CHAPTER 7

Oil price and Banking performance

Overview: In this chapter, we carry out the analysis to determine the impact of oil price changes on the banking performance of commercial banks in India during 2005-2021. Oil price changes in the global market causes disruption in the economy and financial market of every nation. Natural gas and crude oil are the two main components in a production process and hence, changes in their prices affect an economy. This study explores how oil price affects the performance indicators of the Indian banking industry while controlling for a wide range of bank-specific factors. It also investigates whether oil price has a direct or indirect impact on the banking performance. Moreover, the study looked into the moderating role of inflation expectation on the relationship between oil prices and banking performance.

7.1 Introduction

Oil prices in the global market are determined by their global demand and supply. Economic expansion is one of the most important drivers of petroleum products and thus, the demand for crude oil. Growing economies give rise to overall energy demand, particularly for transporting items from producers to consumers. Oil price volatility is associated with a low responsiveness, or inelasticity, of supply to short-term price changes. Geopolitical events and severe weather that hinder the flow of crude oil and petroleum products to the market might have an impact on their prices. These occurrences may cause uncertainty about future supply, leading to increased price volatility. Crude oil production capacity and equipment that uses petroleum products as its primary source of energy are largely stable in the short term. It takes time to create new supply sources or to vary production, and when prices rise, moving to alternative fuels or boosting equipment fuel efficiency in the short term is difficult for customers to do. These conditions can lead to a major shift in prices to rebalance physical supply and demand. According to Enerdata, 2023-24, the United States of America, Saudi Arabia, and Russia are the world's top crude oil producers. It also reveals that India does not produce enough crude oil compared to the rest of the world. It produces only 33 metric tons, whereas the USA produces 762 metric tons.

Despite the growing discussion over the significance of renewable energy sources such as water, solar, and nuclear power, oil continues to play an essential part in the economies of

many countries throughout the world. Thus, oil price shocks may have significant macroeconomic effects for both importing and exporting countries. For the former, oil is a major determinant of production costs, whereas, with the latter, it is the principal source of government revenue. Oil price variations affect manufacturing, heating, and shipping costs. This creates uncertainty about the future of the global economy. This may also induce investors to postpone production decisions and shift personnel and capital from intensive petroleum sectors to non-intensive petroleum sectors (Sill, 2007). It is claimed that changes in oil prices have produced volatility in several macroeconomic aggregates in both oil-exporting and oil-importing countries (Brinin et al., 2016). As a result of oil's twin importance, it has been stated that its price is very volatile and almost unexpected (Dehn, 2001). Oil price fluctuations have varying effects on exporting and importing countries. Exporting countries rely heavily on revenue generated from oil. When oil prices rise, more revenue becomes available to fund development initiatives. On the contrary, when the price of oil falls, governments cannot immediately reduce their spending and therefore, confront a big fiscal deficit. In oil-importing countries, a rise in world oil prices means more revenue is used for importing oil. In this regard, the income drop is determined by the degree of oil price elasticity and the persistence of the oil price (Ghalayini, 2011). Furthermore, central banks may implement conflicting measures to reduce domestic price increases, resulting in further constraints on real production. Thus, volatility in oil prices has a significant impact on monetary and fiscal policies (Saddiqui et al., 2018). The relationship between oil prices and economic growth varies by business cycle and price level (Kilian and Vigfusson, 2011); (Das et al., 2018).

Based on Enerdata, 2023-24, China, India, USA, South Korea, Japan and Germany are the world’s top crude oil importing countries. It also shows that India’s demand for crude oil is much higher than its domestic production. Oil prices significantly impact national economic development and GDP growth. India imports about 70 percent of its crude oil needs (Sreenu et al., 2019). Crude oil contributes significantly to a country's industrial growth and domestic consumption. India, the world's second-largest population and third-largest oil consumer has seen a significant increase in oil demand and consumption since implementing economic reforms in 1991.

India intends to maintain its position as a major exporter of transportation fuels to Asia and the Atlantic Basin. Continued investment in refining capacity and complexity will improve light and middle distillate production, even as the sector shifts towards heavier

and sour crudes. Since 2022, India has become a major swing supplier due to the decrease in Russian product exports to European markets. This has increased demand for Asian diesel and jet fuel in Western markets. In 2023, India was the fourth-largest global exporter of middle distillates and the sixth-largest exporter of refinery products, with 1.2 million barrels per day. According to International Energy Agency Report 2023, India is expected to lead global oil demand growth from 2023 to 2030, surpassing China. India's oil consumption is expected to grow quicker than other countries due to its early economic development. According to the World Bank, India's GDP per capita in 2022 is estimated at USD 2,400. Developing countries with GDP per capita growth between USD 2,000 and USD 10,000 tend to experience the fastest growth in energy consumption.

