Do Budget Deficits Raise
Interest Rates in Nepal?

Shoora B. Paudyal, Ph.D.[*]

Abstract

This paper examines short term and long term relationship between nominal interest rates and budget deficits for Nepal using the data for 1988 to 2011. Engle and Granger Error Correction Mechanism (ECM) is applied for the analysis. The regression results show that budget deficits and budget deficits- GDP ratio do not have significant effects on nominal interest rates in Nepal. So, budget deficits in Nepal are interest rates neutral. We come to the conclusion that budget deficits are not crowding out the private investment in this country. However, the deficits have been increasing the burden of loans financing current consumption at the expense of the future consumption, which will have serious implications on the growth of economy.

---

[*]   Dr. Paudyal is associated with Economics Department, Tribhuvan University, Kathmandu.

I. INTRODUCTION

Budget deficits have increased in Nepal over the years. By 2010/11, the amount of budget deficits has reached Rs 4962.22 million, accounting for 3.6% of GDP. This proportion accounted for 5.5% for 2000/01 and about 10% for 1988/89 (See, Table A1 in appendices). This clearly indicates that budget deficits have been very higher in the past which have declined over the years. Evidences from the other countries reveal that higher budget deficits have serious impacts on the economy as a whole. The effects of the budget deficits pass through interest rates to the major macroeconomic variables such as investment, employment, price level, consumption, exports and imports in an economy. So it is rational to examine the relationship between budget deficits and interest rates asking the question, do budget deficits raise interest rates in Nepal like in some other countries? Are deficits bad? Generally it has been considered in Nepal that budget deficits crowd out the private investment like in other countries; and it is the major contributor to the price hike. Since political instability prevails in the country for long and economic agendas have not yet received due attention, there are not much debates on it. But, it should be a serious policy concern since Nepal has entered into the market economy. If budget deficits raise the interest rates then one of the consequences is the crowding out of the private investment, which could have many forward consequences including the rise in unemployment rate. Moreover, it is necessary to look for the consequences of budget deficits on the other macroeconomic variables such as investment, consumption, and inflation. As deficits are financed by the foreign loans and internal loans, their immediate effects can be seen on the growth of public debt which, in turn, may produce long term effects including further rise in budget deficits due to debt serving and burden for the future generation. The growth of budget deficits and their sources of finance in Nepal are shown by chart 2 (see Appendices), which shows that the internal loans further exceed the foreign loans as budget deficits increase. It clearly indicates that the proportion of internal loans in budget deficits has increased in recent years. This can lead the economy to a situation of crowding out of the private investment. The growth of the budget deficits and interest rates in Nepal over the years is presented in charts 3 and 4 (see Appendices) disclose that budget deficits are on rise but interest rates and deficits-GDP ratio have declined over the years. Chart 1 also reveals that contribution of foreign loan (FL) to capital expenditure (CE) has interestingly gone down and so is the proportion of debt servicing (DS) to recurring expenditure (RE). The political instabilities may be one of the plausible reasons for this and is term as phenomenon.

Chart 1: Foreign loan and debt service
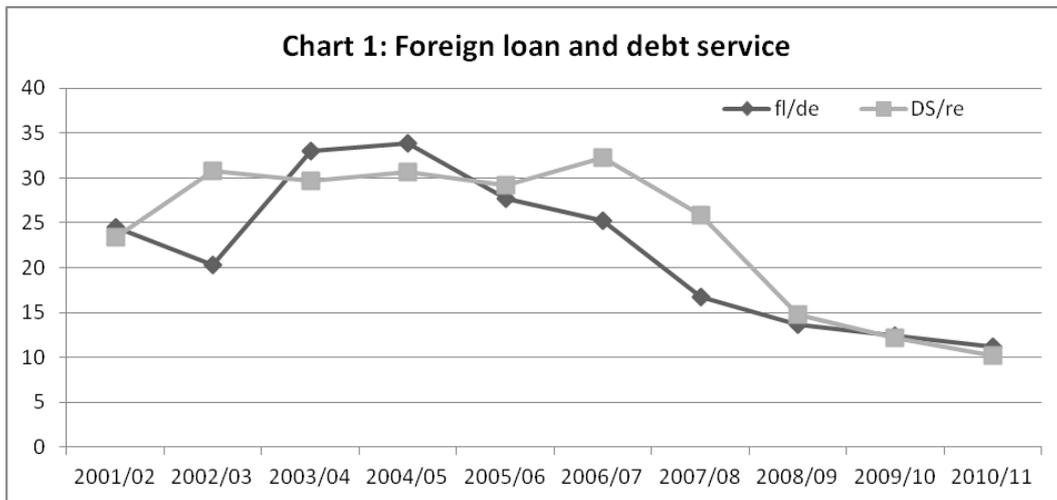
Policymakers generally pay their attention on what effects these deficits are having on the economy because it has been long an important policy variable for economic growth and stability. For this reason, attention has been focused in many countries on whether or not budget deficits raise interest rates and affect other macroeconomic variables. But in this paper, we only examine the relationship between deficits and interest rates. Some claim (Aisen and Hausner, 2008; Obi and Naruddeen; Ezeabasili and Mojekwu, 2011; Laubach,2003, 2007; Kameda, 2008; Noula, 2012) that the deficits raise interest rates, while others advocate deficits are interest rates neutral (Ahmad, 1994; Mukhtar and Jakaria, 2008; Hassett, 2001; Chakarbarty, 2012). Various empirical results (Gale and Orszag, 2003[1]; Ussher, 1998; Labonte, 2005) also report that the results are overwhelmingly mixed and this is not a relevant question either.

