- Chapter 4 -

Central Bank of Nepal and

the Effectiveness of Monetary Policy
The Nepal Rastra Bank, as the central bank of Nepal, has prime responsibility of formulating and implementing monetary policy and its measures in Nepal. Its policy measures can be effective to attain success only when certain conditionalities of the monetary policy are met.

This chapter explores the conditionalities of the monetary policy by addressing six issues. The first section deals with Money Demand, including Velocity of Money, and Money Supply Analysis. The second section deals with Monetary Policy and its role in Economic Activity. The third section deals with Price Stability and Inflation. The fourth section deals with Exchange Rate Stability and Balance of Payments Adjustment. The fifth section deals with Central Bank Independence. Lastly, the role of Nepal Rastra Bank in growth of Financial Institutions is discussed.

4.1 Money Demand and Money Supply Analysis

The first sub-section deals with money demand in Nepal. It analyzes whether there is stability in money demand function in Nepal. At the same time, it also conducts stationarity test to verify the stationarity of variables; and stability tests to determine whether there was structural break in parameters. The second sub-section deals with velocity of money and analyzes behavior of velocity in Nepal. The third sub-section conducts money supply analysis looking at issues of relationship between money-multiplier and high-powered money, contribution of different variables to the high-powered money, and the determinants of money multiplier in Nepal. In addition, it also examines monetary-aggregate targeting in Nepal.

4.1.1 Demand for Money Analysis

The knowledge of the factors that affect the demand for money, and whether there exists a stable and predictable relation between these factors and money supply are essential in order to devise effective monetary policy measures so that their implementation have positive effect on the economy. Various economists have given their opinion at different times about the possible role of money theoretically, and some of the important names in this respect are: Irving Fisher, Alfred Marshall, A.C. Pigou, J.M. Keynes, Milton Friedman, J. Gurley, and E. Shaw, etc. Their assertions explain the effect
of money on the economy, and this pre-knowledge about such effect can be used to steer the economy safely and to mitigate negative influence on economy.

Many economists have conducted empirical studies to estimate the behavior of the money demand in the developed as well as in the developing countries. The short-run demand for money determinants seemed to have become unstable from the beginning of 1974 in the USA as per the finding of Goldfeld’s study. Instances of instability were detected in the money demand functions for several other developed countries. This might have occurred due to institutional factors, financial innovation and changes in the preferences and habits of people in the developed countries. In the case of many developing countries, determinants of the demand for money are stable and predictable: the authorities could influence them by policy measures.

4.1.1.1 Empirical Studies relating to Nepal

In the Nepalese case, the empirical studies on money demand function are very few. According to Pant, when the holding of money by people in Nepal was regressed on certain key variables, namely real income and rate of interest for the period 1966-80, the real income had significant effect on the real demand for narrow money, and the rate of interest had insignificant effect; and that the demand for real balances in Nepal was a stable function of few variables, namely real income and real interest rate, and the speed of adjustment was 35 percent within a year. Khatiwada has pointed out that the demand for money function in Nepal has been found to be stable and interest elasticity of the demand for money has been found insignificant. According to his empirical estimate, the demand for currency, demand deposits or time deposits in Nepal were dependent on income only. His estimates for the period 1966-90, show that the income elasticity of $M_1$ was 1.27, of currency was 1.29, of demand deposit was 0.62, and of time deposit was 0.67. The empirical study conducted by Sharma exhibits that the long-term elasticity of

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154 Pant, R.D., 1983, Interest Rate Policy of Nepal, A Study Sponsored by IDS and IDRC, Ottawa, (Canada), p. 34
155 Khatiwada, Y.R., 1994, Some Aspects of Monetary Policy in Nepal, South Asian Publishing House, New Delhi, p. 52
156 Op. cit., Appendix B
demand for currency with respect to income to be around unity and the income elasticity of demand for deposits to be 1.5; and there seems not much difference between the income and private spending elasticity of the demand for demand-deposits.\textsuperscript{157}

\section*{4.1.1.2 Choice between Linear and Log-Linear Regression Model}

There is a permanent question regarding the choice of regression model, linear or log-linear, to be applied in empirical analysis. Since slope-coefficients in the log-linear model indicate elasticity, it offers distinctive advantage and utility over linear model. In order to make a choice, the following models are estimated by running regressions (4.1.1.1 and 4.1.1.2):

\begin{align*}
\text{Linear Model:} & & Y_t = \alpha_1 + \alpha_2 X_t + u_t & (4.1.1.1) \\
\text{Log-linear Model:} & & \ln Y_t = \beta_1 + \beta_2 X_t + u_t & (4.1.1.2)
\end{align*}

Where $Y_t =$ Dependent variable, in here $GDP$; and $X_t =$ Independent variable, Narrow Money or $M_1$

The regression results are as follows:

\begin{align*}
\hat{Y}_t & = 22813.9 + 5.28041 X_t & (4.1.1.1A) \\
\text{t-statistic:} & & (4.323) & (37.960) \\
F & = 1441.004; R^2 = 0.981608 \\
\ln \hat{Y}_t & = 3.30830 + 0.0860083 \ln X_t & (4.1.1.2A) \\
\text{t-statistic:} & & (36.9487) & (91.9492) \\
F & = 8457.663; R^2 = 0.99682
\end{align*}

The results (4.1.1.1A and 4.1.1.2A) show that both the models fit the data reasonably well since the $t$-statistic and $R^2$ values are statistically significant. While running these two models, $Y_e$ and $\ln e$, estimated values of $Y$ (from linear model) and $\ln Y$ (from log-linear model) respectively are obtained. $Y_e$ and $\ln e$ (the estimated value of $Y$ and $\ln Y$) are used to obtain values of $Z_1$ and $Z_2$.\textsuperscript{158} These values are used in a test


\textsuperscript{158} $Z_1 = \ln Y_e - \ln e$ and $Z_2 = e^{\ln e} - Y_e$
proposed by MacKinnon, White, and Davidson\textsuperscript{159} to make a choice between linear or log-linear models.

Now, regressing \( Y \) on \( X \) and \( Z_1 \), the following results are obtained.

\[
\hat{Y}_t = 36969.7 + 5.00507 X_t - 59420.9 Z_1 \quad (4.1.1.3)
\]

\[
t-statistic: (4.323) \quad (37.960) \quad (-3.653)
\]

\[
F = 1056.67; \quad R^2 = 0.987846
\]

Now, regressing \( \ln Y \) on \( \ln X \) and \( \ln Z_2 \), the following results are obtained.

\[
\ln \hat{Y}_t = 3.80165 + 0.80759 \ln X_t + 7.4333e^{-6} Z_2 \quad (4.1.1.4)
\]

\[
t-statistic: (29.957) \quad (50.044) \quad (3.702)
\]

\[
F = 6223.08; \quad R^2 = 0.997915
\]

The above results, (4.1.1.3 and 4.1.1.4), show that both \( R^2 \) and \( t-statistic \) for both linear and log-linear models are statistically significant representing good fit. Thus, in context of the above results, the present study utilizes both linear and log-linear regression models as the situation warrants.

\subsection*{4.1.1.3 Stationarity Test}

It is common for macroeconomic variables to increase or decrease over a period of time; for instance, output increases with the improvement in technology and innovation. In other words, if a macroeconomic variable shows a definite positive or negative trend, it is said to have a unit-root or non-stationarity. It becomes a serious problem if time series of macroeconomic variables are trended (or non-stationary) since applying ordinary least square (OLS) regressions on such non-stationary variables give unreliable parameter estimates of the relationship between the variables.

To test a variable, \( Y_t \), for a unit-root, following regression equations are estimated:

\[
\Delta Y_t = \delta Y_{t-1} + u_t \quad (4.1.1.5)
\]

\[
\Delta Y_t = \beta_1 + \delta Y_{t-1} + u_t \quad (4.1.1.6)
\]

Where \( \Delta Y_t \) = First difference operator of \( Y_t \) and \( Y_{t-1} \) = One period lag of \( Y_t \)

The first difference of $Y_t$ is regressed against a constant, and first lag of $Y_t$, which is referred to as the Dicky-Fuller ($DF$) test. One lag is usually sufficient with annual data. The test for a unit root is based on the *$t$-statistic* on the coefficient of the lagged dependent variable, $Y_{t-1}$. If this value is greater than critical value, then the *null hypothesis of a unit root* is rejected, and the variable is taken to be stationary. However, the critical values are not the ones used in normal *$t$-tests*, so the conventional rule of thumb that the null hypothesis is rejected if the *$t$-statistic* is greater than two cannot be used here. Instead, the critical values calculated specifically for unit-root tests should be used.

The regression based on the equation (4.1.1.5) gave the following the results.

\[
\begin{align*}
\Delta GDP_t &= 0.092628 \ GDP_{t-1} \quad (4.1.1.5A) \\
t-statistic &= (12.09602) \\
r^2 &= 0.573649 \\
DW statistic &= 1.042690
\end{align*}
\]

The test critical values of *tau* are $-2.650145, -1.953381$ and $-1.609798$ at 1 percent, 5 percent and 10 percent level respectively. Since the computed value of *tau*, 12.09602, in absolute terms, is greater than the 1 percent, 5 percent and 10 percent critical values, the null hypothesis that $\delta = 0$, i.e., the $GDP$(98,280),(874,938) series exhibits a unit-root is rejected. This is another way of stating that the $GDP$ series is stationary.

Likewise, the following result are obtained running the regression based on the equation (4.1.1.6).

\[
\begin{align*}
\Delta GDP_t &= 5311.876 + 0.073166 \ GDP_{t-1} \quad (4.1.1.6A) \\
t-statistic &= (2.535981) \quad (7.075802) \\
r^2 &= 0.658196 \\
DW statistic &= 1.271963
\end{align*}
\]

For stationarity test, the important thing is the *tau statistic* of $GDP_{t-1}$ variable. The null hypothesis is that $\delta = 0$, or $GDP$ series exhibits unit-root. The test critical values of *tau* are $-3.689194, -2.97193$, and $-2.625121$ respectively for 1 percent, 5 percent and 10 percent level. When the computed value of *tau*, 7.075802, is compared with the test critical values, the null hypothesis that the $GDP$ series exhibits a unit-root is rejected. In other words, the $GDP$ series is stationary.
The stationarity test for narrow money supply \((M1)\) is also conducted using equations (4.1.1.5) and (4.1.1.6). As with \(GDP\) series, \(M1\) series is also available on the annual basis. The result of the regression on the basis of equation (4.1.1.5) is given below.

\[
\Delta M1_t = 0.126271 M1_{t-1} \quad (4.1.1.5B)
\]

\[
t-statistic = (16.58)
\]

\[
r^2 = 0.8093
\]

\[
DW statistic = 1.407
\]

The test critical values of \(\tau\) are –2.64712, –1.952910 and –1.610011 at 1 percent, 5 percent and 10 percent level respectively. Since the computed value of \(\tau\), 16.58, in absolute terms, is greater than the 1 percent, 5 percent and 10 percent critical values, the null hypothesis that \(\delta = 0\), i.e., \(M1\) series exhibits a unit-root is rejected.

Likewise, the following result is obtained on the basis of equation (4.1.1.6).

\[
\Delta M1_t = 549.983 + 0.11509 M1_{t-1} \quad (4.1.1.6B)
\]

\[
t-statistic = (1.606) \quad (11.322)
\]

\[
r^2 = 0.8196
\]

\[
DW statistic = 1.524
\]

The test critical values of \(\tau\) are –3.679322, –2.967767, –2.622989 respectively at 1 percent, 5 percent and 10 percent level. The null hypothesis is that \(\delta = 0\), or \(M1\) series exhibits unit-root. Since the \(\tau\) statistic of \(M1_{t-1}\) is greater than the test critical values, the null hypothesis that \(M1\) series exhibits a unit-root is rejected. In other words, \(M1\) series is stationary.

### 4.1.1.4 Stability Tests

It is normal that structural relationship among economic variables changes overtime and such changes are reflected in alterations of the parameters involved. A technique, referred to as Chow’s test\(^{160}\), is often applied to capture such shifts. However, this test requires the exact point of time when the structural change took place; and such vital information is very difficult to find. Another test developed by Brown, Durbin and Evans,

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referred to as CUMSUM-Squared test, is available to determine parameter instability and this test does not require a priori information as the Chow’s test does. Thus, the similar sequence is maintained – the CUMSUM-Squared test is conducted first to detect if any structural break had taken place overtime, and the Chow’s test is applied to verify existence of the structural break as indicated by the CUMSUM-Squared test.

The CUMSUM-Squared test provides a test-statistics, $S_t$, plotted against $t$, time. The obtained plot is then analyzed in terms of the 95 percent confidence interval around its mean. In other words, the significance of departure of cumulative sum, $S_t$, from its expected value is evaluated by referring to a pair of parallel straight lines around the expected value. If the cumulative sum travels beyond the critical lines, it is an indication of parameter instability. To be specific, the null hypothesis of no parameter instability is rejected which is to say, a structural shift in the parameters is said to have taken place at that break point. The cumulative sum of squares, within the 5 percent significance lines, suggests parameter stable.

The CUMSUM-Squared plots for equation of natural log of GDP and natural log of narrow money, $M_1$, are presented in Graph 4.1. The plots in the graph indicate clearly that the structural break may have taken place once over the period FY 1974/75 to FY 2003/04. From the graph, it appears that the structural break took place during FY 1993/94 since the plots have distinctively repositioned within the 5 percent significance lines after that fiscal year. At the same time, the graph also illustrates that ‘indicative’ structural break might have taken place during FY 1986/87. However, it stays very close to the critical line and cannot be conclusively identified as structural break. Thus, FY 1993/94 is taken as a clearly identifiable year when structural break has taken place.

It is pertinent to remember that the breaks indicated by the CUMSUM-Squared test are only suggestive. In fact, a structural break might have taken place earlier and detected only after a lag. Thus, to determine whether structural breaks have taken place as suggested by the CUMSUM-Squared test, the Chow’s test is conducted.

In order to perform the Chow’s test, firstly an equation is estimated by combining all observations, $n_1$ and $n_2$, to obtain its residual sum of squares ($RSS_1$) with $df = (n_1 + n_2 - k)$, where $k$ is the number of parameters estimated. Secondly two regressions are estimated separately, one before break point and another after the break
point, to obtain $RSS_2$ (with $df = n_1 - k$) and $RSS_3$ (with $df = n_2 - k$). Then $RSS_4$ is calculated through summation of $RSS_2$ and $RSS_3$, and $RSS_5$ by subtracting $RSS_4$ from $RSS_1$.

Finally, $F$ is calculated by applying:

$$F = \frac{RSS_k / k}{RSS_4 / (n_1 + n_2 - k)}$$

(4.1.1.7)

If the computed $F$ exceeds the critical $F$ value (following the $F$ distribution with $df = (k, n_1 + n_2 - 2k)$, then hypothesis of structural stability is rejected.

**Graph 4.1: CUMSUM-Squared Test**

![CUMSUM-Squared Test Graph](image)

The result of the Chow’s test, performed by subdividing the data around the break point as indicated by the CUMSUM-Squared test, is summarized below.

**Result from the Chow’s test**

<table>
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<tr>
<th>Variable</th>
<th>Break</th>
<th>Chow’s F</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln GDP</td>
<td>FY 1993/94</td>
<td>41.40890</td>
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</table>
The result obtained from the Chow’s test (conducted in E-Views 4.1) further substantiates the suggested break point obtained from the CUMSUM-Squared test. Since the computed $F$ value is greater than the critical value $F(2, 26) = 3.37$ at 5 percent level, the hypothesis that GDP function in two periods are the same can be rejected. In other words, the hypothesis of the structural stability can be rejected.

4.1.1.5 Model Specification for Nepal

Following regression equations are run to estimate income elasticity of demand for (i) Currency ($C$); (ii) Demand Deposits ($DD$); and (iii) Time Deposits ($TD$).

\[
\ln R_{Ct} = \alpha_0 + \alpha_1 \ln Y_{Rt} + \alpha_2 r_t + \alpha_3 \ln PBO_t + \alpha_4 \ln R_{Ct-1} \tag{4.1.1.8}
\]

\[
\ln R_{DDt} = \alpha_0 + \alpha_1 \ln Y_{Rt} + \alpha_2 r_t + \alpha_3 \ln PBO_t + \alpha_4 \ln R_{DDt-1} \tag{4.1.1.9}
\]

\[
\ln R_{TDt} = \alpha_0 + \alpha_1 \ln Y_{Rt} + \alpha_2 r_t + \alpha_3 \ln PBO_t + \alpha_4 \ln R_{TDt-1} \tag{4.1.1.10}
\]

Where,

- $\ln$ represents natural log;
- $R_{Ct}$ = Real Currency;
- $R_{DDt}$ = Real Demand Deposits;
- $R_{TDt}$ = Real Time Deposits;
- $Y_{Rt}$ = Real Income;
- $r_t$ = Interest rate;
- $PBO_t$ = Population per Bank branch;
- $R_{Ct-1}$ = 1-year lag of Real Currency;
- $R_{DDt-1}$ = 1-year lag of Real Demand Deposits;
- $R_{TDt-1}$ = 1-year lag of Real Time Deposits;

Similarly, regression equation is run for real narrow money, $RM1$, and for real broad money, $RM2$. The real narrow money, $RM1$, consists of real currency and real demand deposits, or $RC+RDD$; and the real broad money, $RM2$, consists of real narrow money and real time deposits, or $RM1+RTD$. 

The regression equations for real narrow money and real broad money are as follows:

\[
\ln RMI_t = \alpha_0 + \alpha_1 \ln YR_t + \alpha_2 r_t + \alpha_3 \ln PBO_t + \alpha_4 \ln RMI_{t-1} \tag{4.1.1.11}
\]

\[
\ln RM2_t = \alpha_0 + \alpha_1 \ln YR_t + \alpha_2 r_t + \alpha_3 \ln PBO_t + \alpha_4 \ln RM2_{t-1} \tag{4.1.1.12}
\]

Where,

- \( RMI_t \) = Real narrow money;
- \( RM2_t \) = Real broad money;
- \( RMI_{t-1} \) = 1-year lag of real narrow money;
- \( RM2_{t-1} \) = 1-year lag of real broad money;

\( GDP \) deflator (base-year FY 1993/94) is applied to convert nominal into real terms. Both short and long-run income elasticity are calculated. The speed of adjustment is \((1 - \alpha_4)\).

Instead of number of bank branches, the population per bank branch \((PBO)\) has been used in the study. Because of growing political instability and internal insurgency in the later years of the study period, the number of bank branches has recorded decline; many of the bank branches were closed or merged for security reasons. The bank branches are expected to positively influence both the demand and time deposits. However, the decline in bank branches in the Nepalese context is contrary to the priori postulation. Thus, the population per bank branch is used.

The period of study covers from FY 1974/75 to FY 2003/04.

### 4.1.1.6 Data

Data for real income and GDP deflator are taken from various issues of the Economic Survey published by the Finance Ministry, the Nepal Government. The population data has been taken from the Statistical Year Book published by the Central Bureau of Statistics, Kathmandu. Data for currency, demand deposits, time deposits, narrow money, broad money, interest rate for 1-year deposit, and number of commercial bank branches are taken from various issues of the Quarterly Economic Bulletin published by the Nepal Rastra Bank.
Table 4.1.1: Basic Financial Data of Nepal

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<td>16313</td>
<td>34490</td>
<td>8</td>
<td>9.01</td>
<td>0.0445</td>
</tr>
<tr>
<td>1994</td>
<td>100</td>
<td>191596</td>
<td>28510</td>
<td>69777</td>
<td>8851</td>
<td>19660</td>
<td>41267</td>
<td>9.5</td>
<td>7.68</td>
<td>0.0451</td>
</tr>
<tr>
<td>1995</td>
<td>106.68</td>
<td>209974</td>
<td>32985</td>
<td>80985</td>
<td>10492</td>
<td>22494</td>
<td>47999</td>
<td>9.5</td>
<td>8.11</td>
<td>0.0455</td>
</tr>
<tr>
<td>1996</td>
<td>115.07</td>
<td>239388</td>
<td>36498</td>
<td>92652</td>
<td>11452</td>
<td>25046</td>
<td>56154</td>
<td>9</td>
<td>8.10</td>
<td>0.0461</td>
</tr>
<tr>
<td>1997</td>
<td>123.41</td>
<td>269570</td>
<td>38460</td>
<td>103721</td>
<td>11127</td>
<td>27334</td>
<td>65260</td>
<td>9</td>
<td>8.33</td>
<td>0.0458</td>
</tr>
<tr>
<td>1998</td>
<td>128.38</td>
<td>289798</td>
<td>45164</td>
<td>126463</td>
<td>14271</td>
<td>30893</td>
<td>81299</td>
<td>7</td>
<td>11.02</td>
<td>0.0455</td>
</tr>
<tr>
<td>1999</td>
<td>139.85</td>
<td>330013</td>
<td>51062</td>
<td>152800</td>
<td>16078</td>
<td>34984</td>
<td>101738</td>
<td>7</td>
<td>3.69</td>
<td>0.0459</td>
</tr>
<tr>
<td>2000</td>
<td>146.29</td>
<td>366251</td>
<td>60980</td>
<td>186121</td>
<td>18837</td>
<td>42143</td>
<td>125141</td>
<td>7</td>
<td>2.45</td>
<td>0.0515</td>
</tr>
<tr>
<td>2001</td>
<td>150.27</td>
<td>394052</td>
<td>70577</td>
<td>214454</td>
<td>22282</td>
<td>48295</td>
<td>73300</td>
<td>6</td>
<td>2.90</td>
<td>0.0538</td>
</tr>
<tr>
<td>2002</td>
<td>161.56</td>
<td>406138</td>
<td>77156</td>
<td>223988</td>
<td>21498</td>
<td>55658</td>
<td>69676</td>
<td>6</td>
<td>4.79</td>
<td>0.0592</td>
</tr>
<tr>
<td>2003</td>
<td>162.94</td>
<td>437546</td>
<td>83754</td>
<td>245911</td>
<td>26869</td>
<td>56885</td>
<td>78403</td>
<td>5.75</td>
<td>3.56</td>
<td>0.0639</td>
</tr>
<tr>
<td>2004</td>
<td>170.62</td>
<td>474129</td>
<td>94292</td>
<td>279125</td>
<td>30751</td>
<td>63219</td>
<td>89395</td>
<td>5.5</td>
<td>3.44</td>
<td>0.0660</td>
</tr>
</tbody>
</table>

Source: Nepal Rastra Bank, Compiled from Quarterly Economic Bulletin, Various issues

Note:
Data for Y (Income), M1, M2, DD, C, and TD in millions of N Rs.;
CPI and r (interest) in percent;
PBO is in millions;
Def = GDP Deflator with the base year 1993/94 = 100;
Before going into empirical results of the period of the study from FY 1974/75 to FY 2003/04, it is pertinent to understand the political and economic scenario of Nepal. From FY 1974/75 to FY 1992/93, there was peace in Nepal and some changes in the governments occurred. Most of the period was marked with normality. In FY 1993/94, structural break took place and internal insurgency, in the form of Maoist rebellion, spread throughout Nepal. The period was marked with disturbances. Therefore, the relationship among the variables that is found may undergo significant changes and the coefficients may even show negative sign. The study covers both periods; thus, the results include a combination of normality and disturbances. However, the important findings that are applicable for policy prescription are the empirical results of the recent past period, i.e. from FY 1993/94 to FY 2003/04. At the same time, the empirical results from FY 1974/75 to FY 1992/93 may even lose relevance while prescribing policy, given the disturbances prevailing in Nepal.

4.1.1.7 Demand for Real Demand Deposits

The regression result of the equation of the demand for real demand deposits (4.1.1.9) is provided in Exhibit 4.1.1 and \textit{t-statistic} of each parameter is given in the parenthesis.

\begin{center}
\textbf{Exhibit 4.1.1: OLS estimates for 1976-2004} \\
Dependent variable: $\ln RDD_i$
\end{center}

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>\textit{t-statistic}</th>
<th>Significance at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>-1.5122</td>
<td>(-0.3803)</td>
<td></td>
</tr>
<tr>
<td>$\ln YR_i$</td>
<td>0.4878</td>
<td>(1.7171)</td>
<td>* (10% level)</td>
</tr>
<tr>
<td>$r_i$</td>
<td>-0.0219</td>
<td>(-0.9603)</td>
<td></td>
</tr>
<tr>
<td>$\ln PBO_i$</td>
<td>0.0065</td>
<td>(0.0424)</td>
<td></td>
</tr>
<tr>
<td>$\ln RDD_{i-1}$</td>
<td>0.5332</td>
<td>(3.6580)</td>
<td>*** (1% level)</td>
</tr>
</tbody>
</table>

$R^2 = 0.97595; F$-\textit{statistic} (4, 24) = 243.48; $D-W$ \textit{statistic} = 2.56

The result shows that the income elasticity of demand for real demand deposits is 0.48, and the speed of adjustment is 0.47 (1 – 0.53) or about 47 percent in one year during the period from 1976 to 2004.

The income has positive effect on demand deposits substantially though \textit{t-statistic} is strong at 10 percent level. The interest rate elasticity is negative at 0.022. It has mild
negative effect, but *t-statistic* of interest rate is statistically insignificant. During the study period, the interest rate declined significantly and became either marginally higher or lower than *CPI*. As evident in Graph 4.2, the real interest rate shows highly erratic behavior and most of the time either stays close to *x-axis* or goes below *x-axis*.

Usually, the demand deposits do not carry interest. Thus, positive real interest rate, i.e. difference between *CPI* and interest, is expected to cause negative effect on demand deposits. This is because positive real return on other deposits will attract people to those deposits as well as to fixed assets, and not to demand deposits. In fact, extra and non-required balance of demand deposits may flow to interest-earning deposits. While utilizing bank services, a customer has both information and transaction costs. At such a lower interest rate, when the difference between the interest rate and *CPI* is unnoticeable, it is unlikely that these costs will be compensated satisfactorily. Thus, the people are not motivated to deposit their cash balances in the banks. This is the reason why interest has weak and negligible effect. In addition, the population per bank branch seems to have mild positive effect and it is statistically insignificant. Both *F-statistic* and *D-W statistic* are satisfactory.

**Graph 4.2: Interest Rate, Inflation and Real Interest Rate**

![Interest Rate, Inflation and Real Interest Rate Graph](image)

*Source: Table 4.1.1*
The demand for real demand deposits with regard to the structural break was also analyzed. Thus, the data was sub-divided into two periods, from FY 1974/75 to FY 1992/93 and from FY 1993/94 to FY 2003/04. The regression results are given below in Exhibit 4.1.2 and \( t\)-statistic of each parameter is given in the parenthesis.

**Exhibit 4.1.2: OLS Estimates for Two Periods**
Dependent variable: \( \ln RDD_t \)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln YR_t )</th>
<th>( r_i )</th>
<th>( \ln PBO_t )</th>
<th>( \ln RDD_{t-1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1975/76 to 1992/93</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>6.432</td>
<td>0.2649</td>
<td>-0.0309</td>
<td>-0.4051</td>
<td>0.4407</td>
</tr>
<tr>
<td>( t)-statistic</td>
<td>(1.0470)</td>
<td>(0.8282)</td>
<td>(-1.2152)</td>
<td>(-1.3919)</td>
<td>(2.2899) **</td>
</tr>
<tr>
<td>Significance level at</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R^2 ) = 0.93705; ( F)-statistic (4, 13) = 48.3774; ( D-W) statistic = 2.516</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln YR_t )</th>
<th>( r_i )</th>
<th>( \ln PBO_t )</th>
<th>( \ln RDD_{t-1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1993/94 to 2003/04</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>-7.1081</td>
<td>0.7771</td>
<td>-0.0456</td>
<td>0.8609</td>
<td>-0.2254</td>
</tr>
<tr>
<td>( t)-statistic</td>
<td>(-0.798)</td>
<td>(1.0158)</td>
<td>(-0.9205)</td>
<td>(2.3179)</td>
<td>(-0.7165) *</td>
</tr>
<tr>
<td>Significance level at</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R^2 ) = 0.951032; ( F)-statistic (4, 6) = 29.132; ( D-W) statistic = 2.184</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the period FY 1975/76 to FY 1992/93, involving 18 observations, the speed of adjustment is about 56 percent \((1 - 0.44)\) in one year. The interest rate has negative coefficient, which is theoretically correct, but it is not statistically significant. Thus, it appears that interest rate does not increase demand deposits and people seem to have used the money to carry out other activities. In addition, people’s reach towards bank services has increased during the observation period and it should have had positive coefficient. However, the coefficient is negative suggesting that it has very weak or no effect. People seem to have preferred to hold cash or invest in lucrative fixed assets instead. The real income has positive effect, but its \( t\)-statistic is not significant.

During the FY 1993/94 to FY 2003/04, the real income elasticity is sizeable but its \( t\)-statistic is weak and statistically significant above 20 percent level. Likewise, interest rate has expected negative coefficient, however, it is also statistically insignificant. The
population per bank branch has significant \textit{t-statistic}. The coefficient is also substantial suggesting elasticity of 0.86. The plausible explanation is that many new joint-venture banks were established during late 80s and they mainly concentrated in urban areas offering efficient and better quality services making bank services less tedious and cumbersome. At the same time, banking habits and preferences of people also changed as a result of rapid urbanization and exposure to new information regarding numerous advantages that banks offer. In the later phases, people have increasingly utilized bank-services from the safety viewpoint as a result of growing political instability.

4.1.1.8 Demand for Real Currency

The regression result of the equation of the demand for real currency balance (4.1.1.8) is provided below in Exhibit 4.1.3 and \textit{t-statistic} of each parameter is given in the parenthesis. It should be noted that the dependent variable is currency with the public and outside financial institutions. When the financial institutions record currency deposited by people as their cash at vault, it shows reduction in the amount of currency with public.

The obtained regression result in Exhibit 4.1.3 shows that the income elasticity of demand for real currency balance is 62 percent, and the speed of adjustment in one year is 38 percent (1 − 0.62).

\textbf{Exhibit 4.1.3: OLS estimates for 1976-2004}

\begin{tabular}{llll}
\hline
\textit{Variable} & \textit{Coefficient} & \textit{t-statistic} & \textit{Significance at} \\
\hline
\text{Const} & -4.4195 & (-1.8878) & * (10\% level) \\
\text{ln \textit{YR}\textsubscript{i}} & 0.6264 & (3.1250) & *** (1\% level) \\
\text{\textit{r}\textsubscript{i}} & 0.0092 & (0.7588) & \\
\text{ln \textit{PBO}\textsubscript{i}} & 0.0193 & (0.2353) & \\
\text{\textit{RC}\textsubscript{i-1}} & 0.6247 & (5.6507) & *** (1\% level) \\
\hline
\end{tabular}

\textit{R}^2 = 0.994318; \textit{F-statistic} (4, 24) = 1049.89; \textit{D-W statistic} = 2.321

The real income seems to influence the demand for real currency, which is significant at 1 percent level. The interest rate should have had negative influence on the demand for real currency because currency does not earn any interest for its holder. When interest rate is higher than inflation rate, people would be motivated to divert their
currency holding to interest-earning assets to benefit from such situation. However, positive coefficient indicates that people prefer to hold cash and interest rate does not have any effect. Steady decline in interest rate, interest rate being either insignificantly higher or lower than inflation rate, existence of large non-monetized sector, and inability to comprehend complexity in banking procedure seems to be the reason for people holding large amount of currency. The population per bank branch (PBO), the proxy of financial deepening, has mild positive coefficient indicating that banking services may have yet to put in an extra effort to draw people to banks to deposit their currency-holdings.

The demand for real currency balance seems to be influenced by the real income over the period of 30 years.

The demand for real currency with regard to the structural break, as shown by the CUMSUM-Squared tests and the Chow’s test, is also analyzed. The data is sub-divided in two periods, from FY 1974/75 to FY 1992/93, and from FY 1993/94 to FY 2003/04. The regression results are given below in Exhibit 4.1.4 and t-statistic of each parameter is given in the parenthesis. To easy comparison and analysis, the results are consolidated in a single exhibit.

**Exhibit 4.1.4: OLS Estimates for Two Periods**

Dependent variable: lnRC

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>lnYR&lt;sub&gt;t&lt;/sub&gt;</th>
<th>r&lt;sub&gt;t&lt;/sub&gt;</th>
<th>lnPBO&lt;sub&gt;t&lt;/sub&gt;</th>
<th>lnRC&lt;sub&gt;t-1&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975/76 to 1992/93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>-0.4306</td>
<td>0.8156</td>
<td>0.0034</td>
<td>-0.2983</td>
<td>0.3586</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(-0.131)</td>
<td>(3.2691)</td>
<td>(0.2447)</td>
<td>(-1.7894)</td>
<td>(2.2045)</td>
</tr>
<tr>
<td>Significance level at</td>
<td>1%</td>
<td>10%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R² = 0.98825; F-statistic (4, 13) = 273.449; D-W statistic = 2.48224

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>lnYR&lt;sub&gt;t&lt;/sub&gt;</th>
<th>r&lt;sub&gt;t&lt;/sub&gt;</th>
<th>lnPBO&lt;sub&gt;t&lt;/sub&gt;</th>
<th>lnRC&lt;sub&gt;t-1&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993/94 to 2003/04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>-2.0099</td>
<td>0.3714</td>
<td>-0.0386</td>
<td>0.5161</td>
<td>0.2274</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(-0.483)</td>
<td>(1.0036)</td>
<td>(-1.5739)</td>
<td>(2.1308)</td>
<td>(0.8815)</td>
</tr>
<tr>
<td>Significance level at</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R² = 0.987421; F-statistic (4, 6) = 117.745; D-W statistic = 1.61686
For the period from 1975/76 to 1992/93, real income seems to be a major influencing factor for the demand for real currency balance. The income elasticity of demand for real currency balance is about 82 percent, whereas the speed of adjustment is about 64 percent \((1 – 0.36)\) during this period. Contrary to the theoretical postulation, interest rate has mild positive influence, though it is statistically insignificant. A marginal difference between the inflation rate and interest rate, and transaction costs involved to deal with the financial institutions failed to encourage the people to deposit cash. Population per bank branch \((PBO)\) has statistically significant negative influence on the demand for real currency. It suggests that increase in bank branches strongly encouraged people to deposit their currency holdings in the banks. Since many of the joint venture banks and other financial institutions had started their operations during this period and Nepal’s international as well as domestic transactions also increased considerably, the currency holdings were diverted to the banking sector. Instead of interest rate, it appears that expansion of bank branches had strong negative influence on currency holding.

During the period from 1993/94 to 2003/04, real income had positive influence on the demand for real currency balance but is statistically insignificant. Interest rate confirms to the priori postulation that it has negative influence on the demand for real currency balance but it is statistically insignificant. The population per bank branch has positive coefficient and is statistically significant at 10 percent level. The positive coefficient suggests that expansion of banking facilities has increased the demand for real currency. Many people migrated from rural to urban areas. To live in new locale, they needed currency; thus they may have withdrawn from interest-earning deposits to hold cash. The increased risk resulting from growing political uncertainty could be the reason behind the increased demand for real currency in later phases of the study.

### 4.1.1.9 Demand for Real Time Deposits

The regression result of the equation of the demand for real time deposits \((4.1.1.10)\) is provided in Exhibit 4.1.5 and \textit{t-statistic} of each parameter is given in the parenthesis.

The obtained regression result in Exhibit 4.1.5 shows that the income elasticity of the demand for real time deposits is 0.83, and the speed of adjustment in one year is about 56 percent \((1–0.44)\). The \textit{t-statistic} of real income is significant at 5 percent level.
Exhibit 4.1.5: OLS estimates for 1976-2004
Dependent variable: $\ln RTD_t$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>$t$-statistic</th>
<th>Significance at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>3.0441</td>
<td>(0.6152)</td>
<td></td>
</tr>
<tr>
<td>$\ln YR_t$</td>
<td>0.8259</td>
<td>(2.3178) **</td>
<td>(5% level)</td>
</tr>
<tr>
<td>$r_t$</td>
<td>-0.0198</td>
<td>(-0.6196)</td>
<td></td>
</tr>
<tr>
<td>$\ln PBO_t$</td>
<td>-0.6427</td>
<td>(-2.1296) **</td>
<td>(5% level)</td>
</tr>
<tr>
<td>$\ln RTD_{t-1}$</td>
<td>0.4352</td>
<td>(2.6052) **</td>
<td>(5% level)</td>
</tr>
</tbody>
</table>

$R^2 = 0.976821; F$-statistic $(4, 24) = 252.85; D-W$ statistic $= 1.70536$

Theoretically, the interest rate should have had positive effect on the time-deposit holding. The analysis here indicates otherwise. The coefficient is negative and is statistically insignificant. In other words, interest has no influence on time deposits. As bank branches increase, it should attract more time deposits – it should influence time deposits positively. However, increase in bank branches has influenced the demand for real time deposits negatively. The people may have used the financial resources to deal with the external sector instead of depositing with bank in interest-bearing deposits as they may have found external sector more profitable. In later period, especially after 2001, there may have been capital flight because of adverse political situation and security reasons. Thus, only the real income has profound influence on the real time deposit balance.

