

ABSTRACT

1. Introduction:

Although banking industry of India has made commendable progress for many years, the progress of the banking sector is plagued by issues such as rising non-performing assets (NPAs), increasing bank frauds, poor financial outreach in rural areas and so on. Additionally, the degree of competitiveness in the sector has intensified over the years. The entry of foreign banks after the introduction of financial reforms in India has added to the growing competition. A low performance of the banking sector can have a negative influence on various sections of the economy. Better performance of banking sector is crucial for overall growth of an economy as financial development and economic growth are observed to be closely related.

Performance of banking sector is known to be dependent upon bank-specific, industry-specific and macroeconomic variables in a nation. The impact of these factors on banking performance have been widely discussed over previous literature. Nonetheless, with changing dynamics of the banking industry of India, it is vital to look into additional dimensions bringing an impression on the performance of the industry. For instance, it is important to investigate whether the implementation of Companies Act 2013 has improved board gender diversity of banks and more importantly if it has been uniformly improved across public sector bank (PSBs) and private sector banks in India (PVBs). Further, the impact of board gender diversity on the performance of PSBs and PVBs in India can highlight on role of the gender diversity in decision making in the board.

Performance of the banking sector is improved if banks are more efficient. An efficient bank will ensure productive utilization of financial resources, lower costs, improved profitability and better service quality. The overall banking efficiency of the banking industry is determined by both profitability efficiency and marketability efficiency and therefore, it is meaningful to assess both profitability efficiency and marketability efficiency of banks in India and their impact on banking performance. Efficiency analysis will help the banking industry to optimize the production process and resource allocation.

Macro-economic variables have a considerable influence on profitability of banks in India. The transient and frequently unexpected nature of most macroeconomic conditions

continues to generate great interest in the link between inflationary conditions and performance of banks. Regulators regarded inflation expectation as an immediate regulatory instrument for attaining stability of the economy. Inflation expectation affects the monetary policy of the country and banking performance in India. Indian banking industry would be able to take strategic decisions for the banking sector, by analysing the impact of inflation expectation on banking performance. In order to improve performance of banks and achieve the economic growth, appropriate macroeconomic strategies should be adopted. Before adoption of these strategies, they have to consider inflation expectation of the country.

Energy is essential for promoting national development. Natural gas and crude oil are the two main components in a production process and hence, are of vital importance for economic activities as well as for capital market (Lee & Lee ,2019). Changes in oil prices impacts both the real and financial sector of an economy (Narayan & Gupta, 2015). The banking sector is affected in terms of liquidity ratio, earnings of capitalization and capital structure (Lee and Lee, 2019). Due to India's large dependency on imports, oil price fluctuations have a considerable influence on its economy through a number of price transmission mechanisms. An assessment of whether price of oil has a direct or indirect impact on the banking performance can indicate if oil price affects the banking performance in India directly through high liquidity ratio, advances linked to oil & oil industry and banking related transactions in the banking sector or due to the macro-economic variables of an economy.

2. Review of literature:

2.1 Board diversity and banking performance:

The relationship between performance of banks and diversity of board is explained by the Agency theory. This theory states that diversity of board increase the effectiveness of an organization (Biswas et al.,2021). Board diversity can create high level of innovation and creativity among diverse groups which promotes different viewpoints and it results in significant improvement of top-level decision-making (Hagendorff et al., 2007). The performance of a firm is found to be positively influenced by gender diversity studies like Carter et al.(2003) Campbell and Mínguez(2008), and Nguyen et al.(2020). In order to help businesses to overcome the constraints imposed by inadequate governance, board

gender diversity can boost supervision and serve as an additional governance instrument (Adams & Ferreira, 2009; Gul & Hong et al., 2020). Further, Galletta et al. (2022) found that female managers are more interested in addressing social issues than female directors. At the same time, they also found that increasing proportion of female directors improves financial performance of banks. Therefore, they suggest a right combination of female managers and female directors to improve social performance along with financial performance.

However, Adams & Ferreira (2009) have discovered that board gender diversity negatively influence the firm performance. Since, mandatory gender quotas can create effect on shareholder value in firms since it could lead to over-monitoring in those organizations. Alesina & Ferrara (2005) point out that high gender diversity leads to high communication cost and conflicts. Moreover, investors react adversely when female board members are appointed causing negative impact on future stock price (Dobbin & Jung, 2011). However, when the presence of women are more than three in the board, it creates a favourable influence on financial performance compared to low female presence. Based on the existing literature, we propose following hypothesis.

