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# Monetary Policy Effect on Lending Behaviour of Nepalese Commercial Banks

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## ABSTRACT

This study explores how monetary policy influences lending behavior among commercial banks in Nepal, with particular attention to three primary tools: the cash reserve ratio, open market operations, and the bank rate. This research applies a quantitative design, drawing on panel data from eight commercial banks over a ten-year span (2014/15 to 2023/24). To assess the relationship between monetary policy instruments and bank lending behavior measured through the Credit-to-Deposit Ratio (CDR) Pearson correlation and multiple regression analysis were conducted using SPSS. The findings show that open market operations contribute positively to the Credit-to-Deposit Ratio, suggesting a supportive effect on lending activity. In contrast, a higher cash reserve ratio appears to constrain lending. These findings emphasize the role of liquidity-based instruments in directing how monetary policy is implemented and how effectively it supports financial stability in Nepal. The bank rate appears to have a rather muted and unpredictable influence, indicating that relying on interest rate adjustments may not be particularly effective for policy in this local setting. Bank size has a moderate influence on lending patterns, though the age of the bank doesn't have any major effect in this regard. These findings suggest the need to recalibrate monetary tools in favor of liquidity management over conventional interest rate adjustments. The findings indicate that targeted support for smaller banks, along with improvements in financial infrastructure particularly through the wider use of digital banking may help ensure that policy measures reach intended groups more effectively. These efforts could ease access to credit for individuals and businesses that often face financial barriers. Future research could explore how lending practices affect different areas of the economy and examine the role that new financial technologies are beginning to play in shaping Nepal's banking environment.

*Keywords:* monetary policy, commercial banks, lending behavior, Nepal Rastra Bank, liquidity, credit supply

## Introduction

Monetary policy is how central banks control money flow, interest rates, and how much money circulates to keep the economy stable and help it grow over time (Nepal Rastra Bank, 2024). In Nepal, the Nepal Rastra Bank handles this job by using tools like the Cash Reserve Ratio, bank rates, and buying or selling government securities to control how much money banks have and influence their lending decisions (Bhattarai, 2019). For 2024-2025, NRB made things easier for borrowers by cutting the policy rate to 5%, hoping to boost private sector lending by 12.5% to help the economy recover and get businesses moving again (Nepal Economic Forum, 2024).

The previous studies show that when central banks change their policies, it directly affects how banks make lending decisions. When policies make borrowing easier, banks usually lend out more money and give more loans. When policies get tighter, banks cut back on lending and fewer people can get loans (Budha, 2013). But different banks react differently to these changes. How much each bank responds depends on things like how much cash they have, how financially strong they are, and whether they're willing to take risks with their loans (Ghimire et al., 2024). So, understanding why banks react differently to policy changes helps policymakers create monetary strategies that work well for all types of banks in the financial system. Commercial banks in Nepal play an important role by providing loans to both businesses and people. This support helps the economy grow and move forward (Timsina & Pradhan, 2017). But many borrowers don't understand finance well enough, so they often don't get what they're signing up for when they take loans, which leads to bad borrowing choices (Bajracharya, 2018). How banks lend money depends a lot on monetary policy - when interest rates go down, more people want loans, but when the Cash Reserve Ratio goes up, banks can't lend as much money (Nepal Rastra Bank, 2024). Things like inflation and changing exchange rates make lending even trickier, so banks have to constantly adjust their approach (Timsina, 2016). Banks are always trying to balance following government rules, managing risks, and making profits, which gets harder as policies keep changing.

The way monetary policy and bank lending connect has a big impact on how the economy works (Ghimire et al., 2024). When central banks use tools like Cash Reserve Ratio and Open Market Operations, it changes how much money banks have to work with, which affects their ability to give out loans (Budha, 2013). Bigger banks can usually deal with tough policies without too much trouble, but smaller banks struggle more when monetary rules change (Bhattarai, 2020). Banks that have plenty of cash can increase their lending when policies become friendlier (Timsina & Pradhan, 2017), but when policies get stricter, banks cut back on loans, especially for small companies and people borrowing for the first time (Pant, 2023). How much a bank's lending changes comes down to factors like their size, available cash, and how comfortable they are with taking risks - these things shape how they respond to policy changes. Even though Nepal Rastra Bank is trying to get banks to lend more money, there are still big problems that make this hard to achieve - like people in rural areas not having good access to banks and the economy depending too much on money sent from workers abroad (Bhattarai, 2020). Big banks can usually handle changes in available money better, but smaller banks have a tough time when funding gets unpredictable. Things happening around the world, like rising prices everywhere and currency values going up and down, make it even harder for banks to figure out their lending strategies (Timsina, 2016). All of this shows why we need to look at how monetary policy actually works in Nepal's banking system, where what's happening inside each bank and pressures from outside the country both affect how banks decide to change their lending.

