Real Interest Rate and Saving Behavior in Nepal

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ABSTRACT

In this paper, an attempt has been made to analyze the level of real interest rate in Nepal during the period of 1975 to 2010 using annual data published by Nepal Rastra Bank (NRB). The findings of the study showed that average real interest rate for that period was as low as 1.32% and that there is a long-run relationship between real interest rate and saving behavior in Nepal. The estimated coefficients of correlation further indicate that the real interest rate have a strong positive correlation with gross domestic saving ratio. Likewise, the real interest rate affects the growth of bank deposit positively but negligibly. Therefore, trying to influence the bank deposit by manipulating interest rates is not likely to be a practical policy option in Nepal. However, the government should attempt to maintain competitive positive real interest rate relative to that of other neighboring countries in order to increase the gross domestic savings.

JEL Classification: E21, E43 and E58

Key Words: Real Interest Rate, Bank Deposit, Gross Domestic Saving, Expected Inflation

INTRODUCTION

In the business of borrowing and lending money, the lender charges and the borrower agrees to pay an amount in excess of the amount lend and borrowed. The excess amount is called interest, in common language. In economic terminology, like rent and wages, interest is a factor payment. It is paid for the use of capital as a factor of production. In other words, interest rate is the cost of capital per unit of time.

Interest is paid for the sacrifice made by the income holder by deferring consumption for the time being and imparting with liquidity, and to reward the income holder for their savings (Khatiwada, 2005). Interest rates are indeed very important economic variables. There are many uses of interest rate data. First, they indicate the conditions in the financial market. Second, they are indicators of expectations about inflation. If the long term interest rates are lower than that of short term, it can be inferred that the market participants have lower inflation expectations. Third, interest rates are indicators of the result of monetary policy actions. Therefore, interest rate data can be used to analyze the ex-post monetary policy stance. Fourth, interest rates can be used as monetary policy targets. Many central banks, in recent years, have moved towards interest rate targeting from monetary targeting. Fifth, interest rate data can be used to analyze exchange rate movements. The last but not the least, the interest rate data can be used to

macroeconomic analysis of consumption, saving, and investment. In this context, it must be noted that interest rates play a key role in monetary analysis, as they are a key element in the transmission process of monetary policy (Thapa, 2005).

The "real interest rate" is approximately the nominal interest rate minus the inflation rate (Fisher, 1911). It is the rate of interest an investor expects to receive after subtracting inflation. This is not a single number, as different investors have different expectations of future inflation. Since the inflation rate over the course of a loan is not known initially, volatility in inflation represents a risk to both the lender and the borrower.

To achieve a higher economic growth, there has to be an increased investment both from the public and the private sector. Increased investment can take place only when savings are mobilized sufficiently. Savings can be increased if real interest rates are positive. In this respect, NRB had adopted interest rate policy for the (i) mobilization of higher level of savings in the form of bank deposits, (ii) prevention of capital flight to India, (iii) allocation of resources to productive sectors of the economy, and (iv) promotion of economic activities particularly industry and trade. For those purposes, interest rates were regulated since 1967 to 1989 (Maskey and Pandit, 2010). In the past, when interest rates were controlled, NRB attempted to keep real interest rates positive by making frequent revisions in nominal rates whenever inflation rates were changing. But NRB was unable to appropriately monitor the movements and the real interest rate was moving up and down over time.

With this background, the objective of this research is to find out the real interest rate and analyze its movements, find possible factors for these movements, and find the correlation between real interest rates and other important variables. The rest of the paper is organized as follows. The next section describes some theoretical aspects of interest rate determination, impact of interest rate on saving and investment. Next section presents review of literature, followed by Methodology. The next section presents the findings of this research followed finally by the conclusion.

Theories of Interest Rate Determination

The term capital is used in two senses; (1) money capital, i.e. stock of money that could be loaned out, and (2) physical assets e.g. land, building, plant, machinery etc. Money capital in the form of bank deposit, share and debenture yields different forms of incomes - interest and dividend. Investment in physical capital yields income called return on capital. Money capital finally takes the form of physical capital and interest paid on money capital takes in the form of cost of capital. Because of this reason, the monetary theory of interest is given more importance than that of real theory of interest.

The common peculiarity of monetary theories of interest is that the interest is a monetary phenomenon. And monetary theorists believed that interest rate varies inversely with supply of money and positively with the purchasing power (value) of money. The defenders of the monetary theories of interest argued that when

supply of money increases, purchasing power (value) of money falls and, hence the rate of interest also come down. Economists agree that the real interest rate is determined in the market for investment and savings and thus by the forces of productivity and thrift. Hence, the real interest rate adjusts to equilibrate desired savings (providing the net supply of funds) with desired investment (generating the net demand for funds). In an increasingly integrated world economy with internationally mobile capital, the real rate of interest is determined largely by global forces of saving and investment. For relatively small open economies, the world real rate of interest is somewhat independent of domestic circumstances, especially over the medium to long term.