2.2 Banking efficiency and banking performance:

Efficiency indicates the capacity to use the resources with minimum cost that will improve the banking performance of the country and market power (Athanasoglou et al., 2005). The relationship between banking efficiency and banking performance is explained by the efficient structure hypothesis (ESH) put forward by Harold (1973) and Peltzman (1977). Under the ES hypothesis, firms with efficient management and production technology can enjoy lower production costs and therefore bring higher profit (Alhassan et al., 2016). Profitability of banks can be reduced by greater degree of cost of efficiency of the banks (Tan et al., 2017). Furthermore, it was found that profitability inefficiency, cost and revenue inefficiency adversely affect the performance of banks. In the Indian context, Rakshit (2023) found that greater degree of profit, revenue and cost efficiency have substantial impact on bank performance. Seiford & Zhu (1999) measures profitability efficiency and marketability efficiency simultaneously and found that relatively large banks do better in terms of profitability, whereas smaller banks perform better in terms of marketability. Based on the existing literature, we propose following hypothesis.

2.3 Inflation expectation and banking performance:

The role of inflation expectation in financial behaviour and financial decisions of economic-agents is explained by prominent theories such as the rational expectation theory, adaptive expectation theory and Fisher hypothesis. Inflation expectation is the rate of inflation expected by distinct sections of the people including workers, business people and investors in the future. According to the rational expectation theory of Muth (1961), for future expectations, economic agents will employ all of the finest available data and economic theory. This theory believes that rational expectations regarding price level, aggregate output and level of unemployment will boost the quality and precision of future decisions (Ahuja, 2008). According to Friedman's adaptive expectation hypothesis, people will take decisions based on past events and trends (Anwar, 2017). The Fisher hypothesis explains why expected inflation and the rate of interest have a favourable relation. When expected inflation is high, the investors also expect to have more profit which affect the bank's profitability (Ayub et al., 2014).

Households' inflation expectations have attracted central banks' interest, as they are important in devising effective monetary policy. The level of inflation expectation has a substantial impact on actual rate of inflation and, as a result, the RBI 's capacity to attain price stability. For central banks, managing inflation expectations has become an important instrument in implementing monetary policy (Maria & Hussain, 2023). Tan & Floros (2012) and Khue and Lai (2020) analysed the effect of inflation and inflation expectation on the banking performance. Inflation and banking profitability have exhibited a positive relationship provided inflation is anticipated correctly. Inflation expectation helps reduce inflation uncertainty and these factors significantly influence banking profitability. Based on the existing literature, we propose following hypothesis.

2.4 Oil price and banking performance:

Hamilton (1988) pioneering work on the relationship between oil price and economic growth has created interest among researchers in this field. Hamilton (1983) found that oil prices have a negative impact on actual output. Crude oil price sensitivity significantly affects the business environment and business conditions of the country. Moreover, the effect of the price will differ in the financial and non-financial sectors (Sodeyfi & Katircioglu, 2016).

Banking performance is affected by oil price through two different channels. The first is the inflation effect channel. Here a rise in rate of inflation in the country, adversely affects credit market operations, causing a decline in the performance of financial institutions (Boyad et al., 2001). There is an adverse relationship between economic development and changing oil price. So the second is considered to be economic growth and unemployment as effect channel (Kilian, 2008). Oil price of the country adversely influences the earnings of firm and economic growth, since oil hikes drive up marginal cost of production. Increasing oil price adversely affect the productivity and outputs of firms. A decline in economic activities creates a negative impact on banking sector performance. Jalili et al. (2019) found that relationship between economic growth and oil price changes in 31 oil-rich nations from 1980 to 2015. Further, it was found that financial system influences the link between oil price and economic development. The changes happening in the price of oil can impact bank profitability through lending, business activity, and surplus liquidity (Sodeyfi & Katircioglu, 2016). Based on the existing literature, we propose following hypothesis.