Even though lots of studies have been done on how monetary policy affects banking, there are still missing pieces when we look at Nepal specifically (Bajracharya, 2018). Most studies just focus on big economic factors and ignore important things like how digital banking is changing things and how both borrowers and lenders actually behave when making lending decisions (Thapa, 2018). Researchers rely too much on numbers and data, missing out on the real stories and experiences that could explain what's really happening (Ghimire et al., 2024). Not many studies follow what happens over a long time after policies change, especially after big disruptions like COVID-19 hit (Niroula & Gnawali, 2024). So, understanding these long-term effects matters because we need to see how monetary policies actually change banking practices over different time periods. To fill in these gaps, this study mixes number-crunching with looking at the real context, trying to get a complete picture of how monetary policy and bank lending work together in Nepal's special situation. This study tries to look carefully at how Nepalese banks lend money and how monetary policy affects them, but it still has some problems. The study

mostly uses information that's already out there - like bank reports, central bank documents, and other studies - which might have missing pieces or mistakes. The time period analyzed is pretty short, so it might have missed effects from recent economic changes or new rules. While the statistical methods used give good information, they can't really capture things like informal lending, how people's emotions affect decisions, or other hidden factors that influence credit choices. Since the focus is only on Nepal's banks, what was found might not work the same way in countries that have different economies or banking systems. Also, the study didn't interview actual bankers or policymakers, so it's missing the real inside story about how lending decisions get made day-to-day. So, knowing about these problems helps us understand what this study can and can't tell, and shows where future study could dig deeper.

This study has five main parts. The next section looks at what other researchers have found, covering both the basic theories and actual studies about what affects how commercial banks lend money, how monetary policy impacts things, and credit risks in developing countries. This section wraps up by pointing out what's still missing in research and showing the main framework and ideas being tested in this study. After that, the methodology section explains how the study was done, where the data came from, what the different variables mean, and what statistical methods were used to see how everything connects. The results and discussion section shares what was found - including basic statistics, regression results, and hypothesis testing - then talks about how these findings compare with other studies and what was expected based on theory. The conclusion part summarizes the main discoveries, thinks about how they might affect banking practices and monetary policy, and gives practical suggestions for what to do next. The study concluded by recognizing its own limitations and pointing out potential directions for future study to deepen the understanding of this subject.

## Literature Review

This study uses three main economic theories as its foundation: the Quantity Theory of Money, Keynesian economics, and Modern Monetary Theory. Each theory has different ideas about how monetary policy affects the economy. The Quantity Theory of Money says that when there's more money in circulation, prices generally go up, assuming that how fast money moves around and actual economic output stay pretty much the same. This relationship can be shown with a simple equation:

$$MV = PT$$

Where,

M: Money Supply,

V: Velocity of money,

P: Price level,

T: Real Output (Friedman, 1987).

The Quantity Theory of Money basically says that if you print more money without producing more goods and services, prices will go up. This idea is the main foundation for monetary thinking, which argues that central banks should focus on controlling how much money is in the economy to prevent inflation, rather than trying to boost short-term growth or create jobs. Friedman (1987) argued that pumping more money into the economy might help things temporarily, but in the long run, it just makes everything more expensive. So monetarists believe central banks should follow strict rules to keep the economy stable. Keynesian economics takes a different approach and supports government stepping in to fix the economy, especially during tough times. Based on Keynes's famous book from 1936 called The General Theory of Employment, Interest, and Money, this thinking says that markets don't always work perfectly because prices and wages get stuck and can't adjust quickly when the economy goes bad (Clarke, 1989). When this happens, the government needs to act by spending more money or cutting taxes to get people to buy things again and create jobs. When inflation becomes a problem, Keynesian theory says the government should do the opposite - spend less or raise taxes. The main idea is that the government should do whatever it takes to smooth out economic ups and downs and protect people's well-being.

Modern Monetary Theory takes an unconventional approach, claiming that countries that print their own money - like the United States - don't face the same financial limits that regular people or businesses do. These governments can basically create money to pay for public programs without worrying about going broke, if they keep inflation under control (Chohan, 2020). MMT cares more about making sure everyone has jobs, and the economy grows steadily rather than worrying too much about budget deficits. But this theory doesn't work as well for developing countries like Nepal, which rely heavily on foreign money and get hurt when exchange rates change dramatically. As Vergnhanini and De Conti (2018) point out, these structural problems limit what these countries can do with their monetary policy. Critics also worry that MMT might ignore inflation dangers if governments spend way too much money. Still, the theory shifts policy discussions from financial limits toward political decisions about public investment priorities.