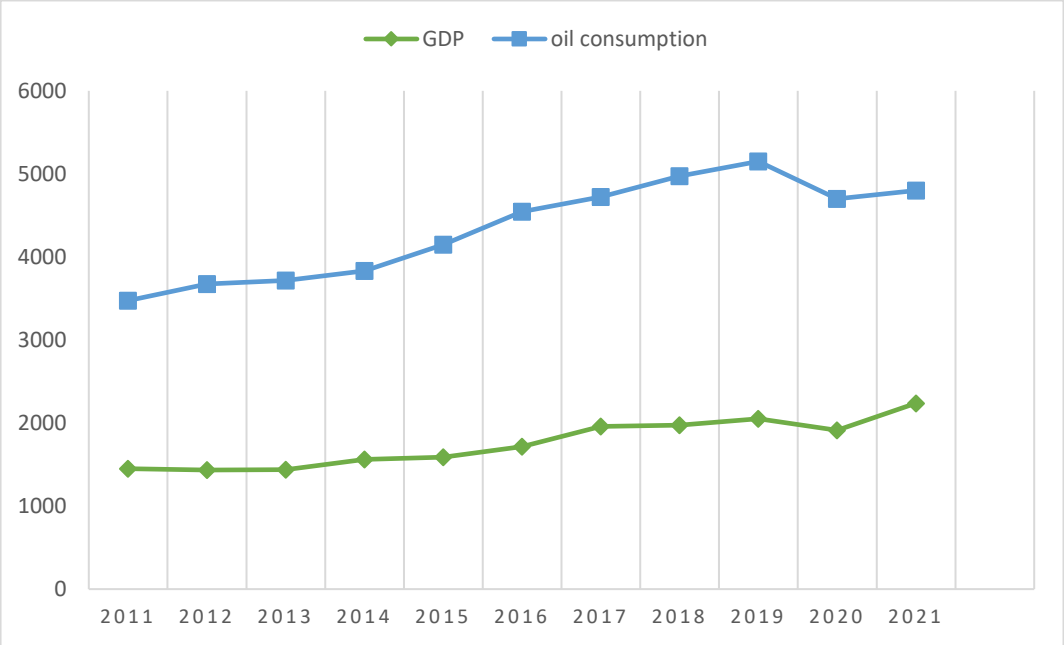

Figure 7.1 India's per capita GDP and oil consumption

Source: GDP - World Bank & CEIC data

The Indian economy is very vulnerable and relies on crude oil imports to meet its energy needs. The rising global cost of crude oil and decreased output from public sector enterprises in India has led to an increase in crude oil imports, affecting the country's economy. India's government is concerned about its excessive dependence on imports, as domestic oil output only meets 10 percent of the country's demands. India's energy policy aims to reduce its reliance on imported oil by increasing indigenous exploration and production. Since 2016, the government has implemented policy and fiscal reforms, as well as improved contract terms for private and foreign companies, to attract investment.

The goal is to reduce the rate of imports and increase crude oil production. According to International Energy Agency Report, India relies on crude oil imports for approximately 90 percent of its refinery needs, with imports increasing by 36 percent over the past decade to 4.6 million barrels per day (mb/d) in the year 2023. Crude oil imports have been heavier and sourer over time as refinery capacity expanded, increasing their contribution by 50 percent over the last decade. In 2023, medium and high-density crude oil made up about 63 percent of total imports. Statistical data shows that changes in crude oil prices had a considerable impact on India's wholesale pricing index but had a smaller effect on the country's GDP growth rate. India, being a net importer of oil, puts pressure on the government's finances, impacting the country's inflation rate when global oil prices are out of balance. Govindaraj & Nandagopal,(2016), in their study, suggests that India's government should consider crude oil prices while formulating policies to reduce inflation. Over time, periodic oil price shocks have caused cost-push inflation across countries and continents, resulting in a decline in output and a shift in the terms of trade. However, due to their own economic situations, industrialized countries can withstand the adversity of an oil price shock. On the other hand, developing countries are hardest hurt due to a lack of oil-saving technology as well as a lack of oil-substituting strategies for the production process (Cashin et al. 2000). According to Bhattacharya and Bhattacharya's (2020) analysis of the Indian economy, a 20 percent shock to oil prices causes a 1.3 percent increase in the inflation of other commodities and a 2.1 percent decrease in output growth. The impact of such a shock last for nearly two years, though its magnitude gradually decreases. Furthermore, they stated that while the short-term inflationary pressure shock caused by increased oil prices may be delayed, it will eventually evolve into a much larger shock. Oil prices would drive up the pricing of other goods in two ways. First, prices will increase substantially due to increased commodity storage in anticipation of future price increases. Second, the economy would have a cost-push effect, with the impacts apparent once an average production cycle is completed. In a developing country like India, where poverty is around 29.5 percent of the population, Inflation will disrupt the country's economic growth, resulting in uncertainty, exchange rate depreciation, a drop in aggregate demand, and, eventually, hyperinflation at the domestic level.