2.5 Research Gap: Following key research gaps are identified in the study-

- Very few studies have addressed the impact of board gender diversity on performance of financial institutions in India. Besides, the divergence of this impact across public and private sector banks have not been studied.
- Studies were found analysing banking efficiency and banking performance. Very few studies have analysed the impact of both profitability efficiency and marketability efficiency as determinants of banking performance.
- Studies are available on the role of inflation in explaining banking performance. However, studies addressing the role of inflation expectation on banking performance especially in the Indian context have not been found.
- Oil price as determinant of banking performance has not been explored much in the Indian context. Moreover, no study has been found to look into the moderating role of inflation expectation on the relationship between oil price and banking performance.

2.6 Research Questions: Based on the research gap, the following research questions are formulated.

- Has the implementation of Companies Act, 2014, improved gender diversity uniformly across listed public and private sector banks in India?
- Does gender diversity have an impact on banking performance India?
- What is the level of profitability efficiency and marketability efficiency for listed public and private sector banks in India?
- Does Indian banking sector have high profitability efficiency compared to marketability efficiency?
- Does profitability and marketability efficiency have an impact on banking performance in India?
- Does inflation and inflation expectation have an impact on banking performance in India?
- Does oil price have an impact on banking performance in India?
- Is the impact of oil price on banking performance direct or indirect in India?
- Does inflation expectation have a moderating effect on the relationship between oil price and banking performance in India?

3. Objectives: The present research work aims to fulfil the following objectives:

- To examine the association between board gender diversity and banking performance.
- To determine the relationship between banking efficiency and banking performance.
- To determine the association between inflation expectation and banking performance.
- To investigate the association of oil price with banking performance.

3.1 Hypothesis

H₁: There is a positive association between board gender diversity and banking performance.

H₂: There is a positive association between profitability efficiency and banking performance.

H₃: There is a positive association between marketability efficiency and banking performance

H₄: There is a negative association between inflation expectation and banking performance

H₅: There is a negative association between inflation and banking performance

H₆: There is a negative association between oil price and banking performance.

H₇: There is a direct impact of oil price on banking performance

Methodologies/approach(es) applied:

4.1 Data & study period: The study is based on secondary data for all listed commercial banks in India over the period 2005 to 2021. Out of thirty listed scheduled commercial banks, three banks were omitted due to lack of data on some relevant variables. The final data set consists of 15 listed private banks and 12 listed public banks. We consider the period from 2005 onwards as the data on inflation expectation is available for the Indian economy from 2005, when RBI had introduced household inflation expectation survey. Maintaining uniformity, the period of study for the other objectives except for first objective has been maintained to be 2005 to 2021. The exception arises for data availability on board gender diversity for which the study period is considered from 2015 to 2021. This is the period post the passing of the new Companies Act, 2013 based on which it is required at least one female director for a specified class of companies. The data related to women representatives in management has been published for banks only after the implementation of the Companies Act, 2013.

4.2 Dependent variables: Two accounting-based indicators- Return on assets (ROA) and Return on equity (ROE) and one market-based indicator Tobin's Q are used to examine banking performance.

Table 1: List of dependent variables

Variables	Type	Source	Measure
ROA	Firm-level	ACE Equity	Profit/total assets
ROE	Firm-level	ACE Equity	Profit/ equity capital
Tobin's (TOBQ)	Firm-level	ACE Equity	The market value of firm+ debt/Total assets

Source: Authors' compilation

4.3 Independent variables: The explanatory variables of our study have been chosen based on our objectives.

Objective 1: To examine the association between board diversity and banking performance

We use Blau index (BI) to measure the gender diversity. BI has a value between 0 and 0.5. When BI rises in value, so does diversity in boards. It is computed as

$$Bi = 1 - \sum_{i=1}^k \rho_i^2$$

Where, Bi denotes Blau's index, "T" denotes the category, " ρ_i " denotes the proportion of board members in each category, and "K" denotes the total number of board members in each category (Saggar et al.,(2022)).

Table 2: List of explanatory variables

Variables	Type	Source	Measure
Gender diversity	Bank specific	ACE Equity	Blau's diversity index

Source: Authors' compilation

The set of control variables included are- board independency, board size, board meeting, market capitalization, leverage, bank size, GDP growth rate and inflation. These variables are summarised in Table (7) towards the end of section 4.