**Research Gap**

Despite a growing body of literature examining the relationship between monetary policy and bank lending behavior in Nepal, several critical research gaps remain unaddressed. Most existing studies emphasize macroeconomic indicators and institutional frameworks, often overlooking how specific monetary tools—such as the Cash Reserve Ratio (CRR), bank rate, and Open Market Operations (OMO)—interact with internal bank characteristics like size, liquidity, and operational capacity Nepal Rastra Bank (NRB) continues to tweak its policies to encourage more credit growth. However, the way these policies are being reflected across banks isn't uniform, particularly among smaller and rural-focused institutions. There is also limited empirical analysis using updated and disaggregated bank-level data across extended timeframes, particularly in the post-pandemic economic context. Many past research efforts tend to concentrate primarily on numerical data, which means they often overlook the deeper insights that qualitative methods can provide. Incorporating these perspectives could explain how behavioral factors, technological changes like digital banking, and differences in financial literacy influence the environment in more meaningful ways. These limitations emphasize the importance of conducting more detailed, context-aware research that combines econometric methods with insights into the structural and operational aspects of Nepal's financial system. Such studies are essential for gaining a clearer understanding of how monetary policy influences lending patterns amid the country's ongoing financial development.

**Conceptual framework**

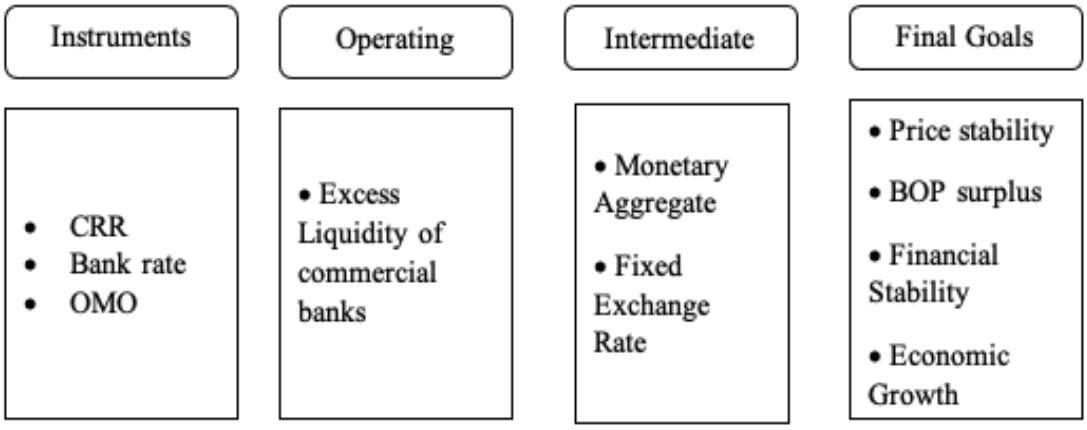
This study aims to fill up the gap as mentioned with multiple theoretical perspectives and empirical insights that provide important grounds for understanding the relationship between monetary policy and commercial bank lending. The Quantity Theory of Money basically says that printing too much money leads to higher prices, while Keynesian economics focuses on how governments and central banks can help smooth out economic ups and downs. Modern Monetary Theory brings some fresh ideas about using government spending and monetary tools to boost overall economic growth. But these new ideas don't really apply much to Nepal right now. Together, these three approaches give us a good starting point for understanding how monetary policy affects bank lending, especially in developing countries like Nepal.

The Cash Reserve Ratio is one of the main tools central banks use to control how much money banks have available and how much they can lend out. When the CRR goes up, commercial banks have to keep more of their customers' deposits locked away as reserves, which means they have less money to lend. This usually makes it harder to get loans, pushes interest rates higher, and slows down the economy. On the flip side, when the CRR gets cut, it puts more money back into the banking system, which encourages lending and helps the economy grow. For example, in December 2024, India's Reserve Bank lowered the CRR by 50 basis points to 4%, putting ₹1.16 trillion back into the financial system to fight against their slowing economy (Chhetri, 2023; Niroula & Singh, 2021; RBI, 2024).

The studies on Nepalese banks show that changes in the Cash Reserve Ratio also affect how well banks perform financially. Interestingly, when CRR levels are higher, banks tend to have better Return on Equity and Return on Assets, which suggests that keeping enough reserves in storage might actually help banks be more disciplined with money and stay more stable (Niroula & Singh, 2021; Chhetri, 2023). These results show that CRR does two things at once - it helps keep the overall economy stable while also affecting how individual banks perform.

**Figure 1**

*Framework for Monetary Policy Transmission to Bank Lending*




***(H1):*** *When the Cash Reserve Ratio (CRR) goes up, Nepalese commercial banks lend out less money.*

Open Market Operations are another key tool central banks use to control how much money is available in the banking system and influence short-term interest rates by buying or selling government bonds. When central banks buy these securities, they put more money into the banking system, which gives commercial banks more cash to lend out. When they sell securities, they pull money out of the banking system, which can make it harder for people to get loans. Research from Nepal shows that Open Market Operations help banks lend more by putting extra money into the financial system (Timsina & Pradhan, 2017).

