

Impact of Monetary Policy on the Profitability of Nepalese Commercial Banks

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Abstract

This study examines the impact of monetary policy instruments on firm profitability in Nepalese commercial banks from 2007/08 to 2021/22. The research investigates the relationship between profitability and various monetary policy instruments, including broad money supply, statutory liquidity ratio, bank rate, investment in treasury bills, and cash reserve ratio. The analysis reveals diverse return on investment (ROI) trends across banks, with NIMBL initially showing high ROI followed by a drop, SBL and SBI displaying substantial increases, and NABIL and HBL maintaining stable ROI. Net Interest Margin (NIM) analysis shows varying profitability, while monetary policy indicators exhibit diverse and occasionally fluctuating values, influencing borrowing costs and liquidity. Correlation analysis identifies positive associations between NIM, M2, and ROI and negative correlations with TBR and CRR. Regression analysis emphasizes the significance of CRR, IRS, and M2 in impacting ROI. The study concludes that the cash reserve ratio, bank rate, and investment in treasury bills affect Nepalese commercial banks' profitability. Recommendations include managing the cash reserve ratio, maintaining low bank rates, encouraging treasury bill investment, and minimizing the statutory liquidity ratio to enhance profitability. Implications suggest that effective management of monetary policy instruments can improve banks' profitability. Future research could explore additional profitability indicators, expand the sample size and observation years, include other financial institutions, and employ a mixed-method approach for a comprehensive understanding of the impact of monetary policy instruments on bank profitability.

Keywords: Monetary policy, profitability, commercial bank, profitability, Broad money

Introduction

The contribution of financial sector reforms towards economic growth and development is tremendous.

Banks play a vibrant role in the economy by regulating the price liquidity by accumulating many small deposits and giving credit to those who require money (Nikhil & Deene, 2021). The regulator of the banking system is the central bank. The central bank regulates the country's economy's money supply and price liquidity through monetary policy.

Monetary policy is the policy issued by the central bank of a nation to manage the supply of money for achieving the macroeconomic goals of the nation. The central bank's use of monetary policy to control the money supply to accomplish preset macroeconomic goals is referred to as monetary policy. It influences the economy's performance through the control of bank credit, the quantity of money, bank deposits, interest rates, and other aspects such as inflation, national production, and employment.

The primary objective of monetary policy is to regulate the money supply, achieved through adjustments in interest rates and inflation rates to promote overall economic growth and stability. Expansionary monetary policy increases the total money supply, while contractionary policy decreases it (Mankiw, 2012). Both policies play a crucial role in fostering economic development by influencing macroeconomic variables such as inflation, gross domestic product, and employment. It is accomplished by manipulating interest rates to control the amount of money in circulation, affecting the cost of borrowing money in the economy.

The government primarily relies on monetary policies in banking sector regulation as the instrument of choice. Embedded within these are the many sorts of tools used to govern banks' activities within the economy. Monetary policies are an integral part of these. The fact that the instruments are external to the banks means they might operate as a militating or mitigating component in increasing their profitability. However, the tools and considerations applied to banks vary according to the nation's economic condition. In the context of stable and developed economies, monetary policy tools are secured from frequent manipulations. The tools highly affect the nation's economic activities in developing countries where the capital market still needs to be fully developed (Nwannebuike, 2015).

The central bank uses monetary policy tools, such as quantitative (bank rate, reserve requirements, open market operations) and qualitative instruments (selective credit control, margin lending), playing a crucial role in contributing to the money supply in the economy. Studying the impact of these instruments on firm profitability is significant. Despite similar findings in other nations, including Nepal, more recent data specific to Nepal is needed. This research analyzes the relationship between monetary policy instruments and firms' profitability in the Nepalese commercial banking sector.

Research Objectives

The study explores the influence of monetary policy instruments on the profitability of Nepalese commercial banks. The specific objectives include assessing the correlation between commercial bank profitability and monetary policy instruments, examining the effects of cash reserve ratio, bank rate, and Treasury bill investments on profitability, and analyzing the overall impact of monetary policy on commercial banks' profitability in Nepal.

Hypothesis of the Study

The following hypothesis has been developed to achieve the objective of this study based on the review

of the literature:

H1: Cash reserve ratio is negatively related to firm profitability.

H2: Bank rate is negatively related to firm profitability.

