

MACROECONOMIC DETERMINANTS OF BANK PROFITABILITY: EVIDENCE FROM RETURN ON EQUITY OF SCHEDULED COMMERCIAL BANKS IN INDIA

Shagufta Khatoon Sheikh ¹✉, Dr. Arpan Parashar ²

¹ Research Scholar, Banasthali Vidyapith, Dist-Tonk, Rajasthan, India

² Assistant Professor, Department of Commerce and Management, Banasthali Vidyapith, Dist-Tonk, Rajasthan, India



Received 21 December 2024

Accepted 23 January 2025

Published 28 February 2025

Corresponding Author

Shagufta Khatoon Sheikh,
Shagufta.Khatoon@outlook.com

DOI

[10.29121/ShodhPrabandhan.v2.i1.2025.118](https://doi.org/10.29121/ShodhPrabandhan.v2.i1.2025.118)

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Copyright: © 2025 The Author(s). This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

With the license CC-BY, authors retain the copyright, allowing anyone to download, reuse, re-print, modify, distribute, and/or copy their contribution. The work must be properly attributed to its author.



ABSTRACT

The study using Autoregressive distributed lag (ARDL) examined the short- and long-term impact of macroeconomic variables on the profitability of scheduled commercial banks in India. For the study the annual data from 2005-2006 to 2022-23 were collected where return on equity (ROE) used as independent variable and FDI, GDP, IIP, inflation and unemployment rate as dependent variable. The outcome revealed that, in long term all macroeconomic variables exerted an insignificant impact on ROE. Inflation and FDI show a positive association, whereas GDP, IIP and unemployment was negatively correlated. In the short-run FDI, GDP, inflation and unemployment displayed significant negative effects on profitability, while IIP showed no significant impact. The findings suggested that macroeconomic shocks influenced banking performance differently depending on the time horizon. Thus, the study is useful for policymakers, regulators and bank managers in framing strategies to safeguard financial stability. By understanding both the short- and long-term effects of macroeconomic changes enable stakeholders to improve their capacity to withstand and recover from external shocks while developing effective adaptive strategies.

Keywords: ARDL Model, Macroeconomic Variables, ROE, Scheduled Commercial Bank of India

1. INTRODUCTION

The economic growth of a country depends largely on the strength and efficiency of its banking sector. This is especially true in developing nation like India where banks play major role in financial system. In India, financial sector plays a crucial role in encouraging savings, promoting investment and providing a secure and efficient payment infrastructure that supports efficient cash flow. The Indian banking sector comprises of public sector, private sector, cooperative and foreign banks. These banks are operating under the regulatory framework of the Reserve

Bank of India. The widespread presence of banking institution in both urban and rural region helps in reducing inequalities and enhancing financial inclusion. The performance of banks has remained a major area of interest for economists, policymakers, and scholars alike, as it directly impacts the economic growth and financial stability of a country.

In recent years, global financial crises, banking frauds, corporate bank failures, and stock market fluctuations have emphasized the importance of macroeconomic factors in influencing the profitability and liquidity of banks. To ensure a stable financial system, it is important to consider both macroeconomic factors and Financial Stability Indicators. It is in this ever-changing economic environment that there is need to build such models that can explain the linkages that exist between macroeconomic determinants and a bank's financial performance. A thorough analysis of these variables would be very helpful in coming up with strategies geared towards enhancing the profitability and viability of banks

This paper's objective is to evaluate the association among macroeconomic variables-such as inflation, FDI inflows, GDP growth, index of industrial production (IIP) and unemployment- and the economic viability of scheduled commercial banks in India, as assessed by ROE. The Autoregressive Distributed Lag (ARDL) approach was used to evaluate data ranging from 2005-06 to 2022-23. The results are anticipated to help understand the long and short-term influence of macroeconomic indicators on financial performance of Indian banks and thus assist in policy making, risk management systems and banking reforms in India. Additionally, the result will enrich the corpus on the consequences of macroeconomic changes on the financial services, as opposed to views that posit uniformly negative effect on sector's performance in the majority of emerging nations.

2. LITERATURE REVIEW

The financial performance of bank is widely recognised as an important indicator of bank profitability, as it reflects the strength and stability of banking sector and create value for shareholders. ROE is commonly used to evaluate profitability, as it measures how efficiently banks utilize shareholders' funds to produce profits. The research highlights the macroeconomic determinants of profitability.

Among macroeconomic indicators, GDP growth has received greatest attention in the literature, though findings are mixed. [Athanasoglou et al. \(2008\)](#) studied Greek banks and reported that capital adequacy ratio improved profitability, while credit risk lowered it, but the impact of GDP growth varied. [Al-Homaidi et al. \(2020\)](#) examined Indian commercial banks and found that NPA, bank size and NIM increases profitability, while GDP and inflation decrease profitability. [Yahya et al. \(2017\)](#) studied banks in Yemen and found that GDP growth enhances profitability. [Das and Uppal \(2021\)](#) studied Indian banks and reported similar results. In contrast to these studies, [Jain et al. \(2019\)](#) found that GDP had a negative relationship with ROE in India which suggested that higher growth periods may intensify competition or compress margins. Globally, [Dietrich and Wanzenried \(2014\)](#), studied 118 countries and observed that GDP had positive relationship with profitability, but with variation across institutional and regulatory settings. Thus, GDP growth may stimulate profitability by raising credit demand, yet it can also create pressures that reduce these gains.