There are various theories, which explain the determination of interest rates. Classical theory posits that interest rate is a real phenomenon and hence real factors determine the level of interest rate. The real factors are the supply and demand for capital. It is argued that the supply of capital comes from savings (thrifts) and the demand for capital comes from the productivity of capital. Interaction of supply of and demand for capital gives us the equilibrium level of interest rate. Therefore, if there is recession in the economy, the return from investment will be low. This will bring down the overall demand for capital. Given the level of savings (the supply of capital), the lower level of demand for capital will bring down the level of interest rates.

The Neoclassical or loanable fund theory includes both real and monetary factors as the determinants of interest rate. This is an acknowledgment of the fact that monetary factors also influence the level of interest rates. According to Keynes Liquidity Preference Theory, interest rates are purely monetary phenomena. On the basis of these theories, a number of factors, which influence the level of interest rate, can be discussed. Among the factors influencing the level of interest rates, the size of government borrowing is very important. The higher the size of the budget deficit, the higher is the level of interest rate and vice-versa. This fact has been one of the factors affecting the level of interest rate in Nepal (Thapa, 2005). It is to be noted that both the government and the private sector borrow from the domestic market. Obviously, funds that can be borrowed from the domestic financial market are given. With the given funds, when the government domestic borrowing increases, it puts pressure on domestic interest rates. With the rise in domestic interest rates, the government borrowing crowds out the private sector investment. The second factor relates to business conditions. When economic recovery takes place, economic activities increase, putting an upward pressure on interest rates and vice-versa. The third factor relates to the role of lobbies and pressure groups. In the society, the different interest groups play their roles in raising or lowering interest rates. Retirees will like to see deposit rates going up. Likewise, households will also prefer higher interest rate on their deposits. On the other hand, industrialists and business community will put pressure for lower interest rates. In the Nepalese context, industrialists and business seems to be found exerting pressure on monetary authority and the political authorities for a lower level of interest rate.

Whether market determined or determined by the monetary authority, there are two aspects of interest rates. The first is the level of interest rate and the second aspect relates to the structure of interest rates. In an interest rate deregulated economy, market forces determine the level and the structure of interest rates. With respect to the former, one of the questions that are very often asked is about the appropriate level of interest rate. For that matter, one can ask: what is an optimal rate of interest for an economy? Nonetheless, there could be a number of ways of judging the appropriate level of interest rate. First, real rate of interest, which should be positive to encourage saving. It discourages low yielding investment and thus has positive impact on growth. Again the question remains unanswered, what should be the optimum level of real interest rate. If some inferences can be drawn from the Taylor's monetary policy decision rule, the level of real interest rate should be 2.0% (Woodford, 2001). Once we agree to this and add the inflation rate to the 2.0% desired real interest rate, optimal nominal interest rate can easily be calculated. Second, interest rates abroad should also be taken into account while judging the optimum level of domestic interest rate. It is important to attract foreign capital to accelerate the economic growth of the country. In this case, the domestic interest rate must be higher than international interest rates. In Nepal's case, Indian interest rates could serve as reference rates. Third, returns on investment projects are also important factors to judge the appropriate levels of interest rates. Fourth, in a developing country like Nepal, interest rates in unorganized markets can also be used to judge the appropriate level of interest rate.

Interest Rate and Saving-Investment

The impact of interest rates on consumption, savings and investment is well established in the literature. Classical and Neoclassical economists took a position that higher interest rates resulted in high savings and lower level of consumption. Keynes, on the other hand, argued that low interest rates increased investment and income, and thereby generating higher savings. Keynes put forward his ideas on interest rates in his famous book, 'General Theory of Employment, Interest and Money' in 1936. He strongly established a negative relationship between the level of investment and interest rate. In order to boost investment, he suggested a lower nominal interest rate. He argued that given marginal efficiency of investment, a lower interest rate would encourage investment, which in turn, would increase output. This phenomenon, in economic literature, is known as Keynes effect. In case, nominal interest rate could not be lowered, he suggested for expansion in money supply leading to a rise in inflation. A rise in inflation would lower real interest rate. This, in turn, would boost investment.

Following Keynes, Tobin also developed a model of money and economic growth and argued that households would maintain their portfolios between money and productive capital assets. He argued that if the return on capital exceed the return on money, the demand for capital in relation to money would increase, resulting in an increased capital to labor ratio. This would enhance labor productivity and per capita income would go up. This analysis suggests for keeping nominal interest rates lower. In case, nominal interest rates could not be maintained at low level

administratively, a case was made for an expansion in the money supply. This would generate inflation, driving down real interest rates.

The objective of this paper is, therefore, to measure the level of real interest rate in Nepal and then gauge its impact on saving level of the economy. As an important variable of financial service sector and intermediate target of monetary policy, interest rate has strong association with real sector of the economy. In such a situation, another objective of this paper is to find out the degree of relationship between the real interest rate and saving.

Review of Literature

The economic literature on saving provides a long list of factors affecting the saving rates. Studies have found an ambiguous effect of increase in real interest rate on savings because of a positive substitution effect towards future consumption and a negative income effect due to increased real returns on saved wealth. Fry (1995) has found a small but positive interest rate elasticity of savings while Giovannini (1985) has found savings to be insignificantly related to real interest rates. The empirical evidence on the effects of real interest rates on savings has proven to be inconclusive (Schmidt-Hebbel et. al. 1999).