H3: Broad money supply is positively related to firm profitability.

H4: Investment in treasury bills is positively related to firm profitability.

H5: There is a positive relationship between interest rate spread and profitability.

Scope and Significance of the Study

The study investigates how monetary policy tools impact the profitability of commercial banks, focusing on the regulatory influence of the monetary authority on credit limits. This analysis is crucial for understanding the constraints on commercial banks, especially in maintaining and improving credit within priority sectors of the economy. Additionally, the study provides insights for investors, highlighting the significance of T-bill investments as indicators of commercial banks' soundness. It holds relevance for diverse stakeholders, including university students, researchers, shareholders, managers, bankers, government officials, and central bank authorities interested in the impact of monetary policy on Nepal's commercial banking sector. The study aims to inform bankers about key indicators, ensuring nominal and fair investment returns, and offers insights into essential monetary instruments like cash reserve ratio, statutory liquidity ratio, and bank rate to maintain financial institutions' sound health.

Review of Literature

This section is broken down into three categories: review of significant literature, review of recent literature, and review of major Nepalese studies. The literature, which originated in terms of popular write-ups, reports, and studies/articles, is reviewed.

The review of significant literature has been chronologically organized under:

Ozili (2023) investigated the impact of monetary policy on financial inclusion in the big five emerging market countries from 2004 to 2020. It was found that the monetary policy rate has a mixed effect on financial inclusion, and the effect depends on the dimension of financial inclusion examined. Specifically, a high monetary policy rate significantly negatively impacts financial inclusion through a reduction in the number of depositors in commercial banks. Overall, the effect of monetary policy on financial inclusion depends on the monetary policy tool used by the monetary authority and the dimension of financial inclusion examined. The monetary authorities should pay attention to how their monetary policy choices might affect the level of financial inclusion and reduce the benefits that society gains from financial inclusion.

Dang and Huynh (2022) examined the relationship between monetary policy and bank performance in a multiple-instrument environment, particularly highlighting the conditioning role of bank business models. The critical analysis of interest reveals that business models considerably matter in the effects of monetary policy on bank performance. The findings demonstrate that banks' business models that yield more non-interest income or diversify more into different income sources may mitigate the pass-through of monetary policy to bank performance. This finding holds across all interest- and quantitative-based

monetary policy indicators and all functions of risk-taking behavior, earning-profit capacity, and financial stability. Furthermore, while plotting the marginal effects of monetary policy, the study realize that they are insignificant for banks whose business models heavily rely on non-traditional segments.

Nguyen et al. (2021) examined the impact of monetary policy on bank performance and risk, which is driven by bank individual characteristics and the COVID-19 pandemic, and the joint effect of bank individual factors and the coronavirus has been under-researched so far. The study find that monetary policy expansion stimulates banks' performance and risk during a COVID-19 pandemic. Interestingly, the effectiveness of monetary policy expansion on banks' operating outcomes depends on the interaction between the heterogeneity of the bank's balance sheet items and the COVID-19 outbreak. More specifically, the performance-decreasing effects of monetary policy loosening are more pronounced in banks with small size, high liquidity, low capitalization, and high credit risk in the shadow of the COVID-19 crisis. Meanwhile, the risk-increasing impacts of monetary policy easing are conspicuous in well-liquid, less capitalized, and high-credit-risk banks in an uncertain time of the COVID-19 crisis. These results are robust to alternative proxies of monetary policy instruments.

Nikhil and Deene (2021) examined the impact of monetary policy tools on the performance of banks in India. The performance is measured by taking three factors: deposits, loans, and advances (L&A), and the total asset value of the banks. All three factors have shown an impact of BR on them during the five years. Loans, and advances affected the least amongst the three factors, but the other two were significantly impacted by the change in BR by the Reserve Bank of India. So, there should be a favorable fluctuation in the BR, which will bring flexibility in the banking system, and they can perform well in the economy, and the central bank can also concentrate on the macroeconomic situation in the country.