Objective 2: To determine the relationship between banking efficiency and banking performance

Bank efficiency is the process of maximizing the utilization of available resources to produce more output per unit of input. We employ the non-parametric DEA approach that is based on linear programming to measure banking efficiency (Goswami et al., 2019). Here, we simultaneously measure profitability efficiency and marketability efficiency of banks.

Table 3: List of explanatory variables

Variables	Type	Source
Marketability efficiency	Bank specific	ACE Equity
Profitability efficiency	Bank specific	ACE Equity

Source: Authors' compilation

In DEA analysis, We used input-oriented BCC, which lowering inputs while maintaining constant output to generate efficiency scores. We have specified the banks' inputs and outputs using the profit approach in order to estimate the DEA. This approach analyses the efficiency and effectiveness of resource utilization to maximize profitability. In Table 4 we have summarised the list of input and output variables used for the DEA estimation.

Table 4: List of input and output variables in DEA

Profitability efficiency	Input variables	Equity	Sum of all capital stock, reserves and surplus and paid-in capital
		Advances	bank's contribution to loans
Profitability efficiency	Output variables	Total Assets	Total assets of bank
		Non-interest income	Non-interest income includes various fees, commissions, and other income-generating activities.
Marketability efficiency	Input variables	Interest income	Revenue generated from the interest charged on loans, securities, and other interest-earning assets
		Revenue	It includes Interest income and noninterest income

	Profit	Net profit
Output variables	Earning per share	Net profit by number of equity shares
	Market value	Proportion of a company's share price to its earnings per share.
	Interest to investors	Interest income earn from their investments

Source: Authors' compilation

The set of control variables included are- market capitalization, liquidity, bank size, lag-dependent value, GDP growth rate, and inflation. These variables along with their definition are summarised in Table (7).

Objective 3: To determine the association between inflation expectation and banking performance.

We use the annual household inflation expectation rate as an indicator of inflation expectation.

Table 5: List of Explanatory variables

Variables	Type	Source	Measure
Inflation expectation	Macro	RBI database	Annual household inflation expected rate

Source: Authors' compilation

The set of control variables included are - market capitalization, liquidity, leverage bank size, GDP growth rate and inflation. These variables along with their definition are summarised in Table (7).

Objective 4: To investigate the association of oil price with banking performance.

To investigate the association between oil price and banking performance, we use the annual average crude price.

Table 6: List of Explanatory variables

Variables	Type	Source	Measure
Oil price	Macro	India-stat	Yearly average crude oil price

Source: Authors' compilation

The set of control variables included are - market capitalization, leverage, liquidity, bank size, GDP growth rate, inflation, and inflation expectation. These variables along with their definition are summarised in Table (7) towards the end of section 4.

To know about the direct and indirect impact of oil volatility on performance of banking sector in India. we include two macro-economic variables in the model-inflation and GDP. Additionally, we include inflation expectation in our model to examine the moderation effect of inflation expectation in the relationship between oil price and banking performance.

Table 7: List of control variables

Variables	Type	Source	Measure
Board independency	Board -specific	ACE equity	Ratio of independent non-executive directors to all board member
Board size	Board -specific	ACE equity	Total number of board members
Board meeting	Board -specific	ACE equity	Total number of board meeting held in a year
Market capitalization	Bank-specific factors	ACE equity	Log of market capitalization
Liquidity	Bank-specific factors	ACE equity	Loan/deposits
Leverage	Bank-specific factors	ACE equity	Debt/market value of the firm
Size	Bank-specific factors	ACE equity	Log of total assets
Inflation	Macro	World bank data	Annual rate of inflation (CPI)
GDP	Macro	World bank database	Annual rate of GDP growth

Inflation expectation	Macro	RBI database	Annual household inflation expected rate
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Source: Authors' compilation

4.4 Methodology:

To begin with, we give a descriptive analysis of the dataset for every objective. Due to panel nature of data set it is important to carry out various diagnostic test as panel data commonly suffers from the problems of heteroscedasticity, auto correlation, cross sectional dependence and endogeneity. We employ the following diagnostic tests prior to applying an econometric model in order to identify if our data suffers from aforementioned issues.