The demand for real time deposits is also analyzed with regard to the structural break. The data has been sub-divided into two periods, from FY 1974/75 to FY 1992/93, and from FY 1993/94 to FY 2003/04. The regression results are given below in Exhibit 4.1.6 and $t$-statistic of each parameter is given in the parenthesis. To make comparison and analysis easy, the results are consolidated in a single exhibit.

During the period from 1975/76 to 1992/93, real income appears to be the only influencing factor for the demand for real time deposit balance. It is statistically significant at 1 percent level. The real income has statistically insignificant positive influence during the period from 1993/94 to 2003/04. Theoretically, the interest rate should have had influenced the demand for real time deposits positively. However, it has mild negative influence, but is statistically insignificant during the period from 1975/76 to 1992/93. The increase in bank branches should positively influence the time deposits. On contrary, it has negative coefficient and is statistically insignificant. Hence, it has no effect.
Exhibit 4.1.6: OLS Estimates for Two Periods
Dependent variable: ln $RTD_i$

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>t-statistic</td>
</tr>
<tr>
<td>ln $YR_i$</td>
<td>-1.6925 (0.381)</td>
<td>0.6529 (3.0304)</td>
</tr>
<tr>
<td>$r_i$</td>
<td>-0.0058 (-0.3360)</td>
<td>0.0738 (1.8713)</td>
</tr>
<tr>
<td>ln $PBO_i$</td>
<td>-0.1872 (-0.6771)</td>
<td>(-0.6771)</td>
</tr>
<tr>
<td>ln $RTD_{i-1}$</td>
<td>0.6092 (5.1125)</td>
<td>(5.1125)</td>
</tr>
</tbody>
</table>

$R^2 = 0.992148$; F-statistic $(4, 13) = 410.667$; D-W statistic = 2.0662

$R^2 = 0.66338$; F-statistic $(4, 6) = 2.9561$; D-W statistic = 2.50505

Though the interest rate confirms to the priori postulation during FY 1993/94 to FY 2003/04, it is statistically insignificant. It appears that the interest rate has very weak influence over the demand for real time deposits. It indicates that interest rate offered by the commercial banks has not motivated people to deposit their currency in the banks as time deposits, and/or convert demand deposits into time deposits. Though access to banks has increased substantially, people do not seem to utilize the banking facilities. It is indicated by the negative coefficient of the population per bank branch ($PBO$). During the period from 1993/94 to 2003/04, Nepal witnessed political instability. The insurgents increasingly targeted bank branches located at rural areas and many branches were merged or closed down for security reasons, which eventually reduced the number of bank branches. At the same time, people seem to have lost confidence in the banking system due to increased political uncertainty. They preferred to hold currency and the banks failed to attract time deposits. Moreover, since interest rate is more favorable on time deposits in the Indian financial institutions than in Nepal, it can be presumed that capital flight might have taken place from Nepal to India to take advantage of interest differentials and to save money from adverse security situation prevailing in Nepal.
In short, real income caused growth in real demand deposits, real currency holding by public, and real time deposits during the period 1976-2004 and the period 1994-2004. The other variables failed to exert significant influence.

4.1.1.10 Demand for Money: Empirical Results

Empirically the null hypothesis of a unit root in GDP \( Y \) was rejected and it was taken to be stationary. When the Dicky-Fuller test was conducted, the computed tau value was greater than the critical values at 1 percent, 5 percent and 10 percent significance levels.

With a view of stationarity, the following equations are run to estimate the demand for real narrow money (\( RM_1 \)) and real broad money (\( RM_2 \)). The equations (4.1.1.11) relating to \( RM_1 \) and (4.1.1.12) relating to \( RM_2 \) are estimated. The results are given in Exhibit 4.1.7 and Exhibit 4.1.8 and \( t \)-statistic of each parameter is given in the parenthesis.

Exhibit 4.1.7 consolidates the results for estimation for the demand for both real narrow and real broad money with a perspective to analyze short-term implication. Through this table, short-term elasticity for both real narrow and real broad money will be evaluated.

### Exhibit 4.1.7: OLS Estimates for 1976-2004

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln YR_t )</th>
<th>( r_t )</th>
<th>( \ln PBO_t )</th>
<th>( \ln RM_{1t-1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-2.4058</td>
<td>0.4787</td>
<td>-0.00228</td>
<td>0.01309</td>
<td>0.6603</td>
</tr>
<tr>
<td>( t )-statistic</td>
<td>(-1.054)</td>
<td>(2.3969)</td>
<td>(-0.1792)</td>
<td>(0.1529)</td>
<td>(6.0345)</td>
</tr>
</tbody>
</table>

Significance level at 5% 1%

\( R^2 = 0.993316; F \text{-statistic} (4, 24) = 891.666; D-W \text{ statistic} = 2.54174 \)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln YR_t )</th>
<th>( r_t )</th>
<th>( \ln PBO_t )</th>
<th>( \ln RM_{2t-1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-2.4746</td>
<td>0.5041</td>
<td>-0.0086</td>
<td>-0.01197</td>
<td>0.6979</td>
</tr>
<tr>
<td>( t )-statistic</td>
<td>(-1.294)</td>
<td>(3.1559)</td>
<td>(-0.7989)</td>
<td>(-0.1628)</td>
<td>(10.093)</td>
</tr>
</tbody>
</table>

Significance level at 1% 1%

\( R^2 = 0.997125; F \text{-statistic} (4, 24) = 2080.97; D-W \text{ statistic} = 2.38155 \)
Exhibit 4.1.8 consolidates the results with a perspective to analyze the long-term implication by evaluating long-term elasticity for both real narrow and real broad money.

**Exhibit 4.1.8: OLS Estimates for 1975-2004**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln Y_R )</th>
<th>( r_i )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-8.295</td>
<td>1.52557</td>
<td>0.002339</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(-6.4356)</td>
<td>(15.7202)</td>
<td>(0.1709)</td>
</tr>
</tbody>
</table>

*** ***

Significance level at 1% 1%

\( R^2 = 0.9794; \) F-statistic (3, 27) = 640.92; D-W statistic = 0.6925

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln Y_R )</th>
<th>( r_i )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-12.8653</td>
<td>1.98051</td>
<td>-0.000456</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(-7.5096)</td>
<td>(15.3371)</td>
<td>(-0.0251)</td>
</tr>
</tbody>
</table>

*** ***

Significance level at 1% 1%

\( R^2 = 0.9789; \) F-statistic (3, 27) = 625.46; D-W statistic = 0.4887

The regression equations presented in Exhibit 4.1.7 show that the short-term income elasticity of real narrow money (\( RM1 \)) and real broad money (\( RM2 \)). The short-term income elasticity of both real narrow and broad money are 0.48 and 0.50 respectively. It indicates the short-term elasticity of \( RM2 \) exceeds that of \( RM1 \). Exhibit 4.1.8 shows the long-term income elasticity of real narrow money is 1.53 whereas long-term income elasticity of real broad money is 1.98. These results indicate that both long-term and short-term income elasticity of \( RM2 \) exceed that of \( RM1 \). The speed of adjustment in one year of \( RM1 \) is 0.34 and that of \( RM2 \) is 0.31.

\( R^2 \) and F-statistic of each equation are satisfactory as shown in Exhibit 4.1.7. The D-W statistic of equations for both \( RM1 \) and \( RM2 \) in Exhibit 4.1.7 are satisfactory with 2.541 and 2.381 respectively and are significant at 5 percent level. Similarly, D-W statistic of the equations for \( RM1 \) and \( RM2 \) in Exhibit 4.1.8 are 0.6925 and 0.4887 respectively, and these raise a doubt whether these regressions are spurious regression. According to co-
integrating regression, *Durbin-Watson (CRDW) test*\(^{161}\), if *D-W statistic* equals to 0.511, 0.386 and 0.322 at 1 percent, 5 percent, 10 percent respectively, the hypothesis is that the regression is not co-integrated. However, if *D-W statistic* is higher than that level, the regression is simply co-integrated. Then the result given is not spurious and the usual *t-statistic* and *F-statistic* are valid. The *D-W statistic* of both equations are above the critical value of *CRDW test*; thus, the equations are co-integration regression and as such, their *t-statistic* and *F-statistic* are valid.

The *t-statistic* of real income in equations (4.1.1.11) and (4.1.1.12) in Exhibit 4.1.7 are significant at 5 percent and 1 percent level, whereas *t-statistic* of real income in equations in Exhibit 4.1.8 are significant at all levels. The coefficients of interest rate \((r)\) in equations (4.1.1.12) and in Exhibit 4.1.8 are opposite to the theoretical hypotheses; thus, they are insignificant. According to the theory, interest on demand deposits should give negative value to the coefficient because interest rate on bank deposit encourages or induces people to shift their demand deposits, which do not provide interest income to depositors, to time deposits which provide interest income. Therefore, time deposits should grow and demand deposits should decrease. The *t-statistic* of interest rate \((r)\) in equation (4.1.1.11) is insignificant though the coefficient has negative value. Likewise, the value of coefficient of interest rate is negative in equation (4.1.1.12); but theoretically, it should be positive for the reason that interest on time deposits attracts such deposit in the banking sector. For equation relating to *RM2* in Exhibit 4.1.8, the coefficient for interest rate is negative and it is statistically insignificant. The population per bank branch \((PBO)\), which is used as proxy of financial development, is statistically insignificant in equations (4.1.1.11) and (4.1.1.12).

The demand for real currency with regard to the structural break is also analyzed by sub-dividing the data in two periods, from FY 1974/75 to FY 1992/93, and from FY 1993/94 to FY 2003/04. The regression results are given in Exhibit 4.1.9 and Exhibit 4.1.10 and *t-statistic* of each parameter is given in the parenthesis. For easy comparison and analysis, the results are consolidated in a single exhibit.

Exhibits 4.1.9 and 4.1.10 relate to 1975-1993 wherein Exhibit 4.1.9 analyzes the short-term income elasticity of real narrow and real broad money, and Exhibit 4.1.10

---

analyzes long-term income elasticity of both narrow and broad money over the same period.

**Exhibit 4.1.9: OLS Estimates for 1976-1993**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>$\ln YR_t$</th>
<th>$r_t$</th>
<th>$\ln PBO_t$</th>
<th>$\ln RM_{t-1}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>2.01909</td>
<td>0.53712</td>
<td>-0.00675</td>
<td>-0.28567</td>
<td>0.4689</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(0.5693)</td>
<td>(2.2414)</td>
<td>(-0.4588)</td>
<td>(-1.6051)</td>
<td>(2.9234)</td>
</tr>
</tbody>
</table>

**Significance level at** 5% 5%

$R^2 = 0.9843; F$-statistic (4, 13) = 203.91; $D-W$ statistic = 2.71506

**Exhibit 4.1.10: OLS Estimates for 1975-1993**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>$\ln YR_t$</th>
<th>$r_t$</th>
<th>$\ln PBO_t$</th>
<th>$\ln RM_{2t-1}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>1.06279</td>
<td>0.53209</td>
<td>-0.00889</td>
<td>-0.25974</td>
<td>0.5822</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(0.3343)</td>
<td>(2.7838)</td>
<td>(-0.696)</td>
<td>(-1.3995)</td>
<td>(4.9029)</td>
</tr>
</tbody>
</table>

**Significance level at** 5% 1%

$R^2 = 0.993208; F$-statistic (4, 13) = 475.421; $D-W$ statistic = 2.7023
The regression equations presented in Exhibit 4.1.9 show the short-term income elasticity of real narrow money ($RM1$) and real broad money ($RM2$). It shows that the short-term income elasticity of both real narrow and broad money stand at 0.54 and 0.53. Exhibit 4.1.10 shows the long-term income elasticity of real narrow money is 2.01, whereas long-term income elasticity of real broad money is 1.06. These results indicate the short-term income elasticity of $RM1$ marginally exceed that of $RM2$. At the same time, the long-term elasticity that of $RM1$ is higher than that of $RM2$. The speed of adjustment of $RM1$ is 0.53 and $RM2$ is 0.42 in one year.

$R^2$ and F-statistic of each equation are satisfactory in Exhibit 4.1.9. The D-W statistic of equations for both $RM1$ and $RM2$ in Exhibit 4.1.9 are satisfactory and significant. Similarly, D-W statistic of the equations for $RM1$ and $RM2$ in Exhibit 4.1.10 are 0.7537 and 0.4713 respectively, and these raise a doubt whether these regressions are spurious regression. However, the computed D-W statistic of $RM1$ exceed the critical values of Durbin-Watson (CRDW) test at all level, and that of $RM2$ at 5 percent. Thus, these regressions are simply co-integrated and the results given are not spurious. Their t-statistic and F-statistic are valid.

The t-statistic of real income in equations (4.1.1.11) and (4.1.1.12) are significant at 5 percent, whereas t-statistic of real income in Exhibit 4.1.10 are significant at all levels. The coefficients of interest rate ($r$) in equation (4.1.1.12) in Exhibit 4.1.9, and equation relating to long-term elasticity of $RM1$ in Exhibit 4.1.10 are opposite to the theoretical hypotheses; thus, they are insignificant. The interest on time-deposit should give positive value to the coefficient because interest rate on time-deposit encourages or induces people to divert their non-interest bearing deposits, such as demand-deposit, to time deposits which provide interest to the deposit-holders. Therefore, time deposits should grow and demand deposits should decrease. The t-statistic of interest rate ($r$) in equation (4.1.1.11) is insignificant though the coefficient has negative value.

Likewise, equation relating to long-term elasticity of $RM1$ in Exhibit 4.1.10, the value of coefficient is positive. Theoretically, it should be negative for the reason that interest is not provided in demand deposits; therefore, there is no plausible reason that interest attracts demand deposits. For equation relating to long-term elasticity in Exhibit 4.1.10, coefficient for interest rate is positive but it is statistically insignificant. The
population per bank branch \((PBO)\), which is used as proxy of financial development, is statistically insignificant in equations (4.1.1.11) and (4.1.1.12).

Exhibits 4.1.11 and 4.1.12 relate to period of 1994-2004. Exhibit 4.1.11 analyzes short-term income elasticity of real narrow and real broad money during that period, whereas Exhibit 4.1.12 analyzes the long-term income elasticity during the same period.

### Exhibit 4.1.11: OLS Estimates for 1994-2004

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>(\ln YR_t)</th>
<th>(r_t)</th>
<th>(\ln PBO_t)</th>
<th>(\ln RM1_{t-1})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-2.602</td>
<td>0.4658</td>
<td>-0.0452</td>
<td>0.6461</td>
<td>0.0702</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(-0.697)</td>
<td>(1.393)</td>
<td>(-2.162)</td>
<td>(3.19)</td>
<td>(0.332)</td>
</tr>
</tbody>
</table>

*Significance level at 10%  
**Significance level at 5%  

\(R^2 = 0.9905; F\)-statistic \((4, 6) = 156.513; D-W statistic = 1.8017\)

### Exhibit 4.1.12: OLS Estimates for 1994-2004

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>(\ln YR_t)</th>
<th>(r_t)</th>
<th>(\ln PBO_t)</th>
<th>(\ln RM2_{t-1})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-5.983</td>
<td>1.0877</td>
<td>-0.044</td>
<td>0.1327</td>
<td>0.2624</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(-1.532)</td>
<td>(2.954)</td>
<td>(-1.933)</td>
<td>(0.774)</td>
<td>(1.439)</td>
</tr>
</tbody>
</table>

**Significance level at 5%  

\(R^2 = 0.9941; F\)-statistic \((4, 6) = 253.815; D-W statistic = 1.4054\)
The regression equations presented in Exhibit 4.1.11 show that the short-term income elasticity of real narrow money ($RM1$) and real broad money ($RM2$) are 0.47 and 1.08 respectively. Exhibit 4.1.12 shows the long-term income elasticity of real narrow money is 1.23, whereas long-term income elasticity of real broad money is 1.71. It indicates the both short-term and long-term income elasticity of $RM2$ exceeds that of $RM1$.

$R^2$ and $F$-statistic of each equation are satisfactory in Exhibit 4.1.11. The $D-W$ statistic of the equations for $RM1$ and $RM2$ in Exhibit 4.1.12 are 0.6637 and 1.1697, and these raise a doubt whether these regressions are spurious regression. As explained earlier, the computed $D-W$ statistic exceed the critical values of Durbin-Watson (CRDW) test at all levels. Thus, the regressions are only co-integrated and not spurious. Their $t$-statistic and $F$-statistic are valid.

The $t$-statistic of real income in equation (4.1.1.12) is significant at 5 percent level, whereas $t$-statistic of real income in equations relating to long-term elasticity of $RM1$ and $RM2$ in Exhibit 4.1.12 are significant at 10 percent and 1 percent respectively.

The $t$-statistic of interest rate ($r$) in equation (4.1.1.11) is significant and the coefficient has negative value. It confirms to theoretical postulation that interest reduces demand deposits, which is non-interest bearing deposit. For the equation relating to long-term elasticity of $RM1$ in Exhibit 4.1.12, coefficient for interest rate is negative but it is statistically insignificant. The coefficients of interest rate ($r$) in equation (4.1.1.12) relating to $RM2$, and in equation relating to long-term elasticity of $RM2$ in Exhibit 4.1.12 are opposite to the theoretical hypotheses. The interest on time-deposit should give positive value to the coefficient because interest rate on time-deposit encourages or induces people to divert their non-interest bearing deposits, such as demand-deposit, to time-deposits which is interest-bearing deposit. Therefore, time deposits should grow and demand deposits should decrease.

The population per bank branch ($PBO$), which is used as proxy of financial development, gives expected result of positive contribution to $RM2$ in equation (4.1.1.12). However, contribution is statistically insignificant.

In short, during the study period (FY 1974/75 to FY 2003/04), and recent past period (FY 1993/94 to FY 2003/04), the short-run and long run elasticity of real income is good for both $M1$ and $M2$. However, both short-run and long run elasticity of $M2$ is greater
than $M1$. The other variables are weak, having poor $t$-statistic, and they do not have any meaningful influence.

4.1.2 Velocity of Money

Velocity of money is the reciprocal of demand for money expressed as a ratio of income. If velocity is predictable, it becomes easier to conduct monetary policy. Empirical finding is that the secular behavior of velocity generally follows a U-shape.\textsuperscript{162} It declines initially, has a flat segment afterwards, and then begins to rise. This behavior of velocity depends on the level of development of countries. There is a falling velocity in low-income countries, rising velocity in high-income countries, and relatively constant velocity in middle-income countries. The tendency of velocity of money seems to be influenced by the development of financial structure and its sophistication, financial innovation, increasing use of private sector created money substitutes, and the level of development.

4.1.2.1 Empirical Studies relating to Nepal

Though there are some studies dealing with money demand function and money supply, there is not a single study done in the area of velocity of money in Nepal.

4.1.2.2 Model Specification for Nepal

The income velocity of the money is derived by dividing the national income by money supply. It means:

\begin{align*}
V_1 &= \frac{\text{National Income}}{\text{Narrow money supply}} = \frac{Y}{M1} \quad (4.1.2.1) \\
V_2 &= \frac{\text{National Income}}{\text{Broad money supply}} = \frac{Y}{M2} \quad (4.1.2.2)
\end{align*}

Where, $V_1 =$ Income velocity of Narrow money supply; $V_2 =$ Income velocity of Broad money supply

The behavioral equations of income velocity of money take the following forms:

\[
\ln V_1 = \alpha_0 + \alpha_1 \ln YR_t + \alpha_2 r_t + \alpha_3 \ln PBO_t + \alpha_4 \ln \Delta RM_{1,t-1} \\
\ln V_2 = \alpha_0 + \alpha_1 \ln YR_t + \alpha_2 r_t + \alpha_3 \ln PBO_t + \alpha_4 \ln \Delta RM_{2,t-1}
\] 

(4.1.2.3)

(4.1.2.4)

Where,
\[\ln\] represents natural log;
\[YR_t\] = Real Income;
\[r_t\] = Interest rate;
\[PBO_t\] = Population per Bank branch;
\[\Delta RM_{1,t-1}\] = 1-year lag of first difference of real narrow money;
\[\Delta RM_{2,t-1}\] = 1-year lag of first difference of real broad money;

If the real income elasticity of the money demand exceeds unity, the real income elasticity of velocity takes negative course. Likewise, if the interest elasticity of the money demand is negative, the velocity of money takes positive course. Theoretically, interest attracts deposits in the banking sector and money stock increases. In such a situation, velocity takes negative course. When bank branches expand, they increase bank deposits; hence the velocity takes negative course.

In the present study, instead of number of bank branches, population per bank branch \([PBO]\) is made use of. As a result of insurgency, the number of bank branches declined in the later phases of the study and it is contradictory to \textit{priori} postulation. Thus, population per bank branch \([PBO]\) is better suited to indicate financial development. The \textit{GDP} deflator is applied to convert nominal income into real terms.

\textbf{4.1.2.3 Data}

Data for real income and \textit{GDP} deflator are taken from various issues of the Economic Survey published by the Finance Ministry, the His Majesty’s Government of Nepal. The population data has been taken from the Statistical Year Book published by the Central Bureau of Statistics, Kathmandu. Data for narrow money, broad money, interest rate for 1-year deposit, and number of commercial bank branches are taken from various issues of the Quarterly Economic Bulletin, published by the Nepal Rastra Bank.
4.1.2.4 Empirical Analysis

A simple time trend equation is run for both $V_1$ and $V_2$. The following results were obtained and $t$-statistic of each parameter is given in the parenthesis.


<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>Time trend</th>
<th>Variable</th>
<th>Const</th>
<th>Time trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>10.291</td>
<td>-0.1767</td>
<td>Coefficient</td>
<td>5.667</td>
<td>-0.1332</td>
</tr>
<tr>
<td>$t$-statistic</td>
<td>(37.89)</td>
<td>(-11.553)</td>
<td>$t$-statistic</td>
<td>(21.002)</td>
<td>(-8.761)</td>
</tr>
<tr>
<td><strong>Significance level at</strong></td>
<td>(1%)</td>
<td>(1%)</td>
<td><strong>Significance level at</strong></td>
<td>(1%)</td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.8266; $D-W$ statistic = 0.6389</td>
<td>$R^2$</td>
<td>0.7327; $D-W$ statistic = 0.3025</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These equations confirm a declining trend for velocity of both narrow money ($M1$) and broad money ($M2$). The continuous fall in the velocity in Nepal puts it in the category of low-income countries according to norm or finding established by Bordo and Jonung.

Graph 4.3: Income Velocities of M1 and M2

Source: Table 4.1.1
The income velocity of both $V_1$ and $V_2$ is presented in Graph 4.3 above. It shows that the decline of $V_2$ is steeper than that of $V_1$. During the period from 1974/75 to 2003/04, $V_1$ has a moderate declining trend after 1977. However, there are numerous bumps in $V_1$ but its ultimate trend is declining. The declining trend of $V_2$ after 1977 is rather smooth over the years after recording a sharp drop during 1975 and 1976.

The following results are obtained when the regression equations, as specified earlier, are used to estimate the $V_1$ and $V_2$ for Nepal. Exhibit 4.1.14 provides the regression results for $V_1$ and Exhibit 4.1.15 lists the regression results for $V_2$.

**Exhibit 4.1.14: OLS estimates for 1977-2004**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>$t$-statistic</th>
<th>Significance at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>11.2778</td>
<td>(4.2588) ***</td>
<td>(1% level)</td>
</tr>
<tr>
<td>$\ln YR_t$</td>
<td>-0.5690</td>
<td>(-4.8285) ***</td>
<td>(1% level)</td>
</tr>
<tr>
<td>$r_t$</td>
<td>-0.0189</td>
<td>(-1.1514)</td>
<td></td>
</tr>
<tr>
<td>$\ln PBO_t$</td>
<td>-0.2145</td>
<td>(-1.8306)</td>
<td></td>
</tr>
<tr>
<td>$\ln \Delta RM_{t-1}$</td>
<td>0.0010</td>
<td>(0.0823)</td>
<td></td>
</tr>
</tbody>
</table>

$R^2 = 0.90790; F$-statistic $(4, 22) = 54.2191$;

**Exhibit 4.1.15: OLS estimates for 1977-2004**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>$t$-statistic</th>
<th>Significance at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>3.07578</td>
<td>(0.7987)</td>
<td></td>
</tr>
<tr>
<td>$\ln YR_t$</td>
<td>-0.59145</td>
<td>(-3.3895) ***</td>
<td>(1% level)</td>
</tr>
<tr>
<td>$r_t$</td>
<td>0.01136</td>
<td>(0.5278)</td>
<td></td>
</tr>
<tr>
<td>$\ln PBO_t$</td>
<td>0.46364</td>
<td>(2.6454) **</td>
<td>(5% level)</td>
</tr>
<tr>
<td>$\ln \Delta RM_{2,t-1}$</td>
<td>0.00581</td>
<td>(0.1849)</td>
<td></td>
</tr>
</tbody>
</table>

$R^2 = 0.91957; F$-statistic $(4, 22) = 62.8864$;

The empirical findings in Exhibits 4.1.14 and 4.1.15 show that about 90 percent of both $V_1$ and $V_2$ are explained in the variables included in the regression equations. The income elasticity of $V_1$ is -0.569 and that of $V_2$ is -0.591. From Graph 4.4, it is evident that the rate of monetary expansion is greater than the rate of income growth in real term; thus,
both $V_1$ and $V_2$ show negative signs. $V_2$ decreases more than $V_1$ when real income increases.

**Graph 4.4: Growth Rate of Real GDP, M1 and M2**

![Graph 4.4: Growth Rate of Real GDP, M1 and M2](image)

*Source: Table 4.1.1*

The estimated equations show expected signs of coefficient in interest rate elasticity of both $V_1$ and $V_2$, but coefficients of these variables are very weak and *t-statistic* are statistically insignificant. The population per bank office ($PBO$), a proxy for financial development is statistically significant for $V_2$ at 5 percent level, it is not statistically significant for $V_1$. Thus, it can be inferred that the branch expansion in Nepal caused velocity of money to take positive course.

The velocity of money with regard to the structural break, as shown by the CUMSUM-Squared tests and the Chow’s test, is also analyzed. The data is sub-divided into two periods, from FY 1974/75 to FY 1992/93, and from FY 1993/94 to FY 2003/04. The regression results are given in Exhibits 4.1.16 and 4.1.17, and *t-statistic* of each parameter is given in the parenthesis.

**Exhibit 4.1.16: OLS Estimates for 1977-1993**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>$\ln YR_t$</th>
<th>$r_t$</th>
<th>$\ln PBO_t$</th>
<th>$\ln \Delta RM_{1,t-1}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>4.3578</td>
<td>-0.3396</td>
<td>-0.017</td>
<td>0.1643</td>
<td>0.0191</td>
</tr>
<tr>
<td>$t$-statistic</td>
<td>(1.318)</td>
<td>(-2.444)</td>
<td>(-1.182)</td>
<td>(1.083)</td>
<td>(1.4918)</td>
</tr>
</tbody>
</table>

**Significance level at 5%**

$R^2 = 0.8701; F$-statistic (4, 12) = 20.0998; $D-W$ statistic = 2.20767;

Dependent variable $\ln V_2$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>$\ln YR_t$</th>
<th>$r_t$</th>
<th>$\ln PBO_t$</th>
<th>$\ln \Delta RM_{2,t-1}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>0.0061</td>
<td>-0.4408</td>
<td>0.00401</td>
<td>0.5730</td>
<td>0.0345</td>
</tr>
<tr>
<td>$t$-statistic</td>
<td>(0.0013)</td>
<td>(-2.1779)</td>
<td>(0.212)</td>
<td>(2.571)</td>
<td>(1.1624)</td>
</tr>
</tbody>
</table>

**Significance level at 10% 5%**

$R^2 = 0.9275; F$-statistic (4, 12) = 38.3613; $D-W$ statistic = 1.32234

The empirical findings in Exhibit 4.1.16 show that about 87 percent of $V_1$ and about 93 percent of $V_2$ are explained. The income elasticity of $V_1$ is -0.3396 and that of $V_2$ is -0.4408; and they are statistically significant at 5 percent level and 10 percent level.

The estimated equations show expected signs of coefficient in interest rate elasticity of both $V_1$ and $V_2$, but $t$-statistic of these variables are very weak and insignificant. The population per bank office ($PBO$) is a proxy for financial development. Whereas $PBO$ is statistically significant for $V_2$ at 5 percent level, it is not statistically significant for $V_1$. Thus, it can be inferred that the branch expansion in Nepal caused velocity of money to take positive course during this period.
Exhibit 4.1.17: OLS Estimates for 1994-2004

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>6.865</td>
<td>(1.347)</td>
</tr>
<tr>
<td>$lnYR_i$</td>
<td>0.212</td>
<td>(0.587)</td>
</tr>
<tr>
<td>$r_i$</td>
<td>0.022</td>
<td>(0.689)</td>
</tr>
<tr>
<td>$lnPBO_i$</td>
<td>-0.705</td>
<td>(-5.856)</td>
</tr>
<tr>
<td>$ln\Delta RM_{1,t-1}$</td>
<td>-0.027</td>
<td>(-1.622)</td>
</tr>
</tbody>
</table>

Significance level at 1%

$R^2 = 0.9788; F$-statistic $(4, 5) = 49.8089$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>5.452</td>
<td>(0.412)</td>
</tr>
<tr>
<td>$lnYR_i$</td>
<td>-1.221</td>
<td>(-1.091)</td>
</tr>
<tr>
<td>$r_i$</td>
<td>-0.012</td>
<td>(-0.145)</td>
</tr>
<tr>
<td>$lnPBO_i$</td>
<td>0.966</td>
<td>(1.808)</td>
</tr>
<tr>
<td>$ln\Delta RM_{2,t-1}$</td>
<td>0.018</td>
<td>(0.198)</td>
</tr>
</tbody>
</table>

Significance level at 1%

$R^2 = 0.4479; F$-statistic $(4, 5) = 1.0142$

The empirical findings for the period from 1977 to 2004, and from 1977 to 1994 (or period before the structural break), are that $R^2$ and $D-W$ statistic for both $V_1$ and $V_2$ are quite significant. It was seen that $V_1$ and $V_2$ were influenced by real income ($YR$) and population per bank-office ($PBO$).

The second period, from 1994 to 2004, is more important for policy formulation and prescription. During this period, as shown in Exhibit 4.1.17, though $t$-statistic is not significant for both $V_1$ and $V_2$, coefficient of real income for $V_1$ is positive and coefficient of real income for $V_2$ is negative. The rate of growth of $M2$ seemed to be greater than that of real income causing $V_2$ to decline.

When the empirical findings between two phases are compared, the coefficients of variables relating to $V_2$ appear consistent and provide similar results. At the same time, variables relating to $V_1$ have given coefficients with different signs in two periods. Therefore, $V_2$ appears to be more predictable.
4.1.2.5  Velocity Behavior in Nepal

An important question arises whether velocity behavior in Nepal shows features of a random walk. If velocity shows random walk feature, then only the current value of velocity can be used to predict that of the next period. In other words, past values of velocity would have no predictive ability. In time-series economics, a time-series that has a unit-root is known as a random-walk time-series. The test for a unit-root is based on \( t \)-statistic on the coefficient of the lagged dependent variable, \( Y_{t-1} \). If this is greater than the critical value, then the null hypothesis of a unit root or random walk is rejected, and the variable is taken to be stationary. However, the critical values are not the ones used in normal \( t \)-tests. The critical values must be calculated specifically for unit-root tests.

In order to find out whether velocity in Nepal has random walk feature the Dickey-Fuller Test (\( D-F \) Test) is conducted using following equations.

\[
\Delta Y_t = \delta Y_{t-1} + u_t \quad (4.1.2.5)
\]
\[
\Delta Y_t = \beta + \delta Y_{t-1} + u_t \quad (4.1.2.6)
\]

Where \( \Delta Y_t \) = First difference operator of \( Y_t \) and \( Y_{t-1} \) = One period lag of \( Y_t \)

When the \( D-F \) test is conducted without constant (equation 4.1.2.5), \( t \)-statistic of independent variable (here, 1-year lag of first difference of \( V_1 \)) is -3.02444. The test critical values are -2.6747, -1.9529, and -1.61001 at 1%, 5% and 10% level. Since computed \( t \)-statistic exceeds the test critical values at all levels, the hypothesis that \( V_1 \) shows a feature of random walk can be rejected. When the \( D-F \) test is conducted by including constant (equation 4.1.2.6), the \( t \)-statistic of independent variable (1-year lag of first difference of \( V_1 \)) is -3.0042 and it exceeds the test critical value of -2.9678 at 5 percent level.

Similarly, when the \( D-F \) test is conducted for \( V_2 \) by excluding constant (equation 4.1.2.5), \( t \)-statistic is -4.5655 and it exceeds the test critical values at all levels. When the \( D-F \) test is conducted by including constant (equation 4.1.2.6), \( t \)-statistic is -6.3638 and it exceeds the test critical values at all levels. Since computed \( t \)-statistic exceeds the test critical values at all levels in both tests (excluding and including constant), it can be conclusively rejected the hypothesis that \( V_2 \) shows a feature of random walk.
Thus, both $V_1$ and $V_2$ are stationary and do not exhibit random walk. The past values of velocity have predictive power that can be used as policy instruments for the purpose of monetary management in Nepal.

4.1.3 Money Supply Analysis

It is widely recognized that money supply is an important variable for achieving the objectives of monetary policy. Variation in the money supply is the means to meet the demand for money as well as variation in the income velocity of money. As mentioned in Chapter Two, the central bank has complete control over the issue of currency but it does not have complete control over money supply. Deposits are a part of money supply. The commercial banks and private sector may participate to multiply demand deposits through extension of bank credit to borrowers and later they can open current account in the banks out of the amount of loans received to conduct their business transactions. Hence, the central bank’s control over the money supply can be said to be relatively weak.

The central bank, through execution of its monetary measures, endeavors to limit the expansion or contraction of money supply to bring about an orderly change in the stock of money, which is consistent with the goals of rapid economic growth with stability in the value of money.

This section presents money multiplier and its determinants, the relationship between money-multiplier and high-powered money, relative contribution of different factors to high-powered money, and the monetary policy target.

4.1.3.1 Empirical Studies relating to Nepal

In the context of Nepal, Khatiwada\textsuperscript{163} has examined the money-multiplier by using the data for the period 1965-1990. According to him, the marginal money-multiplier shows that one rupee change in disposable high-powered money ($DH$) causes a 1.31 rupee change in $M1$, but there is serial co-relation in the residuals, which is corrected with Cochrane-Orcutt method. The first difference of the series has a good fit. The incremental multiplier ($\Delta m$) is about 7 percent during the above period. It is highest at 15 percent

\textsuperscript{163} Khatiwada, Y.R., \textit{op. cit.}, pp 14-47
during 1966-70. The hypothesis that fluctuations in $H$ are counteracted by fluctuation in $m$ in the opposite direction is not proved in the case of Nepal as “…our evidence has only a partial support to this hypothesis, as in many years of cyclical fluctuation in $H$, $m$ has fluctuated in the same direction rather than in opposite one.” He also examined the components of money-multiplier separately, i.e. currency-ratio, time-deposit ratio, and reserve-deposit ratio. In the case of Nepal, his findings show that currency-ratio is positively related with the level of real income, negatively related with interest rate, and expansion of banking branches has no significant effect. In the case of time-deposit ratio, interest rate variable does not exhibit significant effect and expected rate of inflation has negative effect. As regard to excess-reserve ratio, it is not affected by interest rates but by the composition of deposits and the ratio of total loans and advances to total liabilities.

