ECONOMIC FACTORS INFLUENCING THE PROBABILITY OF ADJUSTMENTS IN NEPAL'S EXCHANGE RATE POLICY WITH THE INDIAN CURRENCY

A Binomial Probit Analysis for the Period of 1976 - 1998

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Abstract

A binomial probit analysis, using the monetary model of exchange rate determination, is applied to understand economic influences on the probability for adjustment in Nepal's exchange rate policy with the Indian Currency during the period of 1976 - 1998. Empirical results suggest that both relative Nepalese to Indian money and output growth does not have significant effects on probability of exchange rate change but that the relative interest rate growth does. Additionally, the movement of relative interest rate growth variable of Nepal and India is seen to signal changes in real, versus nominal as put forward in the monetary model, rates of return whose divergence increases the probability of appreciation of the Nepalese Currency vis-à-vis the Indian Currency.
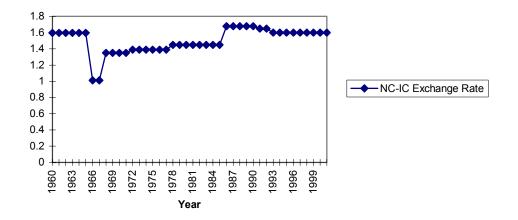
I.   Introduction

Nepal's exchange rate policy with the Indian Currency (IC) has experienced only seven adjustments in the forty years period of 1960 - 2000. What economic factors have contributed significantly to the probability of adjustment in this exchange rate? This is the primary question which this paper examines through the empirical tool of probit regression model using the monetary model of exchange rate determination.

The Nepalese exchange rate policy has been strongly influenced by the exchange rate policy vis-à-vis the IC. The influence of India has geographical dimension which largely determines the commercial relationship between Nepal and India. While Nepal borders both China and India, the Himalayan mountain range minimizes Nepal-China contact and which in turn manifests India's importance to Nepal which lie in the Ganges Valley. This geographical reality is partly reflected in the 1950 Treaty of Peace and Friendship with India as well as in the nature of Nepal-China trade direction. There is presently limited legal restriction on labor and capital movement between Nepal and India.

The importance of the IC for maintaining Nepalese financial stability has been recognized by the Nepalese government. In April 13, 1960 the Nepalese Government adopted the policy of unlimited convertibility of Nepalese Currency (NC) to IC in Nepal.[1] The pegged exchange rate between Nepal and India has existed for over forty years. It necessitates that any change in the exchange rate of the IC vis-à-vis convertible currencies will have to be largely followed by Nepal; if this does not occur then a currency arbitrage opportunity will exist. Given these limitations the NC-IC exchange rate has maintained a surprising level of stability. There have been only seven adjustments in the NC-IC exchange rate over the last forty years whose last exchange rate change occurred on February 1, 1993. The NC-IC exchange rate has maintained the exchange rate of 100 IC for 160 NC since that time.[2] This relationship is shown graphically below whose data is taken from the *Quarterly Economic Bulletin (QEB)* of the Nepal Rastra Bank (NRB).

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[1] Although a currency basket inclusive of IC was introduced in 1983 and the basket remained in operation till 1993, IC never floated in the basket.

[2] It is important to have a clear understanding of the NC-IC exchange rate description. The exchange rate is described in terms of NC for IC (i.e. 160 NC for 100 IC) where an increase in the NC-IC exchange rate reflects a *depreciation* of NC (i.e. to 170 NC for 100 IC) and a decrease in the NC-IC exchange rate reflects an *appreciation* of NC (i.e. to 150 NC for 100 IC).

NC-IC Exchange Rate; 1960 - 2000

The stability of the NC-IC exchange rate, seen above, has been both sensible and workable in stabilizing the Nepalese economy for good healthy growth (Maskay, 2000b).

As the exchange rate is an important mechanism to facilitate trade and foreign transactions with India (i.e. it gives certainty to the value of future goods) it is important to examine the factors which influence the probability of changes in the NC-IC exchange rate. For Nepal and India the existence of the exchange rate for such a long span with only limited discrete changes allows the use of monetary model of exchange rate determination, through binomial probit statistical model, to analyze economic factors affecting probability of NC-IC exchange rate change. That is, how does relative changes in relative money supply, economic output and interest rate in Nepal and India affect the probability of changes in the NC-IC exchange rate changes?

This paper proceeds as follows: The next section discusses the choice of the monetary model of the exchange rate. The third and fourth section discusses the probit model of estimation as well as puts forward estimation results and analysis while the last section summarizes.