Table 8: List of problem and its diagnostic test

Concerned problem	Diagnostic test
Heteroscedasticity	Breusch–Pagan
Autocorrelation	Arellano-Bond test
Cross-section dependence	Frees' test (N>T)
Endogeneity	Durbin–Wu–Hausman test

Source: Authors' compilation

In the presence of the above-mentioned problems, panel data model based on least square estimation may result in inconsistencies and biases. A dynamic panel data model is more appropriate in such cases as it takes care of the above-mentioned problems. We employ system generalized method of moments model (**SGMM**) for the various models of our study. The SGMM estimator produces a result with more reliability.

The use of SGMM is justified if the following two conditions are met:(1) instrument validity, which requires that each instruments of the study associated not with the error term, but with the endogenous variables and (2) For testing residual correlation, It is not required second-order correlation. But it demand the presence of first-order serial correlation in the error term (Maji & Hussain, 2021). The Sargan test is used to assess the first condition, while Arellano- Bond autocorrelation (AR) includes two test, namely the AR(1) and AR (2) tests are used to assess the latter (Arellano & Bond, 1991).

5 Results and Discussion:

5.1 Board diversity and banking performance:

We found that board gender diversity has been gradually improving in the banking sector of India since 2015 after the implementation of Companies Act, 2013. Further we found that the board gender diversity in PVBs is relatively better than that in PSBs in India during 2015-2021.

Next, we studied the impact of board gender diversity on the performance of both public sector and private sector banks and it has been found significant. We have obtained mixed results depending on the banking performance indicator. Gender diversity have favourable impact accounting-based indicators of bank's performance – both PSBs and PVBs. Naturally, if women representation is increased in the board, it brings a heterogeneity in the board and adds to better decision making and policy framing. Of course, the representation of women should be adequate enough as suggested by the Tokenism theory to make the necessary impact in the board's decision. But the effect of gender diversity on performance of banks is also influenced through the existing socio-cultural nature of the country. Even though heterogenous board promotes diverse perspectives, experiences, and insights to decision-making, the socio-cultural factors influence the attitude of investors. It often leads to a rather critical apprehension by the investors about the bank's performance due to presence of women members on the board. This in turn may lead to a reduction in the share value of the banks and adversely affect the market-based indicator of bank's performance. This is seen to reflect in our findings for Tobin's Q which is observed to react negatively towards the board gender diversity (Maria & Hussain, 2024). While western ideas and lifestyles have progressively permeated socio-cultural values of Asia, but people's thoughts are not progressive in case of gender equality. Developing countries have seen high impact from tokenism and stereotype threat. The degree of socio-economic growth reflects the degree of modification made to traditional normative frameworks (Low et al., 2015). Thus, the findings are inconsistent, because of board gender diversity influences the financial performance of the company in together with other board and firms' variables rather than separately. Thus, we find evidence in support of our hypothesis H_1 in the case of accounting-based indicators of bank's performance only.

5.2 Banking efficiency and banking performance:

From the efficiency analysis, we discovered seven banks that are most efficient in terms of profitability. They are State bank of India, Central bank of India, HDFC, ICICI, Axis bank, IndusInd Bank Ltd. and Kotak Mahindra Bank Ltd. Out of them, first two are public sector while the latter five are PVBs. PVBs in India performing better compared to that of public sector banks in profitability efficiency can be attributed to greater degree of bad assets of PSBs in India throughout 2005 to 2021. The marketability efficiency analysis revealed five banks to be most efficient, namely State bank of India, Central bank of India, ICICI banks. ltd, HDFC bank. ltd and Axis bank. ltd. While the first two are PSBs, the other three are PVBs.

Both profitability efficiency and marketability efficiency are found to be significant and positively related to banking performance across the three different measures of bank's performance. Banks with a better degree of profit efficiency have a greater opportunity to enhance their cost efficiency, it can lead to better performance of banks. Thus, it validates our hypothesis H_2 . Banks involvement and performance in the share market is crucial as it positively influences share market by improving liquidity. The liquidity in capital market allows investors to quickly turn their investments into cash as needed, lowering the risk of being unable to sell assets amid volatile market conditions or emergencies. It will increase the trust of investors in banks creating positive impact on banking performance. Thus, it validates our hypothesis H_3 .