In a study by Sharma regarding Nepal, he finds stable currency-ratio, stabilizing role of money-multiplier, and the strong relationship prevailing between the high-powered money and the supply of demand deposits. In other words, since the elasticity of supply of demand deposits with respect to $H$ is almost unity and the money-multiplier tends to stabilize the effect of $H$ on money supply, the policy to regulate the reserve base of commercial banks from the supply side is an appropriate approach to keep money supply under control.

4.1.3.2 Model Specification for Nepal

The money-multiplier model generally captures the action of three major players in the money supply process - the central bank through its setting of the creation of the monetary base; the public through their portfolio decisions, which determine the currency-deposit ratio; and the commercial banks through their decisions on the excess reserves. However, the excess reserves are excluded from the model because their creation are not voluntary, but unintentional on the part of a commercial bank. In respect of India, Ragarajan comments, “…in fact, the Indian commercial banks do not voluntary hold any excess reserves and whatever excess reserves they may be holding are involuntary, due to

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165 Khatiwada, Y.R., op. cit., p 22
166 Sharma, G.N., op. cit., p 194
inadequate facilities for quick transmission of funds from far flung places. This observation holds good for Nepal too.

4.1.3.2.1 Money-Multiplier and High powered Money

In a simple term, money-multiplier is the ratio of reserve-money or monetary base or high-powered to money supply. In Nepal, reserve money consists of currency held by the private sector and commercial banks, and deposits of private sector and commercial banks held by the Nepal Rastra Bank.

The relationship of reserve money with money supply can be explained by the following equations:

\[
M_1 = \alpha_0 + \alpha_1 H_i \tag{4.1.3.1}
\]
\[
\Delta M_1 = \alpha_0 + \alpha_1 \Delta H_i \tag{4.1.3.2}
\]
\[
M_2 = \alpha_0 + \alpha_1 H_i \tag{4.1.3.3}
\]
\[
\Delta M_2 = \alpha_0 + \alpha_1 \Delta H_i \tag{4.1.3.4}
\]

Where,

\( M_1 \) = Narrow money stock;

\( M_2 \) = Broad money stock;

\( H_i \) = High-powered money stock;

\( \Delta M_1 \) = First difference of Narrow money stock;

\( \Delta M_2 \) = First difference of Broad money stock;

\( \Delta H_i \) = First difference of High-powered money stock;

4.1.3.2.2 Sources of High powered Money

The sources of high-powered money can be calculated from the balance sheet identity of the central bank. The identity is based on the relationship between Net Foreign Assets (NFA), Net Claims on Government (NCG), Claims on Enterprises (CENT), Claims on Commercial Banks (CCB), and Claims on Private Sector (CPSEC).

---

It is given below:

\[ H_i = NFA_i + NCG_i + CENT_i + CCB_i + CPSEC_i \pm NAL_i \] (4.1.3.5)

Where,

- \( NFA_i \) = Net Foreign Assets;
- \( NCG_i \) = Net Claims on Government;
- \( CENT_i \) = Claims on Enterprises;
- \( CCB_i \) = Claims on Commercial Banks;
- \( CPSEC_i \) = Claims on Private Sector;
- \( NAL_i \) = Net of Assets over Liabilities, or vice versa

The relative contribution to \( \Delta H_i \) (first difference of high-powered money) of the aforementioned variables in equation can be derived by dividing \( \Delta H_i \) by first differences of aforementioned variables in equation.

### 4.1.3.2.3 Determinants of Money-Multiplier

The determinants of money multiplier are currency, time deposits, reserves, and other deposit ratios. The changes in multiplier are derived from the changes in these ratios. The following equations\(^{169}\) determine the money multiplier.

\[
M1_i = m_1 \times H = \frac{1 + cdr}{rd + cdr} \times H \tag{4.1.3.6}
\]

\[
\Delta M1_i = \Delta m_1 \times \Delta H = \frac{1 + cdr}{rd + cdr} \times \Delta H \tag{4.1.3.7}
\]

\[
M2_i = m_2 \times H = \frac{1 + cdr + tdr}{rd + cdr} \times H \tag{4.1.3.8}
\]

\[
\Delta M2_i = \Delta m_2 \times \Delta H = \frac{1 + cdr + tdr}{rd + cdr} \times \Delta H \tag{4.1.3.9}
\]

Where,

- \( m_1 \) = Money multiplier of narrow money (\( M1 \));
- \( \Delta m_1 \) = Incremental Money multiplier of narrow money (\( M1 \));
- \( m_2 \) = Money multiplier of broad money (\( M2 \));
- \( \Delta m_2 \) = Incremental Money multiplier of broad money (\( M2 \));
- \( cdr \) = Currency to Demand Deposits ratio; \( rd \) = Reserves to Total Deposits ratio;
- \( tdr \) = Time Deposits to Demand Deposits ratio;

\(^{169}\) Excess reserves are excluded. Only total reserve is counted. Money market component is not included in the equation. Excluding these, other variables are based on Baye and Jansen, *op. cit.*, pp. 470-73
The behavioral equations of the determinants of the money-multiplier are specified below:

\[
\frac{C}{DD_t} = \alpha_0 + \alpha_1 \ln YR_t + \alpha_2 r_t + \alpha_3 \ln PBO_t + \alpha_4 \text{TREND} + \alpha_5 \frac{C}{DD_{t-1}} \tag{4.1.3.10}
\]

\[
\frac{TD}{DD_t} = \alpha_0 + \alpha_1 \ln YR_t + \alpha_2 r_t + \alpha_3 \Delta ifr_{t-1} + \alpha_4 \ln PBO_t + \alpha_5 \frac{TD}{DD_{t-1}} \tag{4.1.3.11}
\]

\[
\frac{RES}{D_t} = \alpha_0 + \alpha_1 \ln YR_t + \alpha_2 r_t + \alpha_3 \frac{RES}{D_{t-1}} \tag{4.1.3.12}
\]

Where, \(\ln\) represents natural log;
\(C_t = \) Currency held by the public;
\(DD_t = \) Demand deposits;
\(TD_t = \) Time Deposits;
\(RES_t = \) Reserves;
\(D_t = \) Total Deposits;
\(YR_t = \) Real Income;
\(r_t = \) Interest Rate;
\(PBO_t = \) Population per Bank branch;
\(\Delta ifr_{t-1} = 1\text{-year lag of Inflation rate;}

A rise in the \(C/DD_t\) ratio has contraction effect on money supply and a rise in \(TD/DD_t\) ratio causes expansion in \(M2_t\) but contraction in \(M1_t\). Likewise, an increase in \(RES/D_t\) ratio causes contraction in both \(M1\) and \(M2\).

### 4.1.3.3 Empirical Analysis

This subsection presents the empirical analysis wherein the relationship between money-multiplier and high-powered money will be looked into by estimating equations (4.1.3.1) to (4.1.3.4). Secondly, the contribution of different variables to high-powered money will be analyzed by estimating equations (4.1.3.5). Lastly, the money-multiplier determinant in the Nepalese context will be analyzed by estimating equations (4.1.3.10) to (4.1.3.12).
4.1.3.3.1 Relationship between Money-Multiplier and High-powered Money

The regression estimations of narrow-money multipliers \(m_1\) and \(\Delta m_1\) and broad-money multipliers \(m_2\) and \(\Delta m_2\) are presented in Exhibits 4.1.18 and 4.1.19 respectively. The \(t\)-statistic of each parameter is given in the parenthesis.

### Exhibit 4.1.18: OLS estimates for Narrow-money Multiplier

<table>
<thead>
<tr>
<th>Period: 1975-2004: Dependent variable: (M1),</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Variable)</td>
</tr>
<tr>
<td>(Coefficient)</td>
</tr>
<tr>
<td>(t)-statistic</td>
</tr>
</tbody>
</table>

\(R^2 = 0.99877; \ D-W \ statistic = 1.727;\)

### Exhibit 4.1.19: OLS estimates for Broad-money Multiplier

<table>
<thead>
<tr>
<th>Period: 1976-2004: Dependent variable: (\Delta M1),</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Variable)</td>
</tr>
<tr>
<td>(Coefficient)</td>
</tr>
<tr>
<td>(t)-statistic</td>
</tr>
</tbody>
</table>

\(R^2 = 0.838816; \ D-W \ statistic = 2.748;\)

*Note: *** denotes significance level at 1%*

### Exhibit 4.1.18: OLS estimates for Narrow-money Multiplier

<table>
<thead>
<tr>
<th>Period: 1975-2004: Dependent variable: (M2),</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Variable)</td>
</tr>
<tr>
<td>(Coefficient)</td>
</tr>
<tr>
<td>(t)-statistic</td>
</tr>
</tbody>
</table>

\(R^2 = 0.9942; \ D-W \ statistic = 0.64376;\)

### Exhibit 4.1.19: OLS estimates for Broad-money Multiplier

<table>
<thead>
<tr>
<th>Period: 1976-2004: Dependent variable: (\Delta M2),</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Variable)</td>
</tr>
<tr>
<td>(Coefficient)</td>
</tr>
<tr>
<td>(t)-statistic</td>
</tr>
</tbody>
</table>

\(R^2 = 0.75196; \ D-W \ statistic = 2.39761;\)
In Exhibits 4.1.18 and 4.1.19, the high-powered money explains 99.87 percent and 99.41 percent of the behavior of \( M_1 \) and \( M_2 \) respectively. The \( t \)-statistic of both are significant. \( D-W \) statistic of \( M_1 \) is significant but it is weak for \( M_2 \). The above estimation exhibits that the elasticity of \( H \) to \( M_1 \) is 1.00053 (almost unity). Likewise, the elasticity of \( H \) to \( M_2 \) is 3.00553. The results indicate that money multiplier of \( M_2 \) exceeds that of \( M_1 \).

The incremental money multipliers have been calculated for \( M_1 \) in Exhibit 4.1.18 and for \( M_2 \) in Exhibit 4.1.19. They show that 1 percent increase in \( H \) causes about 0.911 percent growth in \( M_1 \) and about 2.832 percent growth in \( M_2 \).

Empirical findings suggest that the long-term money multiplier of \( M_1 \), with 1.00053, exceeds its incremental money multiplier with 0.911. In other words, it has declined. Likewise, the long-term money multiplier at 3.00553 exceeds its incremental money multiplier of \( M_2 \) with 2.832. This clearly indicates that the money multiplier has increased on account of growth of time deposits at a greater rate. In the equations (4.1.3.2) and (4.1.3.4), relating to incremental money multipliers of \( M_1 \) and \( M_2 \), \( R^2 \) and \( D-W \) statistic are statistically significant. Moreover, while comparing \( D-W \) statistic of 0.6437 and 2.3976 in equations relating to long-term and incremental money-multipliers of \( M_2 \), it suggests that the data for \( M_2 \) is stationary and not auto-correlated.

The behavior of money-multipliers, both long-term and incremental, on the basis of structural break is also analyzed. Exhibit 4.1.20 provides the results of the re-estimated equations in a consolidated basis.

**Exhibit 4.1.20: OLS estimates for Narrow-money and Broad-money Multipliers**

<table>
<thead>
<tr>
<th>Period</th>
<th>( M_1 )</th>
<th>( \Delta M_1 )</th>
<th>( M_2 )</th>
<th>( \Delta M_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-1993</td>
<td>423.39</td>
<td>200.35</td>
<td>-538.67</td>
<td>212.08</td>
</tr>
<tr>
<td></td>
<td>(4.27)</td>
<td>(1.61)</td>
<td>(-2.45)</td>
<td>(0.73)</td>
</tr>
<tr>
<td></td>
<td>0.978</td>
<td>0.9024</td>
<td>2.384</td>
<td>2.25</td>
</tr>
<tr>
<td></td>
<td>(97.14)</td>
<td>(12.16)</td>
<td>(106.78)</td>
<td>(14.61)</td>
</tr>
<tr>
<td></td>
<td>0.9982</td>
<td>0.9985</td>
<td>0.9980</td>
<td>0.9303</td>
</tr>
<tr>
<td></td>
<td>2.272</td>
<td>1.859</td>
<td>2.294</td>
<td></td>
</tr>
</tbody>
</table>

| 1994-2004| -1432.46  | 2229.33         | -24860.8  | 8597.46         |
|          | (-1.05)   | (1.59)          | (-4.50)   | (1.49)          |
|          | 1.025     | 0.68            | 3.308     | 1.86            |
|          | (45.13)   | (3.27)          | (35.96)   | (2.19)          |
|          | 0.9956    | 0.5436          | 0.9931    | 0.3483          |
|          | 2.012     | 2.275           | 2.088     | 2.029           |
Exhibit 4.1.20 reveals that the long-term money multipliers of $M_1$ and $M_2$ have increased. The increase in money-multiplier of $M_2$ during 1994-2004 is significant. However, incremental money-multipliers for both $M_1$ and $M_2$, when compared between two periods, have registered decline.

**Graph 4.5: Money Multipliers of $M_1$**

![Graph 4.5: Money Multipliers of $M_1$]

*Source: Table 4.1.1*

**Graph 4.6: Money Multipliers of $M_2$**

![Graph 4.6: Money Multipliers of $M_2$]

*Source: Exhibit 4.1.21*
The average behavior of money multipliers of $M_1$ and $M_2$ ($m_1$ and $m_2$) and incremental money multipliers of $M_1$ and $M_2$ ($\Delta m_1$ and $\Delta m_2$) are given in the Exhibit 4.1.21.

**Exhibit 4.1.21: Average Money Multipliers of $M_1$ and $M_2$**

<table>
<thead>
<tr>
<th>Period</th>
<th>Long-term multipliers</th>
<th>Incremental multipliers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$m_1$</td>
<td>$m_2$</td>
</tr>
<tr>
<td>1975-1979</td>
<td>1.15</td>
<td>1.98</td>
</tr>
<tr>
<td>1980-1984</td>
<td>1.11</td>
<td>2.25</td>
</tr>
<tr>
<td>1985-1989</td>
<td>1.06</td>
<td>2.34</td>
</tr>
<tr>
<td>1990-1994</td>
<td>1.00</td>
<td>2.36</td>
</tr>
<tr>
<td>1995-1999</td>
<td>0.99</td>
<td>2.66</td>
</tr>
<tr>
<td>2000-2004</td>
<td>1.01</td>
<td>3.00</td>
</tr>
<tr>
<td><strong>Average:</strong></td>
<td>1.052</td>
<td>2.431</td>
</tr>
</tbody>
</table>

From Exhibit 4.1.21, it is clear that $m_1$ recorded a continuous decline and $m_2$ recorded a continuous increase during the period 1975 to 2004. However, the average incremental-multiplier ($\Delta m_1$) exhibited a decline after 1976-79 to 1980-1984, remained constant for the period from 1985 to 1994, again declined during the period from 1995-1999, and thereafter, it increased in 2000-2004. The average incremental multiplier ($\Delta m_2$) declined from 1980 to 1989, and later, it has recorded a rapid growth in the subsequent period. Graphs 4.5 and 4.6 show the graphical representation of trend of money-multipliers in Nepal.

Graph 4.5 shows that the money-multiplier of $M_1$, $m_1$, exhibits some fluctuation between the period of 1977 and 1982 after which it has registered a continuous mild declining trend with mild fluctuations in between. There has been slight increase in $m_1$ after 2002. On contrary, $m_2$ has registered a rather smooth upward trend during the period from 1975 to 2004 as shown in Graph 4.6. The strong upward trend from 1997 to 2001 in $m_2$ is contributed by strong upsurge in time deposits of the banking sector, which are part of $M_2$. After a decline lasting about one year, $m_2$ again surged upwards. The reason is perhaps increased inflow of remittances from the Nepalese working abroad.
Exhibit 4.1.21 reveals that the average $m_2$ is 2.431 for the period from 1975 to 2004; and $m_2$ for the periods 1995-1999 and 2000-2004 exceeds this average suggesting strong growth in time deposits.

The incremental money-multipliers, $\Delta m_1$ and $\Delta m_2$, are volatile; however, volatility of $\Delta m_1$ is more than that of $\Delta m_2$. The volatility in $\Delta m_1$ is sharper above and below the long-term money-multiplier line, $m_1$ as shown in Fig. 4.5. Though $\Delta m_2$ has also registered volatility in its movement, its upswing is sharp but downswing is rather weak along the long-term $m_2$ curve (Fig. 4.6). Such volatility in $\Delta m_1$ may put difficulty before the monetary management authority to influence it through instruments.

### 4.1.3.3.2 Relative Contribution of different Variables to High-powered Money

Exhibit 4.1.22 shows the average relative contribution of different factors to high-powered money or reserve money. From the Exhibit, it is clear that the main contributing factors to reserve money expansion are Net Foreign Assets (NFA) and Net Claims on the Government (NCG) and the contraction factor is Net Others (NAL) during the period 1975-2004.

The average contribution of NFA and NCG to the reserve money during the said period is about 80 per cent and 50 per cent respectively. It reveals the government’s heavy dependence on the central bank to finance its expenditure. During the period 1985-1989, it peaked to about 78 percent, which came down at about 30 percent in 2000-2004. NFA registered a gradual decline from 91 per cent during 1975-1979 to 54 per cent during 1980-84 and further declined to 35 per cent during 1985-1989. However, after 1985-1989, it witnessed an upward trend and reached to 108 percent during 2000-2004. In fact, international reserves registered sharp fall for the period from 1982 to 1987 on account of overall balance of payments deficit.

The contributions from other factors, which include Claims on Enterprises (CENT), Claims on Commercial Banks (CCB), and Claims on Private Sector (CPSEC), are negligible. The contribution of these sectors is approximately 15 percent in total to high-powered money variation.
### Exhibit 4.1.22: Contributing Factors to High-Powered Money (in Ratios)

<table>
<thead>
<tr>
<th>Period</th>
<th>NFA</th>
<th>NCG</th>
<th>CENT</th>
<th>CCB</th>
<th>CPSEC</th>
<th>NAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-1979</td>
<td>0.91</td>
<td>0.27</td>
<td>0.13</td>
<td>0.0987</td>
<td>0.0186</td>
<td>-0.4305</td>
</tr>
<tr>
<td>1980-1984</td>
<td>0.54</td>
<td>0.57</td>
<td>0.13</td>
<td>0.0638</td>
<td>0.0191</td>
<td>-0.3236</td>
</tr>
<tr>
<td>1985-1989</td>
<td>0.35</td>
<td>0.78</td>
<td>0.10</td>
<td>0.0494</td>
<td>0.0274</td>
<td>-0.3180</td>
</tr>
<tr>
<td>1990-1994</td>
<td>0.95</td>
<td>0.56</td>
<td>0.03</td>
<td>0.0019</td>
<td>0.0223</td>
<td>-0.5727</td>
</tr>
<tr>
<td>1995-1999</td>
<td>0.95</td>
<td>0.49</td>
<td>0.03</td>
<td>0.0019</td>
<td>0.0271</td>
<td>-0.5053</td>
</tr>
<tr>
<td>2000-2004</td>
<td>1.08</td>
<td>0.30</td>
<td>0.02</td>
<td>0.0066</td>
<td>0.0401</td>
<td>-0.4520</td>
</tr>
</tbody>
</table>

**Average:**

| 1975-2004    | 0.798 | 0.496 | 0.075 | 0.0370 | 0.0257 | -0.4336 |

### Exhibit 4.1.23: Contributing Factors to High-Powered Money on Incremental basis (in Ratios)

<table>
<thead>
<tr>
<th>Period</th>
<th>∆NFA</th>
<th>∆NCG</th>
<th>∆CENT</th>
<th>∆CCB</th>
<th>∆CPSEC</th>
<th>∆NAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976-1979</td>
<td>0.95</td>
<td>0.61</td>
<td>0.23</td>
<td>-0.213</td>
<td>0.011</td>
<td>-0.594</td>
</tr>
<tr>
<td>1980-1984</td>
<td>-0.10</td>
<td>1.11</td>
<td>0.09</td>
<td>-0.0067</td>
<td>0.0252</td>
<td>-0.119</td>
</tr>
<tr>
<td>1985-1989</td>
<td>0.56</td>
<td>0.75</td>
<td>0.03</td>
<td>0.0012</td>
<td>0.0272</td>
<td>-0.3689</td>
</tr>
<tr>
<td>1990-1994</td>
<td>1.57</td>
<td>0.35</td>
<td>-0.02</td>
<td>-0.0077</td>
<td>0.0154</td>
<td>-0.9131</td>
</tr>
<tr>
<td>1995-1999</td>
<td>0.86</td>
<td>0.32</td>
<td>0.05</td>
<td>-0.0010</td>
<td>0.0348</td>
<td>-0.2651</td>
</tr>
<tr>
<td>2000-2004</td>
<td>1.34</td>
<td>-0.09</td>
<td>-0.0021</td>
<td>0.0118</td>
<td>0.0614</td>
<td>-0.3129</td>
</tr>
</tbody>
</table>

**Average:**

| 1976-2004    | 0.86 | 0.51 | 0.0639 | -0.0359 | 0.0291 | -0.4289 |

The flow data is analyzed in the Exhibit 4.1.23. It shows that \( NFA \) and \( NCG \) are the main sources of variation in the reserve money during the period from 1975-2004. From the period 1980 to 1984, \( NFA \) was the contracting factor since it registered 10 percent decline. However, the scenario changed after that and \( NFA \) began to contribute positively. Its elasticity of contribution was as high as 1.57 during 1990-1994 and 1.34 during 2000-2004. Average contribution of \( \Delta NFA \) to \( \Delta H \) was about 86 percent during the study period. The incremental elasticity of contribution of \( \Delta NCG \) to \( \Delta H \) continuously declined from 111 percent in 1980-1984 to minus 9.0 percent during 2000-2004. Total average incremental contribution of \( CENT \), \( CCB \) and \( CPSEC \) hovered below 10 percent during the study-period.
In conclusion, both stock and flow of \textit{NFA} and \textit{NCG} show that they are the major contributors to high-powered money, but flow data shows that \textit{NFA} played dominant role during the periods 1990-1994 and 2000-2004. The position of \textit{NCG} is second in respect of incremental contribution to $\Delta H$. The decline in share of \textit{NCG} was due to gradual decline in credit accommodation to the government by the financial institutions during 2000-2004.

\subsection*{4.1.3.3 Money Multiplier Determinants}

Estimations of behavior equations of the money multiplier determinants for the study period from 1975 to 2004 are given below in Exhibit 4.1.24. The \textit{t-statistic} of each parameter is given in the parenthesis.

\begin{table}[h]
\centering
\caption{Exhibit 4.1.24: OLS Estimates for 1976-2004}
\begin{tabular}{lcccccc}
\hline
\textbf{Variable} & \textbf{Const} & \textbf{ln YR} & \textbf{r} & \textbf{ln PBO} & \textbf{TREND} & \textbf{C/DD$_{t-1}$} \\
\hline
\textbf{Coefficient} & -12.114 & 1.284 & 0.0529 & -0.139 & -0.0286 & 0.1404 \\
\textbf{t-statistic} & (-0.991) & (1.316) & (1.218) & (-0.462) & (-0.707) & (0.737) \\
\hline
\end{tabular}
\end{table}

\textit{R}^2 = 0.5428; \textit{F-statistic} (5, 23) = 5.461; \textit{D-W statistic} = 2.25015;

\begin{table}[h]
\centering
\caption{Dependent variable: TD/ DD$_t$}
\begin{tabular}{lcccccc}
\hline
\textbf{Variable} & \textbf{Const} & \textbf{ln YR} & \textbf{r} & \textbf{ifr$_{t-1}$} & \textbf{ln PBO} & \textbf{TD/ DD$_{t-1}$} \\
\hline
\textbf{Coefficient} & 7.227 & 0.812 & 0.0480 & 0.0143 & -1.469 & 0.5756 \\
\textbf{t-statistic} & (0.221) & (0.642) & (0.2429) & (0.6201) & (-0.868) & (2.769) \\
\hline
\end{tabular}
\end{table}

\textit{R}^2 = 0.7446; \textit{F-statistic} (5, 23) = 13.4082; \textit{D-W statistic} = 1.95923;

\begin{table}[h]
\centering
\caption{Dependent variable: RES/ D$_t$}
\begin{tabular}{lcccc}
\hline
\textbf{Variable} & \textbf{Const} & \textbf{ln YR} & \textbf{r} & \textbf{RES/ D$_{t-1}$} \\
\hline
\textbf{Coefficient} & 2.0696 & -0.1478 & 0.0087 & 0.3155 \\
\textbf{t-statistic} & (3.3379) & (-3.225) & (2.0711) & (3.4484) \\
\hline
\end{tabular}
\end{table}

\textit{R}^2 = 0.9584; \textit{F-statistic} (3, 25) = 191.814; \textit{D-W statistic} = 1.98285;

\textit{Note}: * denotes significance level at 10%; ** at 5%; *** at 1%;
The estimation shows that the real-income elasticity of currency-ratio (\(C/DD\)) is 1.284. This coefficient should be negative theoretically since people will utilize bank services when financial development takes place. The positive coefficient indicates that people in Nepal prefer to hold money in form of cash than as deposits with bank. However, \(t\)-statistic is not powerful. There is still existence of large non-monetized sector. Since most people are illiterate and do not have the courage to go to the banks to open an account, they prefer to hold cash. As a result of adverse security situation in Nepal, holding cash helped people to hide their actual financial position from others and also provided convenience to conduct transactions to meet daily requirements. All other variables have statistically insignificant \(t\)-statistic suggesting they have either very mild or no effect at all.

The empirical result shows that the real income elasticity of time deposits ratio (\(TD/DD\)) is 0.812. Interest rate has expected positive coefficient but it is statistically insignificant suggesting mild effect. The expected inflation rate (\(\Deltaifr\)) should have had negative coefficient theoretically. On the contrary, its coefficient is positive but \(t\)-statistic is statistically insignificant suggesting very negligible effect.

The real-income elasticity of reserves ratio is -0.148 and it is statistically significant at 1 percent level. Theoretically, the coefficient of interest rate should be negative since interest rate should discourage the commercial banks to hold large reserves to increase its income through lending activities. On the contrary, it is positive in the estimation. It appears that increase in deposits have also increased reserves. In Nepal, the financial institutions appear to hold high reserves involuntarily because of lack of lending opportunities. Moreover, it is difficult to transfer fund from bank branches with reserve surplus to bank branches with reserve deficit situated at far-flung places. Thus, after considering all these factors, it can be inferred that reserve- Holdings of commercial banks in Nepal is involuntary, and banks are unable to invest reserve- Holdings to reduce the same.

Since there is structural break or parameter instability during the study period in 1994, the equations to evaluate the implication of parameter instability in money-multiplier determinants have been re-estimated. Exhibit 4.1.25 provides the results obtained for the period before parameter instability, from 1975 to 1993; and Exhibit 4.1.26 provides results for the period after parameter instability, from 1994 to 2004.

**Dependent variable: \( C/DD_i \)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln YR_i )</th>
<th>( r_i )</th>
<th>( \ln PBO_i )</th>
<th>TRENDS</th>
<th>( C/DD_{r-1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-27.5835</td>
<td>2.6904</td>
<td>0.0521</td>
<td>-0.1756</td>
<td>-0.0846</td>
<td>0.1476</td>
</tr>
<tr>
<td>( t )-statistic</td>
<td>(-1.909)</td>
<td>(1.971)</td>
<td>(1.061)</td>
<td>(-0.261)</td>
<td>(-1.223)</td>
<td>(0.6335)</td>
</tr>
</tbody>
</table>

\[ R^2 = 0.6761; \text{ F-statistic} (5, 12) = 5.01032; \text{ D-W statistic} = 2.17743; \]

**Dependent variable: \( TD/DD_i \)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln YR_i )</th>
<th>( r_i )</th>
<th>( \frac{1}{r_{i-1}} )</th>
<th>( \ln PBO_i )</th>
<th>( TD/DD_{r-1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-7.952</td>
<td>2.495</td>
<td>-0.0342</td>
<td>0.0069</td>
<td>-1.6053</td>
<td>-0.0700</td>
</tr>
<tr>
<td>( t )-statistic</td>
<td>(-0.358)</td>
<td>(2.715)</td>
<td>(-0.319)</td>
<td>(0.653)</td>
<td>(-1.146)</td>
<td>(-0.1903)</td>
</tr>
</tbody>
</table>

\[ R^2 = 0.9267; \text{ F-statistic} (5, 12) = 30.3518; \text{ D-W statistic} = 1.9608; \]

**Dependent variable: \( RES/D_i \)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln YR_i )</th>
<th>( r_i )</th>
<th>RES ( /D_{r-1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>2.2145</td>
<td>-0.1527</td>
<td>0.0031</td>
<td>0.2864</td>
</tr>
<tr>
<td>( t )-statistic</td>
<td>(2.8151)</td>
<td>(-2.629)</td>
<td>(0.4534)</td>
<td>(2.5336)</td>
</tr>
</tbody>
</table>

\[ R^2 = 0.840251; \text{ F-statistic} (3, 14) = 24.5459; \text{ D-W statistic} = 2.26142; \]

*Note: * denotes significance level at 10%; ** at 5%; *** at 1%;*

The re-estimated equation for the period from 1975 to 1993 shows the real-income elasticity of currency ratio \( (C/DD_i) \) is 2.69 meaning 1 percent increase in real-income increases this ratio by about 2.7 percent. The sign of the coefficient is opposite to the theoretical postulation indicating that people prefer to hold cash instead of depositing in the bank. All other variables are statistically insignificant suggesting very mild or no effect.

The real-income elasticity of time-deposit ratio \( (TD/DD_i) \) is 2.49 for the period from 1975 to 1993. It indicates that 1 percent increase in real-income increases this ratio.
by about 2.5 percent and it is statistically significant at 5 percent level. The interest rate has negative coefficient but statistically insignificant \textit{t-statistic}. It indicates that interest has no effect. Contrary to the theoretical postulation, expected inflation has positive coefficient but its insignificant \textit{t-statistic} indicates no effect. Other determinants are statistically insignificant. \textit{D-W statistic} and \textit{R}^2 are statistically significant.

During the period from 1975 to 1993, the real-income elasticity of reserves ratio ($\frac{RES}{D_i}$) is -0.1527 and it is statistically significant at 5 percent level. The result suggests that any increase in real income reduces reserves of the financial institutions. The coefficient of interest rate is opposite of theoretical postulation but it is statistically insignificant. The speed of adjustment of earlier reserve in 1 year is about 71 percent. The \textit{t-statistic} is strong at 5 percent level. It means that the rate of absorption of reserves of the previous year is quite high. \textit{D-W statistic} and \textit{R}^2 are statistically significant. These factors suggest that commercial banks’ reserves holding are involuntary in Nepal.

Graph 4.7 presents the amount of demand deposits, time deposits, total deposits and currency from 1975 to 2004. Graph 4.8 shows the percentage changes of real demand deposits, real time deposits and real currency.

\textbf{Graph 4.7: Demand, Time and Total Deposits and Currency (in Rs. Millions)}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{graph4.7.png}
\caption{Demand, Time and Total Deposits and Currency (in Rs. Millions)}
\end{figure}

\textit{Source: Table 4.1.1}
Graph 4.8: Real Demand, Real Time Deposits and Real Currency (% change)

Exhibit 4.1.26 provides results for re-estimated equations for the period 1994-2004. The t-statistic for each parameter is given in the parenthesis.

**Exhibit 4.1.26: OLS Estimates for 1994-2004**

**Dependent variable: \( \frac{C}{DD_t} \)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln YR_t )</th>
<th>( r_t )</th>
<th>( \ln PBO_t )</th>
<th>TRENDC</th>
<th>( \frac{C}{DD_{t-1}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>50.7394</td>
<td>-3.277</td>
<td>0.083</td>
<td>-1.238</td>
<td>0.2110</td>
<td>-0.2106</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(1.1193)</td>
<td>(-1.012)</td>
<td>(0.4904)</td>
<td>(-0.889)</td>
<td>(1.129)</td>
<td>(-0.469)</td>
</tr>
</tbody>
</table>

\( R^2 = 0.2627; \) F-statistic (5, 5) = 0.3544; D-W statistic = 1.67104;

**Dependent variable: \( \frac{TD}{DD_t} \)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln YR_t )</th>
<th>( r_t )</th>
<th>( \ln PBO_t )</th>
<th>TD / DD_{t-1}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-47.256</td>
<td>18.7602</td>
<td>0.5856</td>
<td>0.0268</td>
<td>-16.896</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(-0.3671)</td>
<td>(1.5842)</td>
<td>(0.8757)</td>
<td>(0.1051)</td>
<td>(-1.220)</td>
</tr>
</tbody>
</table>

\( R^2 = 0.7813; \) F-statistic (5, 5) = 3.5717; D-W statistic = 2.93263;

**Dependent variable: \( \frac{RES}{D_t} \)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln YR_t )</th>
<th>( r_t )</th>
<th>RES / D_{t-1}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>2.3627</td>
<td>-0.1705</td>
<td>0.01369</td>
<td>0.2053</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(0.7217)</td>
<td>(-0.682)</td>
<td>(0.8589)</td>
<td>(0.6067)</td>
</tr>
</tbody>
</table>

\( R^2 = 0.8976; \) F-statistic (3, 7) = 20.4554; D-W statistic = 1.265;
As per the re-estimated equation, the real-income elasticity of currency ratio \((C/DD_c)\) is -3.28 and it indicates decline in currency holdings of the public. The plausible reasons could be an increase in import payments, capital flight, and holding of the Indian currency because of adverse security situation. However, insignificant \(t\)-statistic suggests very weak effect. All other determinants also have weak and/or no effect since their \(t\)-statistic are statistically insignificant.

The real-income elasticity of time-deposit ratio \((TD/DD_t)\) is 18.76; however, its \(t\)-statistic is weak, hence insignificant. Interest rate has expected positive coefficient, but is statistically insignificant. Contrary to the theory, expected inflation has positive coefficient but again it is statistically insignificant. \(R^2\) and \(D-W\) statistic of the equation is significant.

The real-income elasticity of reserve ratio is negative and it is statistically insignificant. The movement of real income caused reduction in reserves of the financial institutions and people held more cash in prevailing difficult period for transaction purposes. Other determinants also have insignificant \(t\)-statistic indicating very weak influence.

The empirical findings derived from 1994 to 2004 provide the result that the variables influencing the money multiplier seems to have eroded to some extent. Such adverse situation cropped up in the country on account of internal insurgency. The monetary authorities may still view real income and interest as potent variables in their arsenal to influence money multiplier. As the positive movement in real income requires a certain period (may be 1 year), interest rate as monetary instrument can be used whenever situation demands.

### 4.1.3.4 Monetary Policy Target

Monetary policy influences both supply and cost of money to the society. Thus, the money supply exerts influence on both output and price level. As such, it is an important variable that policymakers endeavor to deal with, to achieve good macroeconomic results. Monetary policy targets are bifurcated into: (i) monetary-aggregate target; (ii) inflation target; and (iii) exchange rate target. Of the three, a central bank authority may choose a single target or multiple targets. However, the above variables cannot be segregated and they may be ranked on priority. If the monetary aggregate target is the policy goal, then
others maybe put into category of intermediate targets. Monetary instruments are used by
the central bank to achieve the target. The target relating to monetary aggregate target is
discussed here in the ensuing section and other targets will be presented in the subsequent
sections.

4.1.3.4.1 Monetary Aggregate Targeting in Nepal

The preamble of the Nepal Rastra Bank Act, 1955 stated that the NRB (central
bank) should properly manage the issuance of currency and make suitable arrangement for
its circulation; stabilize the exchange rate; mobilize capital for development; and
encourage trade and industry. The preamble was drafted by giving due concern to the then
existing problems of ever-fluctuating exchange rate between the domestic and Indian
currency, and large circulation of Indian currency in the domestic market. The NRB did
nothing prior to 1966. The Act did not provide any authority to devise and implement
monetary policy. An expert from the International Monetary Fund (IMF) remarked that,
“… the government, rather than the Bank, is legally the origin of credit control…”170 The
fifth amendment of the Act in 1966 shifted the initiative of credit control on the NRB.
With the prior approval of the government, the NRB framed the Credit Control
Regulations Act, 1966. The monetary instruments, such as interest rate regulation,
liquidity rates, cash reserves requirement (CRR), margin rates, and rediscount and
refinance rates, came into use. With the passage of time, several amendments to the Act
took place up to 1992 and other monetary instruments were added in the NRB’s arsenal
and used. They were – special liquidity ratio (SLR), credit ceiling, directed credit,
credit/deposit ratio, pre-export credit, and priority/productive sector credit. With a view to
mop up excess liquidity of the economy, the NRB started issuing bonds from December
1991 for few years.