The volatility of oil prices and their impact on other key macroeconomic indicators is critical, particularly in developing countries. Since the first oil shock in the 1970s, the world economy has seen numerous consecutive oil shocks, each of which results in cost-push or supply-side inflation. More specifically, supply-side inflation is related to the fact

that because crude oil is a basic input in production, an increase in its price raises production costs, causing a firm to reduce output. However, the underlying demand effect of fluctuations in oil prices on inflation cannot be overlooked. Consumption is harmed because disposable income and purchasing power would be reduced. Investment is also likely to be impacted if oil price shocks motivate entrepreneurs to replace less energy-intensive capital with more energy-intensive capital, hence influencing economic development.

Based on the work of Brown and Yücel (2003), Tang et al. (2010), and Varghese (2017), we can identify six pathways by which crude oil price shocks might be conveyed to an economy.

1. Impact of supply-side shocks: It refers to a decrease in output induced by a rise in marginal production costs as a result of a positive oil price shock.
2. Impact of wealth distribution: Since wealth will be moved to the oil-exporting country, it signifies a decrease in terms of trade for an oil importing country.
3. Impact on real equilibrium: When a nation's monetary authority raises interest rates to satisfy the growing demand for money without expanding the money supply, this is referred to as a scenario. An increase in oil costs is driving this surge in money demand.
4. Impact of inflation: The economy experiences inflation as a result of rising oil expenses
5. Sector adjustment: A spike in oil prices affects labour markets and the cost of production in specific industries.
6. Unexpected impact: It highlights the impact and unpredictability of oil price shocks.

7.2 Development of hypothesis

This section discusses the development of the various hypotheses which are tested in this chapter.

Higher oil prices lead to increased production and investment expenses, which affect firm performance and the stock market (Kadir et al., 2011). Asset price is calculated using the discounted total of predicted future cash flows. Rising oil prices affect the discount rate and, consequently, stock prices (Fama & French, 2004). Arfaoui (2010) and Filis et al.

(2011) classified oil price as a market risk factor with a negative coefficient. Elyasiani et al. (2011) discovered evidence that oil price variations create a systematic asset price risk at the sector level. According to the growth model, oil price shocks affect the real economy through two channels-namely supply-side shock and demand-side shock. An increase in oil price leads to higher marginal production costs, which negatively affect firms' earnings and economic growth. Energy usage will decline following a rise in oil prices, which in turn lowers productivity and subsequently firms' output. This is known as supply-side shock. The second channel, referred to as demand-side shock, suggests that an increase in oil price engenders a rise in import spending and an increase in prices of goods and services. The increase in the price of the goods will lead to the economy's inflation. It will reduce the demand for goods and services in the economy.

Since the world heavily depends on oil products, the relationship between oil prices and economic growth has gotten a lot of attention from economists over the years. An increase in oil prices may have a detrimental impact on economic activity and borrower' ability to repay their obligations, thereby weakening bank balance sheets. Furthermore, decreasing household demand and investment activity have a negative influence on bank fee revenue, which leads to a decrease in off-balance sheet activities. Finally, it will reduce profitability in Indian banks (Alyousfi et al., 2021); (Lee & Lee, 2019). Sek et al. (2015) examined the impact of oil price changes on inflation rates in two sets of countries: high-dependency and low-dependency. They arrived at two different conclusions: among high-dependency countries, oil prices do not necessarily affect inflation directly but indirectly increase exporters' production costs, which, when combined with real exchange rates, have the greatest shocks to inflation rather than domestic income/output. However, in the low-dependency category, oil prices have a direct impact on inflation because these countries are primarily oil producers and exporters. As a result, higher oil prices increase income/output and people's purchasing power, raising the price level. Some research implies that oil price shocks can damage an enterprise's cash flow and transfer these uncertainties to its predicted returns (Jones & Kaul, 1996). The impacts of oil price shocks have primarily been studied in industrialized countries such as the United States and the G7 countries (Engemann et al., 2011); (Baumeister & Kilian, 2016), as well as representative emerging countries such as China and India (Broadstock et al., 2016). The empirical findings from these investigations are varied. The fundamental explanation is that oil price shocks affect financial markets and macroeconomic variables differently in oil-exporting and oil-importing countries (Gong & Lin, 2017). Increased oil prices, for

example, have a negative influence on stock markets in oil-importing countries, whereas they have a favourable effect on oil-exporting ones (Filis & Chatziantoniou, 2014). Oil price spikes are caused by a variety of factors, including disruptions in production, unexpected global economic expansions, and fears of future oil supply deficits. (Kilian, 2008).

