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Determinants of Bank Lending Behavior in Nepal

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Abstract:
Extension of credit is one of the major functions of banking institution. The study attempts to capture the effectiveness of determinants of lending behavior of commercial banks in the Nepalese context. If banks are not efficient in their lending behavior, it may not contribute to economic growth. On the other hand, their inefficient and imprudent behavior may lead to riskier financial and macroeconomic instability. The main objective of the study is to test the effectiveness of the determinants of commercial banks lending behavior in Nepal. In the study, panel data of 24 commercial banks during the period of 1996 to 2015 were collected and analyzed using descriptive statistics, correlation and regression analysis. The model used is estimated using bank lending as dependent variable and other variables such as stipulated cash reserve ratio, open market operations, bank rate, assets, capital and liquidity as independent variable for the period; 1996– 2015. The result found that Assets, liquidity, OMOs, and CRR are the major determinants to affect bank lending. OMOs and CRR tend to influence the bank lending in negative manner. However, bank rate has positive impact on lending. Hence the central bank, should focus more on OMOs and CRR as monetary instrument. As study found that assets, capital and liquidity have positive impact on bank lending, central bank is recommended to focus more on effective and realistic liquidity monitoring and forecasting. Banks willing to lend more are recommended to increase their assets, capital as well as liquidity position that cushion them at the time of liquidity crisis.

1. Introduction

Banks play significant role in economic growth, price and financial stability. Banks accept customer deposits and use those funds to give loans to other customers or invest in other assets that will yield a return higher than the amount bank pays the depositor (Mc Carthy et al., 2010). If banks are effective, efficient and disciplined, it brings about rapid growth in the various sectors of the economy as well as brings economic stability. For the survival of banks, effective lending is crucial. The principal profit-making activity of commercial banks is making loans to its customers. In the allocation of funds to earn the loan portfolio, the primary objective of bank management is to earn income while serving the credit needs of its community (Reed and Gill, 1989). Lending represents the heart of the industry. Loans are the dominant asset and represent 50-75 percent to total amount at most banks, generate the largest share of operating income and represent the banks greater risk exposure (Mac Donald and Koch, 2006). Bank credit contributes to economic growth in several ways. For example, credit is an important link in money transmission; it finances production, consumption, and capital formation, which in turn affect economic activity (Timsina, 2014).

As bank lending is the major source of generating earnings and it involves remarkable amount of risk, banks should be careful in analyzing the various determinants of bank lending behavior. To lend with the objectives of generating appropriate, sustainable profit, maintaining liquidity and ensuring safety, banks require a high degree of practical policy formulation and application.

Banks mostly transform liquid assets like deposits into illiquid assets like loans (Diamond and Rajan, 1998). This transformational process of banks‟ activity is at best influenced by a host of factors, namely, macroeconomic, bank level (Peek and Rosengreen, 1995) and industry level characteristics (Boot and Thakor, 2000). commercial banks must pay more attention to liquidity than many other types of financial institutions such as life insurance companies (Goldfeld and Chandler ,1986).

Generally, bank lending behavior on the supply side is determined by the various factors such as volume of deposits, capital, assets, liquidity, non-performing loan, return on equity, lagged loan and advances, GDP, inflation, monetary policy instruments, central banks' rules and regulations etc. Haron (2004) documented that the determination of commercial banks lending behavior can be divided into external and internal factor. The internal factors are financial statement variables. The external variables are non-financial statement variables such as numbers of bank branches, states of banks, location, size etc. Chodechai (2004) further stressed that “banks‟ lending decisions are also influenced by the past relationship with the borrowers. John (1993) commented that the ability of commercial banks to promote growth and development depends on the extent to which financial transactions are carried out with trust and confidence and least risk. Usman (1999), commenting on the factors that affect commercial banks’ lending behavior said that the sound and viable functioning of commercial banks in Nigeria is adversely affected by the choice of certain policy instruments for the regulation of banking operations. Such instruments include a rigidly administered interest rate structure, directed credit, unremunerated reserve requirements and stabilizing liquidity control measures like the stabilization securities of the past. Olusanya et al (2012) found that bank lending behavior is greatly influenced by volume of deposits (Vd), exchange rate (Fx), Investment Portfolio (Ip), Interest rate (Ir), Gross domestic product at current market price (Gdp) and Cash reserve requirement ratio (Rr).

Of the various determinants of bank lending behavior, monetary policy instruments are very crucial. Monetary policy is the macroeconomic policy laid down by the central bank. It involves management of money supply and interest rate and is the demand side economic policy used by the government of a country to achieve macroeconomic objectives like inflation, consumption, growth and liquidity (Rasche & Williams, 2007). Okpara (2010) defined monetary policy as a measure designed to influence the availability, volume and direction of money and credits to achieve the desired economic objectives. Government and central bank uses various instruments to accelerate economic growth and maintain economic stability through their impact on bank lending. These instruments include CRR, OMOs, bank rate and priority sector lending, productive lending etc.

Roberto et al (2013) found that the effects of monetary policy on bank lending are significant and heterogeneous in Germany and Italy. Monetary policy appears to exert larger effects on cooperative and savings banks with lower liquidity and lesser capital in Germany and savings banks with smaller size in Italy. Moreover, the role of commercial bank is crucial in implementing monetary policy through bank lending channel. Juurikkala et al (2009) investigates the role of banks in monetary policy transmission mechanism in Russia and found that to achieve the long term goal to switch to inflation targeting, understanding how the banking sector reacts to changes in monetary policy stance is very important for Russian central bank. This study also found existence of a bank lending channel has potentially important implications for the conduct of monetary policy. In the face of monetary contraction, banks will reduce their lending, but well capitalized banks are most likely to react much less than other banks. The finding suggests that well capitalized banks in effect attenuate monetary policy transmission but the factors like bank size and liquidity are generally not important for the way a bank reacts to monetary policy changes. Amedu (2008) found that Ghanaian bank lending behavior is affected significantly by the country's economic activities and changes in money supply. The study also pointed that the central bank's prime rate and inflation rate negatively but statistically insignificantly affect banks lending. With the firm level characteristics, the study found that bank size and liquidity significantly influence banks' ability to extend credit.

From monetary transmission point of view, the role of banks' loan and advances is crucial because monetary policy operates through banking lending behavior, especially in developing countries like Nepal. Excess reserves of commercial banks are taken as an operating target of monetary policy in many countries. How do monetary actions affect the bank lending capacity and how does bank lending impact the real economic variables, can be said only after examining the relationship between bank lending behavior and monetary transmission mechanism. Schumpeter (1971) identified banks' role in facilitating technological innovation through their intermediary role. He argued that the role of bank of channelizing resources from surplus sector to deficient sector plays crucial role in promoting growth. Several others such as (Kinnon 1973), Shaw (1973), Adekanye (1986), Fry (1988), King and Levine (1993), and Adeniyi (2006) have focused on the significance of bank credit to economic growth.

Banks cannot be efficient in their performance without analyzing the impact of monetary policy actions because of the central bank's authority to perform on interest rate, policy rate, OMOs, credit policy, macro prudential measures and regulatory and supervisory aspects for achieving economic and financial stability. On the other hand central bank and policy makers cannot take appropriate policy actions without having appropriate knowledge about bank lending behavior as monetary, financial, credit policies are implemented through banking sector. Understanding the channels of monetary transmission would help monetary policymakers decide which financial market disturbances warrant changes in monetary policy and which do not. It would also assist them in the choice of intermediate targets for policy (Romer and Romer, 1990).

Many international organizations including International Monetary Fund and World Bank have done significant efforts in accelerating economic growth and stability; however no expected result could be achieved. Its main reason is lack of the assessment of lending behavior of commercial banks. Therefore, until and unless this problem is resolved, government and central bank's efforts may not be productive enough to achieve the desired economic stability and growth. Budha (2013) found that banks play a role in Nepal's monetary transmission mechanism. He documented that bank lending decreases after a monetary tightening. Bank size is found to have significant impact on loan supply in Nepal. However we could not find the proper assessment of relationship between bank lending behavior and monetary policy instruments, macroeconomic policy variables and firm characteristics on the basis of bank wise secondary and primary data in those studies. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such evidences using more recent data exist in the context of Nepal. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such evidences using more recent data exist in the context of Nepal. This gap encouraged the researcher to conduct the study on determinants of bank lending in Nepal. Hence the main objective of this study is to analyze the effectiveness of various determinants of lending behavior in Nepal.