Deficits are rather rules than exceptions in a developing economy like Nepal. It is also pertinent to know whether deficits are due to policy changes of the government for the economic growth or simply short of revenues over government spending due to the fall in tax revenues or the fall in foreign grants. This should be an important to know how deficits are affecting the important macroeconomic variables such as interest rates. The adjustment in an economy can occur through important policy variable like interest rates to restore at an equilibrium position in both financial market and goods market. For this reason, state's policy intervention mainly through the monetary and fiscal policies is generally considered desirable whenever an economy is at a disequilibrium level.

In short, generally higher budget deficits are responsible for higher interest rate and price level and thereby affect the economic growth and employment crowding out the private

---

[1]   Gale and Orgszag are of view that deficits affect interest rates are less important and more controversial than the impact on national saving and economic growth. They find that other things remaining the equal, deficits reduce national savings and future national income.

sector investment. Furthermore, budget deficits can lead to trade deficits and affect consumption. However, we examine in this paper only the effects of budget deficits on interest rates dividing the paper into five sections: Section I is introduction. Section II discusses conceptual framework, section III analytical framework, while section IV interpretation of regression results. The last section V concludes the paper.

II. CONCEPTUAL FRAMEWORK

In the conventional Keynesian view, budget deficits expand aggregate demand, and thereby short-term economic growth. When private sector spending is slow, aggregate demand declines. This happens generally during recession. Keynesian believes that it can be offset by the higher government spending. Such higher government spending can exceed government revenues. If it exceeds revenue leads to the budget deficits. If a budget deficit is the result of higher government spending, then the additional government spending directly expands aggregate spending or aggregate demand in the economy. If a budget deficit is the result of tax cuts, then aggregate spending is due to an increase in spending by the beneficiaries of tax cut (Gale and Orszag, 2003). The increase in the budget deficit described here is due to policy changes, i.e. tax cut or increase in government spending. Besides, the deficits can occur due to the changes in economy, such as a fall in tax revenue. When per capita incomes fall due to bad performance of an economy taxable income also falls which causes tax revenues fall, and further creates imbalance between government revenues and government spending and the actual deficits would rise. Such deficits are not considered in this paper. In an economy at full employment, output cannot be increased to match the increase in spending because all of the economy's labor and capital resources are already in use. This mismatch between aggregate demand and aggregate supply must be resolved through market adjustment in a fully employed economy. Since all of the economy's resources are already in use, the government is supposed to redirect resources through the policy interventions. This is not possible without a reduction in the resources available to others. In an market economy, this reallocation occurred through higher prices and interest rates[2]. The higher interest rate, in turn, can crowd out the private investment and consumer durables. This is how it pushes price level up and thereby nominal interest rate and real interest rate. This can be explained with the help of famous macroeconomic identity that is written as follows:

$$S - I = Y - E = X - M$$

Where S and I are the national saving and investment respectively, Y and E national income and expenditure; and X and M exports and imports. Budget deficits

---

[2] This is because, an excess demand in goods market and financial market creates an upward pressure on the prices and interest rates. If higher prices and interest rates are offered, the resources can be available for new uses. So reallocation of resources from one use to another is possible only through the higher price and interest rates. Keynesian explanation for this is that when an economy is at full employment equilibrium, an increase in demand leads to upward shift in AD curve which results in higher price level without any increase in employment and national income.

(Revenue<Government spending) are the outcome of resource gap $(S<I)$[3] which leads to trade deficits $(X<M)$. So budget deficits and trade deficits are interlinked, and this is more explicitly discussed by two gap model. Furthermore, above identity can be written as following to make this point more clear:

$$Sp + Sg - I = X - M$$

National savings (S), can be split into private savings (Sp) and government savings (Sg). Now we show how budget deficits can lead to trade deficits; and how important is the role of interest rates in this process. A rise in budget deficits, that is, a fall in government saving if not offset by private saving results either in a decrease in investment or in a rise in the external deficits to maintain equilibrium. Conventional views claim that such deficits are not offset by a rise in private saving but reflected in a rise in real interest rate and there by leads to lower aggregate national saving relative to investment demand (Krugman, 1992, 5). However, interest rates can be controlled by the monetary policy of central bank.