The real interest rate affects the savings rate positively in Bangladesh and Nepal but negatively in India, Pakistan and Sri Lanka (Agrawal et al. 2007). Their analysis suggests that trying to influence the savings rates by manipulating interest rates is not likely to be a practical policy option in these countries as interest rate changes have only a minor impact on the savings rates. Aron and Muellbauer (1999) present the determinants of private saving in South Africa, separately examining personal and corporate sector saving behavior over nearly three decades, from the late 1960s to 1997. This paper confirms that the main factors behind personal saving in South Africa include direct negative effects of wealth and of financial liberalization and the direct positive effects of real interest rates and uncertainty. Moreover, corporations save more when dividend tax rates rise, while in the absence of capital gains tax, higher inflation encourages corporate saving.

The financial variables are expected to be especially relevant determinants of savings for a developing country like Nepal, which has undergone-and still is in a liberalization process. The most ambiguous financial variable that will be considered is the real interest rate (Shrestha, 2010). This is largely because of the fact that a change in the interest rate entails opposing substitution and income effects. The results of empirical studies have found only a weak interest elasticity of private saving (Amimo, 2004). This implies that the negative income effect of higher interest rates tends to neutralize their positive inter temporal substitution effect. For industrial countries, Koskela and Viren (1982) observed that savings increase as real rates of interest increase. In fact, Balassa (1992) argued that the effect of real interest rates on savings is positive for developing countries.

Macroeconomic uncertainty, usually proxies by the inflation rate, is expected to have a positive impact on saving, as people in such an environment would try to hedge risk by saving (Metin-Ozcan et al. 1998). For a group of industrial countries,

Koskela and Viren (1985) reported that savings increase as the inflation rate increase. Also, Gupta (1987) found that both expected and unexpected components of inflation had a positive effect on savings for a group of Asian countries.

Empirical studies suggest that increase in real interest rate provides an incentive to private household to save more, induce corporate sector to generate its own savings due to high cost of borrowing, thus overall saving would increase (Iqbal 1993). Khan et al. (1992) showed a significant positive impact of interest rate on savings rate. However, consumers may not plan their lifetime consumption but instead respond primarily to current income and may save more (Mason 1998). Iqbal (1993) also found a positive relationship between domestic real interest rate and savings.

There are number of studies which suggested for significantly positive to significantly negative coefficients of real interest rate. It is also important to note that the real interest rates have a positive influence on the private savings and can be taken as an important policy variable in Nepal (Shrestha, 2010). Arrieta (1988), identified activity variables such as the real interest rates and some measures of capital inflows (or foreign saving) as the important variables determining domestic savings in developing countries. Though, some of the studies also included demographic variables, government savings and labor market constraints into the model to investigate their influence on private savings, the interest rate sensitivity of savings has been the subject of literature relating to LDCs. Many economists remain doubtful that interest rates, whether nominal or real, have any significant impact on private sector saving behavior in either developed or developing countries. Since savings is defined as not consuming, economists who do not believe on the role of interest rates conclude that interest rates have little impact on private savings decision to allocate income between consumption and savings: the interest elasticity of savings is held to be zero or insignificantly small. The influence of real interest rate on savings and consumption decisions has been a matter of considerable controversy (Wood, 1995).

At the theoretical level, the influence of real interest rates on savings depends on the relative strengths of the offsetting substitution and income effect. A rise in the rate of return may increase savings by making future consumption cheaper relative to current consumption (substitution effect). At the same time, higher real interest rates may reduce the savings necessary to purchase a given amount of future consumption (income effect). Given the theoretical ambiguities, whether or not savings behavior is interest elastic is a matter for country specific empirical analysis (Bhattrai and Kafle, 2011).

The present study is, therefore, an attempt to estimate the effect of real interest rates on the level of savings in Nepal, and inform policy makers to consider the status of savings behavior for the purpose of economic planning in Nepal.

METHODOLOGY

Most of the data used in this study were obtained from various issues of Economic Survey of Ministry of Finance, Quarterly Economic Bulletin of NRB, and National

Accounts prepared by the Central Bureau of Statistics (CBS), Government of Nepal (GON). The whole study period 1975-2010 has been divided on two phases, 1975-1995 and 1996-2010. In the first phase, 1975-1995, the trend of real interest rate and private saving (total deposits of commercial banks) has been depicted and in the second phase, 1996-2010, the trend as well as relationship between the real interest rate and saving level (both private and public) has been analyzed.