1.1. Overview of the Banking System in Nepal

In the Nepalese context, the government has initiated liberal economic policies since the mid 1980s. The Nepalese financial system has undergone rapid structural changes in the last three decades. The history of Nepalese banking is not very old as the first ever bank, Nepal Bank Limited was established in 1937 to provide commercial credit. With the establishment of the Nepal Rastra Bank as the central bank of Nepal in 1956, the Nepalese financial system gained momentum. Industrial Development Bank was established in 1957 as the first development bank, which was converted into Nepal Industrial Development Corporation in 1959 to provide industrial credit. Within a decade of establishment of Nepal Rastra Bank, a number of financial institutions came into operation. Rastriya Banijya Bank, the second commercial bank fully owned by the government was established in 1966. Agricultural Development Bank came into operation in 1968 with the objective of providing long and medium term credit facilities to agriculture sector. There were only two commercial banks and two development banks until 1983. The pace of financial liberalization actually started in the mid 1980s, when the government allowed the entry of commercial banks in joint venture with foreign bank. When the need to modernize banking services through the transfer of technology and managerial skills, Nabil Bank Limited was established in 1984 as the first

joint venture bank in Nepal, which was later followed by the establishments of Nepal Investment Bank Limited and Standard Chartered Bank Nepal Limited and other commercial banks in private sector as well as in joint venture with foreign sector.

The process of financial liberalization gained momentum in 1987-88, when Nepal entered in to a three-year structural Adjustment Program (SAP) with the International Monetary Fund. The number of commercial banks and financial institutions continued to increase with the pace of liberalization. There were 30 commercial banks ('A' class financial institutions), 76 development banks ('B' class financial institutions) and 48 finance companies ('C' class financial institutions) and 39 micro finance development banks as of mid-July 2015. With the increase in number of financial institutions, outreach, breadth and depth have also grown. From this remarkable increase in number of commercial banks and financial institutions, Nepalese economy including agriculture, commerce and industry is benefitted through large credit facilities.

Prior to the introduction of Structural Adjustment Program (SAP) in the country in 1987, the lending practices of banks were strictly regulated under the close surveillance of the central bank. The SAP period introduced some relaxation of the stringent rules guiding banking practices especially in the form of interest rate deregulation, phase wise removal of priority sector directed lending, entry freedom of foreign joint venture bank etc. However, to bring the banks in prudential trek, the need for appropriate regulation and supervision could not be ignored. The Bank and Financial Institution Act (BAFIA) 2006 and Nepal Rastra Bank directives require banks to report some borrowing indicators such as big lending, sectoral, security wise and product wise lending, to the Central Bank of Nepal. Other credit related compliances such as loan to value ratio, single obligor limit, credit to deposit ratio etc are required. Nepalese banks are not the exception to other countries' commercial banks. They also need to know the determinants of their lending behavior to efficiently manage their loan and advances. Of them, monetary policy actions are the most important. Moreover, for the central bank as monetary authority the study on the relationship of monetary transmission mechanism and bank lending behavior will be of immense help to take appropriate policy actions. Further, policy makers, government, academicians and other stakeholders are expected to benefit from the study.

The study has been organized into six chapters including this chapter. After this introduction chapter, the rest of the paper is structured as follows. The second section reviews the literatures.

The third chapter presents research methodology. The fourth section analyses the effectiveness of various determinants of bank lending behavior in Nepal. The last section concludes the study.

2. Literature Review

A wide body of literature has been reviewed to examine the determinants of bank lending behavior. Goldfeld and Chandler (1980) claimed that commercial banks must pay more attention to liquidity than many other types of financial institutions such as life insurance companies. This results from the high turnover of their debt liabilities. A large part of the gross out payments by a bank is met from current gross receipt of funds in the normal course of business. Liquidity is the main foundation of commercial banking. Commercial banks are just like custodian of public deposits. They have to return back that money upon depositors' request immediately. For that reason, it is necessary for banks to remain adequately liquid. Central bank/regulatory authority usually fix the liquid assets/deposit ratio for this. Such liquidity requirement affects the bank lending. Supporting this view, Ituwe (1983) asserted that a bank's ability to grant further advances is checked by the available cash in its vault. Commercial banks therefore have to stock reasonable quality of cash to meet customer demand. According to all the above mentioned views, it can be said that liquidity is one of the determinants of bank lending behavior.

Kashyap, Stein, and Wilcox (1993) asserted that a monetary contraction is reducing bank lending; it is increasing commercial paper volume. According to them, monetary actions are the determinant of bank lending behavior. Bernanke and Blinder (1995) supported this and said that bank lending is directly constrained by monetary policy actions. Kashyap, (1996) argued that at the heart of the lending view is the proposition that the Federal Reserve can, simply by conducting open-market operations, shift banks' loan supply schedules. Harron (2004) asserted that the determinants of commercial banks' lending behavior can be divided in to external and internal factors. Internal factors are financial statement variables and external factors are non-financial statement variables. In an effort to shed new light on the monetary transmission mechanism, Kashyap and Stein (1999) created a panel data set that included quarterly observations of every insured commercial bank in the U.S. over the period 1976-1993. Key finding was that the impact of monetary policy on lending behavior is stronger for banks with less liquid balance sheets--i.e., banks with lower ratios of securities to assets.

Obamuyi (2004) revealed that banks with high deposit and loans perform better in terms of profitability than banks with low deposits and loans. This showed the positive relationship between deposit mobilization and bank lending. This confirmed that banks generate their incomes through lending and investment activities. Usman (2005) found that the sound and viable functioning of commercial banks is adversely affected by the choice of certain policy instruments for the regulation of banking operations.

With the main aim to identify the factors which explain bank credit, Imran (2008) carried a study using ARDL econometric approach with annual data from 1971 to 2008 for Pakistan with the major focus on the supply side. The growth in bank credit to private sector was used as dependent variable where as growth in domestic deposits, money market rate, M2 as percentage of GDP, real economic growth, inflation and the exchange rate are identified as major explanatory variable to explain the behavior of bank credit. The model used in the study was as follows:

$$Pct = B0+B1FLt+B2DDt+ B3CPI+B4GDPt+B5ERt+B6MMRt+B7M2t+ut$$

From the model, the study revealed that the foreign liabilities, domestic deposits, economic growth, exchange rate, and the monetary conditions had significant impact on bank credit to the private sector in Pakistan, particularly in long run. Whereas the inflation and money market rate did not affect the private sector credit. Moreover, in the short run the domestic deposit did not influence private credit. The reason might be that the banks did not issue immediate loan from currently deposited amount by account holders. The

results also inferred that the financial health and liquidity of the banks played a significant and vital role in the determination of loan. A strong economic condition measured by GDP as motivating factor to banks had statistically significant impact on issuance of more private credit to business.

Shahi (2008) examined that high volume of liquidity showed that the high degree of lending strength in the bank. Lack of reliable lending opportunities and fear of losing the principal in rural sector had been keeping these banks to less orient towards the lending function.

Olokoyo (2011) investigated the determinants of commercial banks' lending behavior in Nigeria. The study attempted to test and confirm the effectiveness of the common determinants of commercial banks lending behavior and how it affects the bank lending behavior. The model used is estimated using Nigerian commercial banks loan advance (LOA) and other determinants such as volume of deposits (Vd), investment portfolio (Ip), interest (lending) rate (Ir), foreign exchange rate (Fx), gross domestic product (GDP), cash reserve requirements ratio (Rr) and liquidity ratio (Lr) for the period; 1980 – 2005. The explicit form of equation is as follows:

$LOA = \alpha 0 + \alpha 1Vd + \alpha 2Ip + \alpha 3Ir + \alpha 4Rr + \alpha 5Lr + \alpha 6Fx + \alpha 7Gdp + \mu$ (2)

Where:

μ: error term, $\alpha 0$= constant, $\alpha 1$= beta coefficient

From the regression analysis, the model was found to be significant and its estimators turned out as expected and it was discovered that commercial banks deposits have the greatest impacts on their lending behavior. The study then suggests that commercial banks should focus on mobilizing more deposits as this will enhance their lending performance and should formulate critical, realistic and comprehensive strategic and financial plans.