The NRB had no goal independence and it had little operational independence.
Nepal also started targeting monetary aggregate as in the US and other developed
countries. However, neither the monetary authority nor the government seems to have
done any assessment study to look into the efficiency of the monetary targeting regime in
fulfilling the objectives of monetary policy. The government had the sole authority to
project the growth rate of money supply and it began to forecast the monetary target from

the Seventh Plan period through the National Planning Commission (NPC). The annual growth rate of narrow money supply (M1) was projected at 13 percent during the Plan period. The central bank did not appear to have had any meaningful role in this process. The Finance Minister used to announce annual monetary growth rate target in the Annual Budget speech and the NRB had to take policy initiatives to meet the target as per the government's directives. However, the events moved fast; and that even in influential economies, continuous adjustments in targets are necessary. Even when the adjustments had to be made, the NRB could not change its monetary measures by mid-term review as the fiscal budget provided goal of monetary aggregate target for each year.

However, with amendment to the Nepal Rastra Bank Act in FY 2001/02, the NRB gained both operational and goal independence. It has been entrusted with the objectives, among others, in the formulation of necessary monetary and foreign exchange policies in order to maintain the stability in price and balance of payments for sustainable development of the economy.

The NRB has begun to announce monetary policy every year in the month of July and it also conducts mid-term reviews. It announces monetary aggregate growth rate as intermediate target. In addition, it also announces possible changes in the balance of payments situation, particularly the change in international reserves, the rate of increase in consumer price, and the gross domestic product (GDP) growth rate. The NRB has not published any estimation procedure and analytical methods as to how it arrived at the announced rate of change in the above variables. As per the announcement, it intends to limit the rate of growth of narrowly-defined money supply (M1) at 11.8 percent in FY 2002/03; and for FY 2003/04, 9.2 percent and 11.2 percent for M1 and M2 respectively.\footnote{For 2002/03, see Nepal Rastra Bank, 2002, \textit{Money and Program}, Kathmandu; and for 2003/04, see Nepal Rastra Bank 2004, \textit{Economic Report 2003/04}, Kathmandu, p 12} Nepal has adopted the practice of projecting target at a fixed level, and not in a range as pursued in the United States and India.

Exhibit 4.1.27 provides the factors that affect the growth of narrow money supply in Nepal. It reveals that the average annual growth rate of $M1$ during the study period was 15.94 percent. During two periods, 1975-1993 and 1994-2004, the average-annual growth rates for $M1$ were 17.48 percent and 13.40 percent respectively. The highest annual growth rate of $M1$ was about 28.3 percent in 1986; and the lowest was recorded during 1997 at 5.83 percent.
Exhibit 4.1.27: Factors Affecting Narrow Money Supply

<table>
<thead>
<tr>
<th>Period</th>
<th>Growth of M1</th>
<th>( \Delta NFA / \Delta M1 )</th>
<th>( \Delta NCG / \Delta M1 )</th>
<th>( \Delta CENT / \Delta M1 )</th>
<th>( \Delta CPSEC / \Delta M1 )</th>
<th>( \Delta TD / \Delta M1 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976-80</td>
<td>16.38</td>
<td>1.205</td>
<td>0.834</td>
<td>0.440</td>
<td>0.633</td>
<td>1.487</td>
</tr>
<tr>
<td>1981-85</td>
<td>14.17</td>
<td>0.045</td>
<td>1.804</td>
<td>0.330</td>
<td>0.872</td>
<td>1.685</td>
</tr>
<tr>
<td>1986-90</td>
<td>21.09</td>
<td>0.830</td>
<td>0.804</td>
<td>0.248</td>
<td>0.899</td>
<td>1.186</td>
</tr>
<tr>
<td>1991</td>
<td>14.19</td>
<td>3.306</td>
<td>1.617</td>
<td>-0.229</td>
<td>1.175</td>
<td>1.989</td>
</tr>
<tr>
<td>1992</td>
<td>19.49</td>
<td>1.462</td>
<td>0.687</td>
<td>0.399</td>
<td>1.157</td>
<td>1.507</td>
</tr>
<tr>
<td>1993-97</td>
<td>14.77</td>
<td>1.017</td>
<td>0.587</td>
<td>0.159</td>
<td>2.771</td>
<td>2.361</td>
</tr>
<tr>
<td>1998-2002</td>
<td>14.99</td>
<td>1.263</td>
<td>0.794</td>
<td>0.204</td>
<td>1.773</td>
<td>0.453</td>
</tr>
<tr>
<td>2003</td>
<td>8.55</td>
<td>0.453</td>
<td>0.492</td>
<td>0.035</td>
<td>2.674</td>
<td>1.323</td>
</tr>
<tr>
<td>2004</td>
<td>12.58</td>
<td>1.651</td>
<td>-0.049</td>
<td>0.152</td>
<td>2.046</td>
<td>1.043</td>
</tr>
</tbody>
</table>

**Average**

<table>
<thead>
<tr>
<th>Period</th>
<th>( \Delta NFA / \Delta M1 )</th>
<th>( \Delta NCG / \Delta M1 )</th>
<th>( \Delta CENT / \Delta M1 )</th>
<th>( \Delta CPSEC / \Delta M1 )</th>
<th>( \Delta TD / \Delta M1 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976-2004</td>
<td>15.94</td>
<td>0.988</td>
<td>0.926</td>
<td>0.250</td>
<td>1.441</td>
</tr>
<tr>
<td>1976-1993</td>
<td>17.48</td>
<td>0.948</td>
<td>1.1140</td>
<td>0.291</td>
<td>0.841</td>
</tr>
<tr>
<td>1994-2004</td>
<td>13.40</td>
<td>1.052</td>
<td>0.576</td>
<td>0.184</td>
<td>2.423</td>
</tr>
</tbody>
</table>

On overall basis, from 1976 to 2004, the main contributing factors for expansion of \( M1 \) were Net Foreign Assets (\( NFA \)), Claims on the Government (\( NCG \)), and Claims on Private Sector (\( CPSEC \)).

During 1976 to 1993, \( NCG \) was the dominating factor contributing to expansion of \( M1 \) with a ratio of 1.114. \( NFA \) and \( CPSEC \) were second and third influencing factors for expansion of \( M1 \) at ratios of 0.948 and 0.841 respectively. However, during the period from 1994 to 2004, the claim on private sector (\( CPSEC \)) became the dominant factor contributing to expansion of \( M1 \) with a ratio of 2.42; net foreign assets with 1.05 and claims on government with 0.576. The claim on enterprises have shown decline between the two periods. The ratio between time deposits and narrow money supply (\( \Delta TD/\Delta M1 \)) has shown significant decline during the period from 1998 to 2002 and the average annual ratio was 1.439 during the period from 1976 to 2004.

Exhibit 4.1.28 reveals the average change in the net foreign asset (\( NFA \)) and domestic credit (\( DC \)).
Exhibit 4.1.28: Average Change in Net Foreign Asset (NFA) and Domestic Credit (DC) for 1975-2004

<table>
<thead>
<tr>
<th></th>
<th>Average Annual Change (in %)</th>
<th>Share of following variables in the Average change in DC (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NFA</td>
<td>DC</td>
</tr>
<tr>
<td>1976-80</td>
<td>18.61</td>
<td>21.68</td>
</tr>
<tr>
<td>1981-85</td>
<td>-1.45</td>
<td>24.18</td>
</tr>
<tr>
<td>1986-90</td>
<td>39.74</td>
<td>18.60</td>
</tr>
<tr>
<td>1991</td>
<td>72.95</td>
<td>18.07</td>
</tr>
<tr>
<td>1992</td>
<td>28.73</td>
<td>20.64</td>
</tr>
<tr>
<td>1993-97</td>
<td>15.02</td>
<td>19.47</td>
</tr>
<tr>
<td>1998-2002</td>
<td>17.77</td>
<td>15.53</td>
</tr>
<tr>
<td>2003</td>
<td>3.38</td>
<td>10.19</td>
</tr>
<tr>
<td>2004</td>
<td>19.03</td>
<td>9.91</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>19.74</td>
<td>19.17</td>
</tr>
</tbody>
</table>

The Exhibit 4.1.28 indicates that the annual growth rate of net foreign asset (NFA) was 19.74 percent during the period from 1976 to 2004. Likewise, annual growth rate of domestic credit (DC) was about 19.17 percent for the same period. In the second period (1994-2004), both of them (NFA and DC) have recorded decline when compared to the first period (1976-1993). During the second period (1994-2004), the share of net claims of government (NCG) on domestic credit has declined significantly to 17.4 percent from 52.7 percent (during 1976-1993). On the other hand, the share of claim on private sector increased from 36.9 percent during the period 1976-1993 to 77.2 percent during the period 1994-2004.

The performance in the monetary sector was not up to the mark and did not meet the projected target during 1997-2002 of the Ninth Plan; the actual annual growth rate of M1 exceeded by about 0.5 percent. However, the actual growth of NFA was 17.7 percent against the target annual growth rate of 9.1 percent; exceeding the target by almost 8.7
percent representing significant deviation. The actual annual real income growth was about 3 per cent against the target annual growth rate of 6 percent. The annual growth rate of domestic credit was projected at 16.1 percent and actual annual growth rate recorded was at 15.53 percent during the Plan period.

The share of claims on government sector (NCG) in the domestic credit (DC) was 15.53 percent during 1998-2002 and that of private sector (CPSEC) 65.5 percent. Over the years, the share of NCG in the domestic credit began to decline after 1981-85; during 1991, because of the newly attained democracy and political expediency, this figure had increased. Thereafter, the upward trend continued during the period 1998-2002 when the political instability and internal insurgency was at zenith. On the other hand, the share of credit to private sector had shown increment over the years only to decline to 65.5 percent during 1998-2002 from 77.5 per cent during 1993-1997.

The most important factor of monetary expansion was the increase in NFA. The government’s dependency on the banking sector finance has been checked to certain extent over a last decade albeit it is still high. The NRB has begun to fix money supply growth rate which is announced publicly under the Monetary Policy announcement since FY 2002/03. The NRB has gained de jure goal and operational independence in respect of monetary policy. It fixed growth rate of money supply (M1) in FY 2002/03, as an intermediate target, at 11.8 percent but the actual growth rate of M1 was only 8.55 percent. This was a result of decrease in NFA and bank credit accommodation to the government. For FY 2003/04, the NRB had fixed the target of growth rate of M1 at 9.2 percent but the actual growth rate of M1 was 12.58 percent. The growth-rate of M1 exceeded the target during FY 2003/04 because of substantial increase in NFA. Thus, to maintain the monetary expansion at a desirable level, the Bank has to devise ways to neutralize the effect of increase in NFA on M1 and further reduce the government’s dependency on bank finance. The monetary expansion in Nepal from 1975 to 2004 is an open evidence of this assertion.

The authorities could have been successful in keeping the growth of M1 within or at the target level in the medium-term (during the plan period) if they had effectively followed the policy of slowing down the increases in NFA and reducing claims on government of the banking sector by restricting accommodation to the government by the banks.
4.2 Money and Economic Activity

There is no disagreement that money is of great importance in determining the course of economic events. However, there is a substantial disagreement concerning the extent to which money matters. A variation in money stock generates variation in the economic activity of producers and consumers. It passes its influence through various transmission channels in the economy, viz. assets market channel, output markets channel, credit channel, balance sheet channel, bank lending channel, exchange rate channel, etc. Potency of exerting influence on the economy by different transmission mechanisms, to a large extent, depends upon the level of economic development of each country, i.e. level of efficiency, integration, information efficiency, etc of the market.

Many empirical studies have been conducted in both the developed and developing countries; however, findings are mixed. According to the findings of couple of studies, in some countries fiscal actions seemed to have had performed better in explaining the changes in the GDP and other economic activities, in others it has been monetary actions. The case of Nepal in this respect is presented below.

4.2.1 Empirical Studies relating to Nepal

There are few empirical studies on money-income relationship in Nepal. Pant had conducted empirical study which covered the period from FY 1962/63 to 1972/73, using the St. Louis Model, developed by Anderson and Jordan of Federal Reserve Board of St. Louis, to examine the relative influence on GDP growth brought about by change in monetary stock or change in government expenditure. His findings were that “…money do not play important role in affecting economic activity in Nepal. The government expenditure appears more powerful than money supply. However, bank credit to the public, among the monetary variables, appears superior to government expenditure.”

Bahadur conducted an empirical study to examine the relative effectiveness of changes in money stock and changes in government expenditure respectively on the change in the GDP at current prices. The study covered the period from FY 1965/66 to FY 1978/79 and highlighted that “…the variations in both narrow and broad money supply are neither the cause nor the consequence of the variation in the economic activity.

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Government expenditure appears to be more powerful variable than money supply in determining the economic activity. The most significant single variable that explains the variation in the economic activity is the variation in bank credit to the private sector.”

Khatiwada also undertook an empirical study to investigate the relative effectiveness of money supply and government expenditure on national income in Nepal with the help of St. Louis type of model and the study period was from FY 1965/66 to FY 1989/90. According to his findings, the co-efficient of money supply was statistically significant whereas that of government expenditure was not. According to him, both Granger’s and Sim’s tests indicate unidirectional causality running from money supply to money income.

4.2.2 Model Specification for Nepal

Structural model or reduced-form model is generally used to examine the relationship between money and income. The former model follows the Keynesian transmission mechanism while the latter model uses the monetarist proposition. In this empirical study, the St. Louis reduced-form model is selected and applied due to lack of data for the whole structure of the Nepalese economy.

The hypothesis of St. Louis Model is simple. The relationship is expressed as follows:

\[ Y = f(M, F) \] (4.2.2.1)

Where, \( Y \) = Economic activity; \( M \) = Monetary actions; \( F \) = Fiscal actions;

The Nepalese economy is underdeveloped; its financial structure is weak; there are few bonds and securities; its financial market is repressed; administered interest rates prevailed for about two-third of the study period; its financial sector is dualistic, that is, well-organized financial institutions exist side by side with an unorganized market for the provision of credit; it has large non-monetized sector; there exists a direct substitution between money and physical assets. Both interest rate and money supply have become the

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policy instruments of the monetary authorities and often they move in the same direction. In such prevailing situation in Nepal, the Keynesian theory of interest rate as well as liquidity preference theory does not hold good.

Even the monetarist proposition of transmission mechanism is difficult to test empirically in a developing country like Nepal. Due to non-availability of adequate data, it is not possible to test empirically the effect of different transmission processes, viz. the balance sheet channel, the lending channel, the assets and output markets channel and the exchange rate channel, separately on the economy. By taking into consideration the nature of Nepalese economy, it is only possible to make a general comment.

The balance-sheet channel presupposes that financial assets are important portions of firms'/consumers' portfolios. It also assumes the existence of sophisticated money, assets and goods and services markets. There exists an implicit assumption that there is relatively free convertibility or substitution between illiquid assets (consumer durables) and liquid assets (financial assets). The financial structure of the Nepalese economy has not yet attained the desired level of depth and sophistication.

The bank-lending channel presupposes the ability of monetary policy to influence the lending capacity of financial institution by varying their monetary reserve through statutory reserve requirements or open market operations. However, the liquidity position of financial institutions in Nepal is always quite high. Thus, even when the central bank conducts open market operations to influence the monetary reserve of financial institutions, it may not bring a desired change in the lending behavior of a financial institution.

The effect of monetary policy (the assets-and-output markets or direct channel) on the relative prices and real wealth presupposes that financial assets constitute a key component of borrowers’ or wealth-holders’ portfolio. In Nepal, there are few financial assets. The main component of real wealth of the wealth-holders is real assets. If there is any effect of monetary policy on the universe of relative prices and real wealth, then that could be marginal or negligible.

The exchange rate mechanism or the Mundell-Fleming effect does not work in Nepal because of nonexistence of free-flow of capital between it and the world-at-large; and, variation in the short-run interest rate does not influence capital flows. One may
argue that the interest rate is not sufficiently high enough to compensate for exchange rate instability, but the desired rate might be too high and could destabilize the economy.

In short, the rudimentary stage of financial system, few financial assets, undeveloped economy, unsophisticated financial structure and unavailability of aggregated or disaggregated data about private sector investment and consumption, the government sector investment and consumption, and savings of different sectors made it inevitable to opt for an aggregate single equation method of estimation of money-income relationship for which data is available. At least, it enables one to find out the ultimate effect of money on income.

Therefore, the St. Louis Model type reduced-form model is used to find out effect of money on economic activity in Nepal, which is given below and this is a distributed lag model.

\[
\Delta Y_t = \sum_{i=0}^{n} \alpha_i \Delta M_{t-i} + \sum_{j=0}^{m} \beta_j \Delta GE_{t-j} \tag{4.2.2.2}
\]

\[
\Delta Y_t = \sum_{i=0}^{n} \alpha_i \Delta DC_{t-i} + \sum_{j=0}^{m} \beta_j \Delta GE_{t-j} \tag{4.2.2.3}
\]

Where,
\[
\Delta Y_t = \text{Annual or quarterly change in National Income};
\]
\[
\Delta M_t = \text{Annual or quarterly change in Money Supply};
\]
\[
\Delta GE_t = \text{Annual or quarterly change in Government Expenditure};
\]
\[
\Delta DC_t = \text{Annual or quarterly change in Domestic Credit};
\]

4.2.3 Data

The availability of data is limited to the annual Gross Domestic Product (GDP) and the annual Government Expenditure (GE) data published by the government in its Economic Survey. The money supply data is published by the Nepal Rastra Bank in its Quarterly Economic Bulletin. The money supply (M1) constitutes of currency held by public (C) and the demand deposits (DD). As regards the monetary aggregate, M1 is used in this section. Both the currency held by public and demand deposits constitute the balance held for the transaction purposes and are used to meet current payments for consumption, production and capital stock formation. In other words, M1 is like blood in
the sinews of the economy that moves it to sustain as well as to grow. The broad money
supply ($M_2$) consists of $M_1$ plus time deposits ($TD$), that is savings, which are held for
precautionary purposes. The saving, though the product of growth in income, is held for
long time and is not directly associated with the current transactions. Therefore, $M_1$ is
selected because of its direct use in generating and pushing the economic activities.

4.2.4 Empirical Analysis

The estimates provided in Exhibit 4.2.1 relate to the Almon or Polynomial
Distributed Lag (PDL) Model (lag 2 and polynomial degree 1) applied with respect to
money supply ($M_1$) and government expenditure ($GE$). In the first instance, money
supply is a proxy for monetary action and government expenditure is a proxy for fiscal
action. This is based on the assumption that narrow money supply is under the control of
the monetary authority, that is, the central bank. Exhibit 4.2.2 is related to domestic credit
($DC$) and government expenditure ($GE$). In this case, domestic credit serves as proxy for
monetary action and government expenditure is a proxy for fiscal action. The lag-length
chosen is 2 whereas degree of polynomial is 1 since “… a fairly low-degree of polynomial
will give good results.”

Exhibit 4.2.1: Polynomial Distributed Lag of $M_1$ and $GE$ for 1978-2004

\[ \Delta \ln Y_i = 0.00259 + \sum_{i=0}^{2} \alpha_i \Delta \ln M_{1-i} + \sum_{i=0}^{2} \beta_i \Delta \ln GE_{i-i} \]

\[ (0.0598) \]

<table>
<thead>
<tr>
<th>Lag</th>
<th>$\alpha_i$</th>
<th>$t$-stat</th>
<th>$\beta_i$</th>
<th>$t$-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.2648</td>
<td>(1.5319)</td>
<td>0.0841</td>
<td>(0.7379)</td>
</tr>
<tr>
<td>1</td>
<td>0.2192</td>
<td>(2.1341)</td>
<td>0.0543</td>
<td>(0.8275)</td>
</tr>
<tr>
<td>2</td>
<td>0.1735</td>
<td>(1.0399)</td>
<td>0.0245</td>
<td>(0.2209)</td>
</tr>
<tr>
<td>Sum of Lags</td>
<td>0.6575</td>
<td>(2.1341)</td>
<td>0.1628</td>
<td>(0.8275)</td>
</tr>
</tbody>
</table>

$R^2 = 0.2805 \quad F$-stat = 2.1446 \quad D-W = 1.9675

In Exhibit 4.2.1, during the period of the study, it is clear that coefficient of 1 year
lag of narrow money supply is statistically significant. Similarly, the coefficients of
current and 1-year lag of government expenditure are also statistically significant, and
$R^2$

is about 28%. The summed elasticity of income with money supply is less than unity at 0.657, which suggests that the monetarist proposition of proportional income and money relationship in the long-run does not hold true in Nepal. At the same time, sum of lagged coefficients of government expenditure (0.163) is much lower than that of money supply. It appears that, during the study period, monetary policy has larger role to play than fiscal policy in bringing about economic stabilization in Nepal.

As an alternate estimation, instead of narrow money supply, domestic credit is used and re-estimated the equation for the study period. Exhibit 4.2.2 reveals that domestic credit instead of enhancing economic activity has dampening effect on the economy. At the same time, the government expenditure has positive influence on economic activity but it does not appear to be strong.

Exhibit 4.2.2: Polynomial Distributed Lag of $DC$ and $GE$ for 1978-2004

\[
\Delta \ln Y_i = 0.09196 + \sum_{i=0}^{2} \alpha_i \Delta \ln DC_{t-i} + \sum_{i=0}^{2} \beta_i \Delta \ln GE_{t-i}
\]

(2.1082)

<table>
<thead>
<tr>
<th>Lag</th>
<th>$\alpha_i$</th>
<th>t-stat</th>
<th>$\beta_i$</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.0124</td>
<td>0.0753</td>
<td>0.1619</td>
<td>1.2022</td>
</tr>
<tr>
<td>1</td>
<td>-0.0414</td>
<td>-0.3873</td>
<td>0.1263</td>
<td>1.4173</td>
</tr>
<tr>
<td>2</td>
<td>-0.9528</td>
<td>-0.6918</td>
<td>0.0906</td>
<td>0.6889</td>
</tr>
</tbody>
</table>

Sum of Lags: $-0.1243 - 0.3873 + 0.3788 = 1.4173$

$R^2 = 0.1481$  
$F$-stat = 0.9564  
$D-W = 1.6023$

Taking into consideration the empirical analyses presented above, the narrow money supply was better proxy of monetary policy during the study period, 1978 – 2004. The regression estimate was able to explain 28 per cent of changes in income when narrow money supply as a proxy for monetary action was included in Exhibit 4.2.1, whereas, the estimate was only able to explain 15 per cent when domestic credit was included as a proxy for monetary action in Exhibit 4.2.2.

As established earlier, there was parameter instability during 1994. In this context, attempt has been made to re-estimate the equations to evaluate the relative effectiveness...
during two periods – before and after parameter instability. Exhibits 4.2.3 and 4.2.4 display the estimations for the period before parameter instability, i.e., from 1978 to 1993.

**Exhibit 4.2.3: Polynomial Distributed Lag of $M_1$ and $GE$ for 1978-1993**

\[
\Delta \ln Y_i = 0.04103 + \sum_{i=0}^{2} \alpha_i \Delta \ln M_{t-i} + \sum_{i=0}^{2} \beta_i \Delta \ln GE_{t-i}
\]

(0.3720)

<table>
<thead>
<tr>
<th>Lag</th>
<th>$\alpha_i$</th>
<th>t-stat</th>
<th>$\beta_i$</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.2275</td>
<td>0.8763</td>
<td>-0.0162</td>
<td>-0.0996</td>
</tr>
<tr>
<td>1</td>
<td>0.2762</td>
<td>1.5288</td>
<td>-0.0628</td>
<td>-0.5703</td>
</tr>
<tr>
<td>2</td>
<td>0.3248</td>
<td>1.2849</td>
<td>-0.1094</td>
<td>-0.7174</td>
</tr>
</tbody>
</table>

**Sum of Lags**

$\alpha_i$ t-stat $\beta_i$ t-stat

0.8285 1.5288 -0.1884 -0.5703

$R^2 = 0.2275$ $F$-stat = 0.8091 $D-W = 2.1882$

It is clear from the re-estimated equation in Exhibit 4.2.3 that 1-year lagged money supply has significant influence on the changes in the income. At that same time, the government expenditure appears to have dampening effect during this period from 1978 to 1993. The monetarist proposition of proportional income and money relationship does not seem to hold during this period as the summed elasticity of income with money supply is less than unity (0.83). During this period, it appears that monetary policy was a superior policy tool for economic stabilization than fiscal policy.

**Exhibit 4.2.4: Polynomial Distributed Lag of $DC$ and $GE$ for 1978-1993**

\[
\Delta \ln Y_i = 0.3973 + \sum_{i=0}^{2} \alpha_i \Delta \ln DC_{t-i} + \sum_{i=0}^{2} \beta_i \Delta \ln GE_{t-i}
\]

(6.1166)

<table>
<thead>
<tr>
<th>Lag</th>
<th>$\alpha_i$</th>
<th>t-stat</th>
<th>$\beta_i$</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-0.2667</td>
<td>-2.101</td>
<td>-0.1887</td>
<td>-1.5762</td>
</tr>
<tr>
<td>1</td>
<td>-0.3417</td>
<td>-3.781</td>
<td>-0.1157</td>
<td>-1.3820</td>
</tr>
<tr>
<td>2</td>
<td>-0.4167</td>
<td>-3.623</td>
<td>-0.0427</td>
<td>-0.3865</td>
</tr>
</tbody>
</table>

**Sum of Lags**

$\alpha_i$ t-stat $\beta_i$ t-stat

-1.0251 -3.781 -0.3471 -1.3820

$R^2 = 0.6161$ $F$-stat = 4.413 $D-W = 1.789$
As for re-estimated equation in Exhibit 4.2.4, both domestic credit and government expenditure have dampening effects. It would be unfeasible proposition that both the monetary action and fiscal action affect economic activity negatively.

The following Exhibits 4.2.5 and 4.2.6 show the relative effectiveness of fiscal and monetary policy during the period after parameter instability was seen.

Exhibit 4.2.5: Polynomial Distributed Lag of $M_1$ and $GE$ for 1994-2004

\[
\Delta \ln Y_t = 0.1205 + \sum_{i=0}^{2} \alpha_i \Delta \ln M_{1-i} + \sum_{i=0}^{2} \beta_i \Delta \ln GE_{t-i}
\]

\[(1.2734)\]

<table>
<thead>
<tr>
<th>Lag</th>
<th>$\alpha_i$</th>
<th>t-stat</th>
<th>$\beta_i$</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-0.1361</td>
<td>-0.3608</td>
<td>0.2856</td>
<td>1.1610</td>
</tr>
<tr>
<td>1</td>
<td>-0.1739</td>
<td>-0.7013</td>
<td>0.1223</td>
<td>0.7282</td>
</tr>
<tr>
<td>2</td>
<td>-0.2119</td>
<td>-0.6534</td>
<td>-0.0411</td>
<td>-0.1587</td>
</tr>
<tr>
<td>Sum of Lags</td>
<td>-0.5219</td>
<td>-0.7013</td>
<td>0.3368</td>
<td>0.7282</td>
</tr>
</tbody>
</table>

\[R^2 = 0.2615 \quad F\text{-stat} = 0.3541 \quad D-W = 1.918\]

Exhibit 4.2.6: Polynomial Distributed Lag of $DC$ and $GE$ for 1994-2004

\[
\Delta \ln Y_t = -0.11058 + \sum_{i=0}^{2} \alpha_i \Delta \ln DC_{t-i} + \sum_{i=0}^{2} \beta_i \Delta \ln GE_{t-i}
\]

\[(-2.3854)\]

<table>
<thead>
<tr>
<th>Lag</th>
<th>$\alpha_i$</th>
<th>t-stat</th>
<th>$\beta_i$</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.0766</td>
<td>4.9762</td>
<td>-0.9357</td>
<td>-3.112</td>
</tr>
<tr>
<td>1</td>
<td>0.9836</td>
<td>3.3539</td>
<td>-0.7922</td>
<td>-2.516</td>
</tr>
<tr>
<td>2</td>
<td>0.8907</td>
<td>1.8637</td>
<td>-0.6487</td>
<td>-1.782</td>
</tr>
<tr>
<td>Sum of Lags</td>
<td>2.9509</td>
<td>3.3539</td>
<td>-2.3766</td>
<td>-2.516</td>
</tr>
</tbody>
</table>

\[R^2 = 0.8831 \quad F\text{-stat} = 7.5563 \quad D-W = 2.7603\]

Exhibit 4.2.5 shows that during the period after parameter instability in 1994, both the monetary-policy proximate (money supply) and fiscal-policy proximate (government expenditure) appear very weak. The coefficients of the lagged money supply are negative.
suggesting that changes in money supply have negative effect on economic activity. At the same time, current government expenditure appeared to have positive influence on the economic activity though \textit{t-statistic} is not strong.

Likewise, when the equation was re-estimated in Exhibit 4.2.6 using domestic credit as a proxy for monetary policy, and government expenditure as proxy for fiscal policy, \textit{t-statistic} of parameters became significant. The influence of domestic credit on economic activity is strongly positive. At the same time, government expenditure exerted strong negative effect. The equation was able to explain about 88 percent \( (R^2 = 0.8831) \) of changes in income when domestic credit, instead of money supply, was included.

\subsection*{4.2.4.1 Granger Test}

It is pertinent to examine whether money is the cause and money income is the effect or whether both are the cause and effect of each other. In other words, whether there is unidirectional effect from money to money income or \textit{vice-versa}; or whether there is bi-directional relationship between them. Along with this, the causal relationship (unidirectional or bi-directional) between money income and government expenditure, and money income and domestic credit is also evaluated. The test procedure, developed by Granger in 1969, attempts to answer this question. The Granger test postulates that only the past causes the future. It involves estimating the following pair-wise regressions. First pair deal with money and income; second pair deal with government expenditure and income; and third pair deal with domestic credit and income.

Unidirectional causality from \( M \) (or \( DC \) or \( GE \)) to \( Y \) is indicated if the estimated coefficients on the lagged \( M \) are statistically different from zero as a group, i.e. \( \Sigma \alpha_i \neq 0 \) (in equations 4.2.4.1, 4.2.1.3 and 4.2.1.5); and, the set of estimated coefficients on the lagged \( Y \) is not statistically different from zero, i.e. \( \Sigma \delta_j = 0 \) (in equations 4.2.4.2, 4.2.4.4, and 4.2.4.6). Conversely, unidirectional causality exists from \( Y \) to \( M \) (or \( DC \) or \( GE \)) if the set of lagged \( M \) (or \( DC \) or \( GE \)) coefficients is not statistically different from zero in equations 4.2.4.1, 4.2.1.3 and 4.2.1.5, i.e. \( \Sigma \alpha_i = 0 \); and, the set of lagged \( Y \) coefficients is statistically different from zero (in equations 4.2.4.2, 4.2.4.4, and 4.2.4.6), i.e. \( \Sigma \delta_j \neq 0 \);
and bi-directional casualty is indicated when the set of $M$ (or $DC$ or $GE$) and $Y$ coefficients are significantly different from zero in both regression.\(^{175}\)

\[
\ln \Delta Y_i = \sum_{j=1}^{n} \alpha_i \ln \Delta M_{t-i} + \sum_{j=1}^{n} \beta_j \ln \Delta Y_{t-j} \tag{4.2.4.1}
\]

\[
\ln \Delta M_i = \sum_{j=1}^{m} \lambda_i \ln \Delta M_{t-i} + \sum_{j=1}^{m} \delta_j \ln \Delta Y_{t-j} \tag{4.2.4.2}
\]

\[
\ln \Delta Y_i = \sum_{j=1}^{n} \alpha_i \ln \Delta GE_{t-i} + \sum_{j=1}^{n} \beta_j \ln \Delta Y_{t-j} \tag{4.2.4.3}
\]

\[
\ln \Delta GE_i = \sum_{j=1}^{m} \lambda_i \ln \Delta GE_{t-i} + \sum_{j=1}^{m} \delta_j \ln \Delta Y_{t-j} \tag{4.2.4.4}
\]

\[
\ln \Delta Y_i = \sum_{j=1}^{n} \alpha_i \ln \Delta DC_{t-i} + \sum_{j=1}^{n} \beta_j \ln \Delta Y_{t-j} \tag{4.2.4.5}
\]

\[
\ln \Delta DC_i = \sum_{j=1}^{m} \lambda_i \ln \Delta DC_{t-i} + \sum_{j=1}^{m} \delta_j \ln \Delta Y_{t-j} \tag{4.2.4.6}
\]

Where,

- $\ln$ = Natural log
- $\Delta$ = First difference
- $Y_t$ = GDP at current prices;
- $M_t$ = Money stock;
- $GE_t$ = Government expenditure;
- $DC_t$ = Domestic credit;

The steps involved in the Granger test calculations are: (i) to regress (restricted regression) current $Y$ on all lagged variables to find out the residual sum of squares, $RSS_r$; (ii) regress both $M$ (or $DC$ or $GE$) and $Y$ variables (unrestricted regression) to find out residual sum of squares, $RSS_{UR}$; (iii) apply $F$-test as $(RSS_r - RSS_{UR}/m)$ divided by $[RSS_{UR}/(n-k)]$, where $m$ is equal to the number of lagged $M$ (or $DC$ or $GE$) terms and $k$ is the number of parameters estimated in the unrestricted regression; (iv) if the computed $F$-statistic exceeds the critical $F$-statistic, then it can be said that $M$ (or $DC$ or $GE$) causes $Y$; and (v) the same procedure to be followed to find out whether $Y$ causes $M$ (or $DC$ or $GE$).\(^{176}\)


\(^{176}\) Ibid, p. 621
The pair-wise results are provided in three exhibits. Exhibit 4.2.7 provides results for the study period, FY 1975/76- FY 2003/04; Exhibit 4.2.8 is for FY 1975/76 – FY 1992/93; and Exhibit 4.2.9 is for FY 1993/94 – FY 2003/04.

**Exhibit 4.2.7: Granger Test Results for 1976 – 2004**

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>$R^2$</th>
<th>$F$-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln ΔDC cause ln ΔY</td>
<td>0.887</td>
<td>2.593</td>
</tr>
<tr>
<td>ln ΔY cause ln ΔDC</td>
<td>0.925</td>
<td>1.613</td>
</tr>
<tr>
<td>ln ΔGE cause ln ΔY</td>
<td>0.926</td>
<td>2.648</td>
</tr>
<tr>
<td>ln ΔY cause ln ΔGE</td>
<td>0.749</td>
<td>7.465</td>
</tr>
<tr>
<td>ln ΔM1 cause ln ΔY</td>
<td>0.846</td>
<td>0.427</td>
</tr>
<tr>
<td>ln ΔY cause ln ΔM1</td>
<td>0.917</td>
<td>3.595</td>
</tr>
</tbody>
</table>

In Exhibit 4.2.7, the first pair involves causality-test between domestic credit and income for the period 1976 – 2004. The approximate critical $F$-values (2, 25) are 5.57, 3.39, and 2.53 at 1 percent, 5 percent and 10 percent. The null hypothesis that domestic credit cause income is accepted as the calculated $F$-value, 2.593, exceeds the approximate critical $F$-value (2, 25) 2.53 at 10 percent level. Likewise, null hypothesis that income cause domestic credit is rejected at all the levels as the calculated $F$-statistic (1.613) is lower than the approximate critical $F$-value at all levels.

The second pair involves causality test between government expenditure and income. The null hypothesis that government expenditure cause income is accepted as calculated $F$-statistic, 2.648, is higher than critical $F$-statistic of 2.53 at 10 percent level. The null hypothesis that income cause government expenditure is accepted as calculated $F$-statistic exceeds critical $F$-statistic at 1 percent. Thus, bi-directional causal relationship between the government expenditure and income is revealed. Symbolically, it can be presented as: $GE \succ Y$ and $Y \succ GE$.