Oil price shocks, in turn, hinder banks' financing of these firms, increasing bank risks. In an indirect approach, oil price shocks cause systematic monetary policy reactions (Bernanke et al., 1997), resulting in economic downturns. Specifically, in reaction to the impact of oil price shocks on inflation, central banks would implement restrictive monetary policies by raising the policy interest rate, as stated by the well-known Taylor rule (Taylor, 1993). As the most important hub of monetary policy transmission, banks are expected to adjust their lending interest rates in proportion to the policy rate set by central banks, influencing banking behaviours and risk. Higher oil prices may increase bank risk through both direct and indirect methods. In the framework of banking theory, interest rates are an extremely critical indicator with a direct link to monetary policy, but they also indicate the risk level of bank loans (Kocaarslan et al., 2020). A rise in interest rates indicates that loans are likely to be associated with higher default risk, such as borrowers with smaller cash flows who are vulnerable to oil price shocks. According to Robert and Andre (2020), increases in oil prices have a positive impact on bank profitability and asset quality because they may cause banks to increase the size of their recurring financial transactions, such as derivatives and loans, resulting in large profits to offset the negative impact of increased oil prices. Furthermore, from the perspective of the resource curse, Adetutu et al. (2020) underlined that during Kazakhstan's oil boom period, the total factor productivity of regional banks deteriorated dramatically, while that of banks with large foreign exchange exposure decreased even more significantly. Hesse and Poghosyan (2009) stated that the price of oil can have an indirect effect on bank performance by altering local economic activities in areas rich in fossil fuel resources, such as oil and natural gas. Because of the positive effects of low oil prices, the local economy will benefit from increasing prosperity, including more activity in the financial sector. In this environment, banks are more likely to grow the loan scale to generate money. Positive developments in the business outlook boost banks' overall profit margins, thereby attracting investment that can further improve banks' operating circumstances, establishing a positive feedback cycle and enhancing bank profitability. Poghosyan and Hesse (2016)

found that shocks to oil prices had an indirect impact on bank profitability through country-specific institutional and macroeconomic variables in their research of bank performance in MENA oil-exporting nations. Additionally, the authors discover that when it comes to investment banks, the effect is more noticeable than it is for ordinary or Islamic banks. Khandelwal et al. (2016) looked into the relationship between global oil price changes and financial developments in the GCC countries. According to Khazali and Mirzaei (2017) and Alyousfi et al. (2018a), changes in oil prices have a considerable impact on the amount of non-performing loans in oil-exporting countries' banks. They discover considerable correlations between oil price changes and bank balance sheets. According to Alyousfi et al. (2018b), higher growth rates in oil and gas prices are connected with an increase in Qatar's bank deposits ratio. The influence of oil price variations on bank non-performing loans may vary by bank abilities. Oil and gas price shocks are expected to impact bank performance significantly. Lee and Lee (2019) examine the effects of oil prices on bank performance in China from 2000 to 2014, focusing on capital adequacy, asset quality, management, profitability, and liquidity. They conclude that oil prices have a major impact on bank capitalization, management efficiency, earning power, and liquidity. The hypothesis tested in this study for the Indian context is:

$H7_a$: There is a negative association between oil prices and banking performance.

Recent literature has tried to distinguish between the direct and indirect impact of oil prices on banking performance. For instance, Kaffash (2014), in his study on Middle Eastern oil exporting countries, established a direct impact of oil revenue on banking performance, revealing an indirect effect of oil shocks on banking performance through inflation and economic growth. Poghosyan and Hesse (2016), in their study, examined the direct and indirect impact of oil prices on banking performance. The direct channel believes that oil price shocks will have a direct impact on bank profits by increasing oil-related lending or business activity. The indirect channel implies that the impact is conveyed through a country's macroeconomic and institutional qualities, which are transmitted by inflation. The study revealed an indirect impact of oil prices on banking performance for MENA oil-exporting 11 nations. India being an oil-importing nation, the impact of oil prices on banking performance is expected to be a direct one. Hence, we propose the following hypothesis-

$H7_b$: There is a direct impact of oil price on banking performance

7.3 Descriptive statistics

Table 7.1 shows the descriptive analysis. The mean ROA, ROE, and Tobin's Q are 1.42, 8.42 and 0.21, respectively. ROA varies from -67.52 to 25.02 and ROE varies from -75.31 to 31.60. Meanwhile, Tobin's Q varies from 0.01 to 5.70. It indicates that banks' profitability measures vary widely. The average oil price is 71.1, with a low of 32.21 and a high of 112, which suggests that oil price volatility is high in the Indian economy.

Table 7.1: Descriptive statistics

Variables	Minimum	Maximum	Mean	Standard Deviation (S.D)
ROA	-67.5	25.02	1.42	5.27
ROE	-75.31	31.60	8.42	15.85
TOBQ	0.01	5.70	0.21	0.36
Oil price	32.21	112	71.1	22.14
MCP	1.95	5.92	3.94	0.74
LIQU	0.01	19.43	0.17	0.95
LEV	0.01	3.29	0.09	0.19
SIZE	3.11	7	5.07	.669
GDP	-7.40	8.50	5.98	3.68
INFL	3.30	11.90	6.81	2.70
EXP	5.50	12.90	10.05	2.45

Source: Author's compilation

7.3.1 Correlation Analysis

The correlation matrix's results are shown in Table 7.2 and the values show low correlation. Therefore, multicollinearity is not an issue for the regression analysis. The general assumption is that multicollinearity is a major concern if the simple correlation coefficient between two regressors is more than 0.8 or 0.9. Since this matrix shows values less than 0.8 or 0.9, multicollinearity does not pose a significant problem in this data set. The matrix shows a correlation of 0.973 for only inflation and inflation expectations.