Buyuksalvarci and Abdioglu (2011) revealed that LOA, ROE and LEV have a negative effect on CAR while LLR and ROA positively influence CAR.

Capital is another important determinant of bank lending behavior, which determines the response of banks towards monetary policy action taken by the central bank. Highly capitalized banks tend to have little response to monetary shocks. Peek and Rosengren (1995) and Kishan and Opiela (2000)) found in their studies that well capitalized banks are more able to raise funds when monetary policy tightens compared to less capitalized banks, using the capital to asset ratio as a proxy. Therefore monetary policy actions are more pronounced through poorly capitalized banks that are forced to cut their loan supply by more than well-capitalized banks.

Djiogap and Ngomsi (2012) documented that bank's ability to extend long term business loans depends on its size, capitalization, GDP growth and the availability of long term liabilities. With the main aim to test the common bank level and macro economics determinants of bank long term loan behavior, this study was conducted. To examine the relationship between bank characteristics and bank propensity to issue long term loans to firms, a large sample of Central Africa countries banks and a broad set of explanatory variables were applied to panel data model. The total number of observations was 60 and 9 independent variables were included. The regression model used in the study was:

$LTBL = \alpha 0 + \alpha 1size + \alpha 2cap + \alpha 3LTLiab + \alpha 4Npl + \alpha 5State + \alpha 6Foreign + \alpha 7Gdp + \alpha 8Gdp + \alpha 9Inf + vt + \mu$ (2)

Here in the equation, long term business loan is dependent variable and size, capital, long term liabilities, non-performing assets, ownership type (state and foreign), GDP and inflation are the independent variables.

Olusanya et al (2012) argued that bank lending behavior is greatly influenced by volume of deposits (Vd), exchange rate (Fx), Investment Portfolio (Ip), Interest rate (Ir), Gross domestic product at current market price (Gdp) and Cash reserve requirement ratio (Rr).

Kimani (2013) used the following regression model to estimate the effects of monetary policy actions on bank lending behavior using primary data:

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

Where: Y = Bank Lending; $\beta 0$ = Constant Term; $\beta 1$, $\beta 2$, $\beta 3$ and $\beta 4$ = Beta coefficients; X1= CBR; X2= Cash Reserve Ratio; X3= Open Market operations; X4= Uncertainty; ε = Error term

She established that CBR, cash reserve ratio, open market operation and uncertainty caused by possible outcomes caused by monetary policy changes influences lending behavior of commercial banks in Kenya.

Malede (2014) to confirmed that the main determinants of commercial bank lending in Ethiopia by using panel data of eight commercial banks in the period from 2005 to 2011. The study tested the relationship between commercial bank lending and its some determinants (bank size, credit risk, gross domestic product, investment, deposit, interest rate, liquidity ratio and cash required reserve). Seven years financial data of eight purposively chosen commercial banks were used for analysis purpose. Ordinary least square (OLS) was applied to determine the impact of those predictor variables on commercial bank lending. The result suggests that, there is significant relationship between commercial bank lending and its size, credit risk, gross domestic product and liquidity ratio. But deposit, investment, cash required reserve and interest rate does not affect Ethiopian commercial bank lending for the study period.

To study the relationship between monetary policies and the lending behaviors of commercial banks, Kimani (2013) used the following regression model to estimate the effects of monetary policy actions on bank lending behavior using primary data:

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

Where: Y = Bank Lending; $\beta 0$ = Constant Term; $\beta 1$, $\beta 2$, $\beta 3$ and $\beta 4$ = Beta coefficients; X1= CBR; X2= Cash Reserve Ratio; X3= Open Market operations; X4= Uncertainty; ε = Error term

She established that CBR, cash reserve ratio, open market operation and uncertainty caused by possible outcomes caused by monetary policy changes influences lending behavior of commercial banks in Kenya.

3. Research Methodology

3.1. Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Kothari and Garg, 2014). The study employed a descriptive as well as empirical research design. It also employs casual comparative research design in the sense that regression analysis was performed to estimate the relationship between the bank lending and other explanatory variables on the basis of secondary data. It establishes the cause and effect relationship between the various determinants and bank lending. Hence this study also employs causal comparative research design.

3.2. Type and Sources of Data

The study is carried out in the area of commercial banks in Nepal and based on secondary sources of data. The main sources of secondary data are Banking and Financial Statistics, Quarterly Economic Bulletin, Monetary Policies and NRB Directives published by Nepal Rastra Bank, and the annual report and website of 24 commercial banks (which are selected in the study) operating in Nepal. Population of this study includes 30 commercial banks of Nepal listed in Nepal Stock Exchange (NEPSE) limited to the end of 2015. This study uses data of 24 commercial banks with 369 observations from 1996/97 to 2015/16. For the selection of sample, stratified sampling technique is used. The data has been analyzed in descriptive, correlation and linear regression method. The statistical tool used for the study is SPSS.

4. Analysis of Data

This chapter deals with the systematic presentation, interpretations and analysis of the data.

4.1. Structure and Pattern of Selected Variables in Nepalese Commercial Banks

This section fulfills the first objective of this study by analyzing the structure of various determinants of bank lending (CRR, OMOs, BR, assets, capital and liquidity) and macro-economic variables (NGDP, Inf and IR) from 1996/97 to 2015/16 for the period of 20 years. The structure has been shown year wise along with average value and standard deviation. The results of structure for sample banks are fluctuating.

4.1.1. Structure and Pattern of Assets in Selected Nepalese Commercial Banks

Figure 1: Pattern of assets (size) of commercial banks from year 1996 to 2015
(The figure shows the pattern of total asset for all sample banks from 1996 to 2015,
The figure has been drawn on the basis of the mean periodic assets (size)
Source: Appendix 2 and author's calculation

Figure indicates that total asset curve is in increasing trends until 2015/16. Moreover, average assets have been increased from Rs. 9319 million in 1996/97 to Rs. 65457 billion in 2015/16.

4.1.2. Structure and Pattern of Capital in Selected Nepalese Commercial Banks

Capital is one of the bank specific characteristic variables, which is said to have impact on bank lending and bank's response towards monetary policy action. Therefore it is necessary to analyze the structure and pattern of bank capital.

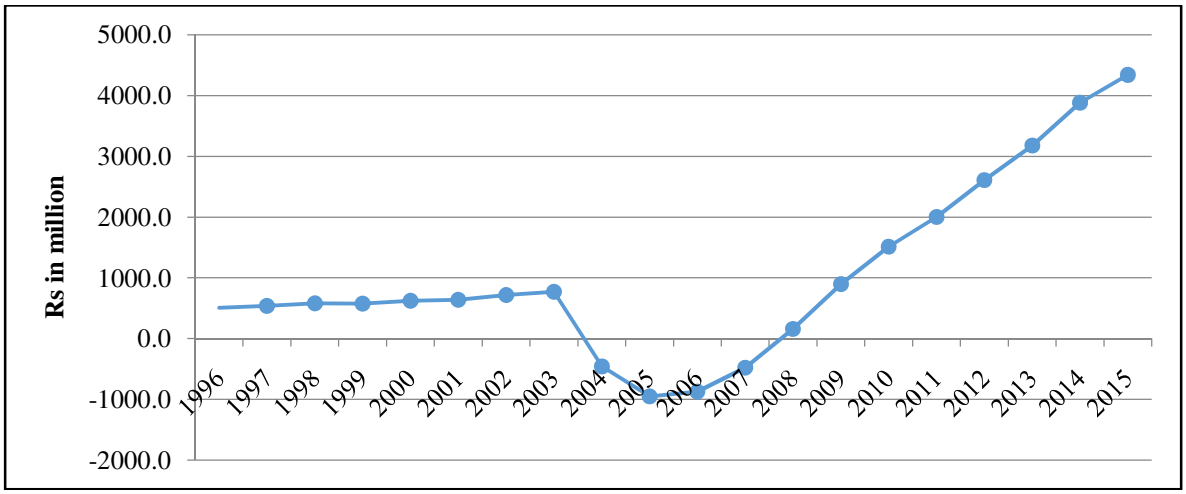

Figure 2: Pattern of capital of sample commercial banks from year 1996 to 2015
(The figure shows the pattern of capital for all sample banks from 1996 to 2015, The figure has been drawn on the basis of the mean periodic capital.)
Source: Appendix 3 and author's calculation

Figure 2 shows the pattern of average capital of sample banks during the period of 1996 to 2015. It shows that average capital of Nepalese commercial banks increase from 1996 to 2003, but it caught declining trend from 2004 to 2007 due especially to negative capital of NBL and RBB. Again it caught increasing trend from 2008 to 2015.