The conventional view (Ussher, 1998, Labonte, 2005) in regards to an economy with underemployed labor and capital resources is reverse. Budget deficit as a policy variable is generally the result of a recession or low economic growth. However, the financing of a budget deficit is no longer a zero-sum game in such economy. It is because the increase in aggregate spending caused by the deficits leads to unemployed resources being brought back into use. As a result, it generates new aggregate output to match the increase in aggregate demand or spending without having any inflationary pressure in the economy. This is how expansionary fiscal policy stimulates the economy during a recession. In an underemployed economy, enough unused resources are available to match the increase in aggregate spending entirely. The increase in the budget deficits would be multiplied because of re-employed workers increase their spending as well. So, the total increase in aggregate spending is larger than the increase in the budget deficits. In this case, the budget deficits would be unlikely to have much effect on interest rates like in the developed economies at full employment level.

Capital mobility view (Obstfeld, 1985; Labonte, 2005) offers a different explanation of the relationship between budget deficit and interest rate. Whether budget deficits raise interest rates or not depends largely on where the resources come from for financing such deficits. If such deficit is financed by the domestic resources then that may lead to higher interest rate. But if the resources do come from the other than domestic sector such as

---

[3]   When planned national resources in government hand are less than the government's planned spending then we call it budget deficits. For this reason, both budget deficits and real sector's gap refer to the same thing. Here planned government spending rises due to the government policy interventions.

foreign sector that does not involve higher interest rates. According to the capital mobility view, because of an inflow of the foreign loans and grants to finance deficits do not affect the interest rates but they crowd out trade sector through rise in price level.

In the Barro-Ricardo view (Labonte, 2005), forward-looking, rational, infinitely-lived individuals see that a budget deficit would result in higher taxes or lower government spending in the future. Therefore, they reduce their consumption and save more today. This is consistent with Milton Friedman's life cycle permanent–income theory which suggests individuals save in the fat years and dis-save in lean years as a logic of all wealth-holding (Cameron, 1991:118). This provides the government with the saving needed to finance its deficit, placing no upward pressure on interest rates; however, they crowd out current private consumption.

From the above discussion, there is apparently less chance of budget deficits raise the interest rates in an economy with huge unemployed resources, where inflow of foreign aid finances the government spending.

III.   ANALYTICAL FRAMEWORK

There are several models which can be applied to examine the relationship between budget deficits and interest rates. One of the popular ones mostly used is error correction models. Error correction models are based on the behavioral assumption that two or more time series exhibit an equilibrium relationship. We in economics would like to examine the equilibrium relationship between two or more variables in short or in long run. One of the good merits of these models is that one can examine the short run as well as long run equilibrium. This method was first used by Sargon (1984; Cited in Gujarati, 2007) and later popularized by Engle and Granger (Cited in Gujarati, 2007) for the correction of disequilibrium between two economic variables and is popularly known as Engle and Granger Error Correction Mechanism (Gujarati, 2007; Pindyck and Rubinfeld, 1991). Accordingly, if two variables are co-integrated, the relationship between those two can be expressed as error correction mechanism. This mechanism not only evaluates the state of equilibrium between dependent and independent variables but also directly estimates the speed at which a dependent variable returns to equilibrium level after a change in an independent variable. The ECM (Engle and Granger Error Correction Mechanism), thus, gives a number of desirable properties which are as follows: a) it estimates of short and long term effects; b) it provides easy interpretation of short and long term effects; c) applications to both integrated and stationary time series data; d) can be estimated with OLS; and e) model the theoretical relationships between variables (unlike VAR model). Now we discuss here two steps ECMs for the analysis of time series data, which is as follows:

In the first step, a dependent variable, Y is regressed on an independent variable, X. As the regression of a non-stationary time series on another non-stationary times may produce a spurious regression results, it is necessary to examine whether Y and X series are individually stationary. Dickey-Fuller or Augmented Dickey-Fuller test are generally

used to see whether such time series are individually stationary. The time series with unit root is stationary at first difference, I (1). For instance, Y is regressed on X as follows:

$$Yt = a_t + bX_t + e_t \qquad\qquad ……….. (1)$$

If Xt and Yt are co-integrated, then they have long term or equilibrium relationship. If the computed value of error term in equation (1) is found to be stationary at level, then two time series (Xt and Yt) are said to be co-integrated. In the second step, the first difference of dependent variable, ΔY_t is regressed on the first difference of independent variable, ΔX_t, and previous period's equilibrium error, that is, the computed error term from co-integrating regression, $\gamma\mu^\wedge{}_{t-1}$.

$$\Delta Y_t = \lambda_1 + \lambda_2 \Delta X_t - \gamma\mu^\wedge{}_{t-1} + \eta_t \qquad\qquad ……….. (2)$$

Equation (2) reveals that ΔY_t depends on ΔX_t and on the one period lagged of computed error term from co-integrating regression, that is, $\gamma\mu^\wedge{}_{t-1}$. The coefficient of the error correction component in the model, γ, measures the speed at which prior deviations from the equilibrium (or disequilibrium) are corrected while λ_2 shows the short run effect of X on Y. Our residual from the co-integrating regression should capture the deviations from the equilibrium of X and Y. Therefore, we can estimate both the short and long term effects of X on Y by including the lagged residuals from the co-integrating regression as our measure of the error correction mechanism.