However, in the following regression analysis, both measures are not evaluated in the same equation but rather in separate sets of equations.

Table 7.2: Correlation matrix

Variable	ROA	ROE	TBQ	OIL	EXP	MCP	LEV	SIZE	GDP	INFL
ROA	1									
ROE	0.085	1								
TBQ	0.029	0.087	1							
OIL	.135**	.210**	-0.014	1						
EXP	0.061	-0.002	0.059	.523**	1					
MCP	-0.011	0.063	.283**	0.083	.327**	1				
LEV	-0.036	0.008	.916**	0.016	0.081	.183**	1			
SIZE	-.136**	-0.058	-0.028	0.031	.293**	.711**	0.023	1		
GDP	.165**	.161**	0.036	-0.033	-0.035	-.095*	0.019	-.161**	1	
INFL	.126**	.350**	-0.003	.640**	.973**	-0.065	0.004	-.148**	-0.002	1
VIF	3.5									

Source: Author's compilation

Further, in Table 7.2, as the Variance Inflation Factor (VIF) values are less than 5, multicollinearity is not a significant issue in this data set.

Table 7.3: diagnostic test and results

Diagnostic test	ROA	ROE	TOBQ
Breusch–Pagan test for heteroscedasticity	Chi2= 2.54 P=.0144	Chi2= 6.3 P=.0000	Chi2= 6.04 P= .004
Arellano-Bond test (1995) for Autocorrelation	P= .2733	P= .1096	P=.1162
Frees' test for Cross-section dependence	P= 0.2928	P= 0.2928	P= 0.2928
Endogeneity for Wu–Hausman test (Beyer 2002)	Chi2= 27.8 P=.000	Chi2= 7.4 P= .007	Chi2=69.9 P = .000

Source: Author's compilation

From Table 7.3, it is observed that the Breusch-Pagan test and Wu–Hausman test confirmed the existence of heteroskedasticity and endogeneity, respectively. The Arellano-Bond test and the Frees' test demonstrate that there is no second-order serial correlation and no cross-sectional dependence, respectively. The occurrence of these issues shows that the GMM is better suited for our data. Furthermore, our data set shows that N is bigger than T, indicating that the GMM model is suitable for estimation.

7.4 Regression Analysis

Table 7.3 shows the results of the various diagnostic tests. The Arellano-Bond test shows no second-order serial correlation, whereas the Breusch-Pagan test indicates heteroskedasticity. The Frees' test demonstrates no cross-sectional dependence. Wu–Hausman test discovered the existence of endogeneity. The occurrence of these issues shows that the GMM is better suited for our data. Furthermore, our data set shows that N is bigger than T, indicating that the GMM model is suitable for estimation.

7.4.1 Regression Analysis (Model I): Table 7.4 below shows the estimation results of SGMM for Model I. The results are divided into three sections showing the impact of oil price on the three separate measures of banking performance - ROA, ROE and Tobin's Q.

Table 7.4: Regression: Impact of oil price on banking performance

Variables	**ROA**		**ROE**		**TOBQ**	
	Coefficient	**Z value**	**Coefficient**	**Z value**	**Coefficient**	**Z value**
Oil price	.063***	22.01	8.09***	6.73	-.005***	-3.22
MCP	.064***	9.62	3.89***	6.60	.001**	2.10
LEV	.022**	2.07	7.00**	2.52	-.002***	-2.79
Size	.035***	13.2	11.2***	20.09	.005***	5.63
Lag ROA	.838***	7.95	.543***	37.9	.487***	4.35
Constant	.054***	2.99	30.9***	12.32	.093***	3.81
No. of observation	432		432		432	
Sargan test	0.8744		0.4736		.6285	
AR(1)	.3576		0.0012		0.1898	
AR(2)	0.4408		0.8605		0.4035	

Source: Author's compilation

From Table 7.4, it is observed that oil price has a significant effect on banking performance. The results show that the coefficient of oil price is significant and positive in explaining the accounting-based measures of ROA and ROE. The positive coefficient of oil prices suggests that increasing oil prices would lead to an increase in bank performance. If oil price has a direct impact on banking performance, it would mean that the impact of oil price changes is transmitted to banking sector performance 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 in oil manufacturing and related industries. The Indian oil and gas sector is one of India's eight core industries and contributes over 15 percent of the nation's gross domestic product. Moreover, it contributed 18 percent to the revenue of the central government and 8 percent revenue of the state government in the financial year 2022-23. When the economy is expanding, businesses borrow more, leading to higher interest income for banks. Additionally, the rising oil price would create a positive impact on the repayment of loans to banks by industries like oil manufacturers and the energy sector. Higher oil prices can boost the financial health of these industries, lowering the chance of loan defaults. This leads to a reduction in non-performing assets (NPAs) and thereby improving overall asset quality and contributing to performance. This positively impacts both ROE and ROA.