4.1.3. Structure and Pattern of Liquidity in Selected Nepalese Commercial Banks

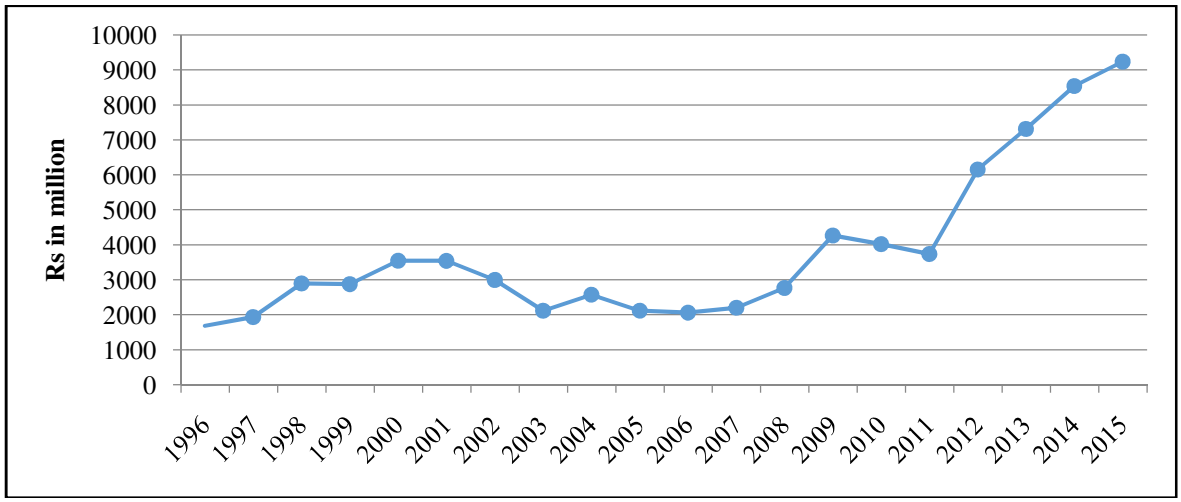

Figure 3: Pattern of liquidity of sample commercial banks from year 1996 to 2015
(The figure shows the pattern of liquidity for all sample banks from 1996 to 2015, The figure has been drawn on the basis of the mean periodic liquidity.)
Source: Appendix 4 and author's calculation

Figure indicates that liquidity curve is showing fluctuating trends until 2015/16. Moreover, average liquidity has been increased from Rs. 1694 million in 1996/97 to Rs. Rs 9243 million in 2015/16.

4.1.4. Structure and Pattern of Lending In Selected Nepalese Commercial Banks

Lending is key to bank business and it is the major source of profit. It is also important because, monetary instruments are being implemented by affecting bank lending. Therefore, the analysis of bank lending is of crucial importance.

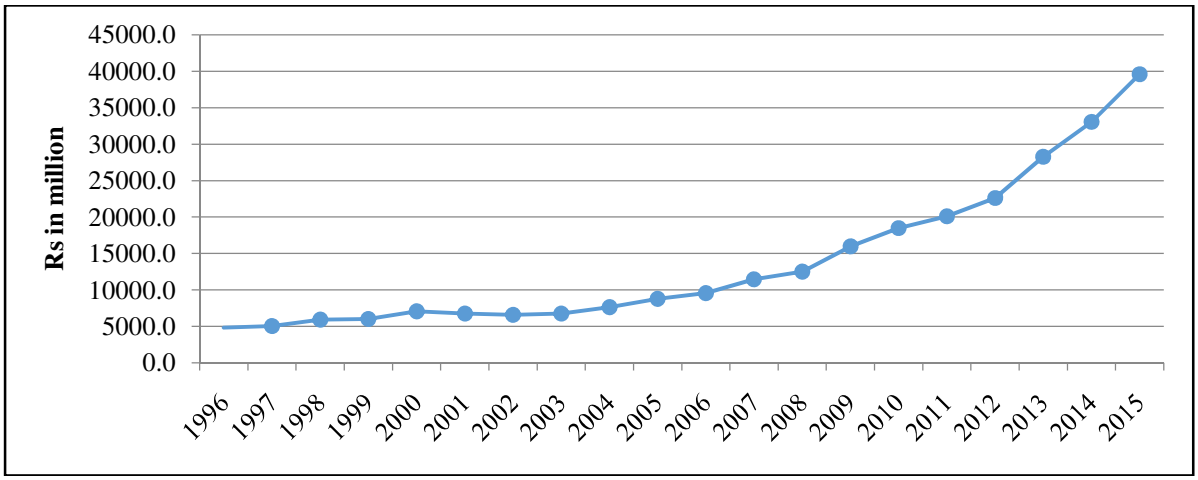

Figure 4: Pattern of lending of commercial banks from year 1996 to 2015
(The figure shows the pattern of total lending for all sample banks from 1996 to 2015, The figure has been drawn on the basis of the mean periodic lending)
Source: Appendix 5 and author's calculation

4.1.5. Trend and Pattern of Monetary Variables (CRR, Omos, BR and IR) in Nepal

The major objective of the study is to analyze the impact of CRR, OMOs, BR on bank lending and interest rate is the control variable, then it is crucial to watch the trend and pattern of such monetary variables. Table 1 presents the situation of CRR, OMOs, BR and IR during the period of 1996 to 2015.

Table 1 shows that NRB determined CRR at 12 percent in 1996 which remained constant up to 1999. It declined to 8 percent in 2000, to 7 percent in 2003, to 6 percent in 2005. Then after, central bank was decreasing or increasing CRR according the situation of private sector credit and liquidity in the economy. In 2015 CRR was 6 percent for commercial bank. The average CRR during the study period was 7.3 percent. As our study period was from 1996 to 2015, formal monetary policy and formal OMOs on regular basis were not in practice up to 2004/05. Only from 2004/05, formal and regular OMOs in the form of outright sale, outright purchase, repo, reverse repo started. Before that NRB used to adopt such monetary instrument and monetary policy on case by case basis as and when necessary. However, any type of OMOs and monetary policy measures affect treasury bill (TB) rate as all these outright sale, outright purchase, repo, reverse repo are being performed using treasury bills under the holdings of the NRB. Therefore 91 day TB rate was taken as the proxy of OMOs in the study. Such OMOs rate was 10.2 percent in 1996, but caught declining trend and became 0.7 percent in 2015. NRB performs OMOs according to the situation of banking sector liquidity. If there is high excess liquidity, it mops up liquidity from the market using outright sale and reverse repo auction and if there is low excess liquidity, it injects liquidity to the market. This process of NRB affects the liquidity and thereby bank lending. Table 7 presents the situation of OMOs in the period from 2004 to 2015.