IV. INTERPRETATION OF REGRESSION RESULTS

We already discuss the analytical framework for the study in the previous section. Under this framework, in this section, time series annual data of average budget deficits and interest rates for Nepal are analyzed, i.e., the ECMs have been applied. Noula (2012) uses this model to analyze the annual data of budget deficits and interest rates for Cameroon. While Mukhtar and Jakaria (2008) apply this framework for the analysis of budget deficits' effect on interest rate using annual data. The dependent variable in their study was interest rates and independent variable- budget deficits. In this study also average lending interest rate (AVR) [4] is dependent variable and budget deficit (BD) is used as an independent variable. Besides, Budget deficits/GDP ratio (BD_GDP) is also regressed on average interest rate. The data are drawn from the various issues of Economic Survey of Nepal Government and from the publications of Nepal Rastra Bank. We use the Engle–Granger two-step method to investigate the relationship between budget deficits and interest rates during 1988-2011. The results from the regression are as follows:

---

[4]   Interest rates are the average annual lending rates of commercial banks (in industry, agriculture, export bills, commercial loans and overdrafts) drawn from various issues of NRB Quarterly economic bulletin.

Table 1: Augmented Dickey-Fuller tests at the level and at the first difference of the variables

	Level	First Difference	1%	5%	10%	Order of Integration
AVR	-0.946	-3.844***	-3.753	-2.998	-2.638	I(1)
BD	2.812	-2.841*	-3.753	-2.998	-2.638	I(1)
BD_GDP	-1.397	- 8.391***	-3.753	-2.998	-2.638	I(1)

***, ** & * significance at 1%, 5% and 10% level

Table 1 displays that the results of Augmented Dickey-Fuller tests (1979, 1981). Accordingly, AVR, BD and BD_GDP ratio series are found non-stationary at level but stationary at first difference. So, in the second step, the interest rates (AVR) have been regressed on the budget deficits (BD) and on the budget deficits/GDP separately. These regressions examine the long term relationship between interest rates and budget deficits. These regressions are known as co-integrating regression (table 2). So the time series of aforementioned variables are found stationary at first difference. This has paved the road to go for the co-integration regressions displayed in table 2.

Table 2: Dependent variable: interest rate (AVR)

Variables	Coefficient	t-stat	DW-stat	Adj R^2	N=23
C	-10.604	-0.108	1.696	0.88	
BD	7.13E-05	1.227			
AR(1)	0.98	14.278***			
C	10.060	2.246**	1.688	0.88	N=23
BD_GDP ratio	0.065	0.338			
AR(1)	0.926	12.042***			

***, ** & * significance at 1%, 5% and 10% level

Table 2 presents the two regression results from the autoregressive models, which show that the effects of previous year interest rates on the current year interests are higher but the effects of budget deficits and budget deficits/GDP ratio on current interest rates are lower. Statistically speaking, the effects of BD and BD_GDP ratio on interest rates are insignificant. But in both regressions, these variables have expected positive sign. But the historical data on AVR shows the downward trend and BD upward trend (see chart 2). It seems there is an inverse relationship between these two variables. It implies that budget deficits can cause the interest rates to fall. The market determined interest rates have been introduced in late 1980s cause interest rates in Nepal to fall. So, other things have not been equal during the study period. But the empirical study shows that the coefficients of BD and BD_GDP variables appear with correct sign indicates that there is positive relationship between two and budget deficits can raise interest rates. The poor regression results suggest that relationship between two variables is not so strong in case of Nepal. Statistically speaking, the relationship between two is not different from zero, which implies that interest rates are budget deficits neutral in the long run.

Table 3 Augmented Dickey-Fuller test at level of the computed residuals

Residuals	Level	1%	5%	10%	Order of Integration
Resid01 (AVR on BD)	-4.539***	-3.788	-3.012	-2.646	I(0)
Resid02(AVR on BD_GDP)	-3.989***	-3.788	-3.012	-2.6461	I(0)

***, ** & * significance at 1%, 5% and 10% level

Table 3 presents the results of Augmented Dickey-Fuller test at level of the computed residuals from the co-integrating regressions given in table 2. The residual series of both regressions are found to be highly significant in Augmented D_F tests at level. It reinforces that both budget deficits and budget deficits/GDP ratio regressions are co-integrating functions implying that there exists long term relationship between interest rates and budget deficits; and between interest rates and BD_GDP.