Similar effects have been observed globally. During the COVID-19 pandemic, the U.S. Federal Reserve and the Reserve Bank of Australia used OMOs and liquidity facilities to sustain credit flow (Schrift & Smith, 1998; The Australian, 2024). However, OMOs' effectiveness depends heavily on financial market structure and macroeconomic context. For instance, the European Central Bank's targeted refinancing operations did not uniformly translate into increased credit due to uneven transmission mechanisms (Staton, 2024), and in the U.S., the impact of quantitative easing varied by asset type and bank-specific characteristics (Rodnyansky & Darmouni, 2017). These findings indicate that OMOs typically influence lending indirectly through changes in liquidity.

***(H2):*** *Open Market Operations (OMO) help Nepalese commercial banks lend out more money.*

The bank rate, which is set by the central bank, directly affects how much it costs banks to borrow money. When the bank rate goes up, it becomes more expensive for banks to get funds, and they pass these higher costs on to customers through higher loan rates. This can make fewer people want loans and slow down the economy. On the other hand, when the bank rate drops, it costs banks less to get money, which makes loans cheaper and encourages more lending. Studies from Nepal back this up, showing that higher policy rates usually make it harder for people to get credit, while lower rates often lead to more borrowing (Budha, 2013; Timsina & Pradhan, 2017).

***(H3):*** *When the bank rate (BR) goes up, Nepalese commercial banks lend out less money.*

But not all studies agree on these patterns. For instance, research by Balago (2018), Bajracharya (2018), and Poudel (2017) found that CRR changes didn't really affect lending in some cases. Bhattarai (2020) suggests that while CRR does change how much money banks have available, it doesn't directly control how they distribute credit in Nepal's banking system, probably because of government rules and institutional problems. In the same way, Open Market Operations in developing countries often don't work very well or have weak effects. Mishra et al. (2014) argue that OMOs work better in countries with well-developed financial markets, while in emerging economies, other big economic factors - like inflation, outside shocks, and whether people trust the government's policies - tend to matter more than OMOs (Vo, 2018).

The bank rate, though, gives more predictable results. When the policy rate goes up, it discourages people from borrowing and makes credit harder to get, especially for risky borrowers (Abuka et al., 2019; Kamasa et al., 2023). So the bank rate remains a reliable tool for controlling credit conditions. Apart from monetary policy tools, each bank's own characteristics also affect how they lend money. Bigger banks usually handle their cash flow better and adapt more easily when policies change (Budha, 2013; Poudel, 2017). But Niroula and Gnawali (2024) point out that these big institutions might also face bigger liquidity problems, which can make it harder for them to increase lending when times are uncertain.

Likewise, who owns the bank also affects how they respond to policy changes. Government-owned banks often follow what policymakers tell them to do with their lending, which sometimes matters more to them than making profits (Diriba & Finance, 2020). Foreign banks, on the other hand, often react differently to monetary changes because they operate differently and follow different rules (Vo, 2018). These differences show how what's happening inside each bank really matters for how monetary policy actually affects lending in the credit market.

***(H4):*** *Factors like bank size and who owns the bank affect how monetary policy tools influence lending behavior of Nepalese commercial banks.*