The third pair involves causality test between narrow money supply and income. The null hypothesis that narrow money supply cause income is rejected since the calculated $F$-statistic, 0.427, is lower than critical $F$-statistic values at all levels. The null hypothesis that income cause money supply is accepted as calculated $F$-statistic, 3.595,
exceeds the critical $F$-value at 5 percent level. Thus, unidirectional causal relationship, from income to money supply, is revealed. The result can be presented as: $M1 \Rightarrow Y$ and $Y \Rightarrow M1$.

Exhibit 4.2.8 provides results for the study period, FY 1975/76- FY 1992/93. The approximate critical $F$-values (2, 14) are 6.51, 3.74, and 2.73 at 1 percent, 5 percent and 10 percent respectively.

**Exhibit 4.2.8: Granger Test Results for 1976-1993**

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>$R^2$</th>
<th>$F$-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\ln \Delta DC$ cause $\ln \Delta Y$</td>
<td>0.997</td>
<td>35.278</td>
</tr>
<tr>
<td>$\ln \Delta Y$ cause $\ln \Delta DC$</td>
<td>0.925</td>
<td>7.748</td>
</tr>
<tr>
<td>$\ln \Delta GE$ cause $\ln \Delta Y$</td>
<td>0.986</td>
<td>14.682</td>
</tr>
<tr>
<td>$\ln \Delta Y$ cause $\ln \Delta GE$</td>
<td>0.821</td>
<td>7.560</td>
</tr>
<tr>
<td>$\ln \Delta M1$ cause $\ln \Delta Y$</td>
<td>0.974</td>
<td>2.3804</td>
</tr>
<tr>
<td>$\ln \Delta Y$ cause $\ln \Delta M1$</td>
<td>0.992</td>
<td>53.455</td>
</tr>
</tbody>
</table>

The first pair in Exhibit 4.2.8 involves causality-test between domestic credit and income for the period 1976 – 1993. The null hypothesis that domestic credit causes income can be accepted. This is because the calculated $F$-value, 35.278, exceeds the approximate critical $F$-value (2, 14), 6.51, at 1 percent. Likewise, the null hypothesis that income cause domestic credit can be accepted as the calculated $F$-statistic, 7.748, exceeds the critical $F$-value. Thus, it shows bi-directional relationship between domestic credit and income during the period from 1976 to 1993. It can be presented as: $DC \Rightarrow Y$ and $Y \Rightarrow DC$. At the same time, effect of domestic credit on income is significant.

The second pair involves causality test between government expenditure and income for the period from 1976 to 1993. The null hypothesis that government expenditure cause income can be accepted since calculated $F$-statistic, 14.682, exceeds the critical $F$-statistic at all levels. The null hypothesis that income causes government expenditure is accepted as calculated $F$-statistic, 7.560, exceeds critical $F$-statistic at all levels. During this period, bidirectional causal relationship between government expenditure and income is
established: the influence of government expenditure on income is much stronger than the influence of income on government expenditure. The result can be presented as: \( GE \succ Y \) and \( Y \succ GE \).

The third pair involves causality test between narrow money supply and income. Since the calculated \( F \)-statistic, 2.38, is lower than critical \( F \)-statistic at all levels, the null hypothesis that narrow money supply causes income can be rejected. The null hypothesis that income cause money supply can be accepted as calculated \( F \)-statistic, 53.455, exceeds the critical \( F \)-value at all levels. The result can be presented as: \( M1 \succ Y \) and \( Y \succ M1 \).

Exhibit 4.2.9 provides results for the study period, FY 1993/94 - FY 2003/04. The approximate critical \( F \)-values (2, 9) are 8.02, 4.26, and 3.01 at 1 percent, 5 percent and 10 percent respectively.

### Exhibit 4.2.9: Granger Test Results for 1994-2004

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>( R^2 )</th>
<th>( F )-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \ln \Delta DC ) cause ( \ln \Delta Y )</td>
<td>0.868</td>
<td>6.3413</td>
</tr>
<tr>
<td>( \ln \Delta Y ) cause ( \ln \Delta DC )</td>
<td>0.804</td>
<td>6.1989</td>
</tr>
<tr>
<td>( \ln \Delta GE ) cause ( \ln \Delta Y )</td>
<td>0.537</td>
<td>0.1592</td>
</tr>
<tr>
<td>( \ln \Delta Y ) cause ( \ln \Delta GE )</td>
<td>0.545</td>
<td>0.8146</td>
</tr>
<tr>
<td>( \ln \Delta M1 ) cause ( \ln \Delta Y )</td>
<td>0.269</td>
<td>0.4984</td>
</tr>
<tr>
<td>( \ln \Delta Y ) cause ( \ln \Delta M1 )</td>
<td>0.352</td>
<td>0.4830</td>
</tr>
</tbody>
</table>

During 1994 – 2004, it appears that there has been dramatic breakdown in the relationship without any significant causal relationship existing between the parameters considered.

In Exhibit 4.2.9, the first pair involves causality test between domestic credit and income. The null hypothesis that domestic credit cause income can be accepted as calculated \( F \)-statistic exceeds critical \( F \)-statistic at 5 per cent level. At the same time, the null hypothesis that income cause domestic credit is also accepted on the basis that calculated \( F \)-statistic exceeds than the critical \( F \)-statistic at 5 percent level. There appears
to be bi-directional causal relationship existent between these two variables during this period. The results can be stated as: \( DC > Y \) and \( Y > DC \).

The second pair involves testing causal relationship between government expenditure and income. The null hypothesis that government expenditure cause income is rejected as calculated \( F \)-statistic is lower than critical \( F \)-statistic at all levels. The null hypothesis that income cause government expenditure is rejected since calculated \( F \)-statistic is much lower than critical \( F \)-statistic at all levels. Thus, the results can be stated as: \( GE > Y \) and \( Y > GE \).

The third pair involves causality test between narrow money supply and income. Since the calculated \( F \)-statistic, 0.269, is lower than critical \( F \)-statistic at all levels, the null hypothesis that narrow money supply cause income is rejected. The null hypothesis that income cause money supply is also rejected since calculated \( F \)-statistic, 0.352, is lower than the critical \( F \)-value at all levels. The result can be presented as: \( M1 > Y \) and \( Y > M1 \).

### 4.3 Price Stability and Inflation

Inflation is not a welcome factor to any economy. This section is divided into six parts. The first part deals with meaning and causes of inflation; the second part with theories of inflation; the third part deals with previous studies on price; the fourth part provides methodology; the fifth part specifies sources of data; the sixth part deals with empirical study on price, in which, whether stability in price level is an attainable objective in Nepal is also explored.

#### 4.3.1 Inflation – Meaning and Causes

Inflation refers to a situation of a sustained rise in the (weighted) average price level due to a variety of causes. Johnson defines inflation as a sustained or persistent rise in price.\(^{177}\) According to Milton Friedman, inflation is always and everywhere, is a monetary phenomenon.\(^{178}\) If the aggregate demand exceeds the aggregate supply in the economy, inflation occurs. Irving S. Friedman states that the inflationary phenomenon is found in all


kinds of societies, at every stage of development, under every kind of government and within all kinds of political, economic and social ideologies.\textsuperscript{179}

Inflationary situation is much abhorred and feared because it generates negative effect on the economy. Inflation decreases the real value of savings, imposes hardship on the fixed income groups, negatively affects economic growth, and debases the value of currency, among others. Inflation brings all-round catastrophe in the economy and even the nation may disintegrate. Debasement of the currency had a great deal to do with destruction of the Roman Empire.\textsuperscript{180} However, there is disagreement about the effect of inflation on the economy. Some argue that a mild inflation is beneficial to economic growth because it helps to keep resources fully employed, generates savings, encourages manufacturers to increase production on account of increase in effective demand, and increases investment. Only the cost-push and high inflation are inimical to growth.\textsuperscript{181} It is generally argued in favor of mild or moderate inflation in developing countries to spur and achieve economic growth. At the same time, there is a great danger that mild or moderate inflation may turn into hyperinflation. There is overwhelming empirical evidence that increase in rates of inflation will lead to a low average economic growth rate and per capita real income over the long run.\textsuperscript{182} Hence, the authorities should always implement effective measures to check it from occurring and rising.

Goltfried Habeler wrote in the fifties, “…there is no record in the history of the whole world, anywhere or at any time, of a serious or prolonged inflation which had not been accompanied and made possible, if not caused, by a large increase in the quantity of money”.\textsuperscript{183} In other words, monetary expansion and inflation are closely linked; thus, a continuous high inflation cannot perpetuate long without monetary nourishment.

Persistent money creation is one of the prime causes of inflation and the other being the supply shortage. Price rise also occurs on account of supply shocks, such as oil shock or crop failure or famine, as well as of increase in the indirect tax. However, continuous inflation occurs when there is a continuous excess money supply growth in proportion to supply growth of goods in the economy.

\begin{itemize}
  \item \textsuperscript{179} Inflation: A World-wide Disaster, Hamish Hamilton, London, 1973, pp. 13-14
  \item \textsuperscript{180} Burns, A.F., Sept. 1977, “The Importance of an Independent Central Bank,” Federal Reserve Bulletin 63
  \item \textsuperscript{181} Thirwall, A.P., 1974, Inflation, Saving and Growth in Developing Economics, Macmillan, London, pp. 22-30
  \item \textsuperscript{183} Cited by Schoenberg, S., April 1996, “Institutional and Policy Condition for Monetary Stability - The European Experience, \textit{RBI Bulletin}, Vol. 50, No. 4, pp. 244
\end{itemize}
The political reason could also be attributed to inflation bias of fiscal and monetary policies. In a more unstable political system, a government may deliberately decide not to reform a tax system for a fear that more efficient tax apparatus will be used in the future by its political opponents to carry out spending programs that the current government dislikes.\(^{184}\) Hence, the government relies upon inefficient taxes, such as the seigniorage and trade taxes. According to Nordhaus,\(^{185}\) in a world where politicians seek to be re-elected, inflation (and more specifically monetary policy) is closely related to electoral competition; and money growth and inflation will go up in the period immediately preceding an election and will come down (possibly jointly with a recession) after the election. In short, political factor is also a significant cause to distort the monetary and fiscal policies, which have generated inflation in many developing countries.

### 4.3.2 Theories of Inflation

There are various theories of inflation. The Keynesian Theory of Inflation is based on excess demand or inflationary gap at full employment, and the gap is conceived in terms of the difference between the saving and investment or income and expenditure. The Cost-push or Demand-pull Inflation theory itself explains the reason for inflation but it is extremely difficult, if not impossible, to devise a test capable of determining whether a particular inflation is of the demand-pull or the cost-push variety.\(^{186}\) The Phillips Curve Theory of Inflation is based on empirical test, which showed an inverse relation between increase in money wages and employment level. The Imported Inflation theory postulates that foreign inflation raises import prices and industrial input cost, which causes wages increase as a response to rising import prices, thereby increasing aggregate demand and domestic prices. The Structural Inflation theory states that inflation is brought about by structural factors, namely weakness in the agricultural sectors, inefficient industrial sector and scarcity of foreign exchange and all these hamper to increase supply to meet the rising demand on account of population growth. Hence, the effective demand exceeds supply and the domestic price rises. The modern Monetary Theory of Inflation postulates a stable demand function of money in real terms; and increase in nominal stock of money causes a

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\(^{185}\) Cited by Edwards, S., *op. cit.*, p. 243

rise in money balances above the desired proportion, and people will try to get rid of extra money on goods and services, which causes a rise in the general price level.

Inflation in the developing countries seems to be the product of structural, monetary, and foreign inflation. The Phillips Curve model of inflation is of limited importance and of use in the developing countries because of small-organized labor market, whereas there exists no direct relationship between wage rate and productivity in vast unorganized sector. Moreover, the vast unorganized sector plays an important role in the determination of prices of goods.187

4.3.3 Empirical Studies on Price in Nepal

In the past, a few empirical studies were conducted to estimate the causes of price rise or inflation in Nepal. Mathema conducted empirical study covering the period from 1964/65 to 1994/95 to analyze the behavior of retail prices, particularly cereals in Nepal.188 His main finding was that the price movement of cereal grains in India affected the price level of the cereal grains in Nepal. The empirical study of Pant showed that the price increase in Nepal was caused by the structural factors on the economy rather than by the changes in money supply; and that changes in money supply might have been reflected in the balance of payment with India instead of reflected in prices.189 Dhungana and Kayastha observed that, in Nepal, price rise was the consequence of price rise in India and monetary expansion; and prices were sticky downward.190 Pant also conducted an empirical study. His finding was that price rise in Nepal occurred due to monetary expansion, price-rise expectation, and price rise in India.191 Sharma found weak association between money and prices and price rise in Nepal was progeny of Indian prices, but McNown study exhibited strong association between money and price.192 Khatiwada studied the money-price relation covering the period from 1965/66 to 1989/90.

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190 Dungana, B., and N. Kayastha, 1977, “Price Analysis of Selected Basic Commodities in Nepal” in (eds.) B. Dungana and N. Kayastha, Studies in Prices (Nepal), CEDA, Tribhuvan University, Kathmandu, pp 93-176
and found that the movement in price in Nepal was better explained by the difference of the rate of change between five year average of money and that of real income ($Δ\ln M_5 − \ln Q_5$) plus the rate of change of five year average Import Price Index ($Δ\ln IPI$). Habibullah conducted a study on money-price relationship in Nepal using P-star Approach. He suggested that inflation equation, using the price gap and lagged inflation in first difference as the determinants, could explain money-price relationship satisfactorily for Nepal. Regarding the speed of adjustment in Nepal, it seemed that actual inflation adjusts to $P^*$ quite rapidly, with about 40 to 66 percent of the deviation eliminated, after about three quarters in the case of $M1$, and about less than two quarters for $M2$. The finding of Shrestha was that the money supply and cost of holding real balances were the explanatory variables to explain the causes of inflation in Nepal. Regarding the flow of causality from money to price or vice versa in Nepal, only Khatiwada has done a study. His result of causality test exhibited the unidirectional causality from money to price, and there was no feedback effect from prices to money.

4.3.4 Model Specification for Nepal

There are only two monetary aggregates in Nepal, namely narrow money ($M1$) consisting of currency held by public and demand deposits, and broad money ($M2$) consisting narrow money plus time deposits. Both the monetary aggregates are used in the estimation in order to determine their explanatory powers. Nepal has not officially published other monetary aggregates namely $M3$, $M4$, or $M5$ as published in India or the United States.

The ratio of the agricultural income to GDP ($RAG$) is used as a structural variable. Since fiscal measures are already reflected in the money supply and GDP, they are excluded in the study. The other structural variables, such as transport bottlenecks, exports instability, defective land tenure system, degree of openness of the economy, production rigidities in the agricultural sector, the immobility of the labor etc. are not considered

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because of the extreme difficulty in quantifying them in the Nepalese context and also due to lack of suitable data.

\( CPI \) is used in this study for estimation. It does not reflect assets prices. The index of asset prices or composite index, comprising both consumer and asset prices, is not available as yet in Nepal. Moreover, the \( CPI \) represents prices of consumer goods in urban areas and does not include prices prevailing in the large rural areas. However, this factor may not belittle its potency, because there might be an implicit relation between rural and urban prices. People living in the rural areas usually come to urban areas to sell or purchase goods. Such activities establish a link between prices prevailing in those areas to some extent. It also represents the official prices of some goods that are subject to the government control. Since the administered price is revised frequently to reduce the budgetary contribution, it follows the market price in the long run. The administered price, therefore, has no serious impact in the \( CPI \) in the medium and long-term in Nepal. Nepal has computed wholesale price index only from FY 2000/01; hence, the number of observations is few and insufficient for regression.

The lagged inflation rate (\( ifr \)) is used as explanatory variable to test the Markov expectation hypothesis as well as the adaptive expectation hypothesis. This assumes that price changes also depend upon peoples’ expectations for the future based on the changes on the price level in the immediate past or over the past few years.

Nepal has international relation in the form of trading transactions with India and other countries. Thus, the import prices of India and other countries affect the domestic prices in Nepal. But the import price index (\( IPI \)) is not available. In place of \( IPI \), \( WPI \) (Wholesale Price Index of India) is used to estimate the influence of international price on domestic price because of the following two reasons. First, there is porous and open border between Nepal and India that allows free flow of people, goods and services between them. The economy of India is big in comparison to very small economy of Nepal, which makes Nepal a price taker; and so any rise in the price level in India will bring a rise in general price level in Nepal. Secondly, \( WPI \) captures the import prices; hence, the Nepalese imports from India implicitly capture some foreign prices. Therefore, it is assumed that \( WPI \) also represents \( IPI \) of Nepal. This assumption is further reinforced by the fact that the exchange rate between the Nepalese currency and the Indian
currency is also implicitly fixed, and the exchange rates of both currencies with respect to other currencies move in the same direction and nearly in the same percentage.

Statistical tools are used to estimate and interpret data in the study. The ordinary least square (OLS) is used to estimate the relationship among the variables. The Granger and Newbold test is applied to find out whether the regression is spurious regression or not. Similarly, the Durbin-Watson test is applied to determine whether the regression is co-integrating regression or otherwise. $R^2$, $F$-statistic, $t$-statistic are also estimated to find out the explanatory power or regression.

The following equations are estimated to evaluate the effect of different variables on the price rise in Nepal.

\[
\ln CPI_t = \alpha_0 + \alpha_1 \ln M1_t + \alpha_2 \ln \Delta YR_t + \alpha_3 \ln \Delta M1_t + \alpha_4 \ln WPI_t + \alpha_5 \ln ifr_{t-1} \quad (4.3.4.1)
\]

\[
\ln CPI_t = \alpha_0 + \alpha_1 \ln M2_t + \alpha_2 \ln \Delta YR_t + \alpha_3 \ln \Delta M2_t + \alpha_4 \ln WPI_t + \alpha_5 \ln ifr_{t-1} \quad (4.3.4.2)
\]

\[
\ln CPI_t = \alpha_0 + \alpha_1 \ln M1_t + \alpha_2 \ln WPI_t + \alpha_3 \ln RAG_t + \alpha_4 \ln ifr_{t-1} \quad (4.3.4.3)
\]

\[
\ln CPI_t = \alpha_0 + \alpha_1 \ln M2_t + \alpha_2 \ln WPI_t + \alpha_3 \ln RAG_t + \alpha_4 \ln ifr_{t-1} \quad (4.3.4.4)
\]

Where, $\ln$ represents natural log; $\Delta$ represents first difference of a selected variable; $CPI_t$ = Consumer price index; $M1_t$ = Narrow money supply; $M2_t$ = Broad money supply; $YR_t$ = Real income; $WPI_t$ = Wholesale Price Index of India; $ifr_t$ = Inflation rate; $RAG_t$ = Ratio of Agricultural income to National Income;

4.3.5 Data

The analysis is based on published official data. The data on $M1$ and $M2$ as well as data for national urban price index ($CPI$) are taken from the quarterly economic bulletin published by the Nepal Rastra Bank. The data of real $GDP$ and $GDP$ deflator are taken from the Economic Survey. The Wholesale Price Index of India ($WPI$) is taken from the Reserve Bank of India Bulletin. The study covers the period from FY 1974/75 to FY 2003/04.
4.3.6 Empirical Analysis

This subsection presents the empirical evidence regarding which of the variables have effect on prices in Nepal and which structural variable influences prices in Nepal.

4.3.6.1 Effect of Different Variables on Price in Nepal

There are two types of money supply: narrow money supply ($M_1$) consisting of currency held by the public and demand deposits held by the commercial banks, and broad money supply ($M_2$) consisting of narrow money supply plus time-deposits held by the commercial banks. The regression equations for both types of money supply with their increment over a period of 1-year are estimated. Exhibits 4.3.1 and 4.3.2 present the regression results, and $t$-value of each parameter is given in parenthesis.

**Exhibit 4.3.1: OLS estimates for 1976-2004**
Dependent variable: $\ln CPI_t$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>$t$-statistic</th>
<th>Significance at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>-1.52574</td>
<td>(-6.9301)</td>
<td>*** (1% level)</td>
</tr>
<tr>
<td>$\ln M_1_t$</td>
<td>0.30189</td>
<td>(1.9953)</td>
<td>* (10% level)</td>
</tr>
<tr>
<td>$\ln \Delta YR_t$</td>
<td>-0.01319</td>
<td>(-0.6413)</td>
<td></td>
</tr>
<tr>
<td>$\ln M_1_\Delta$</td>
<td>0.01891</td>
<td>(0.4581)</td>
<td></td>
</tr>
<tr>
<td>$\ln WPI_t$</td>
<td>0.6161</td>
<td>(2.3990)</td>
<td>** (5% level)</td>
</tr>
<tr>
<td>$\ln irr_{t-1}$</td>
<td>0.05369</td>
<td>(2.4177)</td>
<td>** (5% level)</td>
</tr>
</tbody>
</table>

$R^2 = 0.9958; F$-statistic (5, 17) = 810.751;

**Exhibit 4.3.2: OLS estimates for 1976-2004**
Dependent variable: $\ln CPI_t$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>$t$-statistic</th>
<th>Significance at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>-1.24311</td>
<td>(-6.1678)</td>
<td>*** (1% level)</td>
</tr>
<tr>
<td>$\ln M_2_t$</td>
<td>0.19718</td>
<td>(1.4544)</td>
<td></td>
</tr>
<tr>
<td>$\ln \Delta YR_t$</td>
<td>-0.02569</td>
<td>(-1.1777)</td>
<td></td>
</tr>
<tr>
<td>$\ln \Delta M_2_t$</td>
<td>0.11282</td>
<td>(1.7925)</td>
<td>* (10% level)</td>
</tr>
<tr>
<td>$\ln WPI_t$</td>
<td>0.57747</td>
<td>(2.1828)</td>
<td>** (5% level)</td>
</tr>
<tr>
<td>$\ln irr_{t-1}$</td>
<td>0.05724</td>
<td>(2.4364)</td>
<td>** (5% level)</td>
</tr>
</tbody>
</table>

$R^2 = 0.9959; F$-statistic (5, 17) = 829.567;
The regression results presented in Exhibits 4.3.1 and 4.3.2 indicate that current narrow money supply ($M1$) influences the price rise in Nepal. The narrow money supply elasticity of price is 0.30 and it is statistically significant at 10 percent level, whereas the broad money supply elasticity of price is about 0.20 but it is not statistically significant. Thus, the choice regarding appropriate monetary aggregate that explains price movement in Nepal appears to be current narrow money supply ($M1$) rather than current broad money supply ($M2$). With view of this result, in subsequent analyses, narrow money supply ($M1$) is selected as significant monetary aggregate influencing price in Nepal.

Besides, the theoretical postulation that the increase in real income influences price level negatively is confirmed in both regressions. However, $t$-values of the coefficients of change in real income ($\Delta Y_R$) in both the regressions are statistically insignificant suggesting weak influence.

The Wholesale Price Index of India ($WPI$), which proxies as Import Price ($IPI$) in the Nepalese context, has significant influence on price level in Nepal. In both regressions, coefficients signify the Indian wholesale price elasticity and they are statistically significant at 5 percent level.

1-year lag of inflation rate ($ifr_{t-1}$) was included in the regression equations on the assumption that the peoples’ expectation in rise of current price level will follow the immediate past rise in the price-level. This is the Markov Price Expectation hypothesis. 1-year lagged inflation rate appears to influence current price-level as the coefficients are statistically significant at 5 percent level. It exhibits that expectation formed on the basis of immediate price-rise in Nepal also influences the current price level.

Thus, it can be concluded that during the study period (1976-2004), current narrow money supply, wholesale prices of India, and immediate inflation rate provides best explanation for the changes in Nepalese consumer prices.

### 4.3.6.2 Structural Variables and Price in Nepal

The ratio of Agricultural income to GDP ($RAG$) is included in the regression equation as a proxy to a structural variable. Structuralists usually argue about the structural weakness in the agricultural sector. They postulate that the rate of agricultural production growth falls behind the population, hence prices go up. If $RAG$ increases, it will then have
negative effect on price, and *vice versa*. GDP is excluded in the equation to avoid double counting since $RAG$ is derived as agricultural income divided by GDP.

Exhibit 4.3.3 presents regression results for period from 1976 to 2004.

**Exhibit 4.3.3: OLS estimates for 1976-2004**

Dependent variable: $\ln CPI_t$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>$t$-statistic</th>
<th>Significance at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>-1.3512</td>
<td>(-6.8679) ***</td>
<td>(1% level)</td>
</tr>
<tr>
<td>$\ln M1_t$</td>
<td>0.3512</td>
<td>(3.7042) ***</td>
<td>(1% level)</td>
</tr>
<tr>
<td>$\ln WPI_t$</td>
<td>0.3041</td>
<td>(1.4204)</td>
<td></td>
</tr>
<tr>
<td>$\ln RAG_t$</td>
<td>-0.8945</td>
<td>(-2.6095) **</td>
<td>(5% level)</td>
</tr>
<tr>
<td>$\ln ifr_{t-1}$</td>
<td>0.0067</td>
<td>(3.6337) ***</td>
<td>(1% level)</td>
</tr>
</tbody>
</table>

$R^2 = 0.9959$; $F$-statistic $(4, 23) = 1425.96$;

The analysis indicates that the ratio of Agricultural income to GDP ($RAG$) exerted negative effect on prices in Nepal during the study period, from 1976 to 2004. The $RAG$ elasticity of price is about -0.89, and it is statistically significant at 5 percent level. Money supply ($M1$) and lagged inflation ($ifr_{t-1}$) exert positive influence on price and coefficients are statistically significant. Significant $R^2$ and $F$-statistic indicate good fit.

Taking parameter instability into consideration during FY 1993/94, the effect of aforementioned variables on prices in Nepal is studied by re-estimating the equation during two periods separately. Exhibit 4.3.4 presents the results of regression estimates.

During the first period, i.e. from FY 1975/76 to FY 1992/93, the main factor influencing price rise is the narrow money supply and it is statistically significant at 1 percent level. The money supply elasticity is about 0.48. Additionally, the Wholesale Price of India has elasticity of 0.25 and exerts positive effect on price. The lagged inflation also exerts positive influence on price though the influence is not so strong. Confirming to the theoretical postulation, $RAG$ has negative influence but its influence is not so strong.
### Exhibit 4.3.4: OLS estimates for Two Periods

Dependent variable: \( \ln CPI_t \)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln M1_t )</th>
<th>( \ln WPI_t )</th>
<th>( \ln RAG_t )</th>
<th>( \ln ifr_{t-1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1975/76 to 1992/93</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>-1.7878</td>
<td>0.4776</td>
<td>0.2593</td>
<td>-0.2595</td>
<td>0.0374</td>
</tr>
<tr>
<td>( t )-statistic</td>
<td>(-5.729)</td>
<td>(3.752)</td>
<td>(0.9804)</td>
<td>(-0.515)</td>
<td>(1.3292)</td>
</tr>
<tr>
<td><strong>Significance level at</strong></td>
<td>1%</td>
<td>1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.9913</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( F )-statistic</td>
<td>(4, 12)</td>
<td>340.911</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **1993/94 to 2003/04** |        |                |                |                |                     |
| Coefficient       | -0.5459| 0.0350         | 0.8944         | -0.7279        | 0.0143               |
| \( t \)-statistic | (-0.683)| (0.142)        | (1.7571)       | (-0.617)       | (0.2326)             |
| **Significance level at** | 10%     |                |                |                |                     |
| \( R^2 \)         | 0.9693 |                |                |                |                     |
| \( F \)-statistic | (4, 6) | 47.3156        |                |                |                     |

During the second phase, the wholesale price in India (\( WPI \)) has high elasticity of 0.89. Since the narrow money supply elasticity is quite small, it can be inferred that the price rise in Nepal during this period was largely influenced by the international prices. The expectation of past inflation influencing the current inflation appears to have grown weaker over time though it still exerts positive influence. \( RAG \) has negative influence on price level, though its influence does not appear to be strong.

### 4.3.6.3 Price Stability

The price stability refers to the state of affairs wherein the movement of prices of different commodities, services, and assets remain either in the original level or near to the original level during each span of time. In other words, the concerned institution or authority should endeavor to create a situation by devising and implementing policy measures to keep the price level at the same level or very near to it.

At present, many countries around the world have adopted inflation targeting as final monetary policy goal. The prime objective of the inflation-targeting framework is to achieve a specific inflation target, which could be either a point target or a target band, or
it could be a ceiling. The authorities typically set an inflation target for the medium term, often with annual intermediate target. Regular forecasts of expected inflation are made. If projected inflation over a medium time horizon falls outside the announced range, a change in the monetary policy stance is indicated. The inflation targeting is a forward-looking framework of monetary policy and it is not a monetary instrument. The instruments used to achieve the goal are the exchange rate or interest rate or both.

The inflation targeting needs a comprehensive and sophisticated model of the economy and the country needs to determine as which measure is desirable to achieve this, viz. Consumer Price Index (CPI) or GDP deflator. The countries, which have adopted this framework, use either ‘headline’ consumer price index or ‘underlying’ (core) inflation measures. New Zealand uses underlying inflation measures in which the effects of the estimated impact of goods and services and of interest rates on CPI are excluded from the inflation index. Though the headline CPI is easy to adopt, it is not best suited in the medium to long term as it could be volatile and adversely affect public perception on central bank creditability.

The ‘underlying’ or core inflation is difficult to estimate because it has permanent component and is fully anticipated by the economic agents. The existence of permanent component imparts downward rigidity to the measured rate of inflation in the event of a positive supply shock; and from the monetary policy angle, it is desirable that the policymakers endeavor to reduce core-inflation. For the successful implementation of inflation targeting, according to Bernanke and Woodford, there appears to be no substitute for explicit structural model for the economy and extensive information gathering by the central bank; and private sector forecasts and forecast inferred from financial markets should be part of the information gathered by the central bank but they should be combined with other information for the making of policy.

In Nepal, the Eighth Plan (1993-1997), for the first time projected the inflation to grow at the rate at 9 percent per annum during the Economic Plan period. No basis or justification was provided as to how these figures were arrived at. There was no provision for regular mid-term review and the Nepal Rastra Bank Act, 1955 did not have any

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200 Bernanke, B.S., and M. Woodford, Nov. 1997 “Inflation Forecasts and Monetary Policy”, Money, Credit and Banking, Vol. 29, No. 4, p 656
objective of price stability in its preamble. However, the new statute of the Nepal Rastra Bank has specified the objectives – to maintain the stability of price and balance of payments for sustainable development of the economy, and manage it. After this change in the Act, the Bank has begun to announce permissible limit of annual price rise. It also conducts the mid-term review of the monetary policy to adjust intermediate target and use the monetary policy instruments suitably.

During the fiscal year 2002/03, the limit of price rise was set at 4 percent. The NRB reduced the compulsory cash reserve at vault from 3 percent to 2 percent of deposits in two stages. In spite of such policy measure, the price rise was 4.8 percent during the year. The NRB projected the inflation rate of 4.3 percent for the fiscal year 2003/04, but the actual increase in CPI was 4 percent for the fiscal year due to favorable weather conditions, which prevented the rise in prices of food products, and also due to the decline in the prices of the imports.

As shown in Exhibit 4.3.4, regression result for the period 1994-2004, $M1$ has no influence on CPI as its coefficient is insignificant with very weak t-statistic. The main factor for CPI rise is WPI and dampening variable is RAG. The influence of WPI on CPI is 89.4 percent and dampening influence of RAG on CPI is 72.8 percent; t-statistic of WPI is high whereas t-statistic of RAG is not strong. In FY 2002/03 and FY 2003/04, the growth of WPI was 6.49 and 4.45 percent respectively. The monetary measures did not have any effect.

In brief, the movement of consumer prices in Nepal is highly influenced by the movement of the Wholesale Price Index of India (WPI). In other words, if there is any increase in WPI, CPI also records an increase, and vice versa. The dampening effect is caused by the agricultural output. $M1$ has had no influence in the recent past. Thus, the government and the NRB need to put in effort to ensure that the flow of skill, and physical and financial resources to the agricultural sector even during the period of disturbance. However, caution is required since simply increasing financial flow to this sector will not provide expected benefits, and on the other hand, misuse of such flow may substantially rise.

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4.4 Exchange Rate Stability and the Balance of Payments Adjustment

4.4.1 Exchange Rate Stability

This section provides the meaning of exchange rate, its stabilization, and method of exchange rate fixation in Nepal.

4.4.1.1 Meaning of Exchange Rate

Foreign exchange markets arise because different countries have different monetary systems, and these different domestic countries have to buy goods, services and financial assets. The exchange rates between as well as among different currencies have come into existence in order to facilitate exchange of goods and services. The number of units of one currency that must be given up to buy a unit of another currency is called the exchange rate. Depreciation and appreciation of domestic currency are always relative to another currency.

The exchange rate is determined by the long run and short run factors. In long-run, exchange rates are determined by economic fundamentals such as price levels and real incomes of different countries. The level of real income in an economy ultimately reflects the productivity of the country’s resources. Changes in real income at home relative to that of abroad will shift demand or supply curves in the foreign exchange markets. Another important long-run determinant of foreign exchange rates is the price level. Foreign and domestic interest rates can also influence the long-run exchange rates through their impact on the demand for and supply of currency. Tariffs, trade barriers, and preferences cause change in the exchange rates between countries.

In the short run, exchange rates may even fluctuate wildly if the foreign exchange market is free from control. In fact, traders in the foreign exchange market make their living by buying foreign currency at low exchange rate and selling them at a slightly higher rate. Change in expectations of future exchange rates mostly cause fluctuation of these rates in the short-run. The fixed exchange rate and floating exchange rate regimes are already discussed in Chapter Three. It is noteworthy that exchange rate of every country should follow changes in the fundamentals of its economy in the long run.
In July 1, 1991, exchange rate between Indian rupees (I Rs.) and Nepalese rupees (N Rs.) was adjusted and fixed at NC Rs. 1.65 for each Indian rupee. Alternatively, Indian rupee (I Rs.) is also referred to as Indian currency (IC) and Nepalese rupee (N Rs.) as Nepalese currency (NC). The parity was fixed on February 12, 1993 by reevaluating the national currency by 3 percent, i.e. from NC Rs. 1.65 to NC Rs. 1.60 per rupee of IC. Since then, the exchange rate of NC vis-à-vis IC has remained unchanged.

4.4.1.2 Exchange Rate Stability

The exchange rate policy is usually tailored to suit the need of short run period. In long run, the economic fundamentals govern the exchange rate of the country. The Theory of Purchasing Power Parity, law of one price, i.e. two identical goods within a relevant market must sell for the same price, may not be useful for short run purpose; but nonetheless it is useful because it often accurately predicts the long-run direction of changes in exchange rates.205

There should not be great volatility or fluctuations in the exchange rates in any economy even for few days since it impairs the economy to a larger extent by shaking the stability in the value of domestic currency internally and externally. Therefore, high fluctuations should be avoided in exchange rate of currency by taking timely corrective measures.

Many developed countries adopted exchange rate targeting policy to restrict its movement within a limit, so that volatility in the exchange rate may not take place and impair the economy. The experience of European nations in the context of the exchange rate targeting is neither good nor encouraging. These nations have already given up fixing the exchange rate target as a final objective. Nepal never adopted the exchange rate targeting policy. However, for every country including Nepal, when economic fundamentals change, the rate should be changed in all exchange rate regimes to have favorable effect. Besides, as information regarding condition of different economies flows continuously in the foreign exchange markets, thereby infusing reaction, reasonable movement in the exchange rate takes place during short run period. The determination of exchange rate and operation of foreign exchange market in Nepal is presented below.

4.4.1.2.1 Determination of the Exchange Rate in Nepal

The determination of the exchange rate involves two aspects: firstly, with whom the authority rests and who manages it; and, secondly, maintenance of stable and realistic rates of exchange with foreign currencies.

The Nepal Rastra Bank (NRB) was established in 1956 under the Nepal Rastra Bank Act, 1955. Its preamble states, among others, as “… to stabilize the exchange rates of the Nepalese currency in order to ensure convenience and economic interest of the general public.” The Bank was bestowed with the responsibility by the preamble of the Act to stabilize the exchange rate, but Section 21 (1 and 2) of the Act gave the authority to the government to fix the par value and the Bank to conduct transactions between the Nepalese and foreign currencies at rates fixed by the government. Moreover, the government was entitled to frame regulations and/or issue directives and orders relating to foreign currency control in consultation with the Bank.