On the other hand, if rising oil prices affect banking performance through their impact on inflation in the country, oil prices are said to have an indirect impact on banking performance. Higher oil prices can add to inflationary pressure by raising the costs of manufacturing and transportation. In response, the Reserve Bank of India (RBI) may increase interest rates to combat inflation in the economy. These high interest rates can boost banks' net interest margins (NIM), particularly if they can pass on the increased borrowing costs to borrowers. This can help banks increase their profitability, especially if they have a big portfolio of fixed-rate loans. Thus, increases in the net interest margin of banks can positively affect both ROE and ROA.

On the other hand, in Table 7.4, the coefficient of oil price is significant and negative in explaining the market-based measure- Tobin's Q. If oil price has a direct impact on the market-based measure of banking performance, it would mean that changes in oil price bring down banking performance due to the adverse impact of oil price volatility in the stock market. Furthermore, sudden changes in oil prices can contribute to market volatility, affecting the performance of financial markets. Banks may face challenges in managing

risks associated with market fluctuations and changes in the value of financial instruments. An increase in oil prices causes investment uncertainty, leading to higher expectations of returns by investors on their investments. Moreover, the level of investment in real and financial assets is constrained by high production costs, reduced profits and increased uncertainty due to high oil prices. Tobin's Q is influenced by fundamental variables as well as market sentiment. Higher oil prices can lead to negative thoughts about the economy and profitability of banks, resulting in lower market values for banks and a lower Tobin's Q.

However, oil prices can have an indirect impact on market-based indicators of banking performance through inflation. Increasing oil prices leads to inflation in the country. The inflationary pressure generated by rising oil prices may prompt central banks to raise bank rates, which in turn decreases stock prices (Rafailidis & Katrakilidis, 2014). Higher borrowing costs can restrict consumer spending and business investment, severely impacting corporate earnings and, as a result, stock values. Furthermore, increased bank rates during inflation also limit credit demand by consumers. All of these create downward pressure on share prices. A slowdown in bank's lending could have a detrimental influence on bank's market value. Besides, oil prices are sensitive to geopolitical events and global economic conditions. This will negatively influence the market performance of the bank. Thus, we find that oil prices are significant in explaining banking performance.

Hence, we accept our first hypothesis $H7_a$, for the market-based indicator of banking performance and reject it for the account-based indicators of banking performance.

In terms of control variables, market capitalization has a strong and favourable effect on explaining ROA, ROE, and Tobin's Q in both models. Market capitalization is one of the most effective ways to assess a company's worth. It is vital for readers to realize that a firm's valuation is determined by its stocks. This is a universal approach for calculating any company's market value. It provides an easy approach for investors to compare the performance of several banks. This comparison helps you comprehend not only a company's size but also the risks associated with investing in it. Ultimately, it will have a positive impact on bank performance and profitability.

Leverage, when utilized wisely, can considerably improve banking performance by increasing lending capacity, enhancing profitability, obtaining economies of scale, supporting economic growth, diversifying income sources, optimizing capital, growing

market share, and managing risk. However, banks must carefully manage the risks associated with leverage in order to ensure long-term growth and financial stability.

The size of a bank can have a positive impact on its performance through economies of scale, diverse revenue streams, improved risk management, access to capital, increased customer trust, technological advancements, regulatory advantages, network effects, global presence, and stronger brand equity. These variables allow larger banks to operate more efficiently, attract and keep customers, and better negotiate the complexity of the financial market, resulting in improved performance. For example, larger banks can invest in more advanced technology and infrastructure, lowering per-transaction costs and increasing operating efficiency

Profits from the preceding year may be maintained and added to the bank's capital base. A greater capital base enhances the bank's ability to absorb future losses, expand lending volumes, and meet regulatory capital requirements. Improved financial stability can result in higher credit ratings and lower capital expenses. Additionally, higher profits allow banks to pay dividends to shareholders, boosting investor confidence and stock performance. This increases the bank's potential to obtain more capital through equity markets if necessary. A proven track record of profitability can attract additional investors, resulting in greater stock prices and market capitalization. Thus, we find a significant impact of the lag dependent variable in all three cases.

Next, we include macroeconomic variables as described by equation (2) to examine if there exists a direct impact of oil price on banking profitability.

7.4.2 Regression Analysis (Model II): Table 7.5 shows the estimation results of SGMM of Model II. The results are divided into three sections for three separate measures of banking performance - ROA, ROE and Tobin's Q.

Table 7.5: Direct impact of oil price on banking performance

Variables	**ROA**		**ROE**		**TOBQ**	
	Coefficient	**Z value**	**Coefficient**	**Z value**	**Coefficient**	**Z value**
Oil price	2.53***	6.55	2.47**	2.06	-.007***	-15.60
MCP	1.02***	3.88	2.97***	4.75	.001**	1.66
LEV	5.26***	8.91	6.72**	2.20	-.002**	-2.23
Size	3.29***	6.59	7.31***	11.10	.005***	7.62

INFL	0.02**	2.58	0.21***	3.61	-.003***	-1.96
GDP	0.29***	11.67	0.09***	3.07	.008***	9.24
Lag of dependent	0.43***	20.50	0.57***	4.75	.347***	2.63
Constant	7.83***	2.98	23.4***	5.27	.123***	4.24
No. of observations	432		432		432	
Sargan test	0.80		0.92		0.74	
AR(1)	0.29		0.01		0.19	
AR(2)	0.43		0.09		0.35	

Source: Author's compilation

The results in Table 7.5 show that oil prices have a direct impact on banking performance as the coefficient of oil prices is significant for all measures of banking performance in the presence of macroeconomic variables- GDP and inflation. The fluctuation in oil price has a significant and positive effect on ROA and ROE and a negative impact on Tobin's Q. Thus, the results in Table 7.5 are similar to the findings of Model (I). Hence, in this case as well, we accept our first hypothesis $H7_a$, for the market-based indicator of banking performance and reject it for the account-based indicators of banking performance.