Table 4: Dependent variable: first difference of rate of interest (D (AVR))

Variables	Coefficient	t-stat	DW-stat	Adj R^2	F-stat	N=22
C	-0.414	-1.741*	1.814	0.02	1.253 (0.308)	
D(BD)	7.66E-05	1.427				
Lag_resid01	0.128	0.556				
C	-0.235	-1.002	1.816	-0.09	0.126 (0.883)	N=22
D(BD_ GDP ratio)	0.070	0.266				
Lag_resid02	1.412	0.409				

***, ** & * significance at 1%, 5% and 10% level

Table 4 presents the regression results from the two step error correct models. The short term effects of the budget deficits on interest are positive but it is statistically insignificant. The regression results state that interest rates depend on budget deficits and previous period's equilibrium error term. And also interest rates depend on budget deficits/GDP ratio and previous period's equilibrium error term. If the lag of error term is non-zero, then it is the indication that model is out of equilibrium (Gujarati, 2007). However, in our case statistically speaking, the equilibrium error term, that is, one year lag of resid01, is zero. This suggests that AVR will adjust to the changes in BD within the year bringing back the former to its equilibrium level. The positive sign of equilibrium error term (lag_resid01) reveals that AVR is below its equilibrium value and the positive sign of equilibrium error term will push that of the interest rate (AVR) up to its equilibrium value. The coefficient of error term also suggests that equilibrium will be restored quickly. The case with another regression is not different from this regression since coefficient of lag of estimated residual (lag_resid02) is statistically not different from zero. Compared to this with the budget deficit regression, the higher coefficient of estimated residual (lag_resid02) suggests that the equilibrium value of the AVR will be restored more quickly in the case of budget deficits/GDP ratio.

Table 5: Granger causality test

Variables/Lags	1	2	3	4	5
Granger causality test between BD and AVR					
BD does not Granger cause AVR	0.147 (0.705)	0.334 (0.721)	0.433 (0.732)	0.167 (0.951)	0.301 (0.899)
AVR does not Granger cause BD	0.045 (0.834)	0.163 (0.851)	0.145 (0.931)	0.346 (0.842)	0.27740 (0.913)
Granger causality test between BD/GDP and AVR					
BD_ GDP ratio does not Granger cause AVR	3.164 (0.090)	1.942 (0.174)	1.105 (0.379)	0.72561 (0.593)	1.15280 (0.408)
AVR does not Granger cause BD_ GDP ratio	3.871* (0.063)	0.629 (0.545)	1.683 (0.216)	1.387 (0.301)	1.10459 (0.428)

***, ** & * significance at 1%, 5% and 10% level

Table 5 shows the results of Granger Causality tests. Granger causality tests are useful to find out the direction of effects between two variables. The results are not statistically significant even at 5% level suggest that both BD and BD/GDP ratio do not cause interest rates (AVR) at any lag length. However, the figure on last row in second column in table 5 (significant at 10% level) suggests that, in future, average interest rates can raise the budget deficits, not other way around. These results are consistent with the regression results display in table 4 that indicate that budget deficits do not affect the interest rates significantly in both short term and long term. This study, thus suggests that the budget deficits do not affect nominal interest rates in Nepal, that is, budget deficits are interest rates neutral. However, there exists rather weak relationship between two set of variables.

V. CONCLUSIONS

This empirical study suggests that the budget deficits do not affect nominal interest rates in Nepal, i.e., interest rates are deficits neutral. So budget deficits do not crowd out private investment through the rise in interest rates. This is substantiated by Chart 5, which reveals that private investment and budget deficits follow the upward trend. This is in line with economic theories discussed above where unused resources are waiting for their use in a developing country and with the previous study for Nepal (Pandit, 2005). However, because of private consumption has not declined with the increase in deficits (see Chart 5 appendices), and saving has fallen (Chart 6) it is hard to conclude that Barrow-Ricardian neutrality does hold in case of Nepal. The results seem to support the capital mobility view as discussed above. Because, the deficits have been financed largely by foreign aid in the one hand, and on the other, aggregate consumption has surged over the years because of the inflow of aid money and remittances. Moreover, as interest rates are found deficits neutral largely due to capital mobility, further study on other factors affecting the interest rates is warranted.

The empirical evidence that budget deficits do not raise interest rates, however, is not the evidence that government budget deficits do not impose any burden in the society. The deficit financing through the foreign loans has created intergenerational burden in terms of debt servicing in Nepal. Current consumption has increased at the costs of future consumption since the amount of net outstanding loans has piled up demanding regularly a huge amount for debt servicing. This drains-out the real resources which could be used for the development (see Thapa 2005). This is also evidenced from the share of debt servicing in the government regular expenditure (see table A2 in appendices). Furthermore, an increasing use of internal loans compare to foreign loans in deficit financing (table A2 in appendices) may be indicative that budget deficits will crowd out the private investment. However it may be only a short term phenomenon dictated by political instabilities in the country.

However, foreign aid in terms of grants and loans is not free lunch. Foreign grants may impose many undesirable terms and conditions while foreign loans are the burden for the future generations. Besides, they crowd out the trade sector of the economy.

REFERENCES

Ahmad, M. 1994. The Effects of Government Budget Deficits on Interest Rates: A Case Study of Small Open Economies. Abstract. Retrieved from http://images.ge.camcom.gov.it/f/pubblicazioni/istituto_economia_internazionale/ab/abstracts11994.pdf.

Alisen, Ari, and David Huner. 2008. Budget Deficits and Interest Rates: A Fresh Perspective, IMF Working Paper, WP/08/42.

Barrow, R.J.1989. "The Ricardian Approach to Budget Deficits", *Journal of Economic Perspectives*. 37-54.

Blanchard, Oliver J. and Stanley Fischer. 1989. *Lecturers on Macroeconomics*. Massachusetts Institute of Technology. USA.