The dependent variables are the gross national savings and gross domestic saving at current price (gross national/domestic income less final consumption) and private savings (deposit mobilization by commercial banks). Gross savings are more reliable than net savings because, they do not rely on the estimate for depreciation, which is subject to various statistical and conceptual problems (Ramsaran, 1988). The data of gross national and domestic savings have been obtained from national accounts statistics and that of private savings are taken from the various issues of Quarterly Economic Bulletin of NRB. The real interest rates, the independent variable are weighted average rate on one year time deposits determined by NRB corrected for inflation. Since the calculation of real interest rates requires data on expected inflation, a non-observable variable, percentage change in GDP deflator has been used to calculate real interest rates. The real interest rate is calculated as:

Real Interest Rate (RR) = Nominal Interest Rate (RN) on One year fixed deposit – Expected Inflation Rate

$$\mathrm{RR} = \mathrm{RN} - \Delta\mathrm{GDP\ Deflator} \ldots\ldots 1$$

Where,

$$\mathrm{GDP\ Deflator} = \frac{\mathrm{Nominal\ GDP}}{\mathrm{Real\ GDP}} \times 100$$

This research work has particularly been designed for descriptive and analytical purpose; no sophisticated statistical and econometric tools have been used. Only simple mathematical expressions such as percentage, average, ratio, etc. have been employed. Further, tables and figures have also been used to show the relationship between the variables and to make the analysis more simple and understandable. At the same time, some statistical tools such as correlation co-efficient, standard deviation, and coefficient of variation have been employed to show the empirical relation between real rate of interest and saving.

Correlation Coefficient

Correlation coefficient is the statistical tool used to describe the degree and direction of linear relationship between variables. Karl Pearson has defined the simple correlation coefficient (**r**) of **X** and **Y** variables as follows:

$$\mathbf{r}_{xy} = \frac{\mathrm{COV}\ (X, Y)}{\sqrt{\mathrm{Var}(X)\mathrm{Var}(Y)}} \ldots\ldots 2$$

Where, COV is covariance between X and Y series and is given by:

$\mathrm{COV(XY)} = \frac{1}{n}\sum(X - \overline{X})(Y - \overline{Y})$, And

$\mathrm{Var(X)} = \text{Variance of X} = \frac{1}{n}\sum(X - \overline{X})^2$

$\mathrm{Var(Y)} = \text{Variance of Y} = \frac{1}{n}\sum(Y - \overline{Y})^2$

Generally, (**r**) helps to depict: 1) whether positive or negative relationships exist between **X** and **Y**; 2) the relationship is statistically significant or not, and 3) cause and effect relation between **X** and **Y** if any. The value of correlation coefficient is always lies between -1 to +1 and decisions under this analysis have been taken on the following theoretical ground:

When r = +1, there is perfect positive correlation between two variables.
When r = -1, there is perfect negative correlation between two variables.
When r = 0, there is no correlation between two variables.
When 'r' lies between 0.7-0.999, there is high degree of positive correlation.
When 'r' lies between -0.7 to -0.999, there is high degree of negative correlation.
When 'r' lies within 0.500 to 0.699, there is a moderate correlation.
When 'r' is less than 0.5, there is low degree of correlation.

Probable Error (PE)

Probable error of the correlation coefficient (**r**) denoted by PE is the measure of testing the reliability of the calculated value of (**r**). If the calculated value of correlation coefficient from a sample of (n) pair of observations, and then PE is defined by:

$$\mathrm{PE} = \frac{0.6745 * 1 - r^2}{\sqrt{n}} \ldots\ldots\ldots\ldots\ldots 3$$

It has been used for the interpretation, whether calculated value of (**r**) is statistically significant or not. The decisions have been taken on the basis of following theoretical ground: If r < 6PE it is insignificant. So, perhaps there is no evidence of correlation; if r > 6 PE, it is significant; in other cases, nothing can be done.

The probable error of correlation coefficient may be used to determine the limits within which the population correlation coefficient lies. Limits for population correlation coefficient are (r) ± PE.

RESULTS AND DISCUSSION

Financial Development and Interest Rate Phase in Nepal

Prior to 1955, the domestic financial system was under-developed; it was dominated by unorganized / informal financial system generally driven by private individuals, Shahus (merchants) and landlords (Pant, 1964). To provide financial services, Nepal Bank Limited (NBL) which is the first commercial bank in the country, was established in 1937, and reflects the start of the formal financial system.[1]

The establishment of NRB in 1956 coincided with the period of planning (the first development plan from 1956–1960). At the initial stage, the financial system was still rudimentary and described as "predominantly a cash economy" (NRB, 1965); however the further effort by GON of formalizing the financial system was reflected in the establishment of i) Nepal Industrial Development Corporation (NIDC) in 1959[3]; ii) Rastriya Banijya Bank (RBB) 1966[4]; and iii) Agriculture Development Bank in 1968[4]; these institutions facilitated the elimination of the dual currency system in 1967, which predominated in Nepal (NRB, 1996). In that year, NRB also adopted a controlled interest rate regime, where the Bank used to fix deposit and lending rates of the commercial banks.

Administered Interest Rate Phase (1966 -1983)

As the market based monetary policy instruments were not developed, determination of interest rate was one of the few options left for the NRB at that time. Likewise, there was a lack of competition in the domestic financial system due to the limited number of banks and financial institutions (BFIs) in the country.

Although NRB began to control deposit interest rates in 1966, lending interest rates were untouched. With an objective of reviewing the existing interest rate structure, NRB constituted a high level committee under the chairmanship of a Deputy Governor of NRB in 1969. The committee submitted its report in August 1970. On the basis of report, NRB established a new interest rate structure effective April 14, 1974. Deposit rates were increased to 5-8.5% from 4.5-7% and lending rates were increased to 7.5-13% from 7-12%. With this, NRB began to administer both deposit rates and lending rates.