II.   Monetary Model of Exchange Rate Determination[3]

There are many models for exchange rate determination. However, choosing a model that is most appropriate for Nepal-India relations is important for understanding factors which influence NC-IC exchange rate relations. There are four major models of exchange rate determination; Purchasing Power Parity (PPP), the monetary model, the Dornbush over-shooting model and the portfolio balance model. Each of these models can in turn be eliminated after determining their appropriateness in the Nepal-India context. PPP can be eliminated as there is measurement problems for PPP using the proxy of Consumer Price Index, and international empirical evidence thus far is not supportive of PPP usage. Dornbush over shooting can be eliminated since the model gives greater emphasis to capital markets which is not reflective of Nepal-India relations over the period. The portfolio balance approach can also be eliminated since the model does not reflect the level of financial development between Nepal and India. The monetary model of exchange rate determination likewise has some problems; however it is the best of the given models since it makes some explicit assumptions, discussed below, which reflect open border situation between Nepal and India. Thus, the monetary model of exchange rate determination is chosen to be the most appropriate model in explaining NC-IC exchange rate movements.

The basis of the monetary model of exchange rate determination is the conventional money (domestic and foreign money) demand function given as $\vartheta m - p = \eta y - \sigma r$ and $\vartheta m^* - p^* = \eta y^* - \sigma r^*$ where m and m^* represent natural logs of domestic and foreign money supply, y and y^* represent natural logs of domestic and foreign output, r and r^* represent natural logs of domestic and foreign interest rate respectively. It is assumed that PPP holds continuously and is expressed as $s = p - p^*$ where s is the exchange rate of foreign to domestic currency[4], p and p^* represent the logs of the domestic and foreign price levels. This so called "law of one price" appears to hold in Nepal due to the presence of open border with India and goods arbitrage (Bajracharya and Maskay, 1998). Additionally, the monetarist model makes an assumption that domestic and foreign bonds are perfect substitutes. This being the case, uncovered interest rate parity (UIP)[5] condition holds. However, for Nepal-

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[3] For a textbook description see Pilbeam (1998).
[4] This portion is confusing and is best to get a handle on as the standard method of representation in economics is contrary to that found in the newspapers. Thus, in this formulation it would be 62.5 IC for 100 NC. An increase reflects an *appreciation* of NC while a decrease reflects *depreciation* of NC.

[5] UIP states that $\dot{E}s = r - r^*$, $\dot{E}s$ is the expected change in the exchange rate, r and r^* represent the natural logs of the domestic and foreign interest rates. An additional use of UIP is to measure the level of capital mobility which, at time, does not hold in the short run for Nepal-India. As stated in the past :

India there have been short-term divergence's attributed to temporary non-symmetric patterns of real shocks between both countries (Maskay, 2000a) and facilitated by low levels of capital mobility. While UIP may not hold in the short run, this is good description of the medium to long run relationship between both countries. Rearranging and substituting the final reduced form equation of the monetary model for exchange rate determination results in $s = \vartheta(m - m^*) - \eta(y - y^*) + \sigma(r - r^*)$ where variables are defined as above. For uniformity of analysis in the later portion, we can rearrange the above equation as stating

$$s = \vartheta\left(\frac{m}{m^*}\right) + \eta\left(\frac{y}{y^*}\right) + \sigma\left(\frac{r}{r^*}\right) \text{ with } \vartheta > 0, \eta < 0, \sigma > 0.$$

The monetary model of exchange rate determination thus makes three predictions about the signs of the coefficients as $\vartheta > 0, \eta < 0, \sigma > 0$. That is:

- Relative money supplies affect exchange rate: a given percentage increase in the home money supply leads to an equivalent depreciation in the exchange rate. The rationale behind this is that an increase in domestic money supply leads to an increase in prices which, since PPP holds, leads to similar level of *depreciation* in the exchange rate.
- Relative levels of national income influence exchange rate: an increase in domestic income, translated into transaction demand for money, leads to an increase in demand for real balances and a fall in domestic prices. Since PPP holds, this fall in domestic prices leads to an *appreciation* of the exchange rate.
- Relative interest rate influences the exchange rate: an increase in domestic interest rate leads to a fall in the demand for money and hence a *depreciation* of the exchange rates. This can be viewed from an alternative perspective using the Fisher condition where, with real interest rates constant, an increase in the nominal interest rate signals an increase in inflationary expectations.