Before November 1, 1960, neither the government nor the Bank could determine the exchange rate. The Reserve Bank of India (RBI) conducted all the foreign exchange transactions for Nepal. Only after November 1960, Nepal began to deal in foreign exchange and fix the exchange rate. In the beginning, it followed Indian foreign exchange rates for all currencies other than Indian currency. The exchange rate was fixed at N Rs. 1.60 per Indian rupee and was applicable for all purposes. The system of free and unlimited convertibility of Indian rupee was introduced in 1960.

During 70’s and 80’s, Nepal adopted fixed exchange rate regime and its currency was inconvertible as per Article XIV of the IMF Agreement. The rate of exchange was fixed with the US dollar during that period. Nepal even revalued its domestic currency on June 1966 by 37 percent against the IC when India had devalued its currency by 36.5 percent on June 6, 1966 with the US dollar. When the US discontinued to abide by the provision of one troy ounce of gold per one US dollar and floated the US dollar, Nepal’s exchange rate began to fluctuate with other currencies, including IC. As the NC had fixed parity with both the US dollar and IC, the broken cross rate began to emerge between the US dollar/IC and NC. At times, the magnitude of fluctuation of broken cross rate used to be too large. In order to rectify this anomaly, there was no alternative other than discretionary measures of devaluation or revaluation of the US dollar exchange rate.
Nepal then shifted to basket of currencies to determine the exchange rates between the NC and foreign currencies, including IC, on December 17, 1982. Thus, it adopted floating exchange rate regime. The weight in the basket of currencies composed of 60 percent SDR and 40 percent IC, which were then the actual average share of convertible currencies and IC in Nepal’s international transactions. It adopted the US dollar as numerary. 206

Nepal introduced partial convertibility of its currency in March 1992 and subsequent full convertibility in February 1993 in the current account. Nepal has not opened the capital account as yet. The opening of capital account without analyzing all the relevant issues may push the economy into jeopardy. The experience of the East-Asian crisis is amply evident. Nepal should adopt cautious approach and slow pace to open up its capital account in the future.

From February 12, 1993, there has been no change in the exchange rate between NC and IC and it has remained fixed. It appears that Nepal has adopted implicit pegging of exchange rate of NC. As the exchange rate parity of IC with NC has been fixed, the Bank may want NC to purchase the same unit of the US dollar as IC (if converted in NC) could purchase the US dollar with a view that there should not be large broken cross rate. The exchange rates of other foreign currencies are fixed on the basis of exchange rates of the US dollar with other currencies in the international foreign exchange market.

The authorized dealers (the commercial banks) determine the exchange rates of other convertible currencies on the basis of demand for and supply of the same in the market. The Bank publishes the exchange rates of foreign currencies for its own use and they are only indicative. Each of the commercial banks is free to determine its own buying and selling rates for convertible currencies and other near-money instruments. However, those rates usually do not differ from the rates published by the Bank.

Nepal is a small, poor and developing nation. Thus, it is a price-taker, not a setter in the international context. Its overall international transactions are relatively very small. India, comparatively a very big country with vast economy, is its neighbor in the southern part. Nepal’s economy is like a shadow economy under the giant Indian economy. On the northern part, its neighbor is the People’s Republic of China (PRC). However, because of difficult mountainous terrain lying between Nepal and Tibet, autonomous region of PRC,

there is limited transport, communication and movement of people. Likewise, there is limited trade and commerce. With India, the recorded and unrecorded transactions as a proportion of Nepal’s international transactions are not less than three-fourth. Moreover, culture, social values, scripts, languages, religion are very similar between Nepal and India to a significant extent. Hence, it does not help Nepal if the exchange rate between NC and IC fluctuates daily, which may result in loss of confidence in domestic currency (NC), thereby inviting fatal consequences. Nepal, therefore, did not change the exchange rate with IC and has continued the policy of maintaining fixed exchange rate between the two currencies since 1993.

Previously the government had the main responsibility of fixing the foreign exchange rates. The Section 62 of the amended Nepal Rastra Bank Act, 2002 states that the Bank has “… full authority to formulate, implement and cause to implement foreign policy of the Kingdom of Nepal.” One objective of the Act, among others, is to formulate foreign exchange policies and manage it (Section 4 (a) of the NRB Act, 2002). At present, the Bank has full authority and responsibility to deal with matters relating to foreign exchange, and the Bank can fix and introduce changes in the exchange rates.

4.4.1.2.2 Operation of Foreign Exchange Market

The prime responsibility of maintaining stable exchange rate currently rests with the NRB. Any volatility in the exchange rates weakens the economy. The current account is fully convertible and capital account is still fully controlled in Nepal. Whereas exchange rate of NC vis-à-vis IC is fixed and unchanged, the exchange rates of other foreign currencies are fixed daily and may change each day.

The exchange transactions were conducted through the banking sector only before 1995. Some of the business entities such as hotels, travel agencies, etc were also given licenses but for special purposes with the objective of dealing with clients only.

The NRB starting issuing licenses to the private sector from 1995 onwards to permit dealings in the foreign exchange. The Bank issues two categories of licenses: for IC and for convertible currencies. Each of the commercial bank is the dealer of foreign exchange and it is free to determine the exchange rates for other near-money instruments. Whereas it has the responsibility to fulfill its foreign exchange obligations itself, it is also free to manage its foreign exchange reserves in the international market.
The NRB has been successful in convincing the commercial banks to keep the buying and selling exchange rate within one percent. It means that if a commercial bank fixes buying rate lower, accordingly its selling rate needs to be lower too. When the commercial banks are provided with discretionary power to determine the exchange rates, the rates may be different for different banks. The commercial banks have established an association called the Foreign Exchange Dealers Association of Nepal (FEDAN) with a view of sharing knowledge and avoiding unhealthy competition in the foreign exchange transactions. Each commercial bank sends exchange rate to the FEDAN on a daily basis, which then compiles such exchange rates and sends to the NRB. After receiving the exchange rates of all commercial banks through the FEDAN, the NRB calculates the average exchange rate for the US dollar. After computing the exchange rate of the US dollar, the exchange rates for other convertible currencies are calculated on the basis of cross rates with the US dollar in the international market.

Table 4.4.1: Transactions with Commercial Banks under Intervention
(in millions of US $)

<table>
<thead>
<tr>
<th></th>
<th>Purchase from Commercial banks</th>
<th>Sale to Commercial Banks</th>
<th>Difference (Purchase-Sale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991/92</td>
<td>1</td>
<td>8.7</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>126</strong></td>
<td><strong>1506</strong></td>
</tr>
</tbody>
</table>

Source: Foreign Exchange Department, Nepal Rastra Bank
The NRB focuses on maintaining exchange-rate stability by intervening in the market if the situation warrants so. The NRB intervened in the foreign exchange market, as shown in Table 4.4.1, from FY 1991/92 to FY 2003/04 to purchase US $ 1506 million from the commercial banks in 126 transactions and sold US $ 773.3 million in 64 transactions to smooth out the foreign exchange rate.

In a liberalized exchange rate regime, the NRB would not impose on the commercial banks to fix the rate as prescribed by it. On the request of the commercial banks, it had conducted buying and selling foreign currencies to restrict the fluctuation of the exchange rates within a limit. This was necessary, as the objective of stable exchange rate may not be achieved if the central bank does not intervene in the market to smooth-out the fluctuations in the exchange rates created by the foreign exchange rate dealers, i.e. commercial banks in Nepal. If the central bank fails to take timely action, it creates uncertainty in the exchange rate, which will cause detrimental impact on the overall stability of the economy.

In the Nepalese context, it appears that the NRB has made ample efforts to maintain stability in the exchange rates. It has been buying and selling foreign exchange through intervention to maintain stability in exchange rates. The commercial banks have usually approached the NRB through the FEDAN when their requirement is not fulfilled through inter-bank transactions. It has used the middle rate of the prevailing published rate while buying and selling the foreign exchange from the commercial banks. Sometimes, it has used different rates whenever it believed that the prevailing exchange rate is unduly overvalued or undervalued.

Considering the present position of Nepal, it is prudent to continue and maintain the fixed exchange rate between NC and IC. As regard to other currencies, timely intervention should be made by the NRB in the foreign exchange market to keep the exchange rate stable.

### 4.4.2 Balance of Payments Adjustments

The balance of payments (BOP) account is the mirror of a country’s external strength in respect of foreign exchange matters for a particular period of time. Nepal started compilation and publication of the BOP statistic since FY 1974/75. In the
subsequent sections, definition of the BOP statistics and the empirical study of the monetary approach to the balance of payments are dealt with.

### 4.4.2.1 Definition

The definition of the BOP is presented here is from the BOP Manual 5 published and circulated by the International Monetary Fund (IMF). It defines balance of payments as a “… statistical statement that systematically summarizes, for a specific time period, the economic transactions of the economy with the rest of the world.”

The balance of payments can be defined from national account viewpoint. National income earned is augmented by transfer incomes from abroad and diminished by income transferred abroad. The amount, thus, obtained in the national income is available within the country.\(^{207}\) The difference between national income available and national expenditure equals the balance of payments on current account. In symbolic terms, assuming capital movement to be nil, the balance of current account \(B_{Ca}\) equals total domestic output \(Y\) minus domestic expenditure \(E\), i.e. \(B_{Ca} = Y - E\).

The BOP Account is presented in a set pattern or format. It is divided into Current account \(C_1\), Capital account \(C_2\) and Reserves account \(R\); thus, \(C_1 + C_2 = \pm R\). Current account consists of goods and services, and other incomes. Capital account consists of movement of long-term capital between residents and non-residents. Reserves account consists of movement in the foreign exchange reserve during a specified period of time. The BOP account is prepared following the double-entry system showing inflow and outflow of foreign exchange.

### 4.4.2.2 Empirical Study

The balance of payments adjustment is concerned with short-run problems as the BOP account is usually prepared for a fixed period of time, i.e. one year. In long run, the BOP adjustment depends on the fundamentals of the economy such as productivity, demand for country’s products externally, price level, and improvements in its comparative efficiency and competitiveness.

---

With a passage of time, the adjustment approach in BOP has changed. The main approaches of adjustments are as follows: (i) the elasticity approach; (ii) the income absorption approach; and (iii) the monetary approach.

The elasticity approach assumes that devaluation would promote substitution in production and consumption by effecting a change in the real prices of domestic goods relative to foreign and domestic markets. Increase in exports and decrease in imports as price effect, brought about by devaluation, will correct the BOP deficit. The elasticity approach, however, did not take into account other important macroeconomic aspects of adjustment process including the effect of changes in stock of money.

The income absorption approach viewed the BOP as a relationship between the aggregate receipts and expenditures of the economy rather than as a relationship between the country’s credits and debits on international account. It asserted that there are possibilities of improving the BOP in a condition of high utilization of resources by reducing absorption. This approach argued that the balance of trade can be improved by a policy change, such as devaluation, only if income increases more than expenditure, or if expenditure decreases by keeping the income same. However, a fully employed economy cannot use devaluation alone as a policy instrument for correcting a BOP deficit.

The monetary approach of the BOP considers it as an essentially, but not exclusively, monetary phenomenon. In this proposition, the BOP refers to the money account. The analysis of BOP only makes sense in an explicitly monetary model. The monetary approach recommends an analysis of the BOP in terms of behavioral relationship directly relevant to money account, rather than an analysis in terms of the behavioral relationship with other accounts and, only indirectly to money account.

The monetary approach to the balance of payments is more satisfactory method to analyze the effect of monetary factors on the balance of payments. According to this approach, in the long run, any change in the international reserve is fully reflected in the money stock in an open economy under fixed exchange rate regime and variations in stock of money is fully reflected in exchange rates in flexible exchange rate regime. Thus, stock of money becomes endogenous variable of the regime in the former whereas it becomes exogenous variable in the latter. However, the adjustment path to long run equilibrium permits the monetary authority even in fixed exchange rate regime to influence the course of transitory adjustments in the short run and medium run.
Nepal has full convertible exchange rate regime wherein capital account is fully controlled and current account is completely free. Nepal seemed to have implicitly followed the pegging of the domestic currency (NC) with IC, and it has kept its exchange rate of NC vis-à-vis IC unchanged since 1993. It has only changed NC exchange rates with other foreign currencies taking into account the exchange rates between IC and other foreign currencies in terms of NC. This is almost like a fixed exchange rate. Thus, as in fixed exchange rate regime, the monetary base or money supply is no longer determined by the policy because it becomes endogenous variable of the system which itself is influenced by the surplus or deficit in the balance of payments. In Nepal, therefore, instead of money stock, domestic credit becomes the appropriate instrument of monetary policy.

4.4.2.3 Model Specification for Nepal

As already stated earlier that Nepal is an open economy; and in the open economy, the domestic credit of the banking sector, instead of money supply, is suitable monetary policy instrument for influencing the balance of payments. In this context, well-known Polak model,208 is incorporated to assess the impact of domestic credit on the balance of payments in Nepal.

\[ Y_t = V_t M_t \]  
\[ IMP_t = m_t Y_t \]  
\[ \Delta M_t = B_t + \Delta DC_t \]  
\[ B_t = (EXP_t - IMP_t) + K_t \]

Where, \( \Delta \) represents First difference (or Increment) of a variable;
\( Y_t \) = National income; \( V_t \) = Income velocity of circulation of money;
\( M_t \) = Money supply;
\( m_t \) = Marginal propensity to import;
\( IMP_t \) = Imports; \( EXP_t \) = Exports;
\( B_t \) = Balance of Payments = \( \Delta R_t \) (change in international reserves);
\( DC_t \) = Domestic credit;
\( K_t \) = Net capital inflow of non-banking sector;

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Equations (4.4.2.1) and (4.4.2.2) are behavioral equations; and equations (4.4.2.3) and (4.4.2.4) are identities. These equations are combined to yield solution as equation (4.4.2.5) in discrete time periods.\(^2\)

\[
B_i = \left( \frac{1}{1 + m_i V_i} \right) \Delta (\text{EXP}_t + K_t) - \left( \frac{m_i V_i}{1 + m_i V_i} \right) \Delta DC_i + \left( \frac{1}{1 + m_i V_i} \right) B_{t-1} \quad (4.4.2.5)
\]

This is short-term solution that satisfies the behavioral equations in the model. However, it need not require equilibrium in the balance of payments, which requires \(B_i = B_{i-1}\) and also \(\Delta Y_i = Y_{i-1}\). The long-term solutions that satisfy these conditions are:

\[
B_i = \left( \frac{1}{m_i V_i} \right) \Delta (\text{EXP}_t + K_t) - \Delta DC_i \quad (4.4.2.6)
\]

However, the focus is to look to the short-term solutions only.

### 4.4.2.4 Data

Data for exports, balance of payments, and net capital inflow of non-banking sector are taken from various issues of the Quarterly Economic Bulletin published by the Nepal Rastra Bank.

### 4.4.2.5 Empirical Analysis

The hypothesis to be tested is that the balance of payments is directly related to changes in the sum of exports and net capital movements \([\Delta(\text{EXP}_t + K_t)]\), and international reserves at the end of previous year \((B_{t-1})\); and inversely related to changes in domestic credit \((\Delta DC_i)\).

---

\(^2\) The equation is derived as: \(B_i - B_{i-1} = (\Delta\text{EXP}_t + \Delta K_t) - \Delta\text{IMP}_t\) according to equation (4). The value of \(\Delta\text{IMP}_t\) can be \(m_i \Delta Y_i\) by equation (2) and again it can be \(m_i V_i \Delta M_i\) by using equation (1). It can be \(m_i V_i (B_i + \Delta DC_i)\). Thus, \(B_i - B_{i-1} = \Delta(\text{EXP}_t + K_t) - m_i V_i B_i - m_i V_i \Delta DC_i\). Further is \(B_i + m_i V_i B_i = \Delta(\text{EXP}_t + K_t) - m_i V_i \Delta DC_i - B_{i-1}\); thus \(B_i (1 + m_i V_i) = \Delta(\text{EXP}_t + K_t) - m_i V_i \Delta DC_i - B_{i-1}\). Finally, we get \(B_i = \left( \frac{1}{1 + m_i V_i} \right) \Delta (\text{EXP}_t + K_t) - \left( \frac{m_i V_i}{1 + m_i V_i} \right) \Delta DC_i + \left( \frac{1}{1 + m_i V_i} \right) B_{t-1}\).
The following Exhibit 4.4.1 presents the results of the estimated equation for the Polak-Agry Model. The $t$-value of each parameter is given in the parenthesis.

**Exhibit 4.4.1: OLS estimates for 1977-2004**

Dependent variable: $\ln B_t$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>$t$-statistic</th>
<th>Significance at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>0.420186</td>
<td>(0.2600)</td>
<td></td>
</tr>
<tr>
<td>$\ln \Delta(\text{EXP}_t + K_t)$</td>
<td>0.988718</td>
<td>(2.6697) **</td>
<td>(5% level)</td>
</tr>
<tr>
<td>$\ln \Delta DC_t$</td>
<td>-0.419083</td>
<td>(-1.0953)</td>
<td></td>
</tr>
<tr>
<td>$\ln B_{t-1}$</td>
<td>0.31376</td>
<td>(1.6785)</td>
<td></td>
</tr>
</tbody>
</table>

$R^2 = 0.629567$; $F$-statistic $(3, 15) = 8.49773$;

The results presented above shows that about 63 percent variation in the balance of payments, during the period from 1977 to 2004, can be explained by the above equation. The main factor responsible for positive variation in the international reserves is the sum of exports and net capital movements [$\Delta(\text{EXP}_t + K_t)$]. The coefficient is positive and its $t$-value is significant at 5 percent level. The explanatory variable, $\ln B_{t-1}$, has provided expected results. The coefficient is positive but it is statistically insignificant suggesting weak influence. However, changes in domestic credit ($\Delta DC_t$) have yielded negative effect on the balance of payments. Since domestic credit expansion boosts up imports of capital and consumer goods, this inverse relationship is theoretically plausible. However, its influence appears weak because of insignificant $t$-value.

The Polak-Agry model with regards to the structural break, as shown by the CUMSUM-Squared tests and the Chow’s F-test, is also analyzed. Thus, the data is sub-divided into two periods, from FY 1974/75 to FY 1992/93 and from FY 1993/94 to FY 2003/04 to re-estimate the equations.

The regression results are given in Exhibit 4.4.2 and $t$-value of each parameter is given in the parenthesis.
Exhibit 4.4.2: OLS Estimates for Two Periods

Dependent variable: \( \ln B_t \)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>( \ln (\Delta EXP_i + K_i) )</th>
<th>( \ln \Delta DC_i )</th>
<th>( \ln B_{t-1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1977 to 1993</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>1.89934</td>
<td>1.64446</td>
<td>-1.13476</td>
<td>0.141792</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(2.4552)</td>
<td>(8.7836)</td>
<td>(-4.2660)</td>
<td>(1.2207)</td>
</tr>
<tr>
<td>Significance level at</td>
<td>(10%)</td>
<td>(1%)</td>
<td>(1%)</td>
<td></td>
</tr>
<tr>
<td>( R^2 = 0.9702; ) F-statistic (3, 5) = 54.2819;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1994 to 2004</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>-7.6683</td>
<td>0.9178</td>
<td>-0.15735</td>
<td>0.45809</td>
</tr>
<tr>
<td>t-statistic</td>
<td>(-0.6361)</td>
<td>(1.0795)</td>
<td>(-0.3686)</td>
<td>(1.4713)</td>
</tr>
<tr>
<td>( R^2 = 0.3535; ) F-statistic (3, 6) = 1.09374;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Exhibit 4.4.2 indicates that the sum of exports and net capital inflow exerted positive influence whereas domestic credit has exerted negative influence during the period from 1977 to 1993. Coefficients of both explanatory variables are significant at 1 percent level. The re-estimated equation is able to explain about 97 percent of changes in the international reserves. 1-year lag of changes in the international reserves have positive influence but it appears weak because of insignificant \( t \)-value.

During the second period, from 1994 to 2004, none of the explanatory variables are significant suggesting very weak influence. \( R^2 \) also declined to about 35 percent. This is perhaps the result of political instability especially after 1999/2000.

It is also essential to assess if changes in income caused inverse changes in the international reserves. If there is an inverse relationship, there should be positive correlation between changes in income (\( \Delta Y \)) and changes in imports (\( \Delta IMP \)).

The result of the regression equation estimated for this purpose is presented in Exhibit 4.4.3. The \( t \)-statistic is in the parenthesis.
Exhibit 4.4.3: OLS estimates for 1976-2004

Dependent variable: $\ln \Delta IMP_t$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>$t$-statistic</th>
<th>Significance at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>-3.16052</td>
<td>(-3.1210)</td>
<td>*** (1% level)</td>
</tr>
<tr>
<td>$\ln \Delta Y_t$</td>
<td>1.20238</td>
<td>(10.9779)</td>
<td>*** (1% level)</td>
</tr>
</tbody>
</table>

$R^2 = 0.839738$;

Exhibit 4.4.3 shows that the changes in income brought about 84 percent of changes in imports. The income elasticity of imports stands at 1.2 and is statistically significant at 1 percent level.

As for two different periods, from 1976 to 1993 and from 1994 to 2004, consolidated results are presented below in Exhibit 4.4.4. The $t$-statistic of the parameter is given in the parenthesis.

Exhibit 4.4.4: OLS Estimates for Two Periods

Dependent variable: $\ln \Delta IMP_t$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Const</th>
<th>$\ln \Delta Y_t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976 to 1993</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>-1.3724</td>
<td>0.97983</td>
</tr>
<tr>
<td>$t$-statistic</td>
<td>(-1.0266)</td>
<td>(6.3906)</td>
</tr>
<tr>
<td>Significance level at</td>
<td></td>
<td>(1%)</td>
</tr>
<tr>
<td>$R^2 = 0.7314$;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 1994 to 2004 |       |                  |
| Coefficient | 3.81527 | 0.55237         |
| $t$-statistic | (0.6061) | (0.9818)       |
| $R^2 = 0.1194$;          |       |                  |

During the period, from 1976 to 1993, the elasticity of income is nearly unity and it is significant at 1 percent level. Changes in income brought about 73 percent of changes in imports. However, during 1994-2004, though the coefficient has expected positive sign, it
is statistically insignificant. Furthermore, $R^2$ has declined significantly to about 12 percent only.

It is also vital to evaluate whether the changes in money supply, both narrow money ($M_1$) and broad money ($M_2$), cause changes in imports. It is assumed that with an increase in money supply, income of people also increases; hence, it increases imports in developing nations like Nepal. The results for estimated regression equations are presented below in Exhibit 4.4.5.

**Exhibit 4.4.5: OLS Estimates for 1976-2004**

Dependent variable: $\ln \Delta IMP_i$

<table>
<thead>
<tr>
<th></th>
<th>Const</th>
<th>$t$-stat</th>
<th>$\ln \Delta M_1$</th>
<th>$t$-stat</th>
<th>$\ln \Delta M_2$</th>
<th>$t$-stat</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>-0.745</td>
<td>(-0.727)</td>
<td>1.159</td>
<td>(8.356)</td>
<td></td>
<td></td>
<td>0.744</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>***</td>
</tr>
<tr>
<td>2.</td>
<td>-1.794</td>
<td>(-1.969)</td>
<td></td>
<td></td>
<td>1.1487</td>
<td>(10.558)</td>
<td>0.823</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>***</td>
</tr>
</tbody>
</table>

Note: *** denotes significance at 1% level; ** at 5% level; * at 10% level

The above results for 1976-2004 suggest that narrow money supply and broad money supply can explain about 74 percent and 82 percent changes in imports respectively. The coefficients are also statistically significant at 1 percent level. Thus, one needs to accept the hypothesis that changes in money cause changes in imports during the study period.

As for two different periods, from 1976 to 1993 and from 1994 to 2004, the results are presented below in the consolidated Exhibit 4.4.6. The $t$-statistic of the parameter is given in the parenthesis.

It shows that, during the period from 1976 to 1993, changes in narrow and broad money supply explain 62 percent and 73 percent of changes in imports. The coefficients are statistically significant at 1 percent level and suggest that changes in money supply positively influence changes in imports. However, during the period from 1994 to 2004, the relationship between changes in imports and changes in money supply appears to have
broken down since the coefficients become negative; and theoretically it is not plausible. \( R^2 \) also decreased dramatically.

**Exhibit 4.4.6: OLS Estimates:** Dependent variable: \( \ln \Delta M_P \)

### 1976-1993

<table>
<thead>
<tr>
<th>Const</th>
<th>( t )-stat</th>
<th>( \ln \Delta M_1 )</th>
<th>( t )-stat</th>
<th>( \ln \Delta M_2 )</th>
<th>( t )-stat</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>-0.649</td>
<td>(-0.44)</td>
<td>1.129</td>
<td>(5.179)</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>-2.492</td>
<td>(-1.73)</td>
<td>1.2391</td>
<td>(6.559)</td>
<td>***</td>
<td></td>
</tr>
</tbody>
</table>

### 1994-2004

<table>
<thead>
<tr>
<th>Const</th>
<th>( t )-stat</th>
<th>( \ln \Delta M_1 )</th>
<th>( t )-stat</th>
<th>( \ln \Delta M_2 )</th>
<th>( t )-stat</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>10.736</td>
<td>(5.276)</td>
<td>-0.143</td>
<td>(-0.609)</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>9.594</td>
<td>(3.479)</td>
<td>-0.011</td>
<td>(-0.037)</td>
<td>**</td>
<td></td>
</tr>
</tbody>
</table>

*Note: *** denotes significance at 1% level; ** at 5% level; * at 10% level*

Further the existence of any substantial positive correlation between the changes in international reserves and changes in imports has also been evaluated. Following Exhibit 4.4.7 presents regression result for the study period, i.e. from 1976 to 2004. The \( t \)-statistic is in the parenthesis.

**Exhibit 4.4.7: OLS estimates for 1976-2004**

Dependent variable: \( \ln B_i \)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>( t )-stat</th>
<th>Significance at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>3.09504</td>
<td>(2.780)</td>
<td>**</td>
</tr>
<tr>
<td>( \ln \Delta M_P )</td>
<td>0.54789</td>
<td>(4.025)</td>
<td>***</td>
</tr>
</tbody>
</table>

\( R^2 = 0.4603; \)

The elasticity of changes in imports is about 0.55 and is statistically significant at 10 percent level. \( R^2 \) is 46 percent suggesting that changes in imports can result in about 46 percent of changes in the international reserves.
In Exhibit 4.4.8, the relationship between the changes in international reserves and changes in imports is evaluated.

### Exhibit 4.4.8: OLS Estimates for Two Periods

Dependent variable: \( \ln B_t \)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1976 to 1993</th>
<th>1994 to 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coefficient</strong></td>
<td>2.9867</td>
<td>4.5444</td>
</tr>
<tr>
<td><strong>t-statistic</strong></td>
<td>(2.3367)</td>
<td>(0.3302)</td>
</tr>
<tr>
<td><strong>Significance level at</strong></td>
<td>(5%)</td>
<td>(5%)</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.4830</td>
<td>0.0121</td>
</tr>
</tbody>
</table>

It shows that during 1976-1993, changes in imports have brought in about 48 percent of changes in the international reserves. The import-elasticity was about 0.56 suggesting 0.56 percent change in imports contributes to 1 percent change in the international reserves. The coefficient is statistically significant at 1 percent level. However, during 1994-2004, \( R^2 \) decreased drastically to 1 percent and the coefficient of explanatory variable is statistically insignificant. In this view, during this period, the relationship between changes in imports and changes in the international reserves do not exist.

The findings of the empirical analyses suggest that variation in domestic credit exert negative pressure on the balance of payments. Moreover, in Nepal, domestic credit appears to exert positive pressure on economic activity. In such a scenario, the predicament of the monetary authorities increases manifold with regard to decision whether to control expansion of domestic credit or not. The control on expansion of domestic credit may lead to decrease in income because of the existent positive relationship, and if the monetary authorities do not control the expansion, then the balance
of payments situation may worsen. However, in the Nepalese context, except for six different years of negative balance of payments (during FY 1974/75, FY 1977/78, FY 1979/80, FY 1982/83, FY 1983/84 and FY 1984/85), it has largely remained positive (recording surplus) during the study period.

It is evident from the empirical analysis from the period 1976 to 2004 that changes in exports and net capital flows explains the changes in international reserves. The changes in domestic credit have inverse relationship with changes in international reserves. At the same, during the study period, significant number of years recorded surplus in balance of payments. Therefore, it appears that monetary authorities did not have to take measures to correct disequilibria.

4.5 Central Bank Independence

The independence to the central bank may enable it to manage money in the best interest of the society. Since money is very powerful in modern exchange economy, people expect the central bank would take bold monetary policy measures to maintain the value of money, and to ensure price stability in the economy. So, it needs to be independent to carry out its objectives and achieve the target, and there should not be interference in its activities.

The discussion is divided into three subsections. The first subsection deals with the meaning of central bank independence and reasons of its coming into prominence. The second subsection provides different countries’ experience in respect of the central bank independence. The third subsection accounts for Nepal’s experience regarding central bank independence.

4.5.1 Meaning of Central Bank Independence

The central bank independence means that it should be politically and technically independent to formulate and implement monetary policy. It should not be directed and controlled by a government or outside agencies to devise and implement policy measures so that it could acquire and establish credibility, and the people would repose confidence on it and its measures. Since the establishment of state privileged banks, Sweden in 1668
and England in 1694, there always remained conflict between the ideas whether there should be fiscal domination over the monetary policy or not. Two issues have been widely debated after the central bank independence became a topic of serious academic discussions and of interest about three decades ago. The discussions focused on whether central bank independence was useful or even necessary for sound monetary policy; and whether the notion of central bank independence can be reconciled with fundamental principles of democracy. However, most of the people have begun to accept the usefulness of the central bank independence to devise and implement sound monetary policy.

An important objection to central bank independence in democracies is based on the fact that central bankers are not elected officials; thus, they are not directly accountable to the electorate for their actions. “While too much independence may lead to the creation of democratically unacceptable 'state within the state', too much accountability threatens the effectiveness in some instances, particularly in the case of the government override which may actually nullify independence.”210 “A possible solution to this dilemma is to ensure that the central bank is accountable to the electorate and that its affairs are transparent.”211 In fact, in 1962, Friedman suggested that the central bank independence should be viewed analogously with judicial independence.212

The central bank’s independence should not be viewed as if it is an opponent to the government in the sense that the monetary and fiscal authorities as having different objectives. On the contrary, they have common goal to achieve good economic goal. The most important contribution that any central bank makes towards the achievement of the highest possible standard of living for all the people of the country is to create and maintain a stable financial environment implied in no clearer way than by a stable value of money.213

Why central bank independence is necessary? Money plays a cardinal role, and money-creating power can be wrongly used not only by the politicians, but also by sectorial groups in the economy for the promotion of sectional and selfish objectives.

211 Ibid., p 34
212 Ibid., p 39
The central bank, which is usually provided with money-creation mandate, therefore, must be used properly so that it always serves the national interest. It should never be used to give preferential advantages to any sector or to an exclusive group of the total community. The central bank's power to create money is a constant temptation for politicians to misuse it and as such the governments must be prevented from using this source of budget financing. In order to restrain the politicians as well as the particular vested-interest group to utilize the central bank power for their self-interest, and to act as strong deterrent against such temptation, independence to the central bank is necessary. The plea for its independence or autonomy is therefore not motivated by desire on the part of central bankers to be independent authorities beyond democratic rules of public accountability or national sovereignty. It is rather founded on the acceptance of the obligation of the central bank to execute its function in the interest of the community at all the times. A legally independent central bank will try to minimize political conflicts with the executive branch and, possibly, with the legislative branch as well, in order not to endanger its special status. A de jure independent central bank may, in principle, be prepared sometimes to risk even political conflicts.

What conditions are necessary for the central bank independence and its sustenance? If de jure independence is given to it, the authority is not given away by the sovereign Parliament, but only delegated. The agency to which mandate is given, whether a central bank or judiciary, is granted autonomy to carry out its functions. The central bank itself is responsible and shall endeavor to establish credibility, and influence the community to achieve the given objective. As such, it needs time to gain credibility and it should make an effort to build up reputation for stability, consistency, and successful implementation of its policies.

In a democratic set-up, a central bank is primarily responsible for the total community interest. Thus, it should be made accountable for its actions. Its activities should be more transparent, because in a democratic community, freedom is not unfettered. Independence is only one side of a coin since accountability is also equally necessary. The discretion of central bankers or other unelected officials needs to be subjected to legal control and scrutiny. The greater the freedom or discretion granted to an agency, the greater is the need for accountability. The central bank independence
generally implies statutory provision of fixed-term of a governor, fixed responsibility of achieving a given objective, restriction on accommodation of credit to the government to meet fiscal deficit, and prohibition of taking instructions or directives from the government. In order to maintain people’s confidence, the central bank has to execute the following three functions.

- The central bank should define a clear framework within which monetary policy will be conducted. The framework should include objective of monetary policy, management of total monetary demand, time span involved in pursuing the objective, limitation of monetary policy, and advantage to the total community from the accepted policy.

- The second function is transparency of the central bank’s activities in order to make it accountable for what it does. Since the second half of 90’s, transparency has been increasingly seen as a measure of central bank accountability. The current concern for transparent political and economic structures suggests the need to reach a common understanding of transparency. In this context, two elements are essential: the availability and relevance of the information, and the time framework in which such information ought to be available. Typically information is made available through disclosure procedures, reporting requirement, sometimes by granting a general right of access to information to the recipient. For information to be available, some code of transparency has to be imposed on the given organization, certain duties regarding the quality of information and its presentation. The information must be accurate, clear, understandable, complete, and timely. The central bank usually publishes various documents, lectures, discussions, and their views and forecasts of the economy. It regularly gives opinions regarding the current economic situation, forecasts about the economy, and future measures it intends to take. It tries to educate the people at large. Most of the central banks, unlike in the past, do not want to be opaque but transparent.

Transparency includes a reference to accountability. Accountability is an obligation to give account of, explain and justify one’s actions while transparency
is the degree to which information on such actions is available. The provision of information is clearly an element of accountability. However, accountability is not merely about giving information. It must involve defending the action, policy or decision. The provision of information is hardly ever a neutral account of what happened or what is happening. Hence, there is a need for an explanation or justification from the agency regarding the course of action it has chosen to take. A transparent economic and political environment enhances the effectiveness of accountability. These two concepts are, therefore, mutually enforcing, and they both share the provision of information as a common requirement. Accountability requires, at the very least, that the agency explain and justify its actions and decisions, and give an account of the decisions taken while executing its responsibilities. The lawyers emphasize the institutional dimensions of accountability, i.e. placing of the independent central bank within the existing system of checks and balances in relation to the three branches of the state, viz. legislative, executive and judiciary. Accountability should be diversified to include the parliamentary accountability as well as judicial review of the agency’s actions and decisions. In a national context, the Parliament remains sovereign in its legislative decisions, and one statute proclaiming independence of an agency can always be removed by another revoking it. The parliamentary accountability should be exercised through a variety of procedures and mechanism, including annual reports and appearances of public officials in front of the Parliament on a regular basis and also in the case of an emergency situation. Judicial review of the agency’s actions and decisions is essential to prevent and to control the arbitrary and unreasonable exercise of discretionary powers. This is a fundamental element of the rule of law. The discretion of public officials should never be unfettered but subject to legal control. The economists tend to put the emphasis of performance accountability on the one hand and in disclosure on the other. Disclosure or transparency in this context is viewed as a market-based form of accountability. Performance control is conditional upon the objectives and targets imposed on the central bank. Performance control is facilitated, firstly by the existence of one goal (rather than multiple goals), or by their unambiguous ranking if there are multiple goals; and secondly, by the existence of a clearly stated and narrowly-defined goal.
The third and last condition for greater central bank independence is the requirement of an efficient institutional framework within which monetary policy can be conducted.

At present, transparency and accountability for the actions of central bank are accepted as necessary condition for its independence. The central banks are urged to report more quickly and more openly. However, asking the central banks to produce standard financial account in the name of accountability is inappropriate. The conclusion is that what was undeniably a good idea initially has gone too far.