Best, Robin. 2008. "An Introduction to Error Correction Models". *Oxford Spring School for Quantitative Methods in Social Research*, London.

Chakrabarty, Lekha S. 2012. Interest Rates Determination in India: Empirical Evidence on Fiscal Deficit – Interest Rate Linkages and Financial Crowding out. Levy Institute of Bard College. www.levyinastitute.org/pubs/wp-744.pdf.

Cullis, John and Philip Jones. 2009. *Public Finance and Public Choice*. Oxford University Press, New York.

De Boef, Suzana .2000. "Modeling Equilibrium Relationships: Error Correction Models with Strongly Autoregressive Data". The Society for Political Methodology, Pennsylvania.

Evans, P.1985. "Do Large Deficits Produce High Interest Rates? *American Economic Review,* Vol. 75 (1), 68-87.

Ezeabasili, Vincent N. and Joseph N. Mojekwu. 2011. "Analysis of fiscal deficits and interest rates in Nigeria." *Journal of Economics and International Finance*, Vol. 3(4), 236-245.

Gale, W.G., and Peter Orszag. 2002. "The Economic Effects of Long-Term Fiscal Discipline". Urban Institute-Brookings Tax Policy Center Discussion Paper.

Gale, W.G., and Peter R. Orszag, 2003. "Economic Effects of Sustained Budget Deficits". http://ssm.com/ abstract

Gujarati, D and Sangeeta. 2007. *Basic Econometrics*. Tata McGraw-Hill Publishing Company Limited, New Delhi.

Hassett, Kevin, 2001. Cited in Gale and Orszag. 2003. "Effects of Sustained Budget Deficits. http://ssm.com/abstract.

Kameda, Keigo, 2008. "Budget Deficits, Government Debt, and Interest Rate in Japan: An Analysis Using Published Budgetary Forecasts". *ttps://editorialexpress.com/cgi-bin/conference/download.cgi?.*

Krugman, Paul R.1992. *Currencies and Crises*. Massachusetts Institute of Technology. USA.

Labonte, Marc. 2005. "Do Budget Deficits Push Up Interest Rates and Is This the Relevant Question?" *CRS report for Congress*. Washington DC.

Laubach, Thomas, 2004. "Effects of Budget Deficits on Interest Rates: A Review of Empirical Results." *papers.ssrn.com/sol3/papers.cfm?abstract_id=2040791*

Laubach, Thomas, 2007. "New Evidence on Interest Rate Effects of Budget Deficit and Debt". http:// www. Federal reserve.gov/pubs/feds/2003/200312/revision/200312pap.pdf

Mukhtar, T., and Muhammad Jakaria, 2008. "Budget Deficits and Interest Rates: An Empirical Study for Pakistan." *Journal of Economic Cooperation*, 29, 2.

Noula, Armand G. 2012. "Fiscal Deficits and Nominal Interest Rates Determination in Cameroon: An Application of the Loanable Funds Models." *Global Advanced Research Journal of Management and Business Study, Vol. 1(1), 006-029.*

Obi, Ben, and Abu Nuruddeen. 2004. "Do Fiscal Deficits Raise Interest Rates in Nigeria? A Vector Auto-Regression Approach." *Journal of Applied Quantitative Methods*. j*aqm.ro/issues/volume-4,issue-3/pdfs/obi_nurudeen.pdf.*

Pandit, R. 2005. The Impact of Fiscal Deficit on Long-term Nominal Interest Rate in Nepal. *Economic Review, Occasional Paper*, No. 17. Nepal Rastra Bank, Kathmandu.

Pindyck, R.C., and Daniel L. Rubinfeld.1991. *Econometric Models and Economic Forecasts*; McGraw-Hill Inc, New York.

Thapa, G. 2005. Deficit Financing: Implications and Management. *Economic Review, Occasional Paper*, No. 17. Nepal Rastra Bank, Kathmandu.

Ussher, Leanne J.1998. "Do Budget Deficits Raise Interest Rates: A Survey of Empirical Literature?" *www.qc-econ-bba.org/RePEc/pdf/0005.pdf.*

APPENDICES

**Table A1: Average interest rate, budget deficits and budget deficits/GDP ratio**

Year	Avr	bd	bd/gdp	Year	Avr	Bd	bd/gdp
1987/88	16.88	2320.7	6.1	1999/00	12.80	10908.0	4.7
1988/89	16.63	5199.9	9.6	2000/01	11.95	15921.2	5.5
1989/90	16.88	4563.5	8.1	2001/02	11.70	18339.0	5.0
1990/91	17.25	3192.7	8.9	2002/03	11.45	12577.0	3.3
1991/92	18.38	4983.4	7.5	2003/04	11.05	12662.8	2.9
1992/93	17.88	8773.3	7.0	2004/05	10.23	14295.4	3.1
1993/94	14.44	5401.3	5.8	2005/06	10.35	16427.8	3.8
1994/95	14.94	5644.1	4.8	2006/07	10.30	18762.8	4.1
1995/96	16.05	8810.7	5.6	2007/08	10.00	22475.8	4.1
1996/97	16.15	7252.5	5.1	2008/09	10.25	34356.1	5.0
1997/98	15.50	11262.4	5.9	2009/10	11.30	40731.8	3.5
1998/99	13.70	8996.4	5.3	2010/11	11.05	50506.3	3.6

Source: Calculated by author from MoF/GoN, Economic Survey, various issues and NRB, Quarterly Economic Bulletin, 2012.