Gautam (2020) highlighted the significance of monetary policy as a significant government policy for stabilizing the economy. The study explores the evolution of monetary policy theories, such as monetarism and New Keynesianism, which have been instrumental in understanding and formulating effective policies. The research focuses on applying the New Keynesian framework to analyze Nepalese monetary policy using data from 2002/03 to 2014/15. The comparison of three monetary policy rules reveals that Nepalese monetary policy aligns closely with Friedman's k-percent rule, while the Taylor rule is deemed inappropriate. The analysis underscores the role of exogenous shocks, indicating that Nepalese business cycles are primarily influenced by monetary policy and supply shocks. Additionally, the study identifies significant levels of price rigidity, investment adjustment costs, and habit formation in Nepalese economic dynamics. In terms of optimal monetary policy, the research suggests that a regime aggressively targeting inflation and a fixed money growth rate maximizes aggregate household welfare, making it an optimal policy.

Kaushal and Pathak (2010) assessed the causal relationship among Trade Openness, Financial Development and Economic Growth in India for the post liberalization period ranging from 1991-2013. The empirical findings indicated that growth of a nation which is developing as in the case of India leads to Trade Openness (export and import). Growth is also seen as a significant factor to impact private credit which in turn is seen to cause Trade Openness. Financial Development (Private credit and money supply) have causal impact on Trade Openness by effectively allocating resources to promote productivity growth along with technological upgradation.

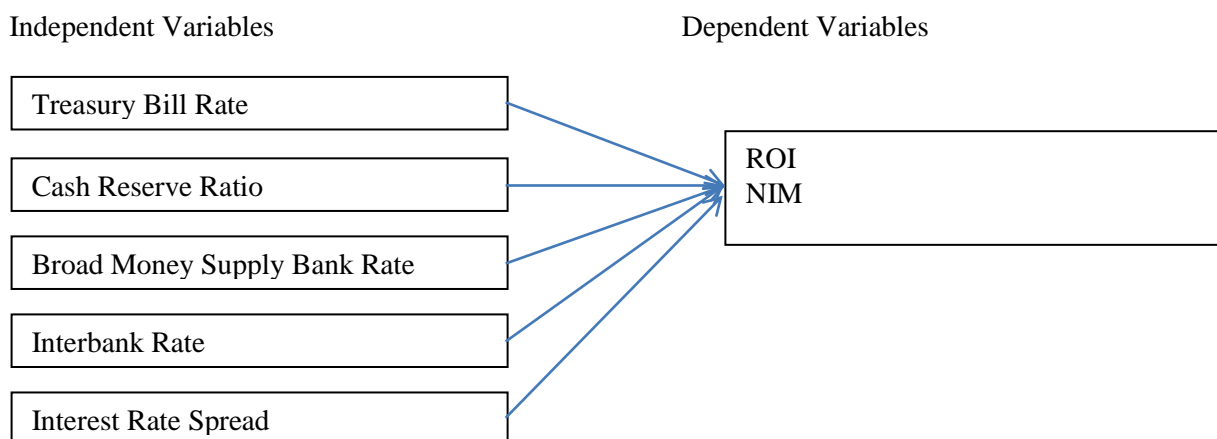
Research Method

The research method highlights the plan of the study. Research methods are employed for data analysis and measurement to know how exactly conclusions can be drawn from this study in the future. This study aims to assess the impact of monetary policy instruments on the profitability of Nepalese commercial banks. Financial statements from ten banks were collected over ten years (2007/08 to 2021/22) using various sources, including the banks' websites, Nepal Stock Exchange, and Nepal Rastra Bank. Data organization was facilitated using Microsoft spreadsheet, while SPSS software was employed for meaningful data analysis, exploring relationships between dependent and independent variables to understand the influence of monetary policy instruments.

Secondary data were obtained from various sources, including the official websites of commercial banks, Nepal Rastra Bank (NRB), the Securities Board of Nepal (SEBON), and the Nepal Stock Exchange (NEPSE), as well as the annual reports of the banks. Statistical and econometric models were employed for analysis, specifically descriptive, correlation, and regression methods. Variables' mean, median, standard deviation, minimum, and maximum values characterized sample firms, while correlation analysis assessed variable relationships. Regression models utilized tests such as t-test, F-test, and Z-test to examine individual and joint effects of independent variables, conducted using SPSS. The subsequent sections provide a detailed analysis of the models and the statistical tests' significance.

Conceptual Framework

The figure shows the conceptual framework of the study. Monetary policy instruments variables are taken as independent variables, whereas a firm's profitability is the dependent variable. The independent variables are the cash reserve ratio, bank rate, broad money supply, investment in the Treasury bill, and statutory liquidity ratio. Return on investment, return on equity, and net interest margin are dependent variables from 2007/08 to 2021/22.



