover, by Forecast error Variance Decomposition technique, we have derived the result that ROA is more significantly explained by its own self, which shows that profitability is significantly forecasted and explained by its own past performance. The results of the study are crucial for banking sector's stake holders & policy makers for the reason that banking sector's profitability is not only dependent upon the internal and bank-specific factors but it is also affected by the macroeconomic factors of the economy. These results help to identify the factors that affect the profitability & performance of banking sector in Pakistan. Better policy implications in regard with these findings may lead to enhance profitability of banking sector. Since the banking sector is one of the largest segments of Pakistan's economy, its prosperity will lead to economic development & growth in Pakistan. Moreover, the boost in profitability of banks will lead to more better mobilization as well as utilization of resources, capital and credits which may help to flourish the large-scale industries and trade encompass the small & medium enterprises as well. As a consequence, the business sectors will lead to accelerate which eventually benefits the GDP as well as economy of Pakistan as a whole. In light of the results, we present some policy implications & recommendations for policy makers and stakeholders of banking sector in Pakistan:

i) Encourage FDI Inflows

FDI flows in country through banking sector so encouraging its inflow and foreign investors may enhance its profitability of banks in Pakistan. Policymakers should restrict administrative obstacles, simplify procedures for approvals, and offer tax incentives to attract foreign investors. However, the political instability in Pakistan, security issues and inadequate infrastructures of the system are the obstacles in the way to promote FDI.

ii) Inflation Management

Implementing effective monetary measures, such as the adjustment of interest rates, can aid in stabilizing inflation & enhance profitability of banks in Pakistan. Moreover, the excess of imports over exports is the main reason of persistent increase in inflation in Pakistan. This is due to the poor infrastructure and shortage of domestic industries in the country. Reducing imports and encouraging domestic productions can help to reduce inflation, since it leads to decreases pressure on prices caused by excessive import demand.

iii) **Effective Exchange Rate Management**

To minimize the risk of losing value of banking assets which are caused by fluctuation in exchange rates, policy makers and stake holders should take steps like insurance for the money in different currencies, promote export oriented policies to increase foreign currency earnings foreign and strengthen foreign reserves in order to stabilize the domestic currency. However, since Pakistan is a developing country so the economic & political instability, burden of international loans as well as poor managements of system are the hurdles in the way of effective management of exchange rate

iv) **Major Role of Internal Factors**

The study reveals that profitability of banking sector in Pakistan relies mostly on internal variables. So the Key implications should include promoting infrastructural reforms, customer centric strategies, digitalization and encouraging financial literacy in the country. The financial inclusion may lead to enhance the deposits of banks and better utilization of credits. Deposits are the bloodline of banks, so, expansion in deposits will also lead to the increase of Liquidity & Credit ratio of Banks which would accelerate the overall performance & profitability of the sector. The expansion of banks size and rise in numbers of banks' branches will also lead to increase the Assets and Deposits, which further helps the profitability to boost. The proactive steps which improve internal structure of the banking sector leads to effectively navigate external economic fluctuations. The above recommendations can affect banking sector, stake holders & policy makers in the way that encouraged FDI in Pakistan might help the profitability of banks to boost, since FDI mostly flows in Pakistan through financial organizations i.e. banking sector. Hence, Deposits of Banking sector will increase which may facilitate the availability of credit in whole economy of Pakistan and help other businesses to groom.

The foreign reserves will also boost in connection with the inflow of foreign currency and capital in Pakistan which may stabilize the exchange rate of PKR as well as the inflation might be controlled. This also leads to the mobility of modern and advance technologies from other developed countries to Pakistan. Hence, the paper will help the policy makers of Pakistan to understand the importance of macroeconomic factors alongside FDI and motivate them make strategies & policies to attract Foreign Investments as well as reform managerial strategies. The encouraged inflow of FDI and growth of banking industry will lead to expand financial system of Pakistan which may eventually lead to growth and development of whole economy. In conclusion, both internal and macroeconomic factors play crucial roles in enhancing banking sector profitability in Pakistan. Policymakers and stakeholders should address all these factors comprehensively in order to promote a conducive environment for sustained profitability & growth of banking sector in Pakistan. The study has contributed by addressing the role of macroeconomic factors including FDI and Inflation on the banking sectors profitability in Pakistan which shows the direction for Pakistan's banking sector and policy makers to help them make policies and strategies accordingly, in order to enhance the profitability of sector which may eventually lead to the growth of whole economy of the country.

6.1. **Recommendations for future researchers**

The current study can be expended for future research analysis to investigate impact of macroeconomic variables; which are not included in our study, on banking sector's profitability in Pakistan.

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