	CRR		OMOs		Bank Rate		Interest Rate	
	Percent	Growth (%)	Percent	Growth (%)	Percent	Growth (%)	Percent	Growth (%)
1996	12.0		10.2		9.0		10.3	
1997	12.0	0.0	3.5	-65.6	9.0	0.0	10.3	0.0
1998	12.0	0.0	2.3	-33.8	7.5	-16.7	9.8	-4.9
1999	12.0	0.0	4.7	100.0	7.5	0.0	8.4	-14.1
2000	8.0	-33.3	5.0	6.4	7.5	0.0	6.9	-17.9
2001	8.0	0.0	4.7	-5.0	5.5	-26.7	6.1	-10.9
2002	8.0	0.0	3.5	-26.1	5.5	0.0	5.3	-14.3
2003	7.0	-12.5	2.9	-15.8	5.5	0.0	5.0	-4.8
2004	7.0	0.0	2.5	-16.0	5.5	0.0	4.3	-15.0
2005	6.0	-14.3	2.8	15.4	6.0	9.1	3.6	-14.7
2006	6.0	0.0	2.4	-14.8	6.3	4.2	3.6	0.0
2007	5.0	-16.7	4.2	74.4	6.3	0.0	3.6	0.0
2008	5.0	0.0	5.8	38.2	6.5	4.0	4.3	17.2
2009	5.5	10.0	6.5	11.5	6.5	0.0	6.0	40.0
2010	5.5	0.0	7.4	14.0	6.5	0.0	8.1	36.6
2011	5.5	0.0	1.3	-82.3	7.0	7.7	8.1	0.0
2012	5.0	-9.1	1.7	32.8	7.0	0.0	6.2	-24.1
2013	6.0	20.0	0.1	-92.5	8.0	14.3	5.3	-14.9
2014	5.0	-16.7	0.4	230.8	8.0	0.0	4.1	-22.1
2015	6.0	20.0	0.7	58.1	7.0	-12.5	3.9	-3.7
Mean	**7.3**	**-2.8**	**3.6**	**12.1**	**6.9**	**-0.9**	**6.1**	**-3.6**
Std D	**2.6**	**12.6**	**2.5**	**72.6**	**1.1**	**9.2**	**2.3**	**17.7**

Table 1: Trend and pattern of CRR, OMOs, BR and IR in Nepal
Source: Monetary policy documents, Quarterly Economic Bulletin and unpublished data of NRB

Table 1 shows that bank rate was 9 percent in 1996 which remained 7 percent in 2015. As it is policy rate and it was not changed by the NRB frequently. Mean bank rate was 6.9 percent in the study period. This rate is effective, only when commercial banks are taking loan from the NRB. Interest rate was 10.3 percent in 1996, which declined to 3.9 percent in 2015. Average interest rate during the study period was 6.1 percent. 1 year saving deposit interest rate was taken as proxy of interest rate in the study as lending interest rates are of several types and also the data were not available for the study purpose.

4.1.6. Relationship between Bank Lending and Monetary Variables

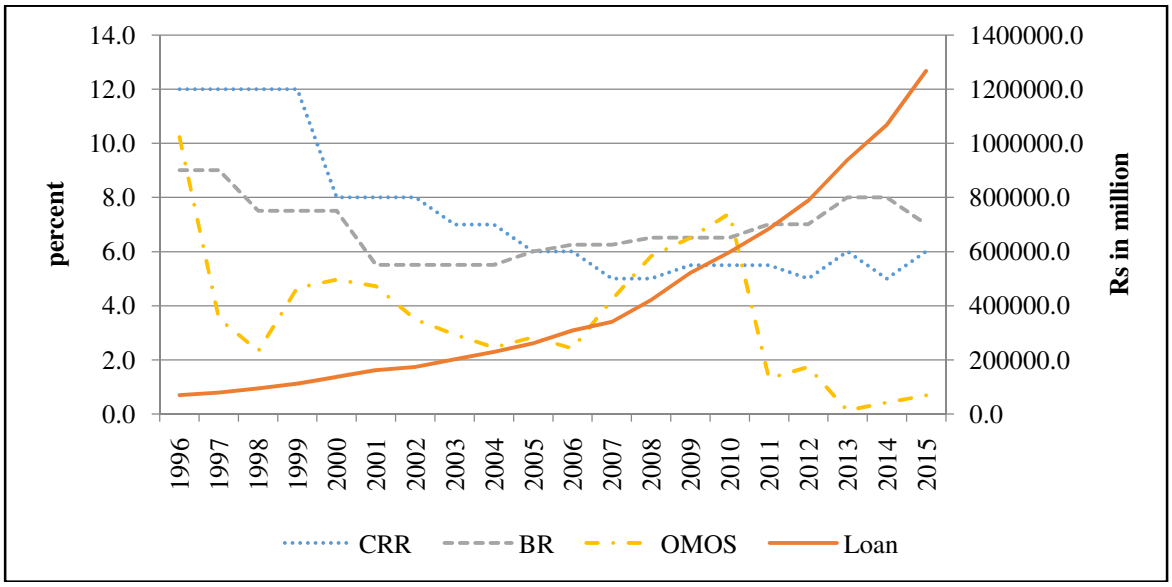

Figure 5: Relationship between bank lending and monetary variables
Source: Author's calculation

Figure 5 shows the negative relationship between monetary variables such as CRR, OMOs and BR and bank specific variable bank lending. It indicates that as central bank increases CRR, OMOs and BR, bank loanable fund declines resulting a decline in bank lending. Here in the figure, bank lending curve is in increasing trend where as CRR and OMOs curves are fluctuating over the years with downward slope. Bank rate did not change very frequently in Nepal over the study period and seems slightly flat compared to CRR and OMOs.

4.2. Descriptive Statistics

The descriptive statistics of different variables selected under the study are shown in Table 8.

Descriptive statistics					
Variables	N	Minimum	Maximum	Mean	Std. Deviation
CRR (percent)	369	5	12	6.72	2.18
Bank Rate (percent)	369	6	9	6.81	.94
OMOs (percent)	369	0.13	10	3.41	2.43
Lending (Rs in millions)		49	75774	15994.10	14446.71
IR (percent)	369	4	10	5.83	2.008
Capital (Rs in millions)	369	-23840	14223	1206.40	3613.92
Assets (Rs in millions)	369	229	150572	29588.56	27487.55
Liquidity (Rs. in millions)	369	44	25116	4217.79	4202.18

Table 3: Descriptive statistics for the selected variables under the study
Table 3 shows descriptive statistics - mean, standard deviation, minimum and maximum values variables associated with 24 sample banks for the period 1996/97 to 2015/16

The average CRR adopted by NRB during the study period was noticed to be 6.72 percent with a minimum CRR of 5 percent and maximum CRR of 12 percent. The bank rate varied from minimum of 6 percent to maximum of 9 percent with an average of 6.81 percent. The OMOs had a minimum value of 0.13 percent and maximum value of 10 percent, with a mean of 3.41 percent. Total lending of sample banks ranged from Rs 49 million to Rs75774 million having an average of Rs 15994.10 million. Likewise, IR had a minimum value of 4 percent and maximum value of 10 percent leading to the average of 5.83 percent. Capital of sample banks had a minimum value of minus Rs 23840 million and maximum value of Rs 14223 million with an average of Rs 1206.40 million. Similarly, average assets (size) of the bank was noticed to be Rs. 29588.56 million with a minimum of Rs. 229 million to maximum value of Rs.150572 million. The liquidity of the banks ranged from Rs 44 million to Rs 25116 million leading to the average of Rs 4217.79 million.

4.3. Correlation Analysis

This section of the study presents the results and discussions of the correlation analysis. The correlation analysis has been carried out to investigate the direction and magnitude of the relationship of monetary, bank specific and macroeconomic variables of the banks. Having indicated the descriptive statistics, the Pearson correlation coefficients have been computed and the results are presented in the Table 4.