Table A2: Share of foreign loan in capital expenditure and that of debt servicing in recurring expenditure

Year	Capital exp10m (CE)	Recurring exp10m (RE)	Budget deficits	Foreign loans	FL/CE	Internal loan (FL)	Debt servicing (DS)	DS/ RE	NOD10m
2001/02	3148.2	5211.5	18339.0	769.9	24.5	800.0	1220.5	23.4	22012.6
2002/03	2235.6	5248.8	12577.0	454.6	20.3	888.8	1618.1	30.8	22343.3
2003/04	2309.6	5832.4	12662.8	762.9	33.0	560.8	1733.9	29.7	23277.9
2004/05	2734.1	6427.2	14295.4	926.6	33.9	893.8	1975.1	30.7	21964.2
2005/06	2960.7	7000.4	16427.8	821.4	27.7	1183.4	2042.4	29.2	23396.9
2006/07	3973.0	7112.2	18762.8	1005.4	25.3	1789.2	2291.6	32.2	21662.9
2007/08	5351.6	9144.7	22475.8	898.0	16.8	2049.6	2370.5	25.9	24996.5
2008/09	7308.9	12773.9	34356.1	996.9	13.6	1841.7	1883.4	14.7	27704.0
2009/10	9023.8	15101.9	40731.8	1122.3	12.4	2991.4	1843.2	12.2	25624.3
2010/11	10815.3	16882.4	50506.3	1207.6	11.2	4251.6	1722.1	10.2	25955.2

Source: Calculated by author from MoF/GoN, Economic Survey various issues, and NRB Quarterly Economic Bulletin. Notes: 2008/09 onward only principal repayment data are incorporated in debt servicing. NOD10m=net outstanding debts in 10 million Rs.

Notes: de_10m=development expenditure at 10 million, re=recurring expenditure, bd=budget deficits, il= internal loans, fl=foreign loan and TL= total loans