The latest emphasis is that central banks should produce full market-to-market financial accounts. Furthermore, these accounts, in the first place, should be as comprehensive as possible, including a full analysis and valuation of foreign exchange reserves since the central banks are usually statutory custodians of a country’s reserves. Secondly, the financial statements should be based on internationally accepted accounting standard and methods. The valuation of foreign exchange reserves may give profit or loss on this account, which is not actually realized. This notional profit or loss will degrade the central bank’s account and show unrealistic profit or loss, and this is not related to the central bank’s policy performance. Thus, the accounting standard practiced by corporations and business concerns, to assess their performance on the basis of annual profit/loss, should not be made mandatory for the central bank since its performance is gauged on the basis of policy success, not on the basis of annual profit or loss. It is not a business concern but a national institution whose main responsibility is to frame and conduct monetary policy, and to achieve the policy target. Its accountability fully rests on the execution of effective policy measures and not on good and standard financial account.

What is the limit to transparency? No one can say. The European central banks' long and principled stand has brought realization that while transparency in the central bank is in most cases a good thing, it is not universally desirable and should not be taken to extremes. Although many countries show that parliamentary proceedings live on television and some even show their courts or justices, but no one has taken any step in

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the name of central bank transparency to show live on television the conducting of meetings and discussions in the Federal Open Markets Committee (FOMC) or the Monetary Policy Committee (MPC).\textsuperscript{215}

The central bank is an institution having high degree of technical orientation. It should be manned by highly proficient persons, having expertise in the areas of money and finance. These persons should be neutral and not political cadets. The Governor or the Deputy Governor or the Director should be capable of doing his job efficiently and properly. One should be capable enough to cultivate good functional relationship with the government officials and elected persons, and at the same time, do his or her job to provide best service to the society at large. The term of the Governor should be quite long so that a change in government should not have negative influence on his performance.

4.5.2 Central Bank Independence in Different Countries

More and more central banks have become independent by statute at present. Some of them are given operational independence and some have both goal and operational independence. Many central banks have begun to adopt single target-monetary policy such as price stability or inflation target. A few follow other objective, namely monetary aggregate.

The US Federal Reserve Bank (FED) Act, 1913 has established the Fed system. It made the Fed system independent from duly constituted government authorities, i.e. executive and legislature as well as from partisan political interest. The Secretary of the Treasury and the Comptroller of the Currency were initially also the members of the Board. The Banking Act, 1935 provided the Fed Board complete power in respect of relation with foreign central banks and setting discount rates. Monetary policy is decided by the Board. The Secretary of the US Treasury and the Comptroller of the currency are no longer allowed to serve on the Board, and members-term lengthened from 10 to 14 years.\textsuperscript{216}

In 1989, New Zealand introduced legislation that overhauled the framework for monetary policy by giving the Reserve Bank of New Zealand (RBNZ) operational

independence in setting interest rates. The Act gave the Bank a single objective of achieving and maintaining stability in the general price-level. The Finance Minister can override the central bank’s decision about the inflation target but such a situation has not taken place until now.

The Central Bank of Japan was given independence on April 1998 and its Act gives its Policy Board more autonomy to pursue price stability. The Policy Board members include the Governor, two Deputy Governors, and six outside members named by the Cabinet and confirmed by the Diet.

The experience of the Bank of Canada and the Reserve Bank of Australia (RBA) suggest that legal independence and a specific mandate of price stability may not be necessary to gain policy stability. Close co-operation between the government and central bank can produce intended result as evidenced by the performance of the above two central banks and governments respectively.

In Australia, in 1983, the government began radical deregulation of the financial sector. The RBA Act, 1959 could not be changed to give single objective of price stability to the Bank. However, in August 1996, the government and the RBA issued a joint statement on the conduct of monetary policy. The joint statement stated “... the government recognizes the independence of the Bank and the responsibility for monetary policy matters, and intends to respect the Bank’s independence as provided by statute.”217 The government publicly endorsed the RBA’s inflation target of 2 to 3 percent over the business cycle. In this manner, the RBA seems to have increased its independence over the years without the need to change the central bank statute.

The Bank of Canada (BOC) was founded in 1934 and nationalized in 1938. The preamble of its Act, among others, mentions to mitigate general level of prices to promote the economic and financial welfare of Canada. The BOC interpreted the preamble to mean the pursuit of price stability. This view was formalized by the adoption of an inflation-target jointly announced by the BOC and the Federal Government. Since 1967, the government has had final responsibility for monetary policy, but the BOC generally controlled the monetary policy. While the Finance Minister can direct the Bank’s action, such direction must be written and made public, but none has been issued

until now.\textsuperscript{218} The Canadian politicians did not need to legislate to provide greater operational independence to the central bank in order to gain policy credibility.\textsuperscript{219}

In India, the Reserve Bank of India (RBI), the central bank, is less independent by statute. The Reserve Bank of India Act, 1934, Section 8(a) reads as “… a Governor and not more than four Deputy Governors to be appointed by the Central Government,” and Section 11(1) states “… the Central Government may remove from the office the Governor, or a Deputy Governor or any other Directors or any members of Local Board.” The term of office of Governor is 5 years and he is eligible for the reappointment after retirement. The Act does not mention any legal proceeding to be pursued for the removal of the Governor or the Deputy Governor. The qualification of the person to be appointed as Governor is not mentioned in the Act but disqualification of such person are given in Section 10. Moreover, Section 7(1) of the RBI Act, 1934 states “… the Central Government may from time to time give such directions to the Bank as it may, after consultation with the Governor of the Bank, consider necessary in the public interest.” Two statements are worth mentioning here. P.S. Narayan Prasad has remarked, “… new Governors and some of the Deputy Governors are not selected from the field of finance and banking for their outstanding expert knowledge and experience but from the ranks of civil services and the Finance Ministry makes policy decisions for the Bank”.\textsuperscript{220} Tarapore, the Deputy Governor of the RBI, said, “… ultimately, it is only a successful track record \textit{vis-à-vis} its objectives that enables a central bank to a position of pre-eminence in an economy. In this context, we need to recall the old adage the autonomy is never ‘given’, it is always ‘earned’.\textsuperscript{221} Both the Central Government and RBI could work in unison to achieve macro-economic objectives including the price stability.

It seems that the price stability or inflation target has become symbol of central bank independence. However, there is no built-in mechanism to measure the independence of a central bank. Different researches have proximate indicators in ranking the status of independence. The widely used indicators are: (i) inflation rate; (ii)

\begin{itemize}
\item\textsuperscript{218} Hubbard, R.G., 2005, \textit{Money, the Financial System and the Economy}, Fifth edition, Pearson, Addison, Wesley, New York, p 447
\item\textsuperscript{219} King, M., Aug 2001, “The Bank of Canada’s Pursuit of the Stability: Reputation as an Alternative to Independence”,\textit{Central Banking}, Vol. XII, No. 1, p 76
\item\textsuperscript{221} Tarapore, S.S., March 1995, “Central Banking Autonomy: An Indian Perspective”, \textit{Reserve Bank of India Bulletin}, Vol. XLIX, No. 3, p 292
\end{itemize}
legal independence and the rate of turnover of the governor; (iii) classification of ownership and management; (iv) pattern of the government; and (v) growth of credit to the government etc. It is generally assumed that the central bank independence provides credibility effect as well as no inflation or mild inflation effect. The success of the Bundesbank, the Swiss National Bank and the Federal Reserve System to maintain comparatively low rate of inflation for prolonged period of time is regarded as causal link between independence and inflation. Empirical studies show that less the central bank independence, more the inflation; thus, there exists negative relationship between the central bank independence and inflation. The other findings are that the larger accommodation to meet the government deficit by the banking system accompanies lower economic growth and the central bank in low-income countries exhibits no independence.

The Parliament creates a central bank by enacting an Act in every country and it can also change all provisions of the statute later. So, the governor of central bank does not enjoy unalterable absolute power. But the governor should be firm in executing his authority and should withstand against the unreasonable demand of the ruling politicians. However, one should be flexible during the time of extraordinary situation to accommodate and help the government to tide over the problem. During the unification of two Germanies, the Budesbank relaxed the monetary rule. The unification for them was more important than the monetary rule implementation. Similarly, during the war and conflict, the central bank should help the government. In the early 1940s, the Fed acted to keep interest rate on the government securities low and almost constant to help the US Treasury finance the war effort at low interest rate. But a friendly agreement between the Fed and the US Treasury in March 1951 ended this practice. In normal time, even if politicians make a fuss for easy finance to meet the budget deficit in order to provide various assistances to their supporters, they generally keep their clamor and efforts within a limit. Even in the developed country like the US, whenever the Fed shows its independence, typically by refusing to expand as far as the administration or the Congress wants, there are calls to clip its wings. This is one way Fed gets message.

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The idea of the central bank independence surfaced in the beginning among the economists and scholars in the developed countries. The financial and other markets in advanced countries were quite developed and integrated, and people were conscious and educated, so they realized the usefulness of the central bank independence and made them independent by changing statutes in many countries. However, the social and cultural situation is quite different in poor and developing countries where people are generally illiterate, less conscious and backward. They do not understand the need of central bank independence. Because of short-run political pressures, large number of political parties and rapid turnover of government, it is extremely difficult for politicians to focus on broader picture and maintain long-run perspectives. Moreover, it is virtually very difficult for these economies, without developed capital markets, to avoid financing substantial part of a large budgetary deficit with money creation.

Many developing countries have already changed their statutes to make the central bank independent and gave them the objective to achieve price stability or inflation target as a result of the pressure imposed on them by the international agencies, such as the International Monetary Fund, the World Bank and other donor countries. The politicians and public authorities accept these pressures because their countries can receive all types of financial aid from international agencies and donor countries only after the acceptance of such proposal. In spite of all these problems, adoption of central bank independence may reduce the political pressure to accommodate budget deficit from bank finance, because of two reasons: first, the central bank may resist unreasonable demand for bank finance to cover budget deficit; and secondly, the continuing pressure imposed by the international agencies and donor countries on the government not to interfere in the affairs of the central bank.

4.5.3 Nepal’s Experience in Central Bank Independence

As mentioned earlier, the Nepal Rastra Bank (NRB), the central bank of Nepal, was established under the Nepal Rastra Bank Act, 1955. At present, the NRB has six branches in the country (three in west and three in east) excluding its head office in Kathmandu, the capital of Nepal. The Bank performs its functions through these offices.

The NRB Act, 1955, the Section 6(2) stated that the Governor of the bank shall be appointed by the Government, the term of office will be five years and the Section 8(2)
provided that the Governor or the Deputy Governor or any Director may retire if circumstances require so. Moreover, the Section 5(1) mentioned that the Government, after consultation with the Governor, could give such direction to the Bank as it may consider necessary in the national interest and it will be the duty of the Bank to comply with such directive.

The above provisions clearly show that the Governor could be hired and fired on the whims of the government, and the Bank needed to conduct and carryout the government’s directive to be issued after consultation with the governor. It was not necessary, however, to give any due weight to the consultation with the governor by the government and it could issue directive, if it had already determined to issue the same. Usually such consultations remained unwritten and secret. The Act did not mention eligibility requirement to be a Governor or a Director. Any person could be appointed as a Governor or a Director if one did not fall within the purview of the disqualification of the Act. In short, the NRB was not an independent central bank, and Damocles’ swords remained always hanging on the neck of the Governor or the Deputy Governor or the Director. In fact, the government forced two Governors to resign from their Governorship - one in 1961 and another in 1984. Each time, there was a change of the government. In 1961, Himalayan Shamsher Rana and, in 1984, Kalyan Bikram Adhikari were the Governors of the Nepal Rastra Bank.

The illegal and unscrupulous dismissal of the NRB Governor also took place in 2000. An unprecedented and risky move for the health of the country’s shaky financial sector surfaced when the government appointed a new Governor of the NRB by unceremoniously sacking the incumbent Dr. Tilak Rawal, who later approached the Supreme Court (SC) for redressal of his grievance. In a writ petition filed by Dr. Rawal at the apex court, who was just appointed to the post of NRB Governor seven months before, the legality of the government's action was questioned. In February 2000, when the Prime Minister Krishna Prasad Bhattarai appointed Dr. Rawal as the Governor, it had generated a lot of controversy within the ruling Nepali Congress (NC). The Finance Minister Mahesh Acharya resigned from the cabinet after Bhattarai refused to approve his recommendation to appoint the then Finance secretary Ram Binod Bhattarai as the Governor. Later, when the ruling party changed its leadership electing G.P. Koirala as the Prime Minister, Mahesh Acharya was reappointed to the post of the Finance
Minister. In order to avenge his previous wound, he sacked Dr. Rawal from the Governorship accusing him of unsatisfactory implementation of the financial sector reform programs. Acharya appointed Dipendra Purush Dhakal to the post of the Governor. On the petition of Dr. Rawal, the Supreme Court reinstated him to the post of the Governor making the government's appointment of Dhakal null and void. The SC gave the verdict that an important and reputed post that of NRB Governor should not be dealt with irregularity and such appointments should be done in accordance to the due process of law.224

After a few years, the NRB Act was changed on the initiative and pressure of the IMF in order to make financial sector reform program a success. A new NRB Act was enacted in 2002 and the old Act was repealed. According to Section 15 (1 to 3) of the NRB Act, the Council of Ministers shall appoint a Governor among the three names recommended by the Recommendation Committee, consisting of three members: the Finance Minister as a chairman and two other members. One member should be the former Governor of the NRB and the second member will be designated by the government from the persons renowned in the field of economics, monetary, banking, finance and commercial laws. The Committee should recommend three persons renowned in the field of economics, monetary, banking, finance, commerce, management, commercial laws and the Deputy Governors. Section 22 provides grounds for removal of the Governor, Deputy Governors and Director, but will be given a reasonable opportunity to defend himself (or herself) prior to removal from the office. The Government shall appoint an Inquiry Committee and remove him or her from the office on the basis of its recommendations. Section 75(5) stipulates that at no time the amount of overdraft provided by the NRB to the government shall be more than five percent of the revenue income in the preceding fiscal year. Section 75(7) states the total amount of debt security purchased by the NRB from the government and taken into its ownership shall not be more than ten percent of the revenue income of the preceding fiscal year.

Thus, the new NRB Act has stated the required qualification to be eligible candidate for the post of governor. The Act does not provide any authorization to the government to issue directive to be abided by the NRB. In order to remove one from the

224 See Kantipur, the Nepalese National Daily, March 29, 2001
post of governor, a procedure to be followed is prescribed by the Act and the government cannot remove the governor on the basis of its whims. The NRB’s accommodation of credit to the government has been fixed and the government cannot take any credit exceeding the limit. It is clearly seen that attempts have been made to make the central bank free from outside interference and make it independent to devise and implement monetary policy measures. The main objectives of the NRB are to formulate necessary monetary and foreign exchange policies in order to maintain the stability of price and balance of payments for sustainable economy and manage it. The NRB, to be successful, needs to prioritize its objectives.

Every time the government tries to appoint a new governor at the Nepal Rastra Bank, it faces trouble. Even the Deuba government was embroiled in the governor’s appointment row. “…. Whenever there is a plum post of power and pelf to be filled, the aspirants go knocking on the doors of politicians to court their personal patronage. Pressure pounds from different groups, strings are pulled from behind and acrimony is traded without qualms.” In 2005, the Prime Minister Sher Bahadur Deuba got stiff pressures from the Finance Minister Bharat Mohan Adhikari, who was also the Deputy Prime Minister, over the issue of the governor’s appointment and tried to have his way by pushing the PM to the wall.

The row started after the Adhikari-led committee recommended three names for the post – Dr. Yuba Raj Khatiwada (then the member of the National Planning Commission), Bijaya Nath Bhattarai (then deputy governor) and Dr. Parthiveshwor Timilsina (economist). The committee – whose two other members included Dr. Badri Prasad Shrestha and Ganesh Bahadur Thapa – had been formed for the purpose of making the recommendations for the post. The UML and the former Finance Minister Dr. Shrestha are reported to be strongly backing Dr. Khatiwada.

However, the PM Deuba was said to have disapproved of the recommendations and became ‘angry’ because he was not consulted before the committee made the recommendations. The PM Deuba was said to favor either appointing the then Chief Secretary Dr. Bimal Koirala or extending the tenure of the then Governor Dr. Rawal, whose term was about to expire.

226 See issue of Spotlight, Vol. 24, No. 24, Jan 07-13, 2005
Adding further fuel to the fire, the president of the Rastriya Prajatantra Party (RPP) Pashupati SJB Rana and the Government Spokesperson Dr. Mohamad Mohasin urged the feuding partners – the PM Deuba’s Nepali Congress (Democratic) and the UML – to bury their differences and appoint a consensus candidate, Rana even called for common policy for appointment in all the important positions. Even after several rounds of meeting, the coalition partners failed to reach to an understanding on this issue and there surfaced clear differences between the PM and the DPM.

Subsequently, the two coalition partners NC (D) and UML were seemingly making the episode as a prestige issue. There were even murmurs from within the UML that they could step down from the government if the PM did not abide by their choice. Amid such warnings and counter warnings, the crucial aspects like policy-leanings and merit appeared to be clouded. As the appointment of the new Governor hanged in balance, party interests and personal egos had taken the front seat and pushed qualities like merit and expertise behind. This had turned the NRB into a political battlefield. A governor is the most important fiscal and monetary advisor to the government. The NRB is responsible for framing monetary policy and maintaining monetary and fiscal stability in the country. Whether it is the single-party or the coalition government, the issue of governor’s appointment has always become controversial. At a time when the country is implementing the financial sector reforms, anybody who is appointed as the governor needs to be a strong reform-minded person with expertise and experience. However, in the end, Bijaya Nath Bhattarai was appointed as the Governor of the NRB.

Such sad and disappointing events have taken place in Nepal. The NRB statute was changed to provide independence and authority to the Bank so as to devise and implement monetary polices independently without interference from the government. Such changes in statute have not taken place as a result of the spontaneous development but on account of the pressure of the International Monetary Fund and donor countries on the government. Their pressure was focused on the speedy and successful implementation of the financial sector reform program and let the NRB authorities to act in independent ways. It was to allow the NRB to take even strong monetary measures, which may not be liked by the politicians. However, repeated transpiring of political interferences and conflicts, even in the appointment of a governor, becomes a serious
matter of concern whether these shortsighted politicians will allow the NRB bureaucracy to devise and execute monetary measures independently.

Even before the enforcement of the new NRB Act, 2002, the NRB used to publish various documents regularly. This practice has been prevalent more than a decade ago. It has been regularly publishing the Economic Report, Monthly Economic Indicators, Quarterly Economic Bulletin, Nepal Banking and Financial Statistics, Annual Reports etc. Every year, the NRB Governor used to address the NRB anniversary function in mid-April and this address contained the current situation of the economy and policy measures. However, since 2002, the NRB Governor has begun to announce the monetary policy for the ensuing year, generally in July. The announcement contains the policy measures and future projection of price rise limit, the balance of payments situation, international reserves, monetary growth rate, etc. The NRB has also begun to conduct mid-term review and adjust policy measures if situation warrants so. It also has begun to conduct dialogue with industrialists, businessmen and scholars at its central office in Kathmandu. The NRB is becoming more transparent by disclosures of its activities.

Both developed and developing countries have adopted central bank independence in recent period. Those countries, which have not adopted *de jure* central bank independence, have tried to adopt it by mutual agreement between the government and the central bank. Even when some countries adopt multiple policy targets, the top priority is accorded to inflation target or price stability. Other objectives are taken as intermediate targets to attain the policy goal, i.e. price stability. The degree of central bank independence is more in advanced countries than in backward and developing countries. The reasons are that the advanced economy is well integrated, people are more conscious, the central bank is more transparent and open, information system is good, and political situation is more stable. On the contrary, in many of the developing countries, there is a frequent change in the government, political parties fuel diverse controversies, high illiteracy and lack of general awareness.

The scenario presented by the qualms and conflict between the Prime Minister and the Deputy Prime Minister in Nepal in respect of appointment of the Governor of the Nepal Rastra Bank is very sad, despicable and showed low morality of the politicians. Transpiring of such event is very unfortunate and was caused by the ruling partners who were at the helm of power structure and they were supposed to provide good guidance to
steer the country for better future. Their pitiably low-grade action will tarnish the
credibility of the NRB, its top executives will become less effective, and confidence on
such authority will go down. Therefore, there is a need to create a proper procedure for
appointment of the top executives of the NRB so that such unfortunate event shall never
take place in the future.

The NRB has tried to become more accountable and transparent by publishing its
activities and performance in booklet forms and disseminating them. The monetary policy
announcement contains many aspects of the economy and its position, and what the NRB
intends to do in the ensuing fiscal year. The mid-term review also provides the information
regarding the economic situation of the country and its direction. However, the NRB still
has to do more for disclosure of its activities and performance. It generally arranges
meetings in Kathmandu, the capital city, and seldom its authorities venture out to deliver
speeches to let the people know more about the Bank and the state of the economy. The
conscened officials of the NRB should visit other parts of the country, various colleges and
universities to arrange meeting for dialogues with the students and scholars to let them
know about the Bank’s functions and performances and solicit their views and advices.
Similarly, the NRB officials should conduct dialogue with businessmen, industrialists and
scholars outside capital city to make them aware of the NRB, its objectives, activities and
performances and to seek their opinion and advice. Such activities will definitely let more
people know about the NRB, its functions, its activities and necessity of its existence and
need, and importance of independent status. The NRB should also widely disseminate
information about its activities through brochures and journals so that it may remain
always before the people.

4.6 Nepal Rastra Bank and the Growth of Financial Institutions in Nepal

Growth of financial sector is considered as a pilaster of economic growth. It is
presumed that the financial growth causes deepening of financial sector and it helps
achieve economic growth in a country.
This part of discussion is divided into four sub-sections. The first subsection gives the meaning of financial sector growth and presumed benefits to the economy. The second deals with the efforts undertaken by the Nepal Rastra Bank (NRB) to expand commercial bank branches in the country, the third details the reforms in the financial sector and the fourth focuses on the performance and deepening of the financial sector.

4.6.1 Meaning and Presumed Benefits of Financial Sector Growth

It is historically proved that the financial sector development helps economic growth. Financial sector development contributes to economic growth in three ways. First, the more developed the financial sector, the more efficiently can the existing tangible assets be allocated through intermediation among assets holders. Secondly, a developed financial sector can encourage more efficient allocation of new investment by optimal intermediation between savers and investors. Thirdly, higher rates of savings and investment result from greater degree of financial development since return from the latter are higher which is a result of the second effect; thus, enabling higher returns to be passed on to the savers.

Problems in inefficient financial sector are associated generally with the poor and developing nations and not with the developed nations. Usually every type of problem is associated with and found in poor countries. The problems of the poor infrastructure, illiteracy, inefficient manpower, lack in technological development, lack of good social and economic overheads, large number of quarrelling and infighting political parties, poor health of the people, low level of capital stock, low productivities, etc. are in existence in almost all the poor and developing countries. Low level of financial development, weak infrastructure, and inefficient operating procedures are the features of their financial sector. The process of financial sector liberalization, which was initiated in 1970s and 1980s, is still continuing. It is viewed that the developing countries are shackled with too much governmental control in the financial sector: repressed financial markets, regulated interest rates, tight foreign exchange control, and repressive regulations. If these

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controlling regulations are removed from the financial and foreign exchange sectors, it is hoped that such steps will foster and strengthen the economic growth in the country.

However, one should not lose sight that these poor countries are burdened with economic growth-dragging factors, and liberalization of financial sector alone cannot do a miracle. Liberalization may revitalize the financial sector and it may be able to contribute positively to the economy. One should take solace that when a government becomes conscious about its difficult economic situation and takes steps to get out of such morass, it means that the government's behavior has changed. Thus, it may take corrective measures consciously and deliberately to improve the situation of all sectors, including the financial sector. As such the financial sector could play meaningful role and contribute to the best of its potentiality to spur economic growth.

McKinnon and Shaw drew attention to the malaise of financial policies prevalent in the underdeveloped countries in their books published separately in 1973. The economic growth can be influenced by the size of physical investment, quality of money and other financial variables. The provision of a positive return on money capital in an appropriate institutional framework, along with a suitable financial environment, can help faster economic growth. According to the views of both, countries are financially repressed when (i) price of financial assets are distorted by regulated interest ceiling below the equilibrium market rate; and (ii) their financial markets are underdeveloped. They considered savings were discouraged despite existence of sound investment opportunities in these countries. McKinnon suggested that the remedy for aforementioned milieu was financial liberalization and financial sector development that emphasized the quality rather than the quantity of investment. The former included: (i) relaxation of internal financial constraints; (ii) the exercise of an effective fiscal policy; (iii) the exploitation of the complementarity between the real money value and investment; and (iv) radical restructuring of tariff and quota, and licensing restraints on foreign trade. He considered securing foreign capital to be necessary for full liberalization of foreign trade. With such successful liberalization, he believed that the growth and savings could interact to produce a virtuous and beneficial circle.

Shaw discussed the problem of shallow finance. He put forward the idea that the distortion of financial prices, including interest rates and foreign exchange rates, reduced

the real growth and size of the financial system. According to him, when finance is shallow in relation to national income or non-financial wealth, one would find such finance would bear low, often negative, real rates of return. Moreover, holders of financial assets, including money, would not be rewarded for real growth in the portfolios; and, on contrary, they would be penalized. With ‘shallow’ finance, every county would have to depend relatively on its fiscal budget and on external capital accounts for saving to finance capital growth. He suggested financial liberalization, which would ultimately lead to financial deepening. Financial deepening included following aspects: (i) an accelerated growth in real assets and increase in monetary system, which may generate opportunities for the positive operations of other institutions; (ii) the specialization in financial functions and financial institutions; and, (iii) a high interest rate that reflect the available investment opportunities more accurately.

Patrik advanced his thinking about finance-led economic growth in 1966. McKinnon-Shaw model proposed a financial environment where successful economic growth can take place. Their standard recommendation consisted of dismantling government controls so that true scarcity price could be seen by the savers and the investors, thereby improving savings mobilization, promoting efficient investment, and accelerating economic growth.

Over the years in 70s and 80s, and at present, many developing countries have adopted the McKinnon-Shaw hypothesis of liberalization and deregulation on the hope that such adoption would help accelerate economic growth. However, success is mixed. As mentioned earlier, many growth-dragging factors are in existence in the underdeveloped countries. Undertaking the process of liberalization and deregulation would not contribute much if other growth-dragging factors are not improved upon simultaneously.

As noted by Fry,\textsuperscript{230} whatever positive effects of financial liberalization were detected in the 70s appears to have become smaller overtime. Several other factors may have had caused the effects of financial liberalization to diminish. The more recent research found that the financial liberalization in some developing countries did not materialize as predicted. Rather, they experienced several severe financial crashes and

\textsuperscript{230} Fry, M.J., 1996, "Saving, Growth and Financial Distortions in Pacific Area and Other Developing Areas", \textit{Department of Economics Discussion Paper No. 96-23}, The University of Birmingham, p 1
distresses. Diaz-Alejandro,\textsuperscript{231} for instance, concluded his study on the Latin-American countries by stating, ‘goodbye financial repression, hello financial crash.’ The World Bank Report 1989 also indicated that some developing countries experienced severe financial crunch and distress in the process of financial reform and liberalization. Thailand prematurely fully opened its foreign exchange sector without understanding the depth of and possible movement in the foreign exchange market and whether its established infrastructure had the capacity to safely cope with liberalization and deregulation without any unpleasant consequences. This caused a great financial crisis in 1997-98 in the foreign exchange market in Thailand and it also engulfed some nearby Southeast Asian countries.

The above discussion highlights the complexity in introducing financial sector reforms and liberalization in the developing countries. One should be careful to recognize the fact that different developing countries have different levels of economic growth, infrastructure build-up, forms of government, awareness level of society etc. Even though the ultimate target to achieve from the financial sector reforms is the same, the ways of tackling each economy needs subtle refinements and emphasis on the measures implemented. Rangarajan said that modifying the policy framework; improving the financial soundness and creditability of banks; creating a competitive environment; and strengthening of the institutional framework are four building block of banking sector reform.\textsuperscript{232}

If the economy is extremely regulated by the government, reform and liberalization of the financial and foreign sectors are necessary. In most of the cases, the government usually claims that such controls are necessary to check the wrong use of resources, and on the contrary, divert resources flow to development purposes. Similarly, the financial and foreign exchange sectors have to be liberalized and deregulated to divert flow of sources for economic growth. Such control-free stage may provide ample opportunities for the institution and the related people to misuse the resources and gain profit. Thus, every loophole has to be plugged so that there should not be any leakage. This needs strong supervision norms and regulations to be imposed to check and control misuse of financial resources. Liberalization and controlled economy both need some forms of regulations and supervision for the proper use of financial resources.


The financial sector reforms and liberalization requires unflinching attention and adoption of various steps before implementation. There is a need for strengthening prudential regulations and controls. Prudential regulations help define the boundaries within which the banks are to operate in order to ensure the safety and soundness of the banking system. These regulations are related to criteria for entry, capital adequacy, assets diversification, insiders’ loans, defining permissible activities, and assets classification and provisioning.233 Second aspect is to look into the financial reforms. There is a growing consensus that stabilization efforts should precede the financial liberalization. The third aspect is the sequencing of financial reforms. Apart from the timing of a liberalization package, the chronological order in which individual financial reform policies are to be implemented has to be decided.234 The fourth aspect is concerned with the speed of financial reforms. Extreme caution is required concerning the pace at which the financial system is liberalized. Plunging them overnight into liberalized and competitive market is risky as they will be completely unprepared for rigors of competitive situation. Lastly, any attempt to establish macroeconomic stability must focus on substantial reduction in fiscal deficit. The central bank should have clear and immediate mandate for monetary and price stability. There should be special focus on prescribing and enforcing risk-weighted capital adequacy standard. There is also the need for banks to have uniform accounting standard to make the appraisal of the financial conditions easier.235 The above measures will not produce intended result if political interference prevents the regulators from enforcing prudential controls.

4.6.2 Nepal Rastra Bank and Financial Sector

The Nepal Rastra Bank (NRB) is an institution created to discharge functions entrusted by its laws. It is entrusted with the task of monetary management, with some specific responsibility, which is to maintain price stability. A central bank usually creates money. Money is needed for all economic activities. That may be establishing and running universities, footing educational expenditure, consumption, paying

wages, road construction, etc. However, a central bank alone, as a creator and manager of money, cannot build an economically prosperous nation. It can contribute a lot to the nation by maintaining price stability, so that the value of savings with the financial institutions does not erode in respect of buying goods and services in the future. It may create, expand, and improve the financial structure of the economy, which may encourage capital formation and other developmental activities through mobilization of savings and intermediation of savings for investment. It helps to create catalysts between the savers and entrepreneurs.

In a developing country, the central bank has to function as an engine of economic growth. As such, its developmental role is no less important than its regulatory or traditional functions. There is, however, no inherent contradiction between the two roles. In fact, the two may be coordinated with each other and one role may even be superimposed upon the other.\textsuperscript{236} As a matter of fact, where economies are undeveloped, a central bank should be considered as a potential development agency of a rather unusual variety.\textsuperscript{237}

The developmental role of a central bank does not mean that it should print more money and use for different activities, including developmental works. Such behaviour will not achieve economic growth but create inflation that will mar the economic growth. The central bank’s developmental role should be viewed as financial deepening in the economy and help upgrade proficiency level of the related persons of the financial sector by imparting knowledge, information and training.

In Nepal, organized financial sector consists of the financial institutions and the capital market. The commercial banks and other financial institutions operate there with other non-bank financial institutions that are not under the direct regulation of the NRB. There is a stock exchange, the trading place of shares, debentures and government bonds, but this institution is not within the direct purview of the NRB.

\textbf{4.6.2.1 The Commercial Banks}

Before the establishment of the Nepal Rastra Bank, a commercial bank, the Nepal Bank Limited (NBL), was established in Nepal in 1937 under the special Act,
the Nepal Bank Act, 1937. The Nepal Rastra Bank, the central Bank of Nepal, was established on April 26, 1956. The preamble of the Nepal Rastra Bank Act, 1955 clearly stated that, "… a Rastra Bank has become very essential also to develop the banking system in Nepal." In addition, some objectives of newly enacted the Nepal Rastra Bank Act, 2002 are as follows: (i) to promote stability and liquidity required in the banking and financial system; (ii) to regulate inspect, supervise and monitor the banking and financial system; and (iii) to promote entire banking and financial system of Nepal and to enhance its public credibility. The above provisions of both new and old Acts show that the responsibility of banking development rested on the NRB.

In 1965, the number of commercial bank branches was 32, of which 5 branches were located in the Kathmandu valley, 7 in the Hills and 20 in the Terai region. Even the NRB was compelled to operate 27 branches to provide limited banking facilities in remote areas. Few years later, most of the branches were transferred to state-owned commercial bank. The government established a commercial bank, the Rastriya Banijya Bank (RBB), in the public sector in 1966. The NRB launched a scheme of bank branch expansion under its Banking Development Fund to extend financial assistance to commercial banks in respect of bank branch expansion. The commercial banks in Nepal preferred to open their branches mostly in urban areas. As they incurred losses on account of low volume of business, they were hesitant to open branches in the interior parts of the country. In July 1968, the NRB decided to compensate 100 percent of operational losses incurred by a commercial bank branch opened in the area prescribed by it.

The commercial banks in Nepal did the similar functions that were performed by the commercial banks of other countries. Their main functions include: (i) to accept deposits; (ii) to extend loans, advances for investment; and, (iii) to provide other banking services to customers.

4.6.2.2 The Development Banks

In the beginning, the functions of commercial banks were highly influenced by the British pattern. The banks extended only short-term credit for trade, but not long-term investment to create capital stock or industry. Therefore, two development banks were established in the public sector to provide long-term credit to the industrial and
agricultural sector. One development bank, the Agriculture Development Bank (ADB/N), was established in 1967 under the ADB/N Act, 1966 to provide loans to individual farmers and cooperative sector. It provided credit for agricultural development, small-scale irrigation projects, agro-based cottage and small-scale industries, etc. The equity participation of the NRB was Rs. 2.5 million of ADB/N total shares of Rs. 7.4 million. As of July 2004, the equity participation of the NRB in the ADB/N stood at about Rs. 30 million out of total shares of Rs. 1574.6 million. The ADB/N is permitted to accept all types of deposits and conduct limited commercial banking functions in some branches.

The second development bank, the Nepal Industrial Development Corporation (NIDC), was established on June 15, 1959 under the NIDC Act, 1959. It was established to encourage and assist the private sector in the development, modernization, and expansion of industries by extending necessary financial and technical assistance. While the NIDC did not accept deposits, it was permitted to issue negotiable certificate of deposits. It was allowed to accept term-deposits from institutions. It used to extend medium-term and long-term loans.

After 1990, five rural development-banking institutions were established under the Commercial Banking Act. The first of such banking institution, Eastern Rural Development Bank, was established in 1992. The Rural Development Banks (RDB) provide micro-finance support in five regions. They were established between 1992 and 1996. These institutions aimed at improving socio-economic status of poor rural women by promoting the self-help groups and facilitating their access to formal credit. Three-fourth shares of these institutions were with the government and the NRB.

Six micro-development banks came into operation after 1996 in the private sector under the Development Bank Act, 1996. These institutions get resources in the form of term deposits and other deposits. However, their major sources of financial resources consist of borrowings, from the commercial banks and other financial institutions. They provide credit to the poor.

The Rural Micro-Finance Development Centre (RMDC) was established in 1996 as a development bank. The main objective of RMDC is to provide refinance facilities to the micro-finance agencies engaged in financing the rural household. It also aims at developing sustainable micro-finance by offering financial and technical
support. The RMDC operated with a loan assistance of US $ 20 million from the Asian Development Bank, and the NRB is assigned as executing and coordinating agency.

4.6.2.3 The Finance Companies

There were 59 finance companies operating in Nepal as of mid-July 2004. The first finance company, the Nepal Housing Development Finance Co., was registered in 1992. All the finance companies were registered under the Finance Companies Act, 1985. They were established as public limited companies and were in the private sector. A finance company can accept time deposits with a maturity period of minimum 3 months and maximum 6 years to a limit of twelve times of the core capital of the company. It could also accept savings deposits. The finance companies are allowed to provide loans to procure vehicles and other consumer durables on hire-purchase terms, land acquisition and building construction, and leasing plant and machinery. Their operations are mainly confined to urban areas.

4.6.2.4 The Micro-finance Institutions

The co-operatives are non-profit organizations established for the mutual benefit of the members. They were registered under the Co-operative Act, 1992. They are allowed to accept deposits from their members and advance loans to them only. They are authorized to conduct limited banking transactions among their members. As of mid-July 2004, there were 35 co-operatives that performed limited commercial banking transactions after taking permission from the NRB. The co-operatives are not allowed to accept demand deposits.