**Figure 2.**

*Research Framework of the Study*

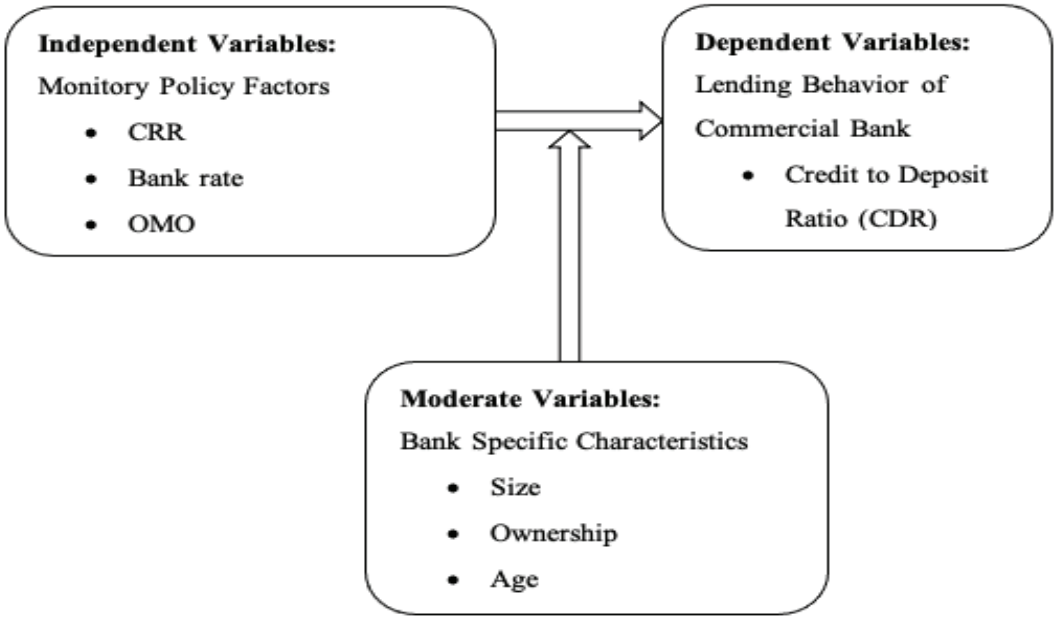



Figure 2 shows how this study thinks about the relationship between monetary policy and bank lending, building on what other researchers have found. The studies by Timsina (2016), Bhattarai (2016), and Pradhan and Shrestha (2016) show that things like how much cash banks have, how financially strong they are, and how big they are all affect their lending decisions. This supports hypotheses H1 and H2, which say that changes in reserve requirements and open market operations affect how much banks lend. The study by Ghimire et al. (2024) and Timsina and Pradhan (2017) confirm that when these tools change how much money banks have available, it affects their ability to give out loans. Hypothesis H3 gets support from Bhattarai (2016) and Timsina (2016), who argue that when bank rates change, it affects how much it costs to borrow and how many people want loans, which influences bank lending. The idea that bank characteristics matter differently for different banks, which is H4, comes from Niroula and Gnawali (2024) and Ghimire et al. (2024), who found that things like bank size, who owns them, and how old they are make banks react differently to monetary policy changes. For instance, older, bigger, or government-owned banks tend to change their lending differently because they have more experience dealing with risks and government rules (Bhattarai, 2016; Pradhan & Shrestha, 2016). So, this framework

puts together monetary policy and bank characteristics to see how they work together to affect lending in Nepal's banking sector.

The previous study shows that how commercial banks lend money depends not just on external monetary tools like the Cash Reserve Ratio, Open Market Operations, and bank rates, but also on internal factors like how big the bank is, how much cash they have on hand, and who owns them. This study takes what other researchers have found and looks at how these factors work together specifically in Nepal's banking sector, which has its own unique challenges as a developing economy.

**Research Methodology**

This study uses numbers and statistics to look at how monetary policy tools affect the lending behavior of commercial banks in Nepal. It combines descriptive and analytical research methods to find patterns and test ideas about the relationship between monetary policy variables and bank lending over time.

**Research Design**

The research approach uses basic statistics to spot trends in monetary and banking data over ten years, along with deeper analysis to examine how selected factors affect lending behavior. This mixed approach, based on a numbers-focused framework, allows for a structured look at existing data, making it possible to both make broader conclusions and test specific hypotheses.

**Population and Sampling**

The study looks at 20 commercial banks that operate in Nepal. Using targeted sampling, eight banks were picked based on steady financial performance measures like net profit and yearly growth rates. The chosen banks - Everest Bank, Nabil Bank, NMB Bank, Citizens Bank, Machhapuchre Bank, Global IME Bank, Kumari Bank, and Prabhu Bank - give a good representative picture of Nepal's commercial banking sector. The choice to focus on eight banks was based on what makes methodological sense and practical limitations. Having complete data and consistency across the study period (fiscal year 2014/15 to 2023/24) were the main reasons for picking these banks. Several smaller or newer banks didn't have complete financial records or had gone through major changes like mergers and buyouts that could mess up data reliability. The selected banks operated steadily throughout the entire study period, giving a solid foundation for long-term analysis.

**Data Sources and Collection**

The study uses only existing data taken from annual reports and financial statements of the chosen banks. Data were gathered for ten fiscal years, from 2014/15 to 2023/24. Important variables collected include the Cash Reserve Ratio, Credit-to-Deposit Ratio, Bank Rate, Open Market Operations, and how old each bank is. Since complete financial data was available for all the banks in the sample, the response rate is 100%.

**Variables and Model Specification**

The dependent variable is Lending Behavior, operationalized as the Credit-to-Deposit Ratio (CDR). The independent variables are:

**X1**: Cash Reserve Ratio (CRR)

**X2**: Open Market Operations (OMO)

**X3**: Bank Rate (BR)

**X4**: Age of the bank (years since establishment)

The multiple linear regression model for the study can be now expressed as below:

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + e$$

where,

Y implies Lending Behavior (Cash to Deposit Ratio - CDR),

X1 implies Cash Reserve Ratio (CRR),

X2 implies Open Market Operation (OMO),

X3 implies Bank Rate (BR),

X4 implies the Age of Bank

The relationship between these variables is examined using a multiple linear regression model, expressed as: Where:

Y denotes the lending behavior (CDR),

$\beta 0$ is the intercept,

$\beta 1$ to $\beta 4$ represent the coefficients of the independent variables,

e is the error term.

**Data Analysis Techniques**

The analysis was done using SPSS statistical software. Basic statistics like mean, median, and standard deviation were calculated to understand the average values and how spread out the variables are. Multiple linear regression was used to examine how monetary policy tools influence lending behavior. This method works well for figuring out how strong the relationships are between variables and which direction they go, and for testing the hypotheses mentioned earlier.