"Starting in January 1995, monetary conditions in India were tightened to reverse an increase in inflation in that country and bolster a weakening external situation. However, the NRB failed to increase interest rates on government securities in step opening up an interest differential between India and Nepal of 4 percentage points by July 1995. The widening differential contributed to the deteriorating BOP in the first quarter of 1995/96. At the same time, the failure to raise interest rates on government securities dampened market demand for those securities…The authorities (NRB) boosted interest rates on Treasury Bills in primary auctions, virtually closing the interest rate differential with India by January 1996. This stabilized the external position as capital outflow were stemmed.." (*IMF Country Report*, 1996, p.9)

In other words, in the short run UIP may not hold reflecting low capital mobility which is attributed to low financial sector development (Maskay, 2000b).

In other words, the monetary model of exchange rate determination has the exchange rate being affected by relative money, output and interest rates.

III. Probit estimation model[6]

The previous section suggests that the monetary model of exchange rate determination is appropriate for explaining exchange rate movements of NC vis-à-vis the IC. Examining the Nepal-India exchange rate history suggests that there have been infrequent and discrete changes in the exchange rate between both countries totaling seven over the period 1960 - 2000. While this situation can be examined using standard analysis for influence of different variables on the exchange rate, this paper examines the effect of different variables on the *probability* of having exchange rate change. This empirical methodology is appropriate as the change in the NC-IC exchange rate has been limited in frequency and magnitude. Thus, this situation of having discrete changes suggests that the NC-IC exchange rate change can be represented by 0 and 1, where 0 represents a state of no change and 1 represents a state of change in the NC-IC exchange rate. As the dependent variable in this regression only takes on those two values, this allows the use of linear probability models.[7]

Applying the linear probability model using simple Ordinary Least Squares (OLS) analysis faces a number of problems such as having non-normally distributed errors as well as having the errors being inherently heteroscedastic etc. The major difficulty of using simple OLS with a linear probability model is that the dependent variable is unbounded between 0 and 1. This problem therefore necessitates a different form of estimation methodology.

For this paper the binomial probit is chosen to estimate the linear probability model. The most significant reason driving this choice is that the binomial probit is based on the cumulative normal distribution which has good small sample properties. The general form of the binomial probit is taken to be (Studenmund, 1992, 525 - 526):

$$(1) \qquad P_i = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{Z_i} e^{-s^2/2} ds$$

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[6] Text book explanations are given in Studenmund (1992) and Johnston et al. (1997).

[7] Linear Probability Models are in the general form of $D_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + .. + \varepsilon$ where the dependent variable is $E[D_i | X_{1i}, X_{2i},..] = P_i$, i.e. the probability before the discrete change is made.

where P_i is the probability that the dummy variable $D_i = 1$, $Z_i = \beta_o + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_i$ and s is a standardized normal variable. While this equation looks quite different from the regular regression equation, it can be written to look quite familiar as $Z_i = F^{-1}(P_i) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_i$ where the β's are the coefficients and the X's are the different independent variables. It is important to be careful when analyzing the economic meaning of regression coefficients from a probit model. For instance β_1 above measures the impact of a one-unit change in X_{1i} on the log of the odds of a given choice holding X_{2i} constant. For this paper we are examining the factors which affect the log of the probability of a change in the NC-IC exchange rate occurring. Thus, the estimation equation used in this paper is:

$$(2) \qquad Z_i = F^{-1}(P_i) = \beta_0 + \beta_1 \left(\frac{m}{m^*} \right) + \beta_2 \left(\frac{y}{y^*} \right) + \beta_3 \left(\frac{r}{r^*} \right) + \varepsilon_i$$

where the variables are defined as above and the expected signs are $\beta_1 > 0, \beta_2 < 0, \beta_3 < 0$.

IV.   Empirical Results

This section proceeds in four stages. First, description of data, second, testing of data, third, results of running binomial probit regression, and finally, analyzing the empirical results.