Many non-government organizations (NGOs) are also engaged in performing saving and credit activities to their members; such NGO is known as Financial Non-government Organization (FINGO). The FINGOs are non-profit making institutions that also act as financial intermediaries. Because of adverse security situation, many commercial bank branches in rural areas were either closed down or shifted to other secured places, or merged with other branches. In such instance, FINGOs are catering to finance needs of the rural areas. The FINGOs get funds from foreign sources and
collect fees from their members. As of mid-July 2004, the number of FINGOs licensed by the NRB had reached 44.

4.6.2.5 Other Financial Institutions

There are other non-bank financial institutions that mobilize savings and extend loans. These institutions are not under the direct supervision and regulation of the NRB. They are Insurance Companies, Postal Savings Bank, Employees’ Provident Fund, and Citizen Investment Trust (CIT).

4.6.3 Financial System and Reform

The situation of the financial sector is presented in this subsection. First, the situation during the Highly Controlled Period will be discussed, and then the Reforms Period will be presented.

4.6.3.1 The Highly Controlled Period

The NRB had maintained complete control over both deposit and lending rates, and credit allocation for some items till 1986. The commercial banks and other financial institutions operated under such highly controlled financial environment. The ADB/N and NIDC also operated under the same situation.

The NRB had taken two policies regarding the expansion of commercial banks in 1968. In 1968, the NRB decided to provide compensation equalling 100 percent of operating losses in the first year if a new commercial bank branch opened in the place prescribed by the NRB incurs such loss. It would provide compensation equalling 75 percent of operating loss in the second year and 50 percent of such loss in the third year. The provision was amended in 1972. According to this amendment, a new branch may get compensation for the third and fourth years on tapering basis and receive up to two hundred thousand rupees as interest-free loan for three years from the NRB for each branch opened by both the commercial bank and ADB/N (if its branch performed limited commercial banking functions). These facilities are no longer in existence. This compensation provision increased the commercial bank
branches from 173 in mid-July 1975 to 441 in mid-July 1995. It declined to 375 by mid-July 2004 on account of security problems due to insurgency. The commercial banks were compelled to reduce their branches either by merging or closing some branches.

The Commercial Bank Act, 1974 was enacted repealing previous Act and even the foreign banks were allowed to participate in domestic banking as a partner. It opened the gateway to foreign banks to start operations in Nepal. The entry for joint-venture banks was encouraged from 1984. As a result, during late 80s and early 90s, three joint-venture banks, namely the Nepal Arab Bank, the Nepal Grindlays Bank, and the Nepal Indo-Suez Bank were established.

There were about 20 controlled lending rates differentiated between different sectors, use of funds and types of collateral before the NRB initiated deregulation in May 1986. The NRB was determining the whole set of deposit and lending rates, and instruments. The reasons for maintaining a few mandatory interest rates can be attributed to the fact that competitive conditions were not sufficient to introduce a fully liberalized system of interest rates. Moreover, there were only two commercial banks, RBB and NRB, in the public sectors up to mid-80s. Further, direct control of lending rates also provided an easy mechanism for credit allocation by differentiating between priority and non-priority-sectors in which the former received concessionary interest rates. The direct control of deposit rates, prior to the deregulatory move, was considered a potentially effective instrument for mobilizing domestic savings.

The commercial banks were authorized to extend medium-term loans, not exceeding 10 years, to agriculture, cottage industry, irrigation, power generation and other occupation as specified by NRB. By the amendment to the Commercial Banking Act in 1984, commercial banks were empowered to extend loans of short-term nature for a period of two years and loans of long-term nature for a period of 12 years. The above two provisions were enacted to help financing the agricultural sector and the latter was to allow commercial banks to finance both working and the fixed capital needs of every sector in the economy.

The NRB issued a directive to the commercial banks in April 1974 to provide 5 percent of their total deposits in the form of loans to priority-sectors of the economy, such as agriculture, and cottage and village industries. This directive was amended in
July 1976 and the limit was raised to 7 percent of total liabilities. The NRB issued a directive to the commercial banks, on the instruction of the government, in FY 1984/85 that their total credit and investment should at least consist 8 percent of priority-sector credit and 17 percent credit to the productive areas. The commercial banks began to participate in the cottage and small industry (CSI) projects in 9 districts from FY 1982/83 and additional 18 districts from FY 1987/88. Moreover, they took part in Lead Bank Scheme in FY 1988/89 to provide credit to the people of poor strata. The limit of priority-sector credit of the commercial banks of total loans and investment was again fixed at 10 percent in FY 1988/89 and 12 percent in FY 1989/90. Moreover, the limit of productive credit was raised to 40 percent of total loans and investments of the commercial banks. The productive sector included credit to the agricultural and industrial sectors. The amendment of the ADB/N Act allowed it to conduct commercial banking activities. This amendment also encouraged ADB/N to mobilize more financial resources, thereby creating a more competitive environment for deposit mobilization.

On May 29, 1986, the commercial banks and financial institutions were granted permission to determine the interest rate as well as maturity of fixed deposits after maintaining the floor rates, i.e. 1-year fixed deposit interest rate, as prescribed by the NRB. They were also granted permission to determine the lending rates except for the priority-sector. In the case of priority-sector lending, the provision of interest rate subsidy that was provided by the NRB to the financial institutions was discontinued. Earlier, the NRB used to provide subsidy to the financial institutions once they started to provide lending to the priority-sector. The refinance facility on such lending, bearing a general interest rate of 4 percent below the commercial lending rate, was restricted to few activities.

4.6.3.2 The Reforms Period

Effective from July 1989, interest rates on deposits of the commercial banks and other financial institutions were completely liberalized and deregulated. In the case of lending rates, except for exports and a few productive sectors, the commercial banks and financial institutions were granted autonomy to determine the rates.
Actually, liberalization in the financial sector began from 1986. Though Nepal opted to join the global move towards liberalization process, the pace of liberalization was not rapid. After 1989, the NRB, along with the government in unison, began to adopt liberalization measures in the financial sector by (i) lifting interest rates controls in both deposits and lending; (ii) allowing the entry of new commercial banks, finance companies, development banks, micro-finance companies; and (iii) lifting of control in margin rate requirements. Liberalization and deregulation did not mean no supervision, no control, and no regulations. In fact, these were more necessary than before, because if the financial institutions are left free without regulations, the financial institutions and their employees will misuse people's money for personal profiteering. Thus, in order to strengthen the financial sector, the NRB gradually introduced prudential norms to put the financial institutions in the right track and place them in sound position. Requisite provisions were added by amendments and new laws concerning the financial sector were enacted. The NRB seemed to have worked in two fronts simultaneously from FY 1995/96 in respect of the financial institutions. First, it relaxed many regulations and encouraged credit to the priority and deprived sectors. Secondly, it attempted to impose strict norms to improve transparency, soundness, and working efficiency of the financial institutions.

4.6.3.2.1 Relaxation of Regulations

In FY 1995/96, the NRB empowered the commercial banks to vary interest rates up to 1 percentage point on deposits; and they could also lower interest rate up to 1 percentage point on lending.

Effective from November 17, 1997, the commercial banks could vary the interest rate up to 0.5 percentage point around the prevailing and published rate on deposits and lending on the basis of the understanding with the customers. The development bank could adjust the interest rate up to 0.5 percentage point with the customer over the published interest rate of deposits and credit. In FY 2003/04, the provision of adjusting lending rate by 0.5 percent with the consent of the commercial bank and the customer was withdrawn.
4.6.3.2.2 Bank Branches

From FY 1998/99, the NRB allowed the commercial banks to transfer their branches and sub-branches immediately for security reason. The NRB issued a directive to the commercial banks in FY 2002/03 that they could open a bank branch outside the Kathmandu valley.

4.6.3.2.3 Deprived-sector Credit

From FY 1995/96, the NRB included the commercial banks’ investments in share capital of the rural development bank in the category of credit to the priority-sector as well as to the deprived-sector. The NRB fixed the minimum amount of lending out of total lending by the commercial banks to the deprived-sector which was as follows: for two commercial banks, NBL and RBB, 3 percent; 0.75 percent for other commercial banks; and 0.25 percent for new commercial banks. It included the commercial banks’ credit to micro-development bank as the deprived sector credit from FY 2002/03. Similarly, credit extended by the commercial banks to the Self-financing Development Bank was also regarded as the deprived-sector credit.

4.6.3.2.4 Priority-sector Credit

From FY 1995/96, the commercial banks were directed to extend a certain proportion of credit to the priority-sector out of their total lending. The loans extended by the commercial banks to the co-operatives were included as the priority-sector credit. The NRB decided to phase out this provision as many micro-lending institutions have come into operation to extend to the poorer section of the society. The proportion of the priority-sector credit to total lending of the commercial banks was fixed at 7 percent in FY 2002/03 and at 6 percent in FY 2003/04. It will be completely phased out by FY 2008/09.

4.6.3.2.5 Micro-finance

There are many micro-credit organizations operating in Nepal. Some of them are managed by the financial institutions themselves and some of them are run through
non-government organizations (NGOs), while others are operated from the
government-created fund. The government established the Rural Self Reliance Fund
(RSRF) with a capital of Rs. 20 million and it provides finance to the NGOs to extend
micro-credit. The NRB also regularly contributes to this Fund. The objective of this
Fund is to provide credit to the poorer section of the rural people for income-
generating activities through the channel of the co-operatives and the NGOs.

There is a Micro-Credit Project for Women, established with assistance from the
Asian Development Bank. In this project, NBL and RBB have also participated. This
program is targeted to channel credit-flow to women through the NGOs and their
auxiliary savings and credit co-operatives. The Production Credit for Rural Women
was initiated with the objective of uplifting the socio-economic condition of rural
women.

4.6.3.2.6 Capital Adequacy Ratio

The provision of capital adequacy ratio was introduced in 1989 and the NRB
had authority to give directive in this respect to the financial institutions. In FY
1995/96, the NRB directed the commercial banks to maintain capital funds of at least
8 percent of their total risk-weighted assets and total off-balance sheet transactions as
on mid-July of each fiscal year. Of this, at least 4 percent was to be core capital.

The capital fund is the sum total of core capital and supplementary capital. The
core capital consists of paid-up capital, general reserve fund, share premium,
undistributed profit, and non-redeemable preferential shares. The supplementary
capital consists of redeemable preferential shares, loan-loss provisioning assets, assets
revaluation reserves, exchange equalisation fund, and unallocated free reserves.

In FY 1996/97, the commercial banks were permitted to include paid-up capital
and reserves for meeting the minimum capital requirement, but they had to deduct net
loss if there were any. The NRB also issued directive to the commercial banks in FY
1996/97 to raise their capital to Rs. 500 million by the end of FY 2000/01. The
development banks had to maintain 10 percent capital fund of their total risk-weighted
assets, out of which 5 percent had be core capital fund. The finance companies were
also directed to abide by this norm. They could not collect financial resources
(through debentures, borrowing, bonds, and deposits) more than 15 times of their core
capital fund. The NRB implemented a new licensing policy for new commercial banks to be established in the Kathmandu Valley; and a new commercial bank would require one billion rupees as paid-up capital from May 15, 2002.

4.6.3.2.7 Single borrower limit

From FY 1995/96, the single borrower credit limit for the commercial banks was fixed at 35 percent in the case of fund-based credit and 50 percent for non-fund based credit (such as letter of credit, guarantee, acceptance letter, etc) of the total capital fund. In the case of consortium finance, they were permitted to extend an additional 10 percent credit above the limit fixed by the NRB. Finance companies’ single borrower credit limit was fixed at 20 percent of the total capital fund for the primary capital fund-based lending and 40 percent for non-fund lending; these limits were raised to 25 percent and 50 percent respectively in FY 1998/99. The single borrower limit of development banks was similar to the single borrower limit applicable to the finance companies. However, the development bank could also provide additional 10 percent for the consortium loan.

4.6.3.2.8 Loan Classification and Reserve Provisioning

The NRB directed the commercial banks to classify their outstanding loans and advances into four categories: good, substandard, doubtful, and bad debt on the basis of maturity period. Similarly, the commercial banks were also asked to maintain adequate reserve fund out of their profits on the basis of the above classification. Both ADB/N and NIDC were also directed by the NRB in FY 1993/94 for loan classification and reserve provision on the basis of quality of the loan maturity status. The development banks, the finance companies, and the co-operative societies (those conduct banking function under the license from the NRB) were directed to follow aforementioned prudential norm in respect of loans and advances.

The UNDP provided technical collaboration to implement the recommendations of the Commercial Bank Problems Analysis and Strategy (CBPASS). The study was carried out to evaluate the real position of the two banks, namely NBL and RBB. The study was to enable these two banks to assess their current financial position and
chalk out plan for further course of action. It also aimed at developing operational strategy to make them capable and competitive. The IMF's Stand-by-Arrangement and the Structural Adjustment Facility (SAF), and the World Bank's Structural Adjustment Lending (SAL) towards the end of 1980s had already pushed for reform in the financial sector to strengthen operational performance, and to enhance the capacity of the central bank to supervise the banking system, etc.

Implementation of CBPASS Programme after 1990 brought about a change in different aspects of the financial institutions. The government raised the capital of RBB by Rs. 215.3 million by issuing 14 percent government securities. In the case of the NBL, the government and the NBL subscribed to 8 percent preference share of Rs. 116.3 million and Rs 111.7 million respectively. The government also issued 14 percent government securities, worth Rs. 1765.79 million to the NBL and the RBB, as repayment of the government-guaranteed loans that these two banks had extended to various public enterprises. The government issued 1 percent government securities of Rs. 1224.0 million securities to the NBL: Rs. 437.0 million to make the provision for the non-guarantee loans to the government enterprises and Rs. 787.0 million to make the provision for loans to the private sector.

4.6.3.2.9 Comprehensive Reform Program

Instead of piecemeal attempts in the past to improve the financial sector, the government and the NRB decided to launch a comprehensive reform program to create an efficient, dynamic, competitive, and prudently managed financial system to promote rapid economic development. The government received financial support from the IDA, the DFID, and the ADB to accomplish the reforms in various areas of the financial system. The Financial Sector Reform Strategy Paper (FSRSP) was approved by the Cabinet on October 3, 2000 and was announced publicly on November 22, 2000. According to the FSRSP, the objectives of the reform are to infuse overall improvement in the performance, structure and other factors influencing the financial sector. The strategy paper included the following commitment of the government.238

Consolidating the role of the central bank by providing more autonomy;
Strengthening the inspection and supervision capacity of the central bank;
Improving the management of the NBL and the RBB in the first phase and commencing reform programs for other financial institutions in the second phase;
Initiating various measures to save financial institutions from falling sick;
Improving the existing accounting and auditing system of the financial sector;
Amending legal provisions related to financial sector;
Adopting wider banking concept;
Revising the capital ownership structure of banks and financial institutions;
Restructuring the Credit Information Bureau (CIB);
Establishing the credit rating agency;
Establishing the assets management company (AMC);
Concentrating to establish regional development banks;
Strengthening the rural development banks;
Broadening and deepening of financial system of Nepal;
Revamping research and financial monitoring strength of the NRB; and,
Initiating restructuring program for the ADB/N and the NIDC.

As a first step in resolving the problems of the two largest commercial banks, the RBB and the NBL, it was necessary to undertake structural reforms by recruiting two international management teams. The ICC Bank Management Team started working in the NBL from July 22, 2002 and the Deloitte (USA) from January 16, 2003 in the RBB.

Only a few years have passed since the comprehensive financing sector reform program was launched in FY 2001/02. Its implementation effect could not be more as it has many teething problems. However, some positive achievements seem to have been made. The new NRB Act, 2002 was enacted to incorporate the commitments made by the government to strengthen the NRB and made it legally independent in respect of monetary policy formulation and implementation. The NRB introduced Voluntary Retirement Scheme (VRS) to reduce the redundant employees. Training is given to staff in the concerned areas to make them efficient. The NRB has been
making effort to improve its information technology level, and for this purpose a consultant from the USA has been hired. The VRS scheme was also introduced both in the NBL and the RBB to reduce excess employees.

The NBL has given a lot of importance and effort to install IT platform in the bank. The NBL has procured equipment from Tech India Ltd. and installed in its Lalitpur branch in April 2004. Within first half of 2005, similar equipments were installed in other branches. The loss position of the NBL was reduced by Rs. 251 million in FY 2002/03 from position of FY 2001/02. The bank achieved a net profit of Rs. 710 million in FY 2002/03. Interest income from loans and advances increased to 7.52 percent in 2003 from 5.67 percent in 2002. It has further increased to 10.17 percent in 2004. However, still much improvement is needed to correct the NBL’s overall position.

The RBB has attempted to improve its staff's expertise and efficiency by imparting them training in their respective areas of work. The RBB was making loss in its operations each year for the last few years, but the position upturned and improved in FY 2003/04 as it made a net profit of Rs. 1.02 billion during the fiscal year. The level of NPA (non-performing assets) came down to 57.64 percent of total loans in 2004 from 60.15 percent in 2003.

Some legislative reforms were also carried out. The promulgation of the Bank and Financial Institution Debt Recovery Act, 2002 and the establishment of the Debt Recovery Tribunal on June 19, 2003 were aimed at making loan recovery aspect more effective. The Bank and Financial Institutions Ordinance, 2004 (BAFIO) was announced. This ordinance embraced all previous acts of the commercial banks, the finance companies, and the development banks under a single umbrella.

4.6.3.2.10 Some Other Norms

The NRB has fixed the promoter's qualification for the commercial bank or the finance company. If an investor is already a promoter of a bank or a finance company licensed by the NRB, then he (or she) cannot be promoter of another bank or finance company. Stockbrokers, market makers and persons involved in auditing the accounts of the bank cannot be directors of a bank and a finance company. One-third of the total promoters should have either economics as a major subject or studied accounts
and bookkeeping, finance etc. at the graduate level and at least one-fourth of the promoters should possess working experience in a bank or a financial institution or possess similar professional experience.

4.6.4 Financial Sector Performance and Deepening

The NRB took a policy to allow establishment of new domestic and foreign commercial banks in the country and the number of commercial banks increased over the years. Only two development banks were in existence up to 1990s in the public sector and they were ADB/N and NIDC. The NRB also participated in the share capital in these two development banks. It actively took part in establishing other development banks during the decade ending 2000 and, as a result, five rural development banks were established to cater the needs of the rural sector. It had dominant share in these banks; now it has adopted a policy of disposing these banks to the private sector after they began to make profit. A few micro-development banks were established to extend micro-credit to rural women and deprived sector.

Many finance companies were established in the urban areas in the private sector. Most of them are operating in the three districts of the Kathmandu Valley. The NRB also permitted some co-operative credit societies to conduct limited banking function in the urban areas. They have to take the license from the NRB and are required to strictly follow its directive. It had taken measures from 1970's to expand commercial banks' new branches to the rural areas and far-flung places even by giving compensation for the newly opened branch's operational loss for few years. With this policy of the NRB, the number of bank branches increased to 375 in mid-July 2004 from 129 mid-July 1975.

Many NGOs are operating to mobilize savings and provide micro-credit. They receive resources from foreign donors, the NRB, and the commercial and development banks. As of mid-July 2004, 17 commercial banks, 11 rural micro-finance development banks, 48 branches of ADB/N (conducting commercial banking functions), 59 finance companies, 21 co-operative societies (conducting limited banking functions) and 44 NGOs (under license from the NRB) were functioning.

Tables 4.6.1 and 4.6.2 provide the total amount of deposits and lending of the all the financial institutions in Nepal.
### Table 4.6.1: Financial Institutions – Deposits and Lending (in Millions Rs.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Commercial Banks a</th>
<th>NIDC</th>
<th>ADB/N b</th>
<th>Total Financial Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deposits</td>
<td>Lending</td>
<td>Credit-Deposit Ratio</td>
<td>Lending</td>
</tr>
<tr>
<td>1975</td>
<td>1174.0</td>
<td>1294.4</td>
<td>1.10</td>
<td>127.1</td>
</tr>
<tr>
<td>1985</td>
<td>8560.1</td>
<td>7209.6</td>
<td>0.84</td>
<td>404.7</td>
</tr>
<tr>
<td>1995</td>
<td>61614.1</td>
<td>67193.2</td>
<td>1.09</td>
<td>1243.5</td>
</tr>
<tr>
<td>2000</td>
<td>154940.8</td>
<td>134204.1</td>
<td>0.87</td>
<td>2140.2</td>
</tr>
<tr>
<td>2004</td>
<td>237642.2</td>
<td>227196.8</td>
<td>0.96</td>
<td>2233.0</td>
</tr>
</tbody>
</table>

*Source: Nepal Rastra Bank, Compiled from Quarterly Economic Bulletin and Economic Reports*

a Including deposits and investments of branches of ADB/N conducting commercial banking functions

b Excluding deposits and investments of branches conducting commercial banking functions

From Table 4.6.1 it can be seen that the credit-deposit ratio of all financial institutions was 1.42 in mid-July 1975, 1.44 in mid-July 1995, and 1.07 in mid-July 2004. It explains that over a period of time, the lending activities of the financial institutions have increasingly become dependent on deposit mobilization rather than borrowings and other types of financial inflows to them.

### Table 4.6.2: Other Financial Institutions: Deposits & Lending (in Millions Rs.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Development Banks</th>
<th>Finance Companies</th>
<th>Co-operative Societies</th>
<th>Micro-development Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deposits</td>
<td>Lending</td>
<td>Deposits</td>
<td>Lending</td>
</tr>
<tr>
<td>1995</td>
<td>3.0</td>
<td>176.6</td>
<td>1730.6</td>
<td>2137.4</td>
</tr>
<tr>
<td>2000</td>
<td>218.1</td>
<td>987.1</td>
<td>9748.6</td>
<td>10192.0</td>
</tr>
<tr>
<td>2004</td>
<td>473.6</td>
<td>1525.8</td>
<td>19391.7</td>
<td>20051.4</td>
</tr>
</tbody>
</table>

*Source: Nepal Rastra Bank, Compiled from Quarterly Economic Bulletin and Economic Reports*
for every 30,000 people on an average. This objective was never realized but the commercial bank branches were extended over the years to a significant extent. In 1975, one bank branch covered 59.4 thousand people on an average, and 42.8 thousand people were covered one bank branch in 1985. However, after that, the population increased but numbers of bank branches declined. Thus, in mid-July 2004, each branch covered, on an average, 66 thousand persons.

The commercial banks and the ADB/N (doing commercial banking functions) branches deposits were Rs. 1.2 billion in mid-July 1975 and that increased to Rs. 237.7 billions in mid-July 2004. The total deposits of other financial institutions as compared to the commercial banks deposits was 0.6 percent in 1975, and that increased to 9.1 percent in mid-July 2004.

During the period 1975-2004, the deposits of financial institutions had gone up considerably from Rs. 1.2 billion to Rs. 259.4 billion (Table 4.6.2), and the number of branches increased substantially, but the interest rate for 1-year deposit had a decreasing trend from 1985 to 2004. During the study period, i.e. from FY 1974/75 to FY 2003/04, the inflation rate fluctuation was witnessed, and taking into account the transaction cost for the depositors, the real interest was very low; hence interest rate was not a factor in deposit mobilization. Similarly, the number of bank branches began to decrease due to various reasons, including security reasons, during 1995-2004; hence bank branch expansion also could not be counted as the factor for deposit mobilization, though total deposits of all financial institutions went up to Rs. 54.3 billion in mid-July 1995. Most of other financial institutions began to function after 1990s. The credit extended by other financial institutions was equal to 28.6 percent of the commercial banks credit in mid-July 1975, 15.9 percent in mid-July 1995 and 21.9 percent in mid-July 2004. The above analysis clearly indicates the dominant position of the commercial banks in comparison to other financial institutions regarding the financial activities in Nepal.

The increase in deposits of financial institutions from FY 1997/98 might have been due to a mild increase in GDP and substantial inflow of remittances sent by the Nepalese working abroad. The amount of remittances increased from Rs. 6.98 billion in FY 1997/98 to Rs 56.59 billion (8.39 times more than the remittance in the FY 1997/98) or equal to 12.3% of GDP in mid-July 2004.
Table 4.6.3: Some Important Data relating to Finance Sector

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (in millions)</td>
<td>12.84</td>
<td>16.31</td>
<td>20.21</td>
<td>22.59</td>
<td>24.75</td>
</tr>
<tr>
<td>Per-Person Deposit (in Rs.)</td>
<td>91.43</td>
<td>524.84</td>
<td>2689.06</td>
<td>6704.65</td>
<td>9242.86</td>
</tr>
<tr>
<td>Per-Person Credit (in Rs.)</td>
<td>129.69</td>
<td>540.16</td>
<td>3870.83</td>
<td>7284.40</td>
<td>12002.5</td>
</tr>
<tr>
<td>Deposit/GDP</td>
<td>7.08%</td>
<td>19.26%</td>
<td>25.88%</td>
<td>45.89%</td>
<td>48.25%</td>
</tr>
<tr>
<td>Credit/GDP</td>
<td>10.05%</td>
<td>19.82%</td>
<td>37.26%</td>
<td>49.86%</td>
<td>62.65%</td>
</tr>
<tr>
<td>M1/GDP</td>
<td>0.0807</td>
<td>0.1233</td>
<td>0.1571</td>
<td>0.1547</td>
<td>0.1989</td>
</tr>
<tr>
<td>M2/GDP</td>
<td>0.1246</td>
<td>0.2767</td>
<td>0.3857</td>
<td>0.4630</td>
<td>0.5887</td>
</tr>
<tr>
<td>Currency per Person</td>
<td>71.38</td>
<td>229.14</td>
<td>1113.01</td>
<td>1865.56</td>
<td>2554.30</td>
</tr>
<tr>
<td>Currency/Deposit</td>
<td>0.7807</td>
<td>0.4366</td>
<td>0.4139</td>
<td>0.2782</td>
<td>0.2764</td>
</tr>
</tbody>
</table>

Source: Nepal Rastra Bank, Compiled from various issues of the Quarterly Economic Bulletin and Economic Reports

During the period from 1975 to 2004, financial deepening in the economy has taken place. Table 4.6.3 gives the picture of financial deepening. During above period, both $M1/GDP$ and $M2/GDP$ ratios grew substantially from 0.0807 and 0.1246 respectively to 0.1989 and 0.5887 respectively. The $M1/GDP$ ratio increased by 2.5 times and $M2/GDP$ ratio increased by 4.6 times reflecting the financial deepening in the economy during 1975 to 2004. During this period, per-person deposit increased from Rs. 91.4 to Rs. 10483.7; per-person credit increased from Rs 129.7 to 11090.5; total deposits/GDP ratio from 7.08 percent to 54.75 percent; credit/GDP ratio from 10.05 percent to 58.41 percent; and currency per person increased from Rs. 71.38 to Rs 2554.30. All these clearly indicate that the financial deepening has taken place in the Nepalese economy.

Despite the substantial expansion, the performance of the financial sector is very far from the satisfactory level. The non-performing assets (NPA) of the old and public sector banks were about Rs. 739.3 million in mid-July 1995. The details regarding NPA of financial institutions are given in Table 4.6.4. The NBL's NPA was 19.24 percent of its total loans and investment, whereas the RBB's was 27.5 percent of the
total credit in mid-July 1995. The NPA of other financial institutions was Rs. 81.2 million or 5.4 percent of their loans and investment. The total NPA of all financial institutions (excluding the NPA of ADB/N and NIDC) was Rs. 820.5 million in 1995. The NPA of two large banks was Rs. 22.7 billion out of the loans and investments of Rs. 47.8 billion, and that NPA was about 6.7 percent of GDP in 2001. The NPA of other financial institutions stood at Rs. 5.7 billion, and that was equivalent to 10.9 percent of lending and 1.5 percent of GDP. By 2004, the NPA of both commercial banks, the NBL and the RBB, were reduced by about Rs. 3.0 billion, an improvement in their condition. However, the NPA of these banks remained about 6.1 percent of GDP.

Table 4.6.4: Non-performing Assets of Financial Institutions
(in Millions Rs.)

<table>
<thead>
<tr>
<th></th>
<th>Commercial Banks</th>
<th>Finance Companies</th>
<th>Development Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NBL</td>
<td>RBB</td>
<td>Others</td>
</tr>
<tr>
<td><strong>FY 1994/95</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPA</td>
<td>3563.7</td>
<td>1783.4</td>
<td>N.A.</td>
</tr>
<tr>
<td><strong>NPA as % of Lending</strong></td>
<td>23.3%</td>
<td>19.24%</td>
<td>N.A.</td>
</tr>
<tr>
<td><strong>FY 2001/02</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPA</td>
<td>10372.9</td>
<td>12336.8</td>
<td>N.A.</td>
</tr>
<tr>
<td><strong>NPA as % of Lending</strong></td>
<td>50.07%</td>
<td>45.07%</td>
<td>N.A.</td>
</tr>
<tr>
<td><strong>FY 2003/04</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPA</td>
<td>6440.1</td>
<td>14470.5</td>
<td>4822.8</td>
</tr>
<tr>
<td><strong>NPA as % of Lending</strong></td>
<td>53.74%</td>
<td>57.64%</td>
<td>5.74%</td>
</tr>
</tbody>
</table>

*Source: Nepal Rastra Bank, Compiled from Quarterly Economic Bulletin and Economic Reports*

The NPA of financial companies was Rs. 1.2 billion out of Rs. 17.6 billion loans and investment, and this amount of NPA was equal to 6.78 percent of loans and investment. Other development banks had Rs. 626 million or 14.8 percent out of Rs. 4.3 billion lending as the NPA in 2004. The NPA of the financial institutions (excluding NPA of the ADB/N, the NIDC, co-operative societies performing limited commercial banking functions) amounted to Rs. 27.6 billion or 6.7 percent of the GDP. The ADB/N also faced the problem of NPA. Its loans and investment stood at
Rs. 32.1 billion in mid July 2004. This NPA reported to be 15 percent, which in reality might be as high as 30 percent of its lending.

The ADB/N's auditor's report of FY 2003/04 commented that its financial position was serious and a matter of grave concern. Some portion of total loans was not shown in the maturity-expired loans and, on the contrary, presented as good loans in order to maintain low risk; and many maturity-expired loans and accrued interests, after a long period, began to be shown as paid by extending new loans to relatives of the defaulters in lieu of the defaulted loans. The NIDC also suffered from NPA. It was estimated that around 45 percent of total loan portfolio was not performing. The NIDC was operating with substantial negative worth, roughly estimated at Rs. 1.0 billion.

The financial conditions of two major commercial banks, the NBL and the RBB, and two specialized development banks, the ADB/N and the NIDC, in the public sector are particularly disheartening. Underdeveloped countries mostly suffer from such unfortunate situations. The reasons are not far to seek. One report remarked that the government interference and financing of large public supported projects are the main reasons behind such a pitiable financial condition of the NIDC. The large amount of NPA, approximately about 10 percent of GDP, is the bane on the economy of Nepal.

Despite almost two decades of liberalization of the Nepalese financial sector, it remains particularly weak and fragile – largely benefiting a narrow base of users in the main urban areas and having little impact on the mass Nepalese in the economy. In its current state, it is highly vulnerable to shocks and internal distortions. Various factors caused such sad occurrence in Nepal. One of the factors responsible for high NPA in the public sector financial institutions is the repeated political interference in their operations. There are many political parties in Nepal and also frequent changes in the governments due to change in combinations of the political parties to form the government. Each change takes place at least once in a year, on an average, and each change in the government causes misuse of loans and advances extended by the public sector financial institutions, and even new appointments as employees. No leader of

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240 Presentation in Financial Sector – Nepal Development Forum meeting held in Nepal in Feb-March 2002, the World Bank, p 67
241 Ibid., p 67
the political parties takes any responsibility for this misuse taking advantage of minimal awareness and illiteracy of people. These political leaders go unpunished, and same corrupt leaders get elected when they get an opportunity. They misuse the resources of public sector financial institutions again. Public ownership has distorted and politicized the financial institutions that are in the public sector. The public also do not treat the state-owned financial institutions in the same manner as they treat the private sector banks. Loans are not repaid, yet deposits continually flow in these institutions with an assumption that the government implicitly stands behind the safety of these funds. The end result has been the financial de-commercialization of most of the institutions as they have accumulated large losses with high level of non-performing loans, and high administrative and overhead expenses. On the occasion of the 38th Anniversary function, the Governor of the NRB stated that the conception of people that bank loans did not have to be repaid needs to be changed.242

Another problem that developed within a few years is the internal insurgency in Nepal that has badly affected the Nepalese economy. The frequent attacks of the insurgents have damaged about 200 small operating units of the ADB/N up to 2003.243 Because of this, the objectives with which the Rural Development Banks (RDB) were established appeared to remain unfulfilled as the employees of these banks could not go to rural areas, move freely and contact people.244 Many commercial bank branches were relocated to other places or two or more branches merged into one. Some of branches were even closed. Commercial banks faced great hindrance to recover priority-sector credit from people as earning of small businessmen and cottage industries were severely affected by the insurgency. At the same time, many financially capable borrowers also did not pay back the loans taking excuse of their bad financial condition.

The NRB, as a central bank, does not seem to be conscious to look after the interest of the savers and borrowers. It is run by public money at large and must pursue the interest of the large number of depositors. It should not let the financial institutions to cater to the interests of few shareholders and certain borrowers. The interest rates provided by these institutions are not above the prevailing inflation rate.

242 See Kantipur, the Nepalese daily, Jan 25, 2001, p 9
243 See Kantipur, the Nepalese daily, Jan 02, 2003, p 9
244 See Kantipur, the Nepalese daily, April 30, 2001, p 9
The interest rates and inflation rate are marginally different. One should not lose sight of, including the central bank and the government, that these institutions use depositors’ money to earn and they should not be cheated in the name of deregulation and liberalization. Since the depositors are not represented in the Management Committees of the financial institutions, the central bank should take responsibility to safeguard their interests.

In a small country like Nepal, there are few commercial banks and they form associations. They repress the interest rates artificially and they agree to shield competition amongst them. In fact, they may outwit the central bank authorities to comprehend the true situation. These banks do not provide interest bearing demand deposits, and their internal operation costs, to a significant extent, are covered by using these deposits to earn charges, fees and other sources of income. Thus, they earn more because of an opportunity to exploit the depositors, and emergence of such situation is made possible by the NRB.

Rampant corruption, mostly among the public sector financial institutions, is another serious area of concern. Corruption occurs through different means. Over valuation of collateral is one way. To provide and accept the same collateral in different banks at the same time is another way and the borrower may actually secure loans from each bank. For instance, a father and son in Biratnagar (industrial city in the Eastern Nepal) got loans successfully at the same time from four different commercial banks by pledging same machinery and stock of the Koshi Plastic Udyog. Such malicious event could not have taken place without connivance of the bank officials.

Weak legal provisions exist even to prosecute very serious loan defaulters. The legal provisions are such that they favor the defaulters. Disposal of lawsuits take a long time in the courts. Some bankers have expressed their anguish that such behavior of the courts. According to them, such behavior of courts not only encourages the incidence of NPA to take place, but also discourages the banks to approach the court. Moreover, it prolongs the defaulters’ existence by placing premium on default. Two major banks in the public sector express their grievances that they did not get expected cooperation from the courts of law to recover NPA. The Chief Executive

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245 See Kantipur, the Nepalese daily, April 24, 2004, p 9
Officer, Mr. Brush Henderson of RBB remarked that they did not get any cooperation from the court in respect of recovery of NPA on the occasion of the Financial Reforms Program arranged by the NRB.\textsuperscript{246} The borrowers (defaulters) used to file legal suit in the court to stop auction of their pledged properties at the bank, and the court used to issue stay order; after that the court did not give verdict on the legal suit for a long time. The Regional Director of the South-East Asia, Finance and Private Sector Division of the World Bank, Simon C. Bell expressed his displeasure while talking with a national daily and he said that the practice of issuing stay-order in favor of defaulters and interference in the process of recovery of loans is not appreciable; to give justice after a long time is equivalent to do injustice.\textsuperscript{247}

\textsuperscript{246} See Kantipur, the Nepalese daily, January 24, 2006, p 9
\textsuperscript{247} See Kantipur, the Nepalese daily, March 24, 2006, p 9