Results

This chapter summarizes, interprets, and analyzes the collected data in two sections. The first section covers descriptive, correlation, and regression analyses, exploring features and profitability and

monetary aspects. It also delves into financial metrics like return on investment (ROI) and net interest margin (NIM), which measure bank profitability in core activities. The chapter also outlines the role of monetary policy in managing economic goals through tools and indicators by central banks like the Federal Reserve or the European Central Bank.

Table 1: Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NIM	105	.29	25.96	9.2137	5.44967
TBR	105	.13	7.41	3.2693	2.36545
M2	105	.39	5.15	1.9873	1.41530
IBR	105	.16	8.22	2.7507	2.35715
CRR	105	3.0	6.0	5.100	.9913
IRS	105	4.50	10.47	8.1387	1.58637
ROI	105	1.96	38.16	12.2467	6.79053

The table shows the descriptive statistics of 105 observations. The minimum ROI value is 1.96, and the maximum value is 38.16. The average ROI, or mean, is 12.24, indicating the typical return on assets. The standard deviation of 6.790 shows the variability or dispersion in the ROI values.

Similarly, NIM has 105 observations, with a minimum value of 0.29 and a maximum of 25.96. The mean NIM is 9.2137, indicating the average net interest margin. The standard deviation of 5.44967 suggests moderate variability in the NIM values.

The minimum TBR value is 0.13, and the maximum is 7.41. The mean TBR is 3.2693, representing the average total borrowings ratio. The standard deviation 2.36545 shows the spread or variability in the TBR values.

The minimum M2 value is 0.39, and the maximum is 5.15. The mean M2 is 1.9873, representing the average value of M2. The standard deviation of 1.41530 indicates the variability in the M2 values. The minimum IBR value is 0.16, and the maximum is 8.22. The mean IBR is 2.7507, representing the average interest burden ratio. The standard deviation 2.35715 shows the spread or variability in the IBR values. The minimum CRR value is 3.0, and the maximum is 6.0. The mean CRR is 5.100, indicating the average cash reserve ratio. The standard deviation of 0.9913 shows the variability in the CRR values. The minimum IRS value is 4.50, and the maximum is 10.47. The mean IRS is 8.1387, representing the average interest rate sensitivity. The standard deviation of 1.58637 indicates the variability in the IRS values.

Correlation Analysis

The correlation analysis shows the direction and magnitude of the relationship between the firm profitability and monetary policy instruments variables of sample banks. The Pearson correlation matrix is presented in Table 4.2.

Table 2: Computation of correlations coefficient of dependent and independent variables

	NIM	TBR	M2	IBR	CRR	IRS	ROI
NIM	1						
TBR	-.061	1					
M2n	.619**	-.007	1				
IBR	-.168	.464**	-.190	1			
CRR	-.077	-.220*	-.624**	-.063	1		
IRS	.376**	.129	.175	-.288**	.149	1	
ROI	.512**	.113	.060	-.031	.196*	.381**	1

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

The correlation coefficients reveal intriguing insights into the relationships involving net interest margin (NIM) and the other variables in the dataset. NIM exhibits relatively low correlation coefficients with the other variables, implying weak linear connections. Notably, NIM displays positive correlations with money supply (M2) at 0.619 and return on investment (ROI) at 0.512, indicating that elevated NIM values are likely linked to higher M2 and ROI values. Conversely, there are negative correlations between NIM and total bad loans ratio (TBR) at -0.061 and Cash Reserve Ratio (CRR) at -0.077, suggesting that higher NIM values could coincide with lower TBR and CRR values.

Total bad loans ratio (TBR) exhibits negative correlations with NIM at -0.061 and interest rate spread (IRS) at -0.129, suggesting that higher TBR values align with lower NIM and IRS values. Similarly, money supply (M2) showcases positive correlations with NIM at 0.619 and IRS at 0.376, implying that higher M2 values might correspond to increased NIM and IRS values.

Interest-bearing resources (IBR) demonstrate a negative correlation with NIM at -0.168, implying that higher IBR values could be associated with lower NIM values. The cash reserve ratio (CRR) exhibits negative correlations with TBR at -0.220 and IRS at -0.288, indicating that higher CRR values might coincide with lower TBR and IRS values. Additionally, CRR displays a negative correlation with M2 at -0.624, suggesting that higher CRR values might be related to decreased M2 values.