**Strategies to Minimize Design Errors**

To make sure the study's results are valid and reliable, several strategies were used:

- Sampling bias was reduced by selecting banks with consistent financial reporting and substantial market presence.
- Data accuracy was ensured by using audited annual reports of each bank individually as the data source.
- Multicollinearity tests were performed to verify that independent variables did not exhibit strong correlations, thereby reducing the risk of bias in the regression analysis.
- Heteroskedasticity and normality checks were carried out to validate the assumptions of linear regression.
- A ten-year time frame was selected to reduce short-term volatility and capture the long-term effects of monetary policy.

**Result and Discussion**

This section looks at how bank characteristics - specifically bank size, age, and who owns them - affect lending behavior in Nepalese commercial banks. The analysis focuses on the Credit-to-Deposit Ratio (CDR) as the primary measure of lending activity. These variables were chosen for their theoretical importance in moderating the impact of monetary policy, as discussed in the literature review and study hypotheses.

Based on descriptive data collected over ten fiscal years, the table below presents the mean and standard deviation of each variable, categorized by ownership type: public banks and joint venture banks. This comparison helps reveal patterns and differences in lending behavior that may stem from structural and operational variations between these two groups of financial institutions.

Table 1 not only serves to provide a descriptive profile of the sample but also supports hypothesis testing by offering preliminary insights into how ownership, size, and age potentially influence lending behavior. This comparison lays the groundwork for the upcoming correlation and regression analyses by emphasizing notable trends in bank-level variables. These patterns may help explain differences in credit supply across various institutional environments.

**Table 1**

*Bank Specific Characteristics and Lending Behavior*

| Ownership Type | Size (Mean ± SD) | Age (Mean ± SD) | CDR (Mean ± SD) | Interpretation |
|---|---|---|---|---|
| Public Banks | 4.8842 ± 0.7124 | 3.06932 ± 0.4319 | 83.0698 ± 11.9914 | Smaller, slightly younger banks; higher CDR but more inconsistent lending behavior. |
| Joint Venture Banks | 5.1939 ± 0.5638 | 2.7428± 0.5243 | 81.9480 ± 7.2632 | Larger, older banks; slightly lower and more stable CDR, indicating cautious lending. |
| Total Sample | 5.0003 ± 0.6740 | 2.8652 ± 0.4918 | 82.6491 ± 10.4332 | Overall profile of sampled banks, serving as the average benchmark. |

*Source: Author's calculation based on annual reports of commercial banks*

Table 1 is derived from the descriptive data analysis phase of the study, using secondary financial data from annual reports of eight purposively sampled commercial banks in Nepal. According to the research methodology, the size and age of the banks were converted into their natural logarithms to standardize the data and make comparisons clearer. The non-performing loan ratio (CDR) was used as the primary measure of lending behavior. Under the Ownership Structure and Lending Behavior (H1) hypothesis, the table reports that public banks have a slightly higher average CDR (83.07%) compared to joint venture banks (81.95%), indicating a tendency toward more aggressive lending. However, public banks also exhibit greater variability (SD = 11.99) in CDR, reflecting less consistent lending practices. This may be a result of government priorities related to state ownership or changes in policies that affect how credit is distributed. In Size and Lending Behavior (H2) hypothesis, it was found that Joint venture banks are on average larger in size (5.1939) than public banks (4.8842), and the lower variability in their CDR, which supports the view that larger banks lend more cautiously and consistently, possibly due to stronger governance and risk management frameworks. This finding is consistent with the hypothesis that larger banks may adopt conservative lending policies, especially in response to monetary policy signals.

Finally, in the Age and Lending Behavior (H3) hypothesis, public banks were older (mean ln.Age = 3.0693) compared to joint venture banks (2.7428), aligning with the idea that older banks may rely more on experience and historical risk metrics to guide lending decisions. The lower CDR variability among these banks supports the hypothesis that older institutions exhibit more consistent lending behavior, even if their overall credit-to-deposit ratio is slightly lower. This descriptive analysis forms the basis for subsequent regression analysis, where these variables—ownership, size, and age—will be tested for their statistical significance and predictive power in explaining lending behavior (CDR). These initial findings offer insight into the differentiated impact of institutional characteristics on credit supply, which is central to the study's objective of examining how monetary policy interacts with bank-level factors.