The index of industrial production (IIP) is an important indicator of short-term economic activity, yet it has not been widely examined in earlier studies. [Jain et al.](#)

(2019) showed that IIP negatively correlated with ROE in Indian Banks. The result of the study implied that growth in industrial output may increase the risk of loan defaults or reduce interest margin, which ultimately lowers profitability. Despite its significance, the impact of the IIP on Indian banking sector remains unexplored, particularly in distinguishing between the effects of short-run cyclical fluctuations from those of long-run industrial trends.

Inflation which is measured by CPI has produced mixed research findings. Athanasoglou et al. (2008) found that inflation had a positive effect on bank profitability in Greece, as banks were able to anticipate inflation and adjust their interest rates accordingly. In contrast, Tan and Floros (2012) reported a negative effect in China, while Al-Homaidi et al. (2020) found similar adverse impact in India. However, Das and Uppal (2021) argued that inflation could enhance the profitability of Indian banks when accompanied by high interest income. These mixed findings can be explained by differences in the capability to forecasting inflation, monetary policy and regulatory frameworks. In India, bank's ability to adapt to inflation pressures continues to play crucial in determining profitability.

In contrast, unemployment has received considerably less attention in South Asian studies. Issah and Antwi (2017) found that unemployment positively impacts profitability in UK, suggesting that higher employment may lead to greater household savings, thereby improving banks liquidity position. However, unemployment can increase the likelihood of loan defaults and weakens loan quality. This duality highlights the importance of incorporating unemployment into banking research. Nevertheless, the empirical studies investigating this relationship in India remain scarce.

Foreign direct investment (FDI) is even less examined. Musah et al. (2018), studying Ghana, found FDI inflows positively affected profitability by increasing deposits and lending opportunities. While India has seen substantial FDI growth, its direct effect on bank profitability has not been systematically explored. Given its association with investment, financial transactions, and growth, FDI may enhance bank profitability, though short-run effects could differ from long-term outcomes.

Recent research increasingly distinguishes between short- and long-run effects of macroeconomic factors using advanced econometric models such as ARDL. Bekhet et al. (2021), analysing Jordanian banks, found that loan loss provisions boosted ROA in the long run, while bank size and expenses reduced it, but in the short run, only loan loss provisions were significant. Similarly, Katusiime (2021) showed that in Uganda, interest rates and treasury bills mattered in the short run, whereas GDP growth and exchange rates shaped profitability over the long term. These studies emphasize the importance of separating cyclical shocks from equilibrium dynamics.

In India, empirical findings on macroeconomic effects are mixed. Bapat (2018) reported that GDP and inflation improved profitability, while non-performing loans and cost-to-income ratios reduced it. Misra (2015) found capital adequacy and non-interest income significant, but GDP and inflation insignificant. Singh (2010) observed GDP positively influencing profitability, though inflation was insignificant. By contrast, Gaur and Mohapatra (2021) concluded that GDP had no significant effect. Such diversity reflects the complexity of macroeconomic influences on Indian banking.

Cross-country analyses reinforce this variability. Dietrich and Wanzenried (2014) found GDP per capita and inflation to positively influence profitability globally, while Salike and Ao (2017) reported GDP growth as beneficial for Asian banks, though inflation and spreads were insignificant. These outcomes highlight

how institutional frameworks, regulation, and structural characteristics shape macroeconomic effects on bank profitability.

In summary, the literature confirms that bank profitability is influenced by a combination of internal and external factors, but the evidence on macroeconomic variables is far from conclusive. GDP growth generally tends to support profitability but sometimes exerts negative effects, as seen in India. Inflation is alternately positive and negative depending on banks' ability to anticipate and respond to price changes. The impact of industrial production, unemployment, and FDI on bank profitability remains underexplored, particularly in the Indian context. Furthermore, most studies on Indian banks have employed static models, providing little distinction between short-run shocks and long-run equilibrium dynamics. Evidence from other countries using ARDL and related approaches suggests that this temporal dimension is essential for understanding how macroeconomic factors shape bank profitability. Thus, there is a clear gap in the literature for a comprehensive study that examines the short-run and long-run impacts of GDP, IIP, CPI, unemployment, and FDI on the profitability of Indian banks, measured through ROE.

3. METHODOLOGY

This study's goal was to figure out the immediate and long-term impacts of macroeconomic factors on the profitability of scheduled commercial banks in India using the ARDL approach. For the study, data of 18 years were collected i.e. from 2005-06 to 2022-23. The selected independent macroeconomic indicators are CPI, FDI, annual unemployment rate, GDP growth, and index of industrial production (IIP). The dependent variables representing bank profits is ROE.