IV.A.   Description of Data

Based on the estimation equation (2) the variables to be used are Nepalese and Indian money supplies which are represented by respective narrow money, Nepalese and Indian outputs which are represented by respective Gross Domestic Product (GDP), Nepalese and Indian interest rate which are represented by respective Central Bank Discount Rate and finally the NC-IC exchange rate which is represented by the official exchange rate given by the NRB. The name, abbreviation, source and span of the data is given below:

#	Variable Name	Abbreviation	Source	Data Span
1	Nepalese Narrow Money	NMS	*IFS # = f34a*	1957 - 1999
2	Indian Narrow Money	IMS	*IFS # = f34a*	1957 - 1999
3	Nepalese Output	NY	*IFS # = f99ba*	1964 - 1999
4	Indian Output	IY	*IFS # = f99ba*	1950 - 1998
5	Nepalese Interest Rate	NIR	*IFS # = f60a*	1976 - 1999
6	Indian Interest Rate	IIR	*IFS # = f60a*	1963 - 1999
7	NC-IC Exchange Rate	ER	*QEB of NRB*	1960 - 2000

NOTE:
1. *IFS* is International Financial Statistic of the International Monetary Fund
2. *IFS # = f34a* is stock of narrow money which comprises transferable deposits and currency outside deposit money banks.
3. *IFS # = f99ba* is final expenditures in the economy.
4. *IFS # = f60a* is the rate which the Central Bank ends or discounts eligible paper for deposit money banks, typically shown on an end of period basis. Also, for Nepal *IFS # = f60a* is labeled as the Discount rate while for India *IFS # = f60a* is labeled as the Bank Rate (end of period); both are the same items.

The span of the data used for this paper is limited by the variable with the shortest span. The floor of the data is 1976 which is limited by the availability of data on Nepalese Interest Rate from *IFS*. The ceiling of the data is 1998 which is limited by the availability of data on Indian Gross Domestic Product from *IFS*. Thus, the span used for this analysis is from 1976 - 1998. The descriptive statistics of the data are given below:

	NMS	IMS	NY	IY	NIR	IIR
Mean	14411.87	872.0174	102504.0	5556.343	11.95652	10.21739
Median	8682.000	543.2000	63864.00	3332.000	12.00000	10.00000
Maximum	45509.00	2703.500	300801.0	17626.10	15.00000	12.00000
Minimum	1636.000	147.6000	17280.00	848.9000	9.000000	9.000000
Std. Dev.	13746.76	789.7701	91444.70	5124.037	1.718304	1.166055
Skewness	0.920201	1.030967	0.910767	1.084825	0.508186	0.623072
Kurtosis	2.478394	2.803131	2.486747	2.919039	2.757759	1.953117
Observations	23	23	23	23	23	23

Note:
1. NMS is given in Millions of NC.
2. IMS is given in Billions of IC.
3. NY is given in Millions of NC.
4. IY is given in Billions of IC.
5. NIR and IIR are given in Percent per annum.

The statistics of the exchange rate represent four changes during the 1976 - 1998 period: devaluation on March 23, 1978 from 139 NC to 145 NC for 100 IC, devaluation on November 30, 1985 from 145 NC to 168 NC for 100 IC, re-valuation on July 1, 1991 from 168 NC to 165 NC for 100 IC and re-valuation on February 1, 1993 from 165 NC to 160 NC for 100 IC. As mentioned earlier, these NC-IC changes are represented by 1 in the dependent variable during those respective fiscal years[8].

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[8]   This is taken to be 1978, 1986, 1991 and 1993 respectively. For November 30, 1985 this falls in the 1985/86 fiscal year of mid-July 1985 to mid July 1986.

IV.B.   Testing of Data

The next step is to determine if the variables have a unit root since its presence would lead to spurious results. Consider the general relationship:

(3) $y_t = \alpha y_{t-1} + \varepsilon_t$

If $|\alpha| < 1$ then y is I(0), i.e. stationary, but if $\alpha = 1$ then y is I(1), i.e. non stationary and has a unit root. There are different tests for unit roots looking at the value of α. The Dickey Fuller (DF) test is utilized, from Dickey and Fuller (1979) against the null of a unit root (i.e. H_0 : $\alpha = 1$). Critical values are given in Davidson and Mackinnon (1993) where, in this case, we limit the lag length to zero and one as with Maskay (1998), whose choice of the optimal lag length is determined by Akaike Information Criteria (AIC)[9], since we were using data with annual frequency.

The first step is to take unit root test of the variable in log levels (i.e. the ratio on Nepalese to Indian level variables):

Variable	Lag (AIC)	ADF Statistic
LNNIMS (ln [m/m*])	0	-2.510069
LNNIY (ln [y/y*])	1	-1.437122
LNNIIR (ln [r/r*])	0	-1.235097

All variables accept the null of a unit root at more than the 10% level of confidence.

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[9]   AIC is given as $\ln \dfrac{e'e}{n} + \dfrac{2k}{n}$. AIC is a model selection criteria which reduces the residual sum of squares (Johnston et al, 1997, p. 74).