After that, NRB used the interest rate policy to accelerate the domestic saving mobilization and divert bank credit to the productive sectors of the economy. To achieve these twin objectives, NRB adopted two approaches to interest rate policy. First, it began to change the nominal interest rate from time to time so as to influence domestic saving mobilization. Second, NRB commenced the differential interest rate policy for different types of bank credit, discriminating one type against the other. In order to extend the flow of bank credit to the preferred sectors of the economy, lower rates of lending were fixed and in order to discourage the bank credit to some other sectors, higher rates were fixed. To support the differential interest rate policy, NRB introduced an intensive banking program in 1981 (NRB, 1985).

Partially Deregulated Interest Rate Phase (1984 - 1989)

In early 1980s, Nepal experienced a series of BOP problem. To control the deteriorating international reserve Nepal adopted the International Monetary Fund (IMF) supported economic stabilization program in 1985, and subsequently entered into IMF's Structural Adjustment Facility; this presaged gradual reform measures in the financial sector (Thornton, 1987). In this regard, on November 16, 1984 NRB initiated a limited flexibility to commercial banks to fix the interest rates. Commercial banks were then allowed to offer interest rate on savings and time deposits to the extent of 1.5 and 1.0% point above the minimum level fixed by NRB. This form of partial deregulation on interest rate helped the BFIs to be more

competitive. In this liberalizing environment, three joint venture commercial banks were established during 1984-1987. Effective from May 29, 1986, interest rates for deposit and lending were further liberalized except for the priority sector lending, in which banks were not allowed to charge interest rate more than 15%. The objective of gradual deregulation of interest rates was to create competitiveness in the banking sector thereby increasing efficiency, effective mobilization, and allocation of resources.

Liberalized Interest Rate Phase (1990 to present)

The work of McKinnon and Shaw in early 1970s provided the theoretical background of interest rate deregulation in developing countries. McKinnon (1973) and Shaw (1973) argued that controlled interest rates retarded economic growth. They contended that the deregulation of interest rates was important because it discouraged domestic investment in those areas, which were not yielding adequate rate of return in the long run. Ceteris paribus, higher real interest rates increase domestic as well as foreign savings and total savings. It also increases the flow of savings through financial intermediaries so that the overall efficiency of savings-investment process is enhanced.

In the light of this theoretical background, controlled interest rate regime in Nepal was completely abolished on August 31, 1989. BFIs are now given full autonomy to determine their interest rates on deposits and lending. This coincided with the period of economic liberalization, which saw a huge spurt in the number of banks and financial institutions. The number of BFIs expanded tremendously from 7 in the last phase to 279 in the current phase - an increase by almost 40 times (Table-1). Although the BFIs are free to determine the interest rate, the NRB has been forced to occasionally issue directives in regard to anomalies in the interest rate determination indicated by a high interest rate spread between deposit and lending rates (NRB, 2010). Therefore, the objective of interest rate deregulation to lower the financial intermediation cost is yet to meet. Although, the NRB Act - 2002 attempted to develop the country's financial system, the continuing high level of interest rate spread suggested greater financial sector development had not brought efficiency in the financial system. To address this, NRB attempted to maintain the interest rate spread of BFIs at a desired level through using moral suasion.

Table 1: Growth of Financial Institutions:

Type of Financial Institutions	1980 Mid-July	1990 Mid-July	2000 Mid-July	2011 Mid-July
Commercial Banks	2	5	13	31
Development Banks	2	2	7	87
Finance Companies	-	-	45	80
Microfinance Institutions	-	-	7	21
S&C Cooperatives*	-	-	19	15
NGOs *	-	-	7	45
Total	4	7	98	279

(Source: NRB); Note: *Licensed by NRB for limited banking services

Real Interest Rate and Saving in Nepal
First Phase (1975-1995)

In early 1970s, the general level of prices began to rise in the wake of oil price shock. For example, inflation increased by 11% in 1973 followed by 18.8% in 1974 and 16.5% in 1975. In the face of a rapid rise in general level of prices, with given nominal interest rates, real interest rates were falling. For example, one year real deposit rate was negative 3.5% in 1973, 9.3% in 1974 and declined further to negative 12.17 in 1975. Therefore, besides containing inflation, another objective of interest rate policy was to keep real interest rates positive. In the process, big changes in interest rates were undertaken in the middle of 1970s. Deposit rates were hiked as high as 16% and lending rates were as high as 18% in 1975. With the hike of nominal interest rate, one year real deposit rate improved but still remained negative at 1.5% in the last quarter of 1975 (NRB, 2007). Real interest rates turned positive only after 1976 when the general price level declined.

The objective of increasing deposit rates was to attract savings into the banking sector and make interest rate structure in Nepal competitive with that of India. With the substantial hike in interest rates, time deposit with the commercial banks increased by an average rate of 30% during 1975-1978 (NRB, 2007).