3.1. MODEL SPECIFICATIONS

Autoregressive Distributed Lag (ARDL) is an estimation method for time series analysis that analyse how dependent variables are influenced by independent variables over time and assesses the influence of bounded variables [Pesaran et al. \(2001\)](#) developed the ARDL approach. This method proves beneficial as it captures both immediate and long-term association between independent and dependent variables within a single-equation framework, thereby rendering it easy to execute and interpret. Furthermore, it also solves autocorrelation problems, allowing for a clear distinction between independent and dependent variables [Pesaran et al. \(2001\)](#). This above strategy is suitable for small sample sizes and accounts for potential endogeneity [Narayan \(2005\)](#).

This paper examined how India's scheduled commercial bank's profitability fluctuates with macroeconomic factors and for this ARDL method is employed. The dependent variable is ROE, and independent variables are FDI, CPI, unemployment rate (UNEMP), IIP and GDP growth rate. The Regression model is:

Model1:

$$ROEt = \alpha_0 + \alpha_1(CPI)_t + \alpha_2(FDI)_t + \alpha_3(GDP)_t + \alpha_4(IIP)_t + \alpha_5(UNEMP)_t + \epsilon_t$$

where α_0 coefficient of the constant. α_1 , α_2 , α_3 , α_4 , and α_5 represent the fractional value of the independent variables. Finally, ϵ_t indicates the stochastic term.

3.2. UNIT ROOT TESTS

Testing the data's stationarity is of vital importance as, when analysing data from time series, non-stationary data in model estimation can lead to spurious regression outcomes. For the ARDL model, certain variables are required to be stable at levels $I(0)$, whereas some should be stable after initial differencing $I(1)$; however, variables that become stationary at the second level $I(2)$ are not suitable Pesaran et al. (2001). Thus, before conducting cointegration analysis, the stationarity of the time series must be verified. To do this, stationarity of the series was examined using the Augmented Dickey-Fuller (ADF) test Dickey and Fuller (1979) and the Phillips-Perron (PP) test Perron and Ng (1996).

3.3. CO-INTEGRATION TEST

Pesaran, Shin, and Smith developed the ARDL approach in 2001. Generalized equation of ARDL is given below:

Model 1

$$ROEt = \alpha_0 + \sum_{i=1}^p \beta_i ROEt-i + \sum_{i=0}^{q1} \gamma_i CPIt-i + \sum_{i=0}^{q2} \delta_i FDI t-i + \sum_{i=0}^{q3} \phi_i GDPt-i + \sum_{i=0}^{q4} \theta_i IIPt-i + \sum_{i=0}^{q5} \lambda_i UNEMPt-i + \varepsilon_t$$

Where

- $ROEt$ represent dependent variable at time t .
- $CPIt-i$, $FDIt-i$, $GDPt-i$, $IIPt-i$ and $UNEMPt-i$ are the independent variables each included with their respective lag structures defined by $q1$, $q2$, $q3$, $q4$ and $q5$.
- α_0 is the constant term.
- Lagged value of both explanatory and dependent variables are represented as β_i , γ_i , δ_i , ϕ_i , θ_i , and λ_i .
- ε_t is error term.

Note- the values of p , $q1$, $q2$, $q3$, $q4$ and $q5$ are selected based on model selection criteria called Akaike info criterion (AIC).

3.4. EQUATION F-BOUND TEST

Bounds F-test in the ARDL framework and Error Correction Model (ECM), is used to examine the long-term equilibrium link among the dependent and independent variables Narayan (2005). The restricted constant implies that the intercept (constant) term is incorporated in the immediate dynamics, however excluded from the long-run model. The "no trend" assumption signifies the absence of linear trend in the data.

3.5. UNRESTRICTED ECM EQUATION WITH RESTRICTED CONSTANT AND NO TREND:

Model 1: ROE

$$\Delta ROEt = \alpha_0 + \sum_{i=1}^{(p-1)} \beta_i \Delta ROEt-i + \sum_{i=0}^{(q1-1)} \gamma_i \Delta CPIt-i + \sum_{i=0}^{(q2-1)} \delta_i \Delta FDI t-i + \sum_{i=0}^{(q3-1)} \phi_i \Delta GDPt-i + \sum_{i=0}^{(q4-1)} \theta_i \Delta IIPt-i + \sum_{i=0}^{(q5-1)} \lambda_i \Delta UNEMPt-i + \psi (ROEt-1 - \mu_0 - \mu_1 CPIt-1 - \mu_2 FDI t-1 - \mu_3 GDPt-1 - \mu_4 IIPt-1 - \mu_5 UNEMPt-1) + \varepsilon_t$$

Where,

- $\Delta ROEt$ represent the first difference.
- α_0 denotes short-run intercept (constant term), which is included only in the short-run dynamics.
- The variables CPI_{t-i} , FDI_{t-i} , GDP_{t-i} , IIP_{t-i} and $UNEMP_{t-i}$ describes the short-run dynamics in varying lags.
- ψ is the speed of adjustment.
- $\mu_1, \mu_2, \mu_3, \mu_4$, and μ_5 are long-run coefficients representing the equilibrium relationships between dependent and independent variables.
- ϵ_t denotes the error term at time t .

