Modelling and Forecasting Fiscal Policy and Economic Growth in Nepal*

*Ram Sharan Kharel, Ph.D.***

Abstract

This paper develops a macroeconomic forecasting model focusing on fiscal policy and economic growth in Nepal. The structure of the model, which comprises a total of 14 equations, allows alternative policy options for maintaining fiscal stability and promoting economic growth as well as switching deficit financing between domestic and foreign loans. We use annual data from 1992/93 to 2009/10 to estimate the model and provide out-sample forecasts for 2010/11 to 2012/13, consistent with the current Three Year Plan period, in order to evaluate the plan performance. The empirical evidence suggests that fiscal policy, particularly governments' capital expenditure affects economic growth positively and also crowds-in private investment. However, there exists a trade-off between fiscal stability and high level of economic growth as the policy goal of achieving both objectives seems to be unattainable. Finally, the out-sample forecast suggests that it is unlikely to attain the targeted economic growth in the Three Year Plan period from the planned fiscal outlay even if it is realized.

JEL Classification: C5, E63, O5

Key words: Fiscal Policy, Macroeconomic Modeling, Economic Growth

I.   INTRODUCTION

Fiscal policy plays a crucial role for enhancing socio-economic activities and economic growth at least in developing countries (Jones, 1995 and Mehrotra and Peltonen, 2005). Despite policy efforts towards achieving a high and sustainable economic growth, the Nepalese economy, however, suffered from a low growth-trap in its history. In quantitative term, public expenditure surged up to 22.2 percent of GDP in 2009/10 from as low as 9.1 percent in 1974/75 while average annual GDP growth at constant price remained at 4.3 percent during this period (MoF, 2011). This poses a serious concern whether public expenditure helps to accelerate economic growth. It is also equally important to assess the degree of trade-off between fiscal stability and a high level

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economic growth as it is unlikely to attain both of them together. These issues are largely untouched in the context of Nepal, while theoretical literature provides ambiguous linkages between fiscal policy and economic growth.

There are primarily two streams of theoretical literature in this area, generally known as exogenous and endogenous growth family models (Esterly and Rebelo, 1993). The former literature, often labeled with neoclassical growth models, suggests that steady state economic growth is driven by exogenous factors that include dynamics of population and technological progress while fiscal policy affects the rate of economic growth during transition to the steady state (Chamley, 1986 and Alam and Rogers, 2011). It means fiscal policy does not have a long run impact on economic growth.

On the other hand, endogenous-growth literature argues that transitional effects of fiscal policy transforms into permanent effect, meaning that fiscal policy has a long lasting impact on economic growth (Romer, 1986; Jones et. al. 1993; Rebelo, 1991 and Turnovsky, 2000 and 2004). The level of impacts, however, depends on the effectiveness of fiscal instruments, elasticity of labour supply and on technology to accumulate human capital and to create new goods (Easterly and Rebelo, 1993).

With regard to fiscal instruments, a distortionary tax policy weakens the incentive to invest in physical and human capital which ultimately reduces economic growth while non-distortionary taxation provides incentive to invest on capital items which, in turn, helps to promote economic growth (Benos, 2009). Likewise, productive expenditure boosts economic growth if that helps to enhance marginal product of private capital. Consequently, unproductive expenditure does not affect or even distort the marginal productivity of private capital and hence reduces economic growth (Barro, 1990).

The impact of government budget deficit is even more complex. If the deficits tend to reduce the growth of savings, there will be adverse impact on economic growth in the long run. Similarly, if a higher deficit today will later be compensated by higher consumption or income taxes the rate of economic growth will decline in the long run (Peretto, 2003 and Pelagidis and Desli, 2004).

Given this context, we develop a comprehensive, consistent and robust macroeconomic model to analyze the impact of fiscal policy on economic growth. Our work contributes to the literature in various ways. First, it explores a forecasting model for fiscal planning in Nepal and provide fiscal and growth outlook consistent with the existing Three Year Plan (2010/11 to 2012/13) period. Second, unlike in a developed economy, we justify that public investment *crowds-in* private investment in Nepal. And finally, we provide evidence to support the endogenous growth models that fiscal policy promotes economic growth, but there exists a trade-off between maintaining fiscal stability and accelerating economic growth.