Interest rate spread (IRS) has positive correlations with NIM at 0.376 and ROI at 0.381, hinting that higher IRS values might align with elevated NIM and ROI values. Finally, return on investment (ROI) demonstrates positive correlations with NIM at 0.512 and IRS at 0.381, indicating that higher ROI values are potentially linked to increased NIM and IRS values. These correlations provide valuable insights into potential relationships among the variables. However, further analysis and domain expertise are required to establish causality and a more profound understanding within the context of the dataset.

Regression Analysis

The regression of monetary policy instruments on firm profitability has been analyzed by defining the firm profitability in terms of return on investment and the net interest margin and monetary policy instruments in terms of bank rate, statutory liquidity ratio, broad money supply, investment on treasury bills, and cash reserve ratio. To test the significance of monetary policy instruments and firm profitability, regression analysis has been used in the study, and the results are presented in three tables.

Regression of monetary policy instruments on return on investment

The results are based on panel data of 7 commercial banks with 105 observations from 2007/08 to 2021/22 using a linear regression model with the dependent variables Return on investment.

Table 3: Coefficients

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	-12.937	5.674		-2.280	.025
	TBR	.335	.324	.117	1.035	.303
	M2	1.055	.613	.220	1.720	.089
	IBR	.180	.322	.062	.558	.578
	CRR	2.180	.895	.318	2.436	.017
	IRS	1.275	.459	.298	2.779	.007

a. Dependent Variable: ROI

Table 3 analyzes the significance and impact of independent variables on the dependent variable, return on investment (ROI). Unstandardized coefficients estimate the effect of each predictor, with the constant term having a coefficient of -12.937, statistically significant at a 0.025 level, suggesting a baseline impact on ROI. Among the predictors, CRR and IRS significantly impact ROI at 0.017 and 0.007 significance levels, respectively. CRR shows a 2.180-unit increase in ROI with a one-unit increase, while IRS indicates a 1.275-unit increase in ROI. TBR, money supply (M2), and IBR do not demonstrate statistically significant impacts on ROI at conventional significance levels. Interpretation should consider p-values, domain-specific implications, and potential model refinement.

Regression of monetary policy instruments on net interest margin

The results are based on panel data of 7 commercial banks with 50 observations from 2007/08 to 2021/22 using a linear regression model with the dependent variables net interest margin.

Table 4: 1Regression of monetary policy instruments on net interest margin

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	-15.676	3.348		-4.682	.000
	TBR	-.054	.191	-.023	-.281	.780
	M2	3.402	.362	.883	9.402	.000
	IBR	.214	.190	.092	1.124	.264
	CRR	2.461	.528	.448	4.660	.000
	IRS	.635	.271	.185	2.344	.021

R square: 0.568

a. Dependent Variable: NIM

The coefficient for TBR is -0.054, suggesting that a one-unit increase in the TBR leads to a 0.054 decrease in NIM. However, this coefficient is not statistically significant ($p = 0.780$), indicating that TBR does not significantly impact NIM.

The coefficient for M2 is 3.402, indicating that a one-unit increase in M2 leads to a 3.402 increase in NIM. This coefficient is statistically significant ($p = 0.000$), suggesting a significant positive impact of M2 on NIM.

The coefficient for IBR is 0.214, suggesting that a one-unit increase in IBR leads to a 0.214 increase in NIM. However, this coefficient is not statistically significant ($p = 0.264$), indicating that IBR does not significantly impact NIM.

The coefficient for CRR is 2.461, indicating that a one-unit increase in CRR leads to a 2.461 increase in NIM. This coefficient is statistically significant ($p = 0.000$), suggesting a significant positive impact of CRR on NIM.

The coefficient for IRS is 0.635, suggesting that a one-unit increase in IRS leads to a 0.635 increase in NIM. This coefficient is statistically significant ($p = 0.021$), indicating a significant positive impact of IRS on NIM.

Overall, the regression model explains 56.8% of the variation in NIM ($R\text{-squared} = 0.568$), indicating a reasonably good fit. Among the independent variables, M2, CRR, and IRS are statistically significant factors that positively influence NIM. This suggests that an increase in M2, CRR, and IRS is associated with an increase in net interest margin. However, TBR and IBR do not have a statistically significant impact on NIM based on this analysis.