Table 2: Real interest rate (%) and bank deposit (1975-1995)

Year	Real interest rate in Nepal	Real Interest rate in India	Growth of bank deposits
1975	-12.17	-	24.47
1976	12.39	-	37.25
1977	18.21	-	33.26
1978	4.23	10.74	18.05
1979	3.66	-1.08	15.27
1980	5.94	4.5	14.73
1981	5.62	5.1	24.43
1982	5.63	7.76	18.44
1983	4.2	7.35	28.11
1984	9.99	7.96	12.42
1985	5.01	8.63	20.79
1986	1.11	9.07	20.38
1987	2.04	6.54	14.95
1988	2.85	7.67	26.58
1989	3.36	7.45	26.77
1990	3.34	5.26	15.46
1991	-11.1	3.64	21.94
1992	-15.6	9.12	24.88
1993	-9.73	5.87	30.65
1994	-4.59	4.32	19.81
1995	-5.93	5.85	17.02
Sum	28.46	115.75	465.66
Mean	1.42	6.81	23.28
S D	8.43	2.67	6.63
C V	592.24	39.23	28.48

The data for real interest rate of India as well as Nepal were taken from International Monetary Fund, International Financial Statistics/data files and that of bank deposits from NRB reports.

During the period of 1975 to 1995 the average real interest rate of one year fixed deposit in Nepal remained as low as 1.42% with standard deviation (SD) of 8.43 and coefficient of variation (CV) of 592.24. While almost for the same time (1978-1995), the average real interest rate of India is 6.81%, which is almost 5 times of Nepal. In the first phase, 4 governments own BFIs were operating and their interest rates were guided by the government decisions, so that the nominal interest rates were relatively lower than that of India. But, the general price level for that period was galloping due to supply side constraints and the expansionary monetary policy stand of NRB. Likewise, the NRB was frequently intervening in the deposit and lending rates of the BFIs. Because of these reasons the real interest rate in Nepal was comparatively lower and volatile relative to India.

Despite lower real interest rates, bank deposits in Nepal increased by an annual average rate of 23.28% during the period of 1975-1995. For that period, SD and CV of the growth rate of bank deposits are 6.63 and 28.48, which indicates the growth rate of bank deposit is comparatively less volatile than that of real interest rate. For the review period, an approximately positive relation between real interest rate and growth rate of bank deposit is observed. During 1975-1995 the real interest rate and growth of bank deposits were moving almost in same direction. Though the real interest rate was negative, the bank deposit was increasing at the rate of 24% in 1975. During 1976 and 1977, the real interest rate was as high as positive level at 12.39 and 18.21% respectively. Accordingly, the growth of bank deposit surged to around 50% point. After that the real interest rate in Nepal remained positive up to 1990. During that period, the total deposit of Nepal's commercial banks registered an annual growth rate of more than 20%.

To begin with, in 1991 the real interest rate in Nepal again went to negative territory and reached as low as negative 15.6 percent in 1992. As a result, the growth rate of bank deposit also fell down from more than 25 percent in 1989 to around 15 percent in 1991. But the bank deposit increased by an annual rate of 30 percent in 1993 while the real interest rate was still negative at around 10 percent. This indicates that real interest rate has little effect, if any, on the deposit growth. Besides, this might be due to some structural changes or due to external shocks. Actually that was the time when number of BFIs was increasing rapidly inside or outside Kathmandu valley because of the liberal economic policy adopted by the first elected government after the restoration of democracy in 1990. There was some improvement in real interest rate during 1992-1994, but again real interest rate started to fall since 1994, the growth of bank deposit also failed simultaneously.

The trend of real interest rate and growth of bank deposit during the period of 1975-1995 has been depicted in the following figure.

Figure 1: Trend of real interest rate and bank deposit during 1975-1995

Second Phase (1996-2010)

The objective of complete deregulation of interest rates was to create a more competitive environment in the financial sector. Likewise, the first aim was to encourage BFIs to mobilize financial resources and secondly that aimed to help them to allocate resources optimally. To support the complete deregulation of interest rates on deposits and lending, a number of policy changes in the financial sector were initiated. To begin with, there was a shift towards, indirect monetary policy stance. There was a gradual relaxation of direct monetary policy instruments such as credit ceilings and margin requirement. The open market operation (OMO) was taken as active instrument of monetary policy.

Some anomalies appeared after the complete deregulation of deposit and lending rates. Banks started offering higher interest rates to some depositors and lower to some other. Similarly, discrimination of borrowers in terms of interest rate differential for the same type of loans also creates distortions in the banking industry (NRB). As a result, interest rate spread increased after the deregulation of interest rates.

Generally speaking, a high spread is indicative of inefficiency of banking industry. This was true for Nepal's banking industry during 1990s. BFIs, instead of competing among themselves for their business expansion through interest rate, they entered into collusion. For example, unweighted interest rate spread went up as high as 7 to 8 percent, which was considered to be very high compared to 2 to 3 percent spread in other countries (NRB, 1998). High spread tends to reduce financial intermediation with obvious impact on economic growth. To limit the spread at 6 percent, moral suasion was used first. When it was found that BFIs did not pay attention to NRB's moral suasion, the matter was taken up seriously. Hence, the interest rate spread ceiling was reviewed and made rigid further by lowering it to 5 percent on July 16, 1998 (NRB, 2005).