Variables	**Capital**	**Assets**	**Liquidity**	**Lending**	**CRR**	**BR**	**OMOs**
Capital	1						
Assets	-0.026	1					
Liquidity	-0.008	0.826**	1				
Lending	0.230**	0.900**	0.778**	1			
CRR	-0.082	-0.316**	-0.179**	-0.368**	1		
BR	0.233**	0.186**	0.255**	0.305**	0.343**	1	
OMOs	-0.095	-0.235**	-0.254**	-0.270**	0.370**	0.112*	1

Table 4: Pearson's correlation matrix for the dependent and independent variables during the period 1996/97 to 2015/16
This table reveals the Pearson correlation coefficients between different dependent and independent variables [CRR, OMOs, BR, Lending, Capital, Assets and Liquidity]. The correlation coefficients are based on the data from 369 observations for the period 1996/97 to 2015/16

Note:
***. Correlation is significant at the 0.01 level (2 tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

The table shows that there is a negative relation between CRR and bank lending which indicates that higher the CRR, lower would be the bank lending. This finding is consistent with the finding that a bank's ability to grant further advances is checked by the available cash in its vault (Ituwe, 1983). It is also consistent with the findings of Kimani (2013). This points out that CRR is one of the determinants of bank lending behavior. The table shows that bank rate is positively correlated with bank lending, which is not in line

with theory. It means that bank rate is not very important tool to affect the bank lending behavior. This finding is consistent with the finding of Budha (2013). Table 4 also shows that there is negative relation between OMOs and bank lending which indicates that higher the OMOs, lower would be the bank lending. This finding is consistent with the findings that Federal Reserve can, simply by conducting open-market operations, shift banks' loan supply schedules (Kashyap, 1996).This finding is also consistent with the findings of Kimani (2013), Budha (2013) who asserted that OMOs has great effect on bank lending behavior. This shows that OMOs is also an important determinant of bank lending behavior. However, positive relationship between bank rate and bank lending found from the correlation analysis is not consistent with the findings of Bernanke and Blinder (1992). Never the less these all findingsmake clear that monetary policy action has important implication on bank lending. This is consistent with the findings of Ghosh (2006) and Julkefly (2010). This is also consistent with the findings of Kashyap, Stein, and Wilcox (1993) that a monetary contraction is reducing bank lending.

Table 4 shows that bank specific characteristics such as capital, liquidity and assetsare positively correlated with bank lending, which indicates that bank with more capital, liquidity and assets can lend more. Therefore, capital, liquidity and assets are also the determinants of bank lending.

With regard to the bank specific characteristics such as capital, liquidity and assets on monetary policy actions such as CRR, BR, and OMOs, table shows that there is negative impact of capital, liquidity and assets on CRR and OMOs which indicates that highly capitalized, highly liquid and big size banks have low response to monetary policy actions. This finding is consistent with Kashyap and Stein (1999), Peek and Rosengren (1995), Kashyap and Stein (2000), Ehrmann et al. (2001), Djiogap and Ngomsi (2012) and Budha (2013).

From the table, relationship between monetary instruments and real economic variables can also be found. CRR and OMOs have negative impact on economic growth and inflation, which is in line with theory. But positive relation between bank rate and economic growth and inflation is not in line with theory.

Similarly, there is negative relation between CRR and liquidity which indicates that if central bank increases the CRR, commercial banks have to keep more money with central bank as cash reserve which ultimately lowers the liquidity (loanable funds) of the commercial bank. This is in line with theory of loanable funds. From the table, it can also be found that there is negative relation between interest rate and economic growth and inflation which indicates that increase in interest rate leads to reduction in investment, loan demand and there by reduction in economic growth. Similarly, to combat inflation, central bank uses to increase interest rate which is in line with theory and practice. Another finding from the table is that not only bank lending affects economic growth and inflation, but also bank lending is positively affected by economic growth and inflation.

4.4. Test of Significance (Regression Analysis)

In order to test the statistical significance and robustness of the results, regression models have been used. The regression analysis has been conducted to investigate whether or not the lending of the banks are affected by monetary policy actions and other bank specific variables.

Models	Intercept	Regression Coefficients of Lending						Adj R^2	SEE	F	DW
		OMOs	CRR	BR	Assets	Capital	Liquidity				
1	19647.04 (16.08) **	-1324.12 (5.197) **						0.07	12120.75	27.01	0.80
2	27345.85 (14.44) **		-1996.09 (-7.32) **					0.13	11707.64	53.59	0.85
3	-11623.54 (-2.63) **			3752.35 (5.921) **				0.09	11991.10	35.06	0.83
4	2096.32 (4.84) **				0.45 (38.33) **			0.84	5476.94	1469.18	1.35
5	113486.03 (19.72) **					0.81 (4.38) **		0.05	12250.79	19.20	0.84
6	4238.59 (6.93) **						2.61 (22.90) **	0.61	7916.38	524.41	1.42
7	-7051.18 (1.88)	-718.85 (-3.16) **	-2607.14 (10.60) **	5985.66 (10.56) **				0.36	10068.76	65.07	1.17
8	977.26 (2.70) **				0.89 (13.36) **	0.42 (24.67) **	0.32 (2.86) **	0.88	4407.77	818.98	1.84
10	-4739.66 (-3.06) **	-71.04 (-0.75)	-750.01 (-6.34) **	1753.87 (6.80) **	0.38 (23.25) **	0.72 (23.26) **	0.29 (2.67) **	0.90	4061.04	493.02	2.02

Table 5: Regression of various determinants of bank lending on lending of commercial banks

The results are based on panel data of 24 commercial banks with 369 observations for the period of 1996 to 2015 by using linear regression model. Bank lending is the dependent variable while, CRR, OMOs, BR, capital, liquidity and assets, are the independent variables. The model is: $Lending_{it} = \beta_0 + \beta_1 OMO_t + \beta_2 CRR_t + \beta_3 BR_t + \beta_4 Assets_{it} + \beta_5 Capital_{it} + \beta_6 Liquidity_{it} + error.$

Note:

1) Figures in parentheses are t-values.
2) The asterisk (**), (*) sign indicates that results are significant at 0.01 and 0.05 level of significance respectively.
3) Dependent variable is bank lending.

Table 5 shows the regression result in terms of determinants of bank lending behavior. The regression of monetary variables and other bank specific variables on bank lending reveals that beta coefficients for CRR and OMOs are negative but for bank rate, it is positive. It is also found that beta coefficients for bank capital, assets and liquidity are positive.

Analyzing the explanatory variable individually, it is found that that higher the CRR, lower would be the bank lending though adj. R-squared and DW were quite low. Such negative relation of CRR with bank lending is in line with theory. This finding is consistent with the

finding that a bank's ability to grant further advances is checked by the available cash in its vault (Ituwe, 1983). It is also consistent with the findings of Olusanya et al (2012) and Kimani (2013). From this it is clear that CRR is one of the determinants of bank lending behavior. Similarly, Table 8 shows that OMOs has negative impact on bank lending which indicates that higher the

OMOs, lower would be the bank lending. This is in line with theory. This finding is consistent with the findings that Federal Reserve can, simply by conducting open-market operations, shift banks' loan supply schedules (Kashyap, 1996). This finding is also consistent with the findings of Kimani (2013), Budha (2013) who asserted that OMOs has great effect on bank lending behavior. This shows that OMOs is also an important determinant of bank lending behavior. From the table, it is shown that bank rate has positive impact on bank lending, which is not in line with theory. In Nepal, bank rate is taken as policy rate and it is effective, only when commercial banks take loan from central bank. If not so, it is not much effective. Therefore, it is not surprising that the result in case of BR is not in line with theory. This positive relationship between bank rate and bank lending found from the regression analysis is not consistent with the findings of Bernanke and Blinder (1992), but it is consistent with the findings of Budha (2013). Never the less these all findings make clear that monetary policy action has important implication on bank lending. This is consistent with the findings of Ghosh (2006) and Julkefly (2010). This is also consistent with the findings of Kashyap, Stein, and Wilcox (1993) that a monetary contraction is reducing bank lending. When we analyze the impact of all monetary variables such as CRR, OMOs and BR on bank lending in one model, then the result is quite strong. Signs are same (negative for CRR, OMOs and positive for BR), but R-squared and DW became strong compared to the individual analysis.

Table 5 also shows that bank specific variable such as asset has strong positive impact on bank lending with adjusted R-squared (0.84) and DW (1.35). It indicates that higher the bank assets, higher would be the bank lending as loan and advances (with investment) occupy a largest share (78 percent) of bank assets in Nepal. Similarly, capital has positive impact on bank lending but adjusted R-squared (0.05) and DW (0.84) are quite weak. Liquidity has positive impact on bank lending with quite strong adjusted R-squared (0.61) and DW (1.42). It indicates that higher the liquidity, higher would be the bank lending. It also makes clear that banks with higher liquid funds are better able to buffer their lending activity against the availability of external finance, by drawing on their stock of liquid assets (Budha, 2013). In other words, less liquid banks are found to show a stronger reduction in lending after a monetary tightening than do more liquid banks. The underlying reason is that banks with more liquid balance sheets can use their liquid assets to maintain their loan portfolio and as such are affected less heavily by a monetary policy tightening (Erhmann et al., 2001). When we analyze the impact of all bank specific variables (assets, capital and liquidity) on bank lending in one model, then the result is quite strong. In such a case, beta coefficients for assets, capital and liquidity are 0.89, 0.42 and 0.32 respectively. Adjusted R-squared and DW in such situation are 0.88 and 1.84. Signs are positive. This finding is consistent with the findings of Djiogap and Ngomsi (2012).If we analyze the impact of all independent variables on bank lending then coefficients of CRR, assets, capital and liquidity are significant with expected signs but the coefficient of OMOs is not significant and coefficient of bank rate is not with expected sign. However adjusted R-squared and DW are 0.90 and 2.02 respectively, which are quite strong.