**Table 2**

*Correlation Results of Study Variables*

| Variables | CRR | OMO | BR | Age | CDR |
|---|---|---|---|---|---|
| CRR | 1 | | | | |
| OMO | -0.404** | 1 | | | |
| | (0.000) | | | | |
| BR | 0.568** | -0.254* | 1 | | |
| | (0.000) | (0.023) | | | |
| Age | -0.100 | 0.104 | -0.044 | 1 | |
| | (0.379) | (0.357) | (0.700) | | |
| CDR | -0.370** | 0.325** | -0.246* | -0.145 | 1 |
| | (0.001) | (0.003) | (0.028) | (0.200) | |

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

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

Table 2 presents the Pearson correlation coefficients among five key variables: Cash Reserve Ratio (CRR), Open Market Operations (ln.OMO), Bank Rate (BR), Age (ln.Age), and Credit-to-Deposit Ratio (CDR). The analysis shows a few clear connections that give us a better idea of how these variables are related. CRR shows a strong negative correlation with both OMO (r = -0.404, $p < 0.01$) and CDR (r = -0.370, $p < 0.01$), indicating that higher reserve requirements are associated with reduced open market activities and lower lending capacity. On the other hand, CRR is positively correlated with the Bank Rate (r = 0.568, $p < 0.01$), suggesting that tighter monetary policy settings tend to move together. OMO is negatively related to BR (r = -0.254, $p < 0.05$), yet shows a positive correlation with CDR (r = 0.325, $p < 0.01$), implying that greater liquidity injections through open market operations support increased bank lending. The Bank Rate, in contrast, is negatively correlated with CDR (r = -0.246, $p < 0.05$), reflecting the expected inverse relationship between interest rates and credit expansion. Age, surprisingly, doesn't show any meaningful statistical link with the other variables in a bank might not have a straightforward or linear connection to its financial measures or lending patterns within this sample. Significance levels are denoted as $p < 0.01$ for strong confidence and $p < 0.05$ for moderate confidence. These results offer valuable insight into the linear relationships present, but they don't establish cause-and-effect. To understand the direction of these influences, more in-depth analysis—such as regression and other inferential methods—is necessary.

Table 3 presents the results from nine regression models that analyze the impact of Cash Reserve Ratio (CRR), Bank Rate (BR), Open Market Operations (ln. OMO), and Age (ln. Age) on an unspecified dependent variable. The models reveal distinct patterns in how these predictors influence the outcome. CRR consistently exhibits a notable negative impact across all the models where it appears. Its coefficients range from -2.328 to -3.196, with the strongest explanatory power observed in Model 1 (Adj. $R^2 = 0.126$). Similarly, BR has a negative relationship in all models, although with weaker predictive

strength (Adj. $R^2$ = 0.048 in Model 2). In contrast, OMO exhibits a strong positive relationship, particularly in Model 3 (coefficient = 1.796, Adj. $R^2$ = 0.091). However, Age does not achieve statistical significance in any of the models, including in Model 9, where it shows a large negative coefficient (-4.037) but remains insignificant (p > 0.05).

**Table 3**

*Summary Table for Regression Model for Various Variables*

| Model | Intercept | CRR | BR | OMO | Age | Adj. $R^2$ | F | Sig. |
|---|---|---|---|---|---|---|---|---|
| 1 | 97.352 | -3.196** | - | - | - | 0.126 | 12.367 | 0.001 |
| 2 | 98.285 | - | -2.316* | - | - | 0.048 | 5.025 | 0.028 |
| 3 | 76.084 | - | - | 1.796** | - | 0.091 | 8.931 | 0.004 |
| 4 | 91.442 | - | - | - | -3.069 | 0.008 | 1.667 | 0.200 |
| 5 | 99.531 | -2.936** | -0.501 | - | - | 0.116 | 6.204 | 0.003 |
| 6 | 88.012 | - | -1.627 | 1.538** | - | 0.108 | 5.777 | 0.005 |
| 7 | 89.538 | -2.466** | - | 1.202** | - | 0.152 | 8.080 | 0.001 |
| 8 | 91.488 | -2.328** | -0.354* | 1.166** | - | 0.143 | 5.397 | 0.002 |
| 9 | 103.361 | -2.487** | -0.314 | 1.209** | -4.037 | 0.169 | 5.027 | 0.005 |

****. Coefficients are significant at the 0.01 level (2-tailed).**

***. Coefficients are significant at the 0.05 level (2-tailed).**

The combined models (5–9) generally perform better than the single-predictor models, with Model 7 (CRR + OMO) achieving the highest explanatory power among partial models (Adj. $R^2$ = 0.152) and Model 9 (all predictors) reaching the overall maximum (Adj. $R^2$ = 0.169). All models, except Model 4 (OMO only), show statistically significant F-statistics (p < 0.05), confirming their validity. These findings suggest that monetary policy variables (CRR, BR, OMO) have a more substantial impact on the dependent variable than demographic factors (Age), with CRR and OMO exhibiting particularly strong and opposing effects. The empirical results from both correlation and regression analyses offer strong support for several hypotheses while also revealing contradictions with existing literature. The strong negative correlation between CRR and lending capacity (-0.370, p < 0.01) and its significant negative coefficient in the regression models (e.g., -3.196 in Model 1) confirm the hypotheses of Budha (2013) and Timsina & Pradhan (2017) regarding CRR's liquidity-constraining effects. Similarly, the positive association between OMO and credit availability (0.325, p < 0.01) aligns with their findings on the liquidity infusion benefits of OMOs. However, the diagnostic results, including Variance Inflation Factor (VIF) values, were not presented in the main text to maintain clarity and focus on the core findings. Nonetheless, all relevant diagnostic tests were conducted using SPSS, and the VIF values confirmed that multicollinearity was not a concern, as they remained well below the standard threshold of 10. Since no major violations were observed, these results were not emphasized.