The main objective of the imposition of rigid interest rate spread was to increase financial deepening by forcing BFIs to lower their financial intermediation cost. NRB, in the mean time, adopted a number of measures aimed at helping in maintaining the positive real interest rate. Cash Reserve Requirement (CRR), an indirect instrument of monetary policy and tax on financial intermediation, has direct impact on cost of capital of BFIs and in turn on real interest rate. In the light of this fact, the level of CRR was reduced from 12% to 10% in 1998. It was further reduced to 9% in December 2001 and 8% in 2002. CRR was cut further to 6.0% in 2003 and on July 19, 2004 to 5.0%. It was raised to 5.5% in 2009 and again reduced to 5% in 2011.

Likewise, the bank rate, policy rate on which BFIs used to borrow from central bank by pledging their securities, was gradually lowered. Because the rate has direct impact on the cost of capital of the BFIs, which may increase the cost of production an ultimately general price level. Thus with an aim at helping to contain the inflation and to keep real interest rate positive, the bank rate was gradually reduced from 11% in 1997 to 5.5% in 2002. But, the bank rate was gradually raised to cope with the inflationary pressure in the economy and ultimately reached at 7% in 2010. Likewise, refinance rates were also lowered from 7.0% to 1.5 -3.25% between 1998 and 2010. As a result of the policy measures adopted by NRB, the real interest rate remained positive in 11 years during 1996 to 2010. The trend may also show that due to increased number of BFIs and increased competition BFIs are putting up competitive interest rate to survive in the business. Thus, relative to the first phase where government owned bank dominated the scenario, this phase showed positive movement in interest rate although various other factors hampered positive development in the real interest rate movement.

Table 3: Real interest rate and saving (1996-2010)

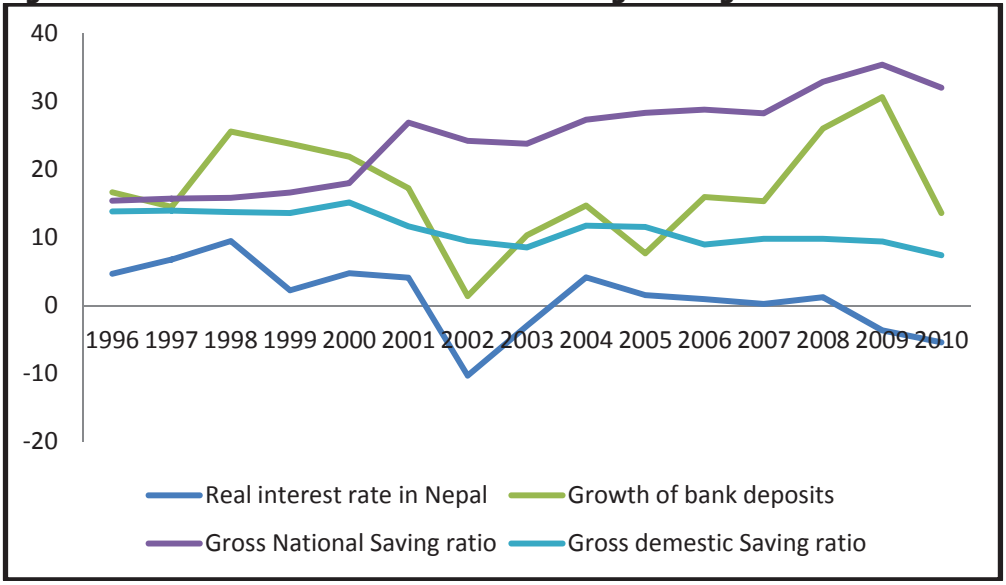
Year	Real interest rate in Nepal (%)	Real Interest rate in India (%)	Growth of Bank Deposits (%)	Gross National Saving Ratio (%)	Gross Domestic Saving Ratio (%)
1996	4.69	7.82	16.65	15.4	13.83
1997	6.77	6.93	14.51	15.72	13.96
1998	9.5	5.15	25.58	15.84	13.74
1999	2.25	8.42	23.8	16.62	13.61
2000	4.77	8.47	21.89	18.01	15.17
2001	4.11	8.79	17.26	26.91	11.66
2002	-10.3	7.82	1.39	24.23	9.49
2003	-2.98	7.63	10.34	23.8	8.56
2004	4.16	2.04	14.72	27.34	11.75
2005	1.54	6.31	7.69	28.33	11.56
2006	0.94	4.49	15.96	28.81	8.98
2007	0.25	6.87	15.34	28.27	9.82
2008	1.23	6.2	26.03	32.9	9.83
2009	-3.64	4.32	30.64	35.43	9.41
2010	-5.4	-	13.61	32.04	7.39
Sum	17.89	91.26	255.41	369.65	168.76
Mean	1.19	6.52	17.03	24.64	11.25
S D	5.08	1.93	7.62	6.80	2.38
C V	425.75	29.64	44.75	27.60	21.18

(Source: NRB, CBS, and RBI)