5. Conclusions

The major conclusion of this study is that assets, liquidity, capital, OMOs, and CRR are the major determinants to affect bank lending. OMOs and CRR tend to influence the bank lending in negative manner. However, bank rate has positive impact on lending, which is not in line with theory. As the study observed negative relationship between OMO, CRR and bank lending. Hence the central bank willing to increase the efficiency of monetary management, should focus more on OMOs and CRR as monetary instrument. Moreover, commercial banks should be very compliant and careful on central bank's such monetary actions while taking lending decision. Based on the study, banks are recommended to increase their assets if they are willing to increase their lending as there is positive relationship between bank assets and lending. As positive relationship has been observed between liquidity and bank lending, banks willing to lend more are recommended to increase their liquidity position because banks with higher liquid funds are better able to buffer their lending activity against the availability of external finance, by drawing on their stock of liquid assets (Budha, 2013). Similarly, central bank is recommended to focus more on effective and realistic liquidity monitoring and forecasting.

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Annexure

Bank	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Mean	Std Dev
NBL	25618	29178	37934	44348	46120	50868	63817	66330	64064	65259	54133	47707	49660	54609	50094	55700	61072	77171	83311	90309	55865	15958
RBB	38842	42455	50201	53788	65049	73645	76118	82098	80825	81342	83481	74590	84686	99663	89448	94647	107478	115352	130047	150572	83716	27324
NABIL	8490	9664	11265	12328	15902	19454	19646	18276	18234	18615	24135	29660	38479	45942	54610	61293	71545	78260	93760	124850	38720	31546
NIBL	2679	2990	3695	3671	4180	5534	5388	9102	13565	16638	22007	28573	40206	54635	59555	61357	69782	77999	91987	111043	34229	33309
SCBNL	8035	10339	11288	14381	18356	21418	19676	22309	24459	22759	26798	29937	34313	41679	41525	45227	42971	47024	54790	66289	30179	15556
HBL	5051	6839	9163	12600	16781	20929	21381	24721	26751	29103	31065	34646	37527	40791	44769	49299	55898	63098	75397	85854	34583	21885
NSBI	1859	2646	4156	4922	5191	7400	6952	8001	8933	10617	13736	15397	18594	31990	39381	47130	59197	66327	62762	61096	23814	22626
NBBL	969	1507	2724	4789	7465	10331	11999	12929	15897	15540	16722	14282	15584	16830	16022	18322	22886	24719	34258	43649	15371	10227
EBL	229	582	1348	2288	3412	5240	6774	8260	9967	15069	16715	23335	28566	38000	42053	46896	56609	66678	71454	100034	27175	27867
BOK	1422	1898	2035	2998	4481	6529	6814	7966	9963	10246	12661	14998	18159	21009	24059	25582	29834	33575	40116	47083	16071	13158
NCC		713	1840	2629	3540	4603	5018	5636	7616	8680	8641	8817	10176	11657	14443	15036	19941	26549	26886	31975	11284	8855
LBL				718	1325	2544	3411	3652	4785	5383	6735	7135	7394	8446	8077	9126	10233	13768	21012	24064	8106	6203
NIC				748	2670	4382	3863	4248	6154	40742	49221	58991	15451	92124	20696	22568	25930	48509	53461	62609	30139	26217
MPL						801	1188	2432	3496	20255	9256	11197	13142	18583	21678	20228	25448	31553	42756	51408	18228	14535
KBL						675	1612	3067	5730	7696	9391	12324	15619	19265	21500	21903	26752	30462	33638	40070	16647	11904
LXBL							390	1112	2622	3936	5509	8801	13028	18855	21629	22452	27150	31291	37548	48922	17375	14447
SBL								875	1955	3193	4901	9442	12142	18595	23273	25514	30944	77171	43550	54028	23506	22117
ADBN												53497	54496	60829	60582	66668	79257	92584	108376	119614	77323	22959
GBL												3589	8333	12819	17566	18085	33163	41876	6351	71148	23659	20549
CBL												3720	7355	13163	16749	17503	20957	27238	34565	42701	20439	11867
PCBL													6458	13619	20559	22408	28063	33575	39966	48085	26592	12842
SNBL													7710	22521	17376	20220	22222	27464	31533	39420	23558	8901
GRBL													5334	9951	10563	13041	17887	22586	26495	14091	14993	6531
NMB													9037	16610	13614	16246	19011	25830	30824	42063	21654	10022
Mean	9319	9892	12332	12324	14959	15624	15878	16530	17942	22063	23241	24532	22977	32591	31242	34019	40176	49194	53118	65457		
Std Dev	12790	13591	16347	17044	19309	20590	22260	22999	21938	21700	21133	20193	19582	24959	20239	21849	24353	26700	30513	34672		

Appendix 1: Pattern of assets (size) of commercial banks from year 1996 to 2015(Rs in million)

Bank	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Mean	Std Dev
NBL	703	853	882	1015	1044	1126	1350	1449	1064	-10348	-10067	-6057	-5400	-4959	-4852	-4608	-3084	-964	2630	3347	-1744	4011
RBB	1334	1385	1391	1441	1483	1507	1538	1558	-23840	-21438	-20283	-18385	-17220	-13291	-8617	-7423	-2313	2504	1273	2387	-5750	9366
NABIL	449	628	805	863	934	1047	1063	1146	1804	1482	1658	1875	2057	2436	3129	3836	4567	5465	6690	7642	2479	2047
NIBL	231	248	328	347	357	407	420	557	741	1235	1158	1371	1959	3421	3765	4585	5161	6052	7023	7928	2365	2457
SCBNL	380	439	494	756	835	920	1012	1119	1528	1278	1576	1755	2117	2493	3053	3372	3678	4141	4599	5090	2032	1433
HBL	153	179	205	315	397	502	652	741	1436	1328	1542	1766	2147	2513	3120	3439	3996	4632	5300	6083	2022	1790
NSBI	135	162	139	223	209	244	542	583	823	689	1120	990	1163	1415	2142	2508	2822	3198	3799	4624	1376	1315
NBBL	61	63	147	177	251	300	596	623	1039	1038	235	-1562	-2783	-1046	1112	1846	2145	2954	3573	4110	744	1597
EBL	48	60	119	128	128	249	498	587	666	980	833	964	1602	2067	2204	2759	3114	4166	4820	5449	1572	1637
BOK	68	93	93	97	205	260	511	520	735	651	721	840	982	1342	1742	2071	2435	2700	3549	3549	1158	1108
NCC		350	351	356	360	364	381	511	941	726	261	-308	201	685	1099	1523	1749	1923	2262	2600	860	769
LBL				35	35	351	351	381	358	526	106	-622	-34	394	1152	1442	1849	2033	2402	2548	783	913
NIC				325	492	520	531	526	559	620	673	767	1070	1352	1660	1765	1998	4216	4388	4873	1549	1450
MPL						84	137	486	543	553	803	931	1087	1577	1700	1774	2636	2648	2797	3236	1399	999
KBL						350	347	349	501	560	767	863	1596	1370	1625	1966	2214	2377	2657	2967	1367	878
LXBL							275	330	550	613	618	799	1048	1158	1796	1913	2114	2301	2721	3674	1422	984
SBL								350	350	377	538	703	932	1296	1493	1878	1989	-964	2502	3026	1113	1026
ADBN												215	4523	8756	8976	10904	12463	13135	14223	12959	9573	4346
GBL												510	660	1023	1522	1563	2424	3406	5316	6363	2532	1973
CBL												560	545	1034	1308	2144	2234	2282	2380	3770	1806	983
PCBL													700	728	1329	2411	2491	2591	3090	3617	2120	1013
SNBL													700	1325	1582	2182	2146	2151	2451	2905	1930	650
GRBL													1168	1770	1884	2033	2118	2161	2183	955	1784	440
NMB													1137	1533	1816	2170	2212	2264	2424	2813	2046	495
Mean	505	538	579	577	624	639	718	768	-455	-951	-874	-477	158	896	1510	2003	2607	3175	3883	4341		
Std Dev	402	410	414	422	428	407	397	384	6003	5903	5635	4522	4102	3728	3045	3146	2726	2649	2634	2474		