Hypotheses are

H0 : $\Psi = 0$ (no existence of cointegration)

H1 : $\Psi < 0$ (existence of cointegration)

The F-test is utilized to determine the cumulative significance of the lagged level parameters, and its results are compared to critical boundaries established by [Pesaran et al. \(2001\)](#), [Narayan \(2005\)](#). If the projected F-statistic surpasses crucial limits, then the null hypothesis is rejected, showing a valid long-term association. If the F-statistic falls below the lower boundaries, the null hypothesis is not rejected and if the F-statistic is between the bounds, the findings are wrong.

4. RESULTS AND DISCUSSION

Table 1

Table 1 Exploratory Statistics						
Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Observation
ROE	9.732778	11.81	15.98	-2.81	6.303719	18
CPI	6.778757	6.498159	11.98939	3.328173	2.603317	18
FDI	1.873267	1.74152	3.620522	0.886101	0.605483	18
GDP	6.205556	7.3	9.1	-5.8	3.398178	18
IIP	94.57253	95.41872	121	57.84565	18.10016	18
UNEMP	7.783333	8.05	8.7	4.8	0.973321	18

Source: Author

[Table 1](#) shows the exploratory statistics of variables. The table shows that IIP has highest mean 94.57253 with standard deviations of 18.10016 followed by ROE with the mean of 9.732778 and standard deviations is 6.303719. Similarly, mean of CPI, FDI, GDP and UNEMP are 6.778757, 1.873267, 6.205556 and 7.783333 respectively.

Before conducting a cointegration test, it is crucial to ensure that the data series is stationary. Under the ARDL model, stationarity of variables is necessary, either in their original levels or once first-differenced. If the parameters are stationary at second differences, then the ARDL model cannot be applied [Pesaran et al. \(2001\)](#).

To ascertain stationarity of the variables, unit root tests were performed, specifically the an ADF test and Phillips-Perron (PP) test. The results, as depicted in [Table 2](#), revealed that certain variables, namely ROE, IIP, UNEMP and CPI are stationary at their first differences, while FDI and GDP are stationary at level at the 5% significance level. No variable reached stationarity when differenced twice.

Therefore, the ARDL linear regression approach is deemed appropriate for this study.

Table 2

Table 2 ADF and PP Test					
Variables	Augmented Dickey-Fuller (ADF) Test		Phillips-Perron (PP) Test		Status
	t-statistics	P-value	t-statistics	P-value	
ROE	-2.040873	0.0433	-3.099808	0.047	I (1)
CPI	-3.703042	0.0152	-3.703042	0.152	I (1)
FDI	-3.313653	0.0306	-3.313653	0.0306	I (0)
GDP	-3.87549	0.0102	-3.876814	0.0102	I (0)
IIP	-3.93983	0.0104	-5.200315	0.0009	I (1)
UNEMP	-9.082526	0	-4.515429	0.0032	I (1)

Source: Author

For cointegration, the F-Bounds test is conducted using EViews 12 software for both models. The ideal lag lengths have been identified using the Akaike Information Criterion (AIC), which gives a standard deviation that is lesser than the Schwarz Information Criterion (SIC) [Pesaran and Pesaran \(1997\)](#). The optimal lag lengths for Model 1 is 2 for the dependent variable (ROE) and 1 for the independent variables (CPI, FDI, GDP, IIP, and unemployment), resulting in the appropriate model ARDL (2, 1, 1, 1, 1, 1).

The test outcomes of the ARDL F-Bound test are depicted in Table 3. At a 5% significance level, Model 1 yields an F-statistic of 13.12570, which surpasses the upper bound, confirming the presence of cointegration between the independent parameters and ROE.

The presence of cointegration suggests long-run associations among the selected variables. Therefore, both the long-run and short-run dynamics, including Error Correction Mechanism (ECM), are analysed in the ARDL model.