During the period of 1996-2010, an average real interest rate of Nepal was just 1.19% while such rate was 6.52% in India. However, the SD of 5.08 is lower than 8.43 in the first phase as well as CV of 425.75 is also lower than 592.24 of the first phase. This showed that there are lots of improvements in the interest rate movements and it is less volatile and is fluctuating less. The stability in interest rate also helps economic development and hence this phase could be considered better, in this regard. The Nepalese banking system is dominated by the public BFIs in terms of deposit mobilization and loan portfolio and the public BFIs hold larger share of total deposit of the banking system. At the mean time, the interest rate offered by that government owned BFIs in deposits are relatively lower than that of other BFIs. Because of this reason, the weighted industry average rate of one year time deposit tends to be lower. Apart from that, the rising inflation resulted from economic as well as non-economic reasons is the major factor influencing the real interest rate in Nepal. Despite the fact that, the real interest rate in Nepal was lower during second phase, total bank deposit was increased by an annual average rate of 17.03%. This is due to structural changes of Nepalese economy and due to the effort of financial sector reform program implemented by the government. Likewise, the gross national saving and gross domestic saving ratios for that period have registered an annual average value of 24.64 and 11.25 respectively. The

growing inflow of money remitted by Nepalese people working abroad, especially in the Middle East and gulf countries has played significant role to maintain the gross national/domestic saving ratios in comfortable levels for that period. In such a situation, the trend of real interest rate, growth of bank deposit, gross national saving and gross domestic saving ratios has been depicted in the following graph.

Figure 2: Trend of real interest rate and savings during 1996-2010



Correlation Analysis

Although, theories and literatures of saving and investment have established a positive relationship between real interest rate and saving (source of fund), and negative relationship between real interest rate and investment (use of fund), the correlation analysis, in this study, has been performed to find out the degree and direction of relationship between real interest rate (RR) and bank deposits (BD), gross national saving (GNS) and gross domestic saving (GDS) in Nepalese context.

Table 4: Correlation Matrix

Variables	RR	BD	GNS	GDS
RR	1.00			
BD	0.4382	1.00		
GNS	-0.5550	0.0295	1.00	
GDS	0.7780	0.2765	-0.8077	1.00

Based on the above table, it is found that the total deposit of commercial banks is moderately interrelated with the real interest rate indicating 1% increase in real interest rate will raise 0.43% bank deposit. But the result is statistically insignificant as the calculated value of (**r**) is smaller than 6*PE (0.7512). Likewise, the gross national saving (GNS) is negatively correlated with that of real interest rate and the result is statistically insignificant as the calculated value of (**r**) is lesser than that of 6*PE (0.5677). At the same time, the gross domestic saving is highly correlated

with the real interest rate of Nepal for the review period indicating 1% increase in real interest rate will raise 0.77% GDS. The result is statistically significant as indicated by the calculated value of (**r**) is greater than that of 6*PE (0.1071). Thus there is evidence of positive correlation between real interest rate and gross domestic saving in Nepal.

CONCLUSIONS

In this paper, I have analyzed the real interest rate and saving behavior in Nepal using annual data for the period of 1975-2010. First, the whole study period is divided into two sub-periods, 1975-1995 (first phase) and 1996-2010 (second phase). During the first phase, an average real interest rate remained at 1.42% and the total bank deposit grew by an annual average growth of 23.28%.

For the second phase (1996-2010), the real interest rate and annual growth of bank deposit are relatively lower (1.19) and (17.03) than that of first phase. Likewise, the gross national saving and gross domestic saving ratios for that period have registered an annual average value of 24.64 and 11.25 respectively. However, despite lower values it is to be noted here that the volatility of real interest rate is relatively stable in this period and hence comfortable for the public than that in controlled regime (first phase). Due to relatively stable and less fluctuating interest rates, thus, the market-led economy could be considered better.

Next, the trend lines of real interest rate and growth of bank deposit show that there is a long-run positive relationship between these variables.

Apart from that, the correlation analysis has been performed to measure the degree and direction of relationship between real interest rate and saving in the country. It is found that the real interest rate has weak connection with growth of bank deposit indicated by the low and statistically insignificant correlation coefficient. Likewise, the real interest rate has statistically insignificant negative effect on gross national savings. This may be due the high influence of remittance inflow in the gross national saving. At the same time, real interest rate has high correlation on gross domestic saving as indicated by statistically significant result.

In conclusion, the real interest rate affects the growth of bank deposit positively but negligibly. This result suggests that trying to influence the bank deposits by manipulating interest rates is not likely to be a practical policy option in Nepal. However, the government should attempt to maintain competitive positive real interest rate relative to that of other neighboring countries in order to increase the gross domestic savings. The present paper only used the simple mathematical and statistical tools to analyze the relationship between real interest rate and saving in Nepal using annual data. However, there is room for in-depth analysis to measure the impact of real interest rate to the saving variable using more sophisticated econometric methods and quarterly or monthly data.

Notes

[1] The Tejarath Adda had been established in 1880 however, as it had been only a credit institution, it did not play the essential role of financial intermediation.

[2] This was established under Nepal Industrial Development Cooperation Act, 1959 with the objectives of mobilizing capital to industrial sector and facilitating industrial development in private sector

[3] This was established under Agriculture Development Bank Act, 1967 with the objective of providing credit to agriculture sector throughout the country

[4] This was established under Rastriya Banijya Bank Act, 1965 with the objective of providing banking services throughout Nepal and contributing to the socio economic development of the country (e.g. NBL and RBB) which controlled the lion's share of the resources.

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