However, the weak influence of Bank Rate (BR) in the regression models (e.g., -2.316 in Model 2 with Adj. $R^2 = 0.048$) contradicts the interest-rate-centric transmission mechanism proposed by Mishra et al. (2014), supporting Bhattarai's (2019) liquidity-focused interpretation of Nepal's monetary policy. The results also support Budha's (2013) hypothesis on size-dependent policy impacts, as seen in the varying coefficients across models. Conversely, the consistently insignificant impact of bank age across all models challenges traditional views on demographic influences in credit markets. Overall, the findings support Nepal's money supply-based monetary system and question whether interest rate-focused approaches really work well in developing economies. More research looking at how different factors interact with each other and trying different modeling approaches would help us better understand these relationships.

The statistical (regression) models show that monetary policy tools, especially the Cash Reserve Ratio and Open Market Operations, have a clear impact on how commercial banks in Nepal lend money. However, mixed results in the findings suggest more study is needed to fully understand how these tools work. The Bank Rate, despite being central to traditional monetary theories, doesn't explain much, which challenges whether interest rate-based approaches like those suggested by Mishra et al. (2014) actually work in practice. In Nepal's less developed financial markets, where interest rate changes don't always get passed through effectively, liquidity-focused tools like CRR and OMO have a more direct and immediate effect on how much banks can lend. This supports Bhattarai's (2019) idea that monetary policy in Nepal works mainly through controlling the money supply rather than through interest rates. The consistently insignificant effect of the Age variable challenges the assumption that older banks, with greater market experience, would demonstrate distinct lending behaviors. This result indicates that simply having a more developed institutional framework doesn't necessarily make banks more responsive to policy changes. It could be that common regulatory standards or similar structural limitations across institutional level the playing field, reducing differences in how quickly they adapt.

The relatively low Adjusted $R^2$ values, even in the best models, suggest that there are likely other factors at play that aren't captured here things like how risk is managed, borrower behavior, or the role of informal credit networks. These contradictions reveal how challenging it can be to apply broad economic theories to a developing economy built on distinct institutions and market conditions. Therefore, future research should explore interaction effects, include qualitative insights, and consider broader structural variables (e.g., financial literacy, digital adoption, rural banking access) to build a more comprehensive understanding of monetary policy effectiveness in Nepal.

## Conclusion and Implications

The research finds that tools like the Cash Reserve Ratio (CRR) and Open Market Operations (OMO) play quite different roles in shaping how commercial banks in Nepal lend money. While one tends to restrict lending, the other encourages it, emphasizing their contrasting impacts on banking behavior. CRR consistently demonstrates a strong negative impact on credit to deposit ratios (CDR), reinforcing its role as a liquidity-restricting tool. OMO clearly has a strong, beneficial impact, demonstrating its ability to loosen liquidity restrictions and support more lending from banks. The Bank Rate, while usually considered a key tool for monetary policy, seems to have a weaker and less predictable influence, suggesting that interest rate-based approaches might not work as well in Nepal's bank-dominated financial system. Bank-specific factors like size do affect these outcomes to some degree, while how old a bank is don't seem to matter much. This challenges the common belief that basic bank characteristics play a big role in how much a bank can lend.

These findings have two main implications. First, policymakers should focus more on liquidity-based tools like the CRR and OMO instead of depending mainly on traditional interest rate changes. In Nepal, monetary policy works better through reserve and liquidity channels, showing how important these tools really are. Policies should be adjusted based on each bank's unique features, especially their size, so they work better for different kinds of banks. The study shows that commercial banks need to carefully manage their cash reserves and meet reserve requirements, especially when policy signals change. Also, it's important to align lending strategies with what's happening in the economy overall. That way, things stay steady and there's support for growth. These insights help explain how monetary policy works in developing economies, giving practical guidance for both government strategies and everyday banking operations.

This study doesn't just look at current policy issues but also suggests plenty of ideas for new study down the road. Since this analysis looked at the whole sector, future studies could break down how monetary policy tools affect specific types of banks to understand how different institutions respond to credit changes. Exploring the impact of emerging technologies and fintech innovations can offer valuable perspectives on how digital transformation is changing the way money moves through developing economies. A longitudinal analysis comparing the pre- and post-digital banking periods or assessing the role of mobile banking in rural credit flow could be especially valuable. These research extensions could play an important role in strengthening Nepal's monetary policy, especially as the country's financial environment continues to evolve rapidly.

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