The next step is to take the unit root test of the variable in growth form (i.e. the ratio of Nepalese to Indian growth rates)[10]. They are:

Variable	Lag (AIC)	ADF Statistic
DLNNIMS (dln [m/m*])	1	-5.816857***
DLNNIY (dln [y/y*])	0	-5.711956***
DLNNIIR (dln [r/r*])	0	-5.046072***

All the variables in log difference form reject the null of a unit root at greater than the 1 % level of confidence. This suggests the appropriate representation is the log growth rates ratios of the different variables. Thus, satisfied that the log growth rates ratio address this problem of unit roots to the next section of the analysis is proceeded to.

IV.C.   Results from running binomial probit regression

Equation (2) given above is run using the statistical program E-views version 3.1. The output of 22 observation, after adjusting for endpoints, of this regression is given below:

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-1.863844	0.638158	-2.920664	0.0035
DLNNIMS	10.22502	6.764166	1.511645	0.1306
DLNNIY	3.414924	11.12071	0.307078	0.7588
DLNNIIR	-17.00078	10.01145	-1.698134	0.0895
LR statistic (3 df)	12.51619	McFadden R-squared		0.599948
Probability(LR stat)	0.005809			

The overall fit of the probit regression is good with the McFadden R-squared[11] of 0.599948. This result suggests that the probit regression model is able to explain almost sixty percent of

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[10] Both representations are equal. That is, the ratio of log levels are $\ln\left(\dfrac{m}{m^*}\right)$. The log difference can be

represented by $\ln\left(\dfrac{m}{m^*}\right) - \ln\left(\dfrac{m_{-1}}{m^*_{-1}}\right)$ which, through simple algebraic representation, can be shown to be

equal to $\ln\left(\dfrac{\Delta m}{\Delta m^*}\right)$ or the ratio of the log growth rates.

empirical results. The LR[12] statistic reject the joint null hypothesis that all slope coefficients, except the constant, are zero at better than the 1 % level of confidence (specifically, p-value is 0.005809). This result suggests that all the variables are important in influencing the probability of NC-IC exchange rate adjustment.

The empirical results above suggest that both relative Nepalese to Indian money and output growth does not have a significant effect on probability of exchange rate change and that relative Nepalese to Indian interest rate growth does. This is because the coefficients of relative Nepalese to Indian money and growth is not significant at even the 10% level of confidence with respective p-values of 0.1306 and 0.7588. The coefficient of relative Nepalese to Indian interest rate growth, on the other hand, is significant at the 10% level of confidence with a p-value of 0.0895. While this coefficient is significant it has the *opposite* of the expected sign put forward by the model with the regression result coefficient of -17.0078. What this suggest is that when the ratio of interest rate growth between Nepal and India increase by one percent there is a 17 percent change in the probability of an adjustment in the NC-IC exchange rate keeping the other variables constant. While this result, suggesting financial sensitiveness, may seem unrealistic given the embryonic level of financial development in both countries, this result has to be taken in perspective of the low, annual, frequency of the data. In other words, adjustment between both countries may take place over the given twelve-month period.

It is also important to note that the period of the 1990's has seen economic liberalization in both countries. This suggests that some measure to capture the regime shift is necessary. While there are no consensus formal test for such in the probit regression model, "eye-balling" the data series (shown in the graph below) suggests there has not been any significant Nepal-India relative changes in the variables. This result is consistent with, empirical tests on the whole which have not shown significant changes during the 1990's (Maskay, 1998 and 2000a,b). This result may be because changes in India have affected the country in a <u>similar</u> way as changes in Nepal have also affected the country thus resulting in no relative change.

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[11] The McFadden R-squared is the likelihood ratio index computed as $1 - \dfrac{l}{\overset{\circ}{l}}$, where $\overset{\circ}{l}$ is the restricted likelihood. As the name suggests, this is an analog to the R^2 reported in linear regression models. It has the property that it always lies between zero and one (Johnston et al., 1997, pp. 424).

[12] The LR is computed as $-2\left(\overset{\circ}{l} - l\right)$ with l being the likelihood function (Johnston et al., 1997, pp. 147 - 148).