5.3 Inflation expectation and banking performance:

We find that inflation expectation is a significant determinant of banking performance. Both inflation and inflation expectation show that favourable influence on accounting-based measures of banking performance. If inflation expectation rises with the actual trend of current inflation, it will result in workers demanding higher wages and higher interest rates on their investments. To accommodate the hike in wages, businesses will have to raise the prices of the product which, in turn, would drive up inflation. In order to reduce rising inflation, the RBI should make adjustments in the monetary policies by changing the interest rates of the banks. It will increase the bank rates to curb the excess money supply in the economy. Banks are able to make extra profits as bank rates go up. However, inflation expectation has a negative impact on Tobin's Q. The rising inflation expectations

drive clients to expect more return on their investments. Investment decisions with long-term pay-offs take into account these expectations of future economic variables. So, investors' expectations of inflation will decide where they want to invest. They favour inflation-protected securities as a better investment option. To retain investors, banks will have to provide high-interest rates on the investments and meet the investors' expectations. Eventually, it affects the return of the investors. Thus, we find evidence in support of our hypothesis H_4 in the case of market-based indicator of bank's performance only.

The study also finds that inflation has a favourable influence on accounting-based measures and an adverse effect on market-based measure of banking performance. Banks adjust interest rates according to the inflation level of the economy. Positive impact of inflation due to the increase of the revenues faster than costs. Additionally, when the rate of inflation is increased, demand for other financing will be reduced, but demand for banks loans increases and they increase the interest rate. This will result in handsome returns on shareholder investments. However, inflation has a significant negative impact on Tobin's Q. It implies that businesses might simply increase their prices to cover the additional cost of producing goods and services. Banks can make additional profits as market value goes up. However, this profit may also be decreased as their cost of funds increases. Thus, we find evidence in support of our hypothesis H_5 in the case of market-based indicator of bank's performance only.

5.4 Oil price and banking performance:

We found that oil price volatility has a considerable influence on banking sector performance in India. This impact is observed to hold true when macro-economic variables are accounted. Hence, direct effect of oil price volatility on performance of banking industry in India is established. Thus, it means that impact of oil volatility are transmitted to profitability of banks through the channels of oil-related lending, banking business activity or excess liquidity in the banking sector. Increasing oil prices can be associated with increased profits of oil manufacturing and related industries. Approximately 15 percent of India's GDP is generated by the oil and gas industry, which is one of the country's eight primary sectors. When the economy is expanding, businesses borrow more, leading to higher interest income for banks. This positively impacts both ROE and ROA. However, fluctuations in oil price causes stock market volatility. It also brings down bank market performance as higher borrowing costs can restrict consumer spending and

business investment. This severely impacts corporate earnings and, as a result, market values diminish. Thus, we find evidence in support of our hypothesis H_6 in the case of market-based indicator of performance of banks only. Moreover, the oil price affects banking performance through direct channel. This validates our hypothesis H_7 .

We also find a significant moderating role of inflation expectation on the relationship between oil price and performance of banking industry. The moderation effect is found to be negative. Due to rising oil price, an economy experiences the higher inflation. If inflation expectation rises with the actual trend of current inflation, banks will have to provide high-interest rates on the investments and meet the investors' expectations. It will negatively affect banking profitability position (Maria & Hussain, 2023). In addition, higher expected inflation may result in a higher discount rate, that reduces the present value of future earnings and it leads to subsiding the value of equity. Inflationary expectations can influence the economic situation of the country which will automatically affects the borrowers' ability to repay loans as it increases the debt burden on borrowers. This can lead to a rise in non-performing loans and lowering the bank's asset quality. In summary, inflationary expectations when associated with rising oil price rise can create uncertainties and problems for a bank's profitability, asset quality, and overall financial health, affecting banking performance in India. India majorly being an oil importing country faces adversity of changing price of oil with the increasing costs of manufacturing and transportation due to inflationary pressure in the economy. This validates the findings of negative moderating role of inflation expectation on the association between oil price and banking performance.

6. Conclusion: Performance of banks is influenced by not just bank-specific elements. Along with bank specific factors, corporate governance and macro-economic factors plays a vital role. Enhancing the performance of banks and attaining economic growth can be facilitated by the implementation of appropriate management and macroeconomic strategies that consider both bank-specific and macroeconomic factors. Even though banking sector can't control the changes in macro-economic factors, the proper management policies, a balanced board and efficiency can help to reduce the negative impact of inflation expectation and oil price changes. Therefore, the study offers vital information for formulating future strategies for the Indian banking industry.