Table 3

Table 3 ARDL F-Bound Test		
Significance	I (0) Bound	I (1) Bound
1%	3.06	4.15
2.50%	2.7	3.73
5%	2.39	3.38
10%	2.08	3
Model 1: ROE F-statistics is 13.12570		

Source: Author

Considering the conclusive proof of cointegration from [Table 3](#), the long-run and short-run relationships were computed by applying ECM. Table 4 outlines the long-term relationships between macroeconomic variables and the profitability of Indian banks. It is evident from [Table 4](#) that in long run all the macroeconomic indicators except CPI have insignificant long-run effects on the profitability Indian banks. The CPI shows significant positive connection with ROE (Coefficient = 1.4681, $p = 0.0481$), indicating that during the research period to some extent expected inflation provides banks with an opportunity to modify interest rates appropriately, enabling

revenues to grow quickly than costs and thus positively affecting profitability [Misra \(2015\)](#), [Bapat \(2018\)](#), [Athanasoglou et al. \(2008\)](#), [Anshu and Gakhar \(2019\)](#). FDI exhibits a positive correlation with ROE (Coefficient = 0.3716, $p = 0.8866$); that is, as FDI inflows increase, ROE will also rise, result similar to [Musah et al. \(2018\)](#). Furthermore, GDP growth shows an adverse and insignificant correlation with ROE (Coefficient = -4.5838, $p = 0.2484$), a finding similar to that of [Bekhet et al. \(2021\)](#). The Index of Industrial Production (IIP) also exhibits adverse association with ROE (Coefficient = -1.0756, $p = 0.0895$), indicating that as industrial output increases, the bank profitability decreases [Jain et al. \(2019\)](#). Finally, the results show adverse association among unemployment and ROE (Coefficients = -18.6949, $p = 0.1223$). This adverse relationship suggests that as unemployment increases, the profitability of banks declines, findings same as [Horobet et al. \(2021\)](#).

Table 4**Table 4 Long-term coefficients using ARDL model**

Variables	Model 1: ROE		
	Coefficient	t-statistic	p-value
CPI	1.468102	3.232838	0.0481
FDI	0.371552	0.155065	0.8866
GDP	-4.58383	-1.42819	0.2484
IIP	-1.075622	-2.477632	0.0895
UNEMP	-18.69487	-2.135921	0.1223

Source: Author

[Table 5](#) illustrates the short-run association between macroeconomic determinants and the profitability of scheduled commercial banks. In accordance with cointegration, the error correction term (ECT) was introduced into the framework to make an association between behaviour of short-run and long-run variables. The error correction model (ECM) was utilized to examine whether the short-term deviations from the long-run relationship are transitory thereby confirming the presence of stable long-term equilibrium. ECM also shows the presence of short-run association among parameters along with their direction. The outcomes demonstrate that the error correction coefficients for Model 1 (ROE) is adverse and statistically crucial, confirming adjustment toward the long-run equilibrium. Specifically, the ECT coefficients for ROE is -0.449020, implying that approximately 44.9020% of disequilibrium is corrected each period.

In the short-run, GDP growth has a considerable and adverse influence on ROE. This indicates that a 1% increase in GDP corresponds to a decline ROE by 1.545802%. This negative association between GDP and profitability is likely explained through the notion that bank assets contribute more to the GDP, resulting in competitive banking sectors that generally have smaller margins and lower profitability [Demirgüç-Kunt and Huizinga \(1999\)](#). Similarly, unemployment shows a strong adverse influence on profitability in short-run similar to [Horobet et al. \(2021\)](#). A 1% rise in unemployment in India, causes a decrease in ROE by 6.273780%, Increasing unemployment restrains the flow of income and deposit mobilization for investment by the banking sector, which in turn reduces its overall profitability. Further, ROE, CPI and FDI also exhibit negative relationships, with CPI being significant at the 10% level and FDI at the 1% level in short-run. The coefficients for CPI and FDI are 0.294948 and 1.816070, respectively. This negative impact of FDI may be attributed to the role of FDI in enhancing the operational

efficiency of regional enterprises by boosting foreign exchange earnings, fostering capital formation, advancing technology, and strengthening the credibility of local businesses, thereby improving loan quality and boosting bank profitability [Musah et al. \(2018\)](#). CPI's negative link with profitability in short period may stem from banks' sluggish adjustment of interest rates, which causes costs to rise more quickly than revenues, thereby adversely affecting performance [Das and Uppal \(2021\)](#). In contrast, IIP shows a positive but insignificant influence on ROE, indicating that with a 1% increase in IIP, the ROE of commercial banks in India will rise by 0.071552%.

Table 5**Table 5 Short-term coefficients using ARDL model**

Model 1: ROE			
Variables	Coefficients	t-statistic	p-value
CointEq (-1)	-0.44902	-16.6024	0.0005*
ROE (-1)	-0.925074	-10.57482	0.0018*
CPI	-0.294948	-2.476536	0.0895***
FDI	-1.81607	-4.776852	0.0174*
GDP	-1.545802	-14.48373	0.0007*
IIP	0.071552	1.704	0.1869
UNEMP	-6.27378	-13.14914	0.0010*