IV.D. **Analysis**

The empirical regression results of the probit estimation are given in the previous section. This section analyzes the implications of the regression results.
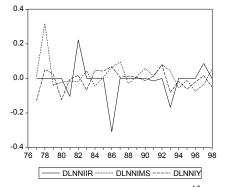
The empirical results for both relative Nepalese to Indian money and output growth have no significant effect on NC-IC exchange rate. This empirical result may be explained by the open and porous border between both Nepal and India as well as the low, annual, frequency of the data. The Nepalese and Indian geographical situation results in money and output growth between both countries being closely linked. For the prior it is net foreign assets which make Nepalese and Indian money supply growth similar especially over the long term (Khatiwada (1994), Poudyal (1991), Thapa (1997) etc.). For output it is the trade balance between both countries which force output growth to move similarly (Maskay, 2000b). More importantly, the low frequency of data is not sensitive to capture changes within a year as any changes in expectations may occur within this given time.

The relative interest rates examined are those variables which are in the control of policy makers. The results suggest that once growth rate of Nepalese and Indian interest rate diverges there is increasing probability of NC-IC adjustment. The analyses for this variable proceed forward in two phases. First, is the significance of the relative Nepalese to Indian interest rate growth consistent with the data? Second, explaining the contrary sign of the relative Nepalese to Indian interest growth rate variable.

The significance of the relative Nepalese to Indian interest rate growth is consistent with the data. We can see this from the chart below:

Date of NC-IC Adjustment	DLNNIIR
March 23, 1978	0
November 30, 1985	-0.310155
July 1, 1991	-0.015267
February 1, 1993	-0.167054

DLNNIIR explains three of four exchange rate adjustments of NC-IC. The first unexplained exchange rate by change in DLNNIIR occurred in a period of foreign market exchange rate instability - in fact this adjustment in NC-IC exchange rate reflected the start of the dual exchange rate period in Nepal and a 4% devaluation between NC-USD (Maskay, 2000b). These three periods have seen divergence's in growth of relative Nepalese to Indian interest rates. This relationship can be verified by examining the plots of the graphs are given below:

The graph indicates the divergence of the log growth rates[13] which correspond to changes in the exchange rate. There are three periods where divergence in interest rate growth did not result in NC-IC exchange rate adjustment. The first two occurred in 1981 and 1982 with DLNNIIR of -0.105361 and 0.223144 respectively. During this period there had been turbulence in exchange markets and while the NC-IC exchange rate had been stable, the exchange rate of NC to foreign currencies other than IC had been volatile (Maskay, 2000b). Also, on June 1, 1983 there had been an exchange rate regime shift with the existing dual peg exchange rate regime being replaced by the basket of currency system. The third period of relative interest rate growth divergence occurred in 1997 of 0.087011 although there has not been any discernible effect on the foreign exchange market. Thus, divergence in the relative Nepalese to Indian growth rates of interest rates is consistent with the data and indicate increasing probability of NC-IC exchange rate changes.

The second phase attempts to explain the contrary sign of the coefficient of DLNNIIR. Earlier, when examining the monetary model of exchange rate determination, a positive sign (i.e. depreciation) was expected in NC-IC where a change in relative interest rate reflected an increase in nominal interest rate and thus signaled an increase in inflationary expectations. The opposite sign of DLNNIIR seems to suggest changes in interest rate reflect changes in real interest rate, versus change in nominal interest rate, thus signaling changes in real return.[14] This would result in an appreciation of NC-IC as observed in the probit regression results. This is more likely because the examined variable for interest rate are those prescribed by the respective governments and thus may not be able to adequately capture inflationary expectation. This may more likely be because of the low frequency of data where annual data may not be sensitive to capture these changes in

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[13] Recall that as these are log growth rates, exact growth rates would have a ratio of one which, in logs, would be equal to zero.

[14] In other words, this would suggest that the Fisher condition does not hold for the Nepal-India context.

expectations. Thus, DLNNIIR appears to be capturing relative Nepalese to Indian *real* interest rate growth as seen in the movements of NC-IC exchange rate.

V. Summary

A binomial probit analysis is applied, using the monetary model of exchange rate determination, to understand economic influences on the probability for adjustment in Nepal's exchange rate policy with the Indian Currency. Empirical results suggest that both relative Nepalese to Indian money and output growth <u>do not</u> have significant effects on probability of exchange rate change but that the relative interest rate growth <u>does</u>. The probit regression results suggest that relative Nepalese to Indian interest rate signal real, versus nominal, rates of return whose divergence increases the probability of appreciation in the NC-IC exchange rate. This result suggests that the divergence in relative Nepalese to Indian interest rate growth is a significant factor for affecting probability of change in Nepal's exchange rate vis-à-vis the Indian currency during the period of 1976 - 1998.

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