Discussion

The performance of different banks in terms of return on Investment (ROI) has shown diverse trends over the years. While some banks have maintained consistent or gradually changing ROI values, others have displayed more pronounced fluctuations. Notably, NIMBL initially showcased exceptionally high ROI values, but a significant and noteworthy drop followed this. Similarly, banks like SBL and SBI exhibited substantial increases in their ROI during specific periods. On the other hand, banks like HBL and NABIL demonstrated relatively stable ROI trends, albeit with some variations.

Net interest margin (NIM) is a crucial gauge of bank profitability, reflecting diverse trends over time influenced by factors like interest rate changes, economic conditions, and shifts in the competitive banking landscape.

Monetary policy indicators, including treasury bill rate, broad money supply, interbank rate, cash reserve ratio, and interest rate, show varied values over time, impacting borrowing costs, liquidity levels, and the overall economic environment. This highlights the intricate dynamics within the financial system.

Correlation coefficients provide insights into financial variable relationships. Notably, NIM exhibits positive correlations with metrics like broad money supply (M2) and return on investment (ROI), indicating higher NIM values align with increased M2 and ROI values. Conversely, negative correlations with indicators like treasury bill rate (TBR) and cash reserve ratio (CRR) suggest that shifts in these indicators may impact NIM differently.

In order to comprehensively evaluate the impact of monetary policy indicators on profitability metrics, regression analysis was conducted, explicitly focusing on return on investment (ROI) and net interest margin (NIM). The constructed regression models accounted for a significant portion of the variance observed in the dependent variables. Certain variables showcased statistically significant impacts on the profitability metrics among the monetary policy indicators. Notably, the cash reserve ratio (CRR) and interest rate spread (IRS) emerged as influential factors affecting return on investment (ROI), underscoring their significance in shaping banks' profitability. Additionally, M2 significantly positively impacted net interest margin (NIM), further highlighting the intricate connections between monetary indicators and banks' operational performance.

According to Kaushal and Pathak (2010), profitability is highly determined by bank interest income. The central bank employs monetary policy instruments. Similarly, the banking system is a vital part of the economy as it has a huge role in contributing to the money supply in the overall economy.

Friedman (1968) revealed that monetary policy promoted price stability by increasing disinflation with fiscal policy with its potential to affect aggregate. Smitha (2010) examined that monetary policy has an impact in both the long run and short run, where the short-run impact is typically seen in the financial market, and the long run is seen in the real sector of the economy (Smitha, 2010). Similarly, the cash reserve ratio becomes another integral part because a decrease in the cash reserve ratio increases the money supply in an economy and vice versa. The statutory liquidity ratio is the other aspect that determines the money supply in an economy. Also known as the secondary reserve, an increase in statutory liquidity ratio tends to decrease the money supply in an economy and vice-versa.

The various instruments of monetary policy that the central banks employ can be classified into direct or indirect instruments. Indirect monetary policy instruments include bank rate variation, open market operations, and reserve requirements, which regulate the overall level of credit in the economy through central banks. At the same time, direct monetary policy instruments aim to control specific types of credit. It has been analyzed that changing margin requirements and regulation of customer credit broadly impact commercial banks' profitability (Jhingan, 2009).

Conclusion

The study concludes that the cash reserve ratio, bank rate, and investment on treasury bills are the most dominant variables in the monetary policy instruments to analyze its impact on the profitability of Nepalese commercial banks. The cash reserve ratio has been found to have a negative relationship with return on equity, revealing the fact that the higher the cash reserve ratio, the lower the bank's profitability. Likewise, the bank rate has a negative relationship with return on investment, which indicates that a higher bank rate would lead to lower bank profitability. Similarly, investment in treasury bills has been found to have a negative relationship with the return on equity, which indicates that higher investment in treasury bills could be the return on equity. In contrast, a positive relationship has been found between the return on assets and net interest margin, which indicates that higher investment in treasury bills would lead to higher profitability of commercial banks.

The study also concludes that there is a positive relationship between investment in treasury bills, broad money supply, and cash reserve ratio. These results reveal that the higher the investment in Treasury bills, the higher the return on investment would be. Likewise, the higher the broad money supply, the

higher the return on investment. Similarly, the positive beta coefficient for the cash reserve ratio indicates that the higher the cash reserve ratio, the higher the return on investment.

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