Appendix 2: Pattern of capital of commercial banks from year 1996 to 2015 (Rs in million)

Bank	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Mean	Std Dev
NBL	4001	5168	7167	8035	7649	8051	8064	4771	6444	5886	5517	7004	5055	9455	9969	11238	11992	14384	6646	4344	7542	2666
RBB	6015	6639	10318	10278	13633	14560	15090	8159	10704	6715	7496	5708	14585	13482	11587	7136	19531	15109	24990	22922	12233	5382
NABIL	1991	2402	3725	3783	5542	6285	4999	4162	3917	1345	2365	1963	4624	3925	4514	4885	5099	7513	10728	16324	5004	3325
NIBL	603	798	1520	1463	1534	447	1899	926	1215	1340	2355	2792	3755	7918	7558	8290	12009	13520	16977	14315	5062	5194
SCBN	2376	3456	3929	5240	8063	8087	2891	3170	4242	3370	3254	3996	4248	6789	3599	7257	8492	9414	17149	23549	6628	5126
HBL	1246	1808	3123	4788	5447	7193	7659	8282	8614	8173	2678	3260	2503	4399	4325	3805	6627	5710	5738	9449	5241	2378
NSBI	220	392	762	1358	1010	2348	1403	1332	775	460	895	1755	1652	1911	3549	4878	5687	7852	6655	8436	2666	2526
NBBL	202	243	437	603	636	1810	1837	892	1489	1493	1765	1195	1962	2971	2049	2475	5010	5133	8095	7378	2384	2216
EBL	44	49	187	461	279	824	809	1156	870	1624	1620	3330	3198	6164	7819	6123	10363	11216	13173	25116	4721	6159
BOK	237	289	488	682	1036	1530	811	693	1150	1428	1946	1561	1513	2422	2722	2159	3901	4291	4998	5725	1979	1553
NCC		154	278	543	900	940	810	793	1025	711	805	832	1632	1373	2356	1756	2282	4391	3299	5175	1582	1339
LBL				127	241	302	532	466	681	469	452	831	710	1311	1033	1100	2211	3508	5308	3536	1342	1414
NIC				119	222	539	607	348	449	1095	1098	859	1352	1461	2186	1677	2755	6076	7813	6673	2078	2331
MPL						152	265	422	560	746	1518	1434	1588	2771	3121	2512	5440	4993	6546	8387	2697	2454
KBL						272	129	292	1067	513	814	1425	1491	2079	3389	1620	4014	4160	5401	5427	2139	1795
LXBL							223	169	491	529	225	483	1490	2083	2744	2823	5108	3905	6053	5615	2281	2063
SBL								97	247	170	362	733	1022	2028	3056	2789	5088	13384	8407	6388	3367	3845
ADBN												3517	3624	7447	5800	4882	6285	9656	8783	11481	6830	2587
GBL												485	1724	1419	2652	1754	4978	5320	7773	7690	3755	2605
CBL												928	1066	2455	2681	1732	3790	4825	5995	5781	3250	1830
PCBL													748	1379	3509	3529	5737	5811	7317	6671	4338	2276
SNBL													365	6365	2525	2228	4507	5371	6042	3057	3807	1969
GRBL													878	1726	1541	1336	3278	4389	6590	1357	2637	1856
NMB													5694	9134	2312	1753	3588	5772	4630	7028	4989	2296
Mean	1694	1945	2903	2883	3553	3556	3002	2125	2585	2122	2068	2204	2770	4269	4025	3739	6157	7321	8546	9243		
Std D	1977	2260	3281	3319	4198	4286	4101	2681	3161	2439	1909	1794	2928	3311	2663	2617	3915	3652	4945	6540		

Appendix 3: Pattern of liquidity of commercial banks from year 1996 to 2015 (Rs in million)

Bank	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Mean	Std Dev
NBL	14856	18069	19472	22395	22864	21729	20756	19078	19108	17456	12180	13378	15481	19261	25074	26638	29551	37844	41191	53241	23481	9933
RBB	18405	18922	22405	26340	29141	28081	28184	27970	26514	28614	26864	25215	27354	31464	35617	36792	40346	48981	60792	75774	33189	13750
NABIL	4306	4625	5295	5812	7324	8173	7072	7997	8635	11078	13021	15657	21515	27817	32903	38766	42732	47523	55830	66996	21654	18818
NIBL	1703	1729	1678	1422	2071	2386	2693	5873	7174	10295	13007	17482	27146	36250	40690	41665	42510	47369	53093	67033	21163	20667
SCBNL	3131	3582	4171	4693	4957	5839	5676	6029	6662	8214	8905	10538	13355	13119	15932	17698	18376	23126	26317	27986	11415	7587
HBL	2891	3382	4276	5372	7423	8837	9674	10894	13082	13245	15516	17672	19985	25292	28977	31657	34283	39649	44400	53124	19481	14393
NSBI	1177	1721	2415	2930	3560	4091	4529	4761	5491	6619	8060	9847	12575	15465	17887	21657	26404	29147	35061	39667	12653	11535
NBBL	676	1200	1958	3259	4612	7022	7969	8363	9996	8740	9011	8303	8420	8508	8860	9944	10673	12920	18825	25440	8735	5585
EBL	49	322	868	1355	2270	2964	3970	5031	6117	7914	10124	14059	18814	24366	28130	31535	36376	44008	47956	54884	17056	17242
BOK	1075	1336	1282	1812	2995	4275	4840	4913	6050	6167	7525	9664	12693	14895	16847	17248	18064	21806	26974	31795	10613	8830
NCC		297	1272	1524	1937	2894	2937	3322	4418	5934	5837	5084	5085	7142	8373	9217	12868	15920	17846	21268	7009	5798
LBL				472	922	1793	2295	2627	3207	3817	4315	4938	5366	5680	5480	6211	6979	9175	14247	17240	5574	4331
NIC				481	1659	2573	2329	2528	3729	4895	6883	9108	11447	13889	12906	15149	17460	32241	37301	42042	12742	12491
MPL						499	681	1494	2542	5051	6033	7281	8881	12957	14934	14711	16023	21634	29220	33770	11714	9904
KBL						264	1120	2144	3709	5519	6918	9011	11449	14682	14875	14898	17809	20083	22797	27024	11487	8001
LXBL							124	764	1701	2701	4274	6528	9784	13446	14732	15263	15848	19143	21865	29414	11113	8577
SBL								629	1568	2635	3869	6320	9481	13505	16859	18398	20115	37844	27577	36382	15014	12248
ADBN												34225	36585	38271	39375	40389	45338	54959	62455	72216	47090	12429
GBL												2597	5058	9149	12139	12762	20410	26832	42555	49321	20091	15539
CBL												2047	4788	8196	10906	12437	14326	17684	23106	29095	13620	8142
PCBL													5154	9817	14102	17070	19160	21736	27815	33077	18491	8552
SNBL													4045	8907	12147	12369	14597	18335	20846	27348	14824	6800
GRBL													3691	6456	7501	9034	11382	14322	14677	9566	9578	3549
NMB													2010	5010	7508	10815	11135	15880	20135	26819	12414	7669
Mean	4827	5017	5917	5990	7057	6761	6553	6730	7630	8759	9550	11448	12507	15981	18448	20097	22615	28257	33037	39605		
Std Dev	6404	6802	7591	8380	8745	7889	7595	7088	6583	6402	5598	7804	8808	9644	10473	10912	11596	13307	14757	18040		

Appendix 4: Pattern of lending of commercial banks from year 1996 to 2015 (Rs in million)