Source: Author

4.1. RESIDUAL DIAGNOSTIC TEST

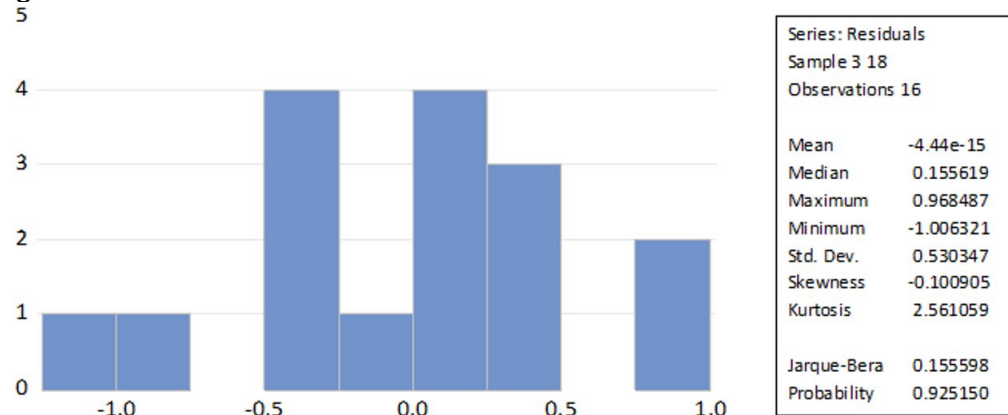
[Table 6](#) reports the outcome of various diagnostic tests performed to test the stability of models. To detect serial correlation, Breusch-Godfrey LM test was used. The p-value for Model1 (ROE) was 0.1986, indicating that in the model no serial correlation found. Next the presence of heteroskedasticity was tested using the Breusch-Pagan-Godfrey test. It was found that the residuals were homoscedastic which means that regression results are valid. To test the linearity, the Ramsey RESET test was applied and result revealed that model was correctly specified.

Table 6**Table 6 Residual Diagnostic Test Results**

Test Performed	Nature of Tests	Model 1: ROE	
		p-value	Interpretation
4Breusch-Godfrey LM test	Serial Correlation test	0.1986	No serial correlation
Breusch-pagan- Godfrey test	Heteroscedasticity test	0.2386	Residual are homoscedastic
Ramsey RESET test	Linearity test	0.3058	Model is correctly specified

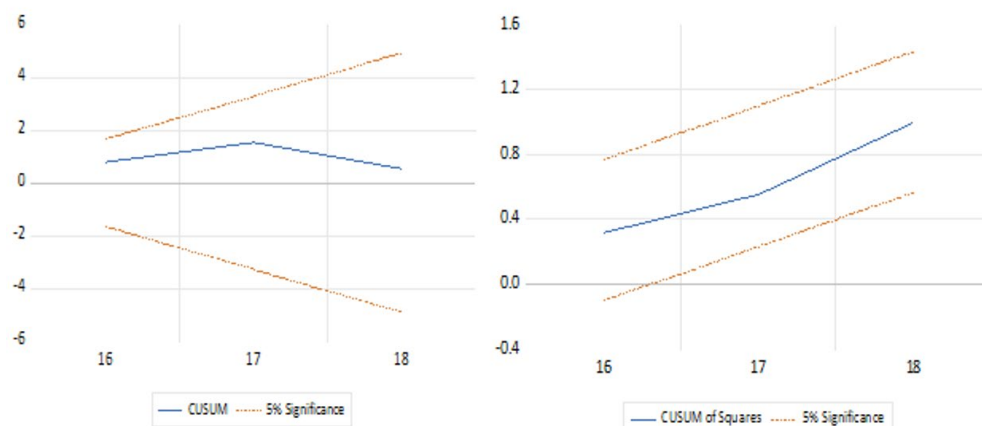
Source: Author

Further, to check the normal distribution of residuals, a histogram normality test was applied. Figures 1 show that the Jarque-Bera test result is not significant, thus concluding that the residual distribution is normally distributed.

Figure 1**Figure 1 Histogram Normality Test for Model 1: ROE**

Source: Author

For testing stability, CUSUM (Cumulative Sum) test and CUSUMSQ (Cumulative Sum of Square) test were used [Brown et al. \(1975\)](#). Figure 2 show that both the model is within the significance level of 5%, indicating the tested model is stable throughout the observation period.

Figure 2**Figure 2 CUSUM Test and CUSUM Square test for Model 1: ROE**

Source: Author

5. CONCLUSION

This research depends on understanding of the interrelation between the macroeconomic environment and social banking profitability in India by filling in the missing link of this area. The study's findings show that the economic health of banks is volatile and reacts to changes in the external economy with different trends in short- and long-run. The study draws different understandings of bank profitability allure by how their resources and capital of shareholders are adversely affected by level of inflation, FDI, GDP, IIP and unemployment.

In the long-term view, a positive relationship (correlation) is observed both for inflation (CPI) and for FDI, as to the influence capitalist profit deriving from the banking activity shows over long periods of time. Banks enhance revenue faster than costs by increasing interest rates in conformity with the ongoing price level. It is this relationship that states that inflationary trends, to some extent when controlled can facilitate rather than dim the prospects of a bank's profitability. Some other banks use inflation as windows of opportunity during which they can increase target lending and deposit rates without losing their interest margin or even increase it. FDI is positively related to both partial and total bank performance – lending in particular, meaning that foreign capital inflow is important in improving the performance of the bank. Through capital formation, or technology, and creating confidence for the internal financial market, foreign direct investment helps in the growth of local entities. This in turn translates into reduced credit risk and improved returns for the banks. Also, foreign investment results in more foreign earnings, since the bank's products and services become more attractive and competitive in nature which aids in profitability.