The macroeconomic variables in this model – GDP and inflation are both significant in explaining banking profitability. As the impact of oil price fluctuation on banking profitability is found significant when the macroeconomic variables are accounted for, it implies a direct impact of oil price fluctuation on banking profitability. It indicates that oil price affects the profitability of banks directly through oil-related lending, banking business activity or excess liquidity in the banking sector (Sodeyfi, 2016); (Sodeyfi & Katircioglu, 2016). Thus, the results are in support of our second hypothesis $H7_b$

Among the macroeconomic variables, we find a positive impact of GDP for all three measures of banking performance. When the GDP increases, businesses expand and consumer confidence soars. This usually results in a rise in demand for loans. Companies seek loans to fund new projects, expansion, and working cash. Consumers also borrow more for personal expenses like housing, education, and autos. Increased loan demand expands banks' loan portfolios and interest income, increasing profitability. Furthermore, economic growth tends to strengthen capital markets since higher corporate profits and a stronger economic outlook raise investor confidence. Banks frequently make large investments in equities and other market instruments, and a strong capital market boosts

the returns on these investments. Banks can also use increasing activity in the equity and debt markets to generate additional revenue through underwriting, brokerage, and advisory services. Thus, GDP positively impact ROA, ROE and Tobin's Q.

Inflation, on the other hand, has a positive impact on ROA and ROE. It indicates that banks adjust interest rates according to the inflation level of the economy. This will result in revenues that increase faster than costs, with a positive impact on profitability. 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 decrease as the cost of funds increases. This will create a negative effect of inflation on Tobin's Q.

The findings for other control variables- market capitalization, size leverage, and lag dependent variables are similar to those in Model I above.

Next, we consider the moderation effect of inflation expectation and oil price on banking profitability after finding a direct impact of oil price on the latter.

7.4.3 Regression Analysis (Model III)

Table 7.6 shows the estimation results for SGMM Model III. The results are divided into three sections for three banking performance indicators - ROA, ROE and Tobin's Q.

Table 7.6: Moderation effect

Variables	**ROA**		**ROE**		**TOBQ**	
	Coefficient	**Z value**	**Coefficient**	**Z value**	**Coefficient**	**Z value**
Oil price	4.97***	7.52	5.16***	2.84	-0.0131***	-2.97
EXP	2.10***	8.53	2.35***	3.03	-0.009***	-4.69
MCP	0.98***	7.31	2.50**	2.42	0.003*	1.73
LEV	3.25**	2.44	1.2**	2.05	-0.005**	-2.4
Size	5.68***	15.43	2.08***	6.35	0.069***	20.01
LIQU	2.94***	14.52	4.31***	2.7	0.0037***	8.78
GDP	0.36***	11	.0557**	2.44	0.005***	3.54

Oil price* inflation expectation	-6.40***	-6.34	-2.33***	-2.55	-0.004***	-2.7
Lag of dependent	0.45***	6.37	0.481***	5.97	0.2236***	5.29
Constant	1.70***	9.42	2.25***	4.74	0.1314***	5.68
No. of observations	43		432		432	
Sargan test	0.3781		0.9276		.3060	
AR(1)	0.3599		0.0170		.1187	
AR(2)	0.5054		0.0884		.0199	

Source: Author's compilation

From Table 7.6, it is observed that oil price continues to have a significant impact on ROA, ROE, and Tobin's Q, as shown in Model I and Model II above. The main objective of Model III is to determine the moderation effect of inflation expectation on the relationship between oil prices and banking performance. We find that the coefficient of the interaction term (*Oil price* inflation expectation*) is significant for all three measures- ROA, ROE, and Tobin's Q. It indicates a significant moderation effect of inflation expectation on the relationship between oil price and banking performance. The moderation effect is found to be negative in all three cases. Due to rising oil prices, an economy experiences 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 the 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 affect the borrowers' ability to repay loans as they increase the debt burden on borrowers. This can lead to a rise in non-performing loans and lower the bank's asset quality. In summary, inflationary expectations, when associated with rising oil price rises, 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 the brunt of oil price volatility with the rise in the costs of manufacturing and transportation due to inflationary pressure in the economy. This validates the findings

of the negative moderating role of inflation expectation on the relationship between oil prices and banking performance.