Notes: Indices of bd=log of budget deficits, avr=log of interest rates.
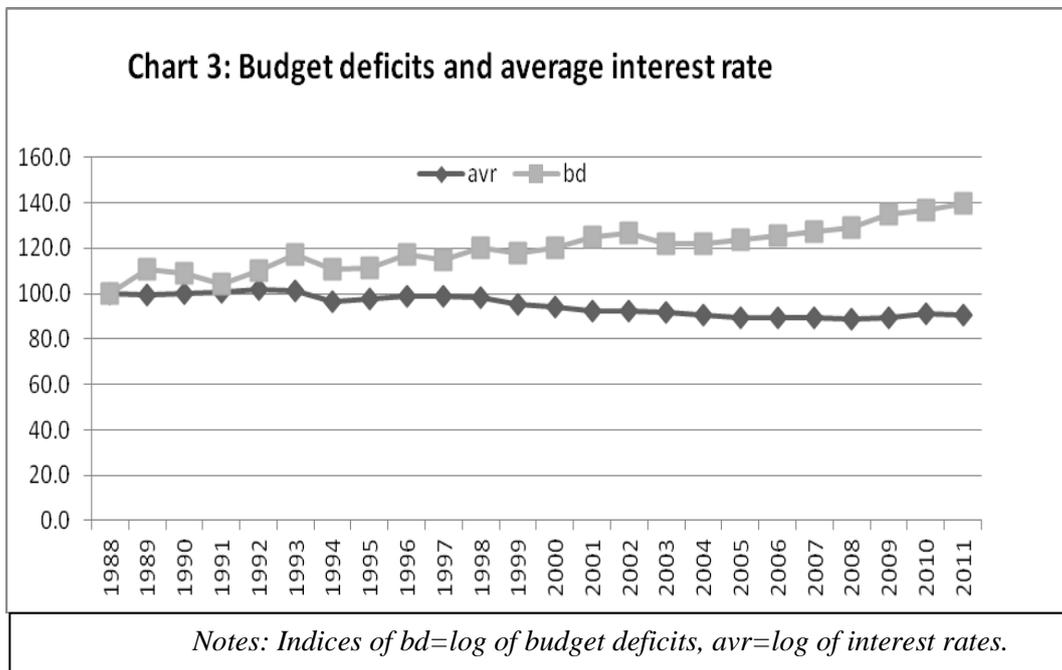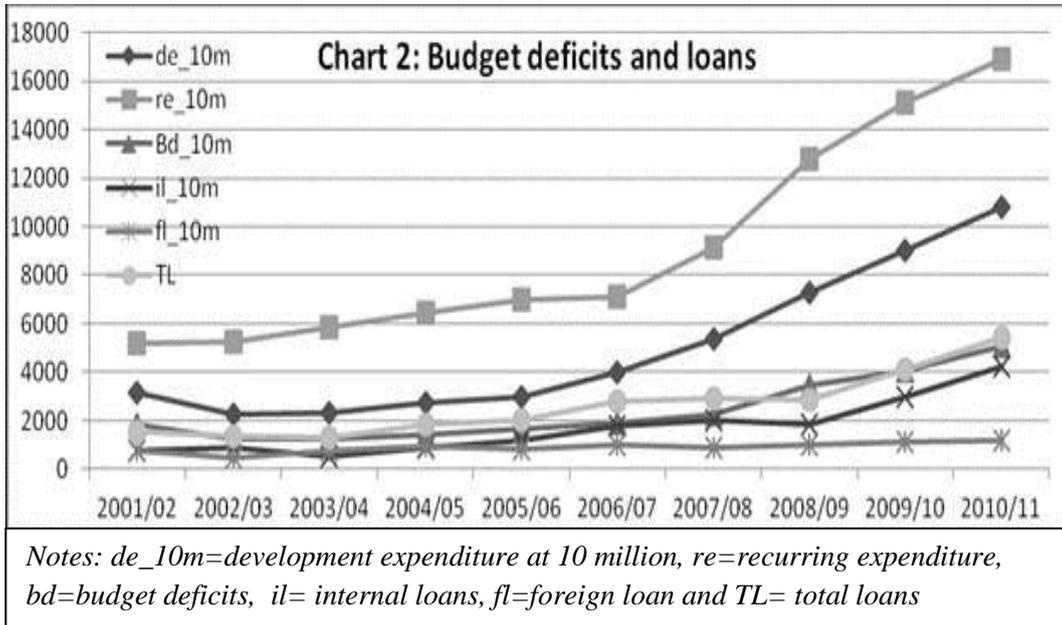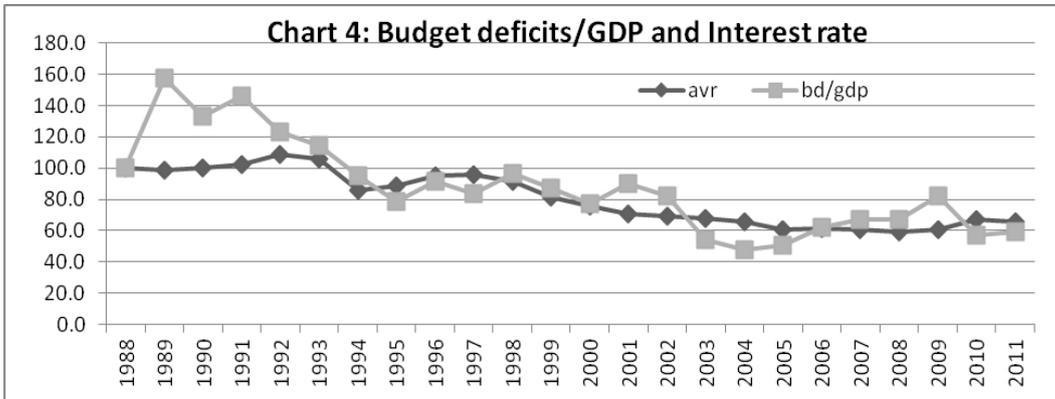
Notes: Indices of bd=budget deficits, avr=interest rates.
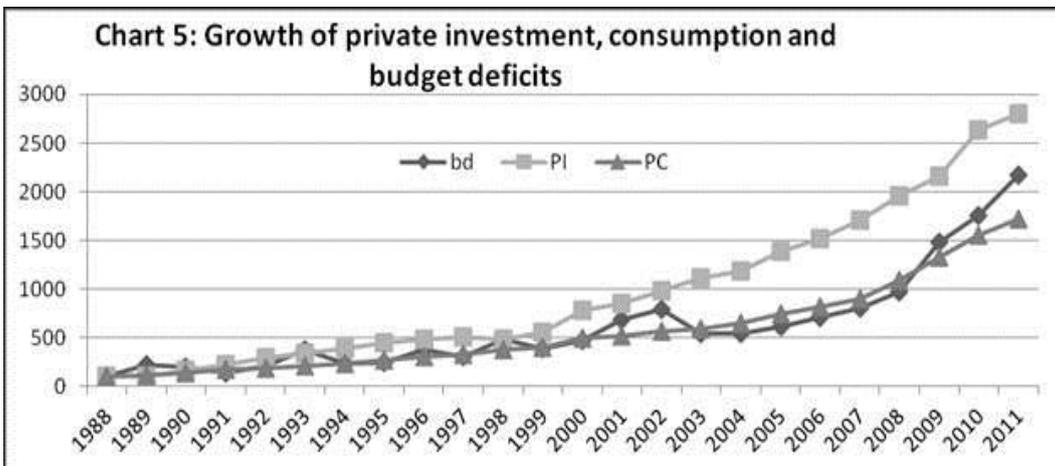
Notes: PI=private investment, PC=private consumption and bd=budget deficits