Alternatively, GDP growth rate, IIP, and unemployment are factors that exhibit a negative long run relation with profitability. The relationship of negative correlation between the GDP growth and profitability aghast be counter intuitive but this can be accounted for due to the stiffer competition brought on during economic booms. Along with growth, the number of players in the industry i.e. banks, financial investors among others are also on the increase which lowers the earnings due to stiff competition. Also, the IIP's adverse effect on profitability suggests that higher interests in industrial production alone is not a profit earner for most of the banks possibly because they are squeezed to underwrite many industrial investments at low returns.

Finally, the negative relationship that exists between leisure and profit is supported by the fact that when people are unemployed, they find it difficult to deposit savings or repay debts which in turn undermines the overall financial stability of banks.

In the short-term findings indicate that GDP expansion and unemployment have effects, on ROE for banks which suggests an immediate unfavourable impact on bank profitability due to these factors as GDP increases banks might encounter reduced margins while contending for loaning prospects The substantial negative influence of unemployment demonstrates the pressure that a growing rate of unemployment puts, on the banking industry. When there's an increase, in unemployment rates people and businesses face challenges in meeting their commitmentss resulting in more cases of missed loan payments and reduced savings amounts, all of which led to less spending by consumers and ultimately result in lower profits, for banks.

In the short-term period of time the study reveals that GDP growth and unemployment exert significant negative influences on ROE, signalling the immediate adverse effects of these factors on bank profitability. As GDP grows, banks may face shrinking margins as they compete for lending opportunities. The significant negative impact of unemployment reflects the strain that a rising jobless rate places on the banking sector. Higher unemployment rates lead to loan defaults, reduced savings, and lower overall consumer spending, all of which contribute to decline in bank profits.

The results of this study are a pointer for the bank managers to be sensitive to adjustments in the macroeconomic environment. In the short term, therefore, the effects of GDP growth and unemployment should be managed through immediate

risk mitigation measures such as improving the process of screening loans and giving more emphasis to the recovery of loans. In the long term, banks should also reposition themselves to take advantage of inflation and FDI inflows by realigning their interest rate policies and capitalizing on emerging opportunities from foreign investments.

Ultimately, this study highlights the significant influence of macroeconomic parameters on the profitability of Indian scheduled commercial banks. While CPI and FDI present long-term advantages, GDP growth, IIP, and unemployment pose challenges. Particularly in the short term, it is observed that GDP growth and unemployment exert pronounced negative impact and, hence, bring out the need for proactive management of economic conditions outside the country.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

- Al-Homaidi, E. A., Almaqtari, F. A., Yahya, A. T., and Khaled, A. S. D. (2020). Internal and External Determinants of Listed Commercial Banks' Profitability in India: Dynamic GMM Approach. *International Journal of Monetary Economics and Finance*, 13(1), 34–67. <https://doi.org/10.1504/IJMEF.2020.105333>
- Ali, M., and Puah, C.-H. (2019). The Internal Determinants of Bank Profitability and Stability: An Insight from the Banking Sector of Pakistan. *Management Research Review*, 42(1), 49–67. <https://doi.org/10.1108/MRR-04-2017-0103>
- Anshu, and Gakhar, K. (2019). Impact of Macroeconomic Variables on Financial Performance of Indian Banking Sector. *International Journal of Engineering Applied Sciences and Technology*, 4(3), 259–265. <https://doi.org/10.33564/IJEAST.2019.v04i03.043>
- Athanasoglou, N. P., and Ekananda, M. (2023). Loan to value ratio, KPR and KPA in Indonesia: An ARDL Approach. *Journal of Developing Economies*, 8(1), 218–230. <https://doi.org/10.20473/jde.v8i1.39737>
- Athanasoglou, P. P., Brissimis, S. N., and Delis, M. D. (2008). Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability. *Journal of International Financial Markets, Institutions and Money*, 18(2), 121–136. <https://doi.org/10.1016/j.intfin.2006.07.001>
- Bapat, D. (2018). Profitability Drivers for Indian Banks: A Dynamic Panel Data Analysis. *Eurasian Business Review*, 8(4), 437–451. <https://doi.org/10.1007/s40821-017-0096-2>
- Bekhet, H. A., Alsmadi, A. M., and Khudari, M. (2021). Dynamic Linkages Between Profitability and Its Determinants: Empirical Evidence from Jordanian Commercial Banks. *The Journal of Asian Finance, Economics and Business*, 8(6), 687–700. <https://doi.org/10.13106/JAFEB.2021.VOL8.NO6.0687>
- Brown, R. L., Durbin, J., and Evans, J. M. (1975). Techniques for Testing the Constancy of Regression Relationships Over Time. *Journal of the Royal Statistical*