As in Model I and Model II above, we find the same result for the control variables- - market capitalization, size, leverage and the lag dependent variable. In Model III, inflation expectation is also included as a control variable. It is found to be positive and significant in explaining both ROA and ROE. In order to decrease rising inflation in the economy, the central bank will modify monetary policies by changing bank interest rates. It will raise interest rates to reduce the surplus money supply in the economy. As interest rates rise, banks can increase their earnings. In other words, when inflation is expected to increase, central banks frequently raise interest rates to manage it. This raises interest rates in the economy, including the rates that banks charge for loans and pay on deposits. However, increases in loan interest rates often outstrip increases in deposit rates, allowing banks to raise their net interest margin (NIM). A greater NIM immediately increases a bank's profits. Furthermore, inflation forecasts may encourage borrowers to seek loans sooner rather than later in order to lock in cheaper rates before expected rate hikes. This increase in loan demand can strengthen a bank's loan portfolio and interest income, that leads to improved overall performance. Furthermore, in a rising inflationary climate, economic activity and borrowing tend to increase. This can lead to more transactions, such as loan origination, processing fees, and other service fees, resulting in higher non-interest income for banks.

However, inflation expectations have a considerable negative impact on Tobin's Q. Rising inflation predictions are causing people to anticipate higher returns on their assets. Adaptive expectation theory states that people build their expectations from their past experiences. If consumers have already experienced a specific amount of inflation, they may anticipate a similar pace. Households always construct inflation expectations rather than attempting to understand variations in demand and supply (Binder, 2021). Furthermore, excessive and unpredictable inflation can create uncertainty and make it difficult for people to develop appropriate expectations. These future economic variables are taken into account while making investment decisions with long-term returns. As a result, where investors choose to invest is determined by their inflation expectations. They see inflation-protected securities as a preferable investment alternative. To retain investors, banks must offer high interest rates on investments and match their expectations. It ultimately impacts investors' returns. (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 affect the borrowers' ability to repay loans as it increases the debt burden on borrowers. If consumers have difficulty repaying loans due to increasing interest rates. This can lead to a rise in non-performing loans (NPLs) and lowering the bank's asset quality

Liquidity is another control variable added in Model III, which was found to be positively significant in all three cases. It improves banking performance in India through a variety of factors. High liquidity indicates that banks have more cash or easily convertible assets on hand. This increasing cash flow enables banks to provide additional loans to businesses and consumers. In a country like India, where there is tremendous demand for credit for diverse objectives such as infrastructure, agriculture, and small company development, increased lending capacity can lead to higher interest income for banks, thereby enhancing their profitability. Liquidity helps banks better control their asset quality. They are better positioned to provide restructuring options to borrowers experiencing temporary financial difficulties, hence reducing the number of non-performing assets (NPAs). A lower level of NPAs improves banks' financial soundness and boosts investor trust. Furthermore, enough liquidity protects against unanticipated financial shocks, such as depositor withdrawals or market disruptions. This consistency is critical for sustaining the trust of both depositors and investors. Financially sound banks are more likely to attract deposits and investments, which strengthens their market position.

7.7 Conclusion

The study found that global oil price changes create a substantial impact on the success of banking performance. Although the impact is positive for accounting-based measures, a negative impact is observed on the market-based measure of banking performance. This has serious implications for market risk and market performance of the listed commercial banks in India. Moreover, it has the potential to affect the entire capital market of the country. These findings are relevant for policymakers and regulators in choosing and implementing appropriate and effective measures to protect the share market and the economy against significant shocks due to changes in the price of oil. Governments or authorities should encourage strong economic policies and good governance to assist create buffers to meet against inelastic supply caused by geopolitical events or severe

weather conditions. Furthermore, the financial system should review appropriate procedures to reduce credit risks related to the systemic risks of oil price volatility.

The study also found that oil price changes directly influence Indian banking performance through the channels of oil-related lending, banking business activity or excess liquidity, investment uncertainty and market risk in the banking sector. Although the direct impact of oil prices is good for the banking industry, the benefits from this direct impact should be able to outweigh the cost of inflation inflicted on the economy due to rising oil prices. Additionally, the study investigated the moderation effect of inflation expectation on the relationship between oil prices and banking performance and discovered that when an oil price rise is associated with inflation expectation, it can create uncertainty in the economy and affect bank's profitability.

The knowledge of oil price impact on the financial market would create a better understanding among policymakers to safeguard the financial institutions and the economy from adverse effects of oil price volatility. The understanding of how energy prices affect the overall economy (Hamilton, 2011), the equity market (Bagirov & Mateus, 2019), and the currency markets (Lizardo & Mollick, 2010) has improved from the results established in various empirical studies on the impact of oil prices on financial markets. The global expansion of financial institutions requires a thorough examination of the banking sector's performance in developing and emerging countries such as India. The banking system in India has seen substantial expansion, but some public and private sector banks have remained vulnerable to changes in global economic, political, and financial conditions.

Bank managers should consider developing early warning and reaction capabilities and they have to utilize the inflationary conditions properly for the better performance of the banks.