- Society: Series B (Methodological), 37(2), 149–163.
<https://doi.org/10.1111/j.2517-6161.1975.tb01532.x>
- Das, S. K., and Uppal, K. (2021). NPAs and Profitability in Indian Banks: An Empirical Analysis. *Future Business Journal*, 7(1), Article 53.
<https://doi.org/10.1186/s43093-021-00096-3>
- Demirgüç-Kunt, A., and Huizinga, H. (1999). Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence. *The World Bank Economic Review*, 13(2), 379–408.
<https://doi.org/10.1093/wber/13.2.379>
- Dickey, D. A., and Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, 74(366), 427–431.
<https://doi.org/10.2307/2286348>
- Dietrich, A., and Wanzenried, G. (2014). The Determinants of Commercial Banking Profitability in Low-, Middle-, and High-Income Countries. *The Quarterly Review of Economics and Finance*, 54(3), 337–354.
<https://doi.org/10.1016/j.qref.2014.03.001>
- Gaur, D., and Mohapatra, D. R. (2021). Non-Performing Assets and Profitability: Case of Indian banking Sector. *Vision*, 25(2), 180–191.
<https://doi.org/10.1177/0972262920914106>
- Horobet, A., Radulescu, M., Belascu, L., and Dita, S. M. (2021). Determinants of Bank Profitability in CEE Countries: Evidence from GMM Panel Data Estimates. *Journal of Risk and Financial Management*, 14(7), Article 307.
<https://doi.org/10.3390/jrfm14070307>
- Issah, M., and Antwi, S. (2017). Role of Macroeconomic Variables on Firms' Performance: Evidence from the UK. *Cogent Economics and Finance*, 5(1), Article 1405581. <https://doi.org/10.1080/23322039.2017.1405581>
- Jain, R. K., Metri, B., and Rao, K. P. V. (2019). Determinants of Profitability of Indian Commercial Banks. *Indian Journal of Finance*, 13(1), 8–19.
<https://doi.org/10.17010/ijf/2019/v13i1/141016>
- Katusiime, L. (2021). COVID-19 and Bank Profitability in Low-Income Countries: The Case of Uganda. *Journal of Risk and Financial Management*, 14(12), Article 588. <https://doi.org/10.3390/jrfm14120588>
- Misra, S. D. (2015). Determinants of Bank Profitability in India. *International Journal of Indian Culture and Business Management*, 10(2), 193–211.
<https://doi.org/10.1504/IJICBM.2015.068170>
- Musah, A., Gakpetor, E. D., Kyei, S. N. K., and Akomeah, E. (2018). Foreign Direct Investment (FDI), Economic Growth and Bank Performance in Ghana. *International Journal of Finance and Accounting*, 7(4), 97–107.
<https://doi.org/10.5923/j.ijfa.20180704.02>
- Narayan, P. K. (2005). The Saving and Investment Nexus for China: Evidence from Cointegration Tests. *Applied Economics*, 37(17), 1979–1990.
<https://doi.org/10.1080/00036840500278103>
- Nayak, R. K. (2022). Performance of Odisha State Co-Operative Bank: An ARDL Approach. *Arthaniti: Journal of Economic Theory and Practice*, 21(1), 7–26.
<https://doi.org/10.1177/0976747920941769>
- Perron, P., and Ng, S. (1996). Useful Modifications to Some Unit Root Tests with Dependent Errors and Their Local Asymptotic Properties. *The Review of Economic Studies*, 63(3), 435–463. <https://doi.org/10.2307/2297890>
- Pesaran, M. H., Shin, Y., and Smith, R. J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16(3), 289–326. <https://doi.org/10.1002/jae.616>

- Salike, N., and Ao, B. (2017). Determinants of Bank Profitability: Role of Poor Asset Quality in Asia. *China Finance Review International*, 8(2), 216–231. <https://doi.org/10.1108/CFRI-10-2016-0118>
- Singh, D. (2010). Bank Specific and Macroeconomic Determinants of Bank Profitability: The Indian Evidence. *Paradigm*, 14(1), 53–64. <https://doi.org/10.1177/0971890720100107>
- Tan, Y., and Floros, C. (2012). Bank Profitability and Inflation: The Case of China. *Journal of Economic Studies*, 39(6), 675–696. <https://doi.org/10.1108/01443581211274610>
- Yahya, A. T., Akhtar, A., and Tabash, M. I. (2017). The Impact of Political Instability, Macroeconomic and Bank-Specific Factors on the Profitability of Islamic Banks: Empirical Evidence. *Investment Management and Financial Innovations*, 14(4), 30–39. [https://doi.org/10.21511/imfi.14\(4\).2017.04](https://doi.org/10.21511/imfi.14(4).2017.04)