The rest of the paper is structured as follows. The next section presents the structure of the model followed by description of data in section III. Section IV estimates the model while section V presents the forecast results. Finally, section VI concludes the paper.

II. SPECIFICATION OF THE MODEL

We develop a fiscal model to explore a nexus between fiscal outlay and economic growth together with various propositions for maintaining fiscal stability and promoting economic growth (Jones and Skinner, 1992). The model has two main blocks - real sector and fiscal sector. The real sector block starts with specifying sources of economic growth followed by fiscal sector which provides estimates for government resources, expenditure, budget deficits and sources of deficit financing. The model develops strong inter-linkages between these two blocks as government capital expenditure becomes one of the important sources of economic growth while revenue is the function of Gross Domestic Product (GDP) in the public finance block. In addition to this, budget deficits and domestic borrowings are linked to GDP. Thus, the model comprises both the direct and feedback effects.

Real sector block: It is obvious that output is the function of all possible inputs that includes land, labour, capital, technology, management, productivity, among others. Most of the empirical studies, however, consider labour and capital as the function of output (for instance see Khatiwada et. al., 2002). It is mainly because capital and labour are important determinates of output while other factors of production are associated with the use of these two variables either directly or indirectly. Further, quantitative information of other inputs are also unavailable in a systematic way. For this reason, we define output, represented by gross domestic product (Y_t), as the Cobb-Douglas function of labour (L_t) and capital (K_t) as follows;

$$Y_t = e^A L_t^\tau, K_t^{1-\tau} U_t \tag{1a}$$

Where, t is the time subscription, e is exponential term, A is the constant term (shift factor), τ is the share of L_t, $1 - \tau$ is the corresponding share of K_t and U_t is a random walk which represents other factors of production unexplained by L_t and capital K_t. Dividing both side by L_t, taking log and re-arranging terms yields:

$$\log(Y_t / L_t) = A + \tau \log(K_t / L_t) + U_t \tag{1b}$$

Eq (1b) is a Cobb-Doglas type of linear production function expressed in per capita labour term where K_t is capital accumulation which is defined as previous period capital stock (K_{t-1}) and current investment (I_t) as

$$K_t = K_{t-1} + I_t \tag{2}$$

We then decompose total investment, I_t into private investment (PI_t) and public investment (GI_t) as

$$I_t = PI_t + GI_t \tag{3}$$

Then, following Keynesian setting PI_t is defined as the function of interest rate (r_t) and public investment (CE_t).

$$PI_t = f(r_t, CE_t) \tag{4}$$

Here, we make a strong assumption that public investment *crowds-in* private investment[1]. As the country is undergoing through peace process after a long political deadlock, it is rational to expect that government needs to invest more on economic infrastructure for attracting private investment in Nepal (Khan and Kumar, 1997). This assumption may hold for next few years until the country makes progress on achieving a high level of economic growth.

Finally, we complete the real sector block with specifying public investment (GI_t). Theoretically, GI_t is identical with government capital expenditure (CE_t) but it is not the case in practice as capital expenditure includes investment and associated administrative costs. Hence, GI_t is obtained from CE_t using escalating factor (γ) as follows:

$$GI_t = \gamma \cdot CE_t \tag{5}$$

Where, $\gamma = GI_{t-1} / CE_{t-1}$, represents administrative costs.

Public finance block: The government of Nepal has maintained fiscal stability after adopting economic liberalization policy since mid-80s. As one of the major indicators of fiscal stability is the budget deficit, we begin modeling public finance block by defining the identity for budget deficit (BD_t) as:

$$BD_t = TE_t - Z_t \tag{6}$$

Where, TE_t is the total public expenditure and Z_t is the total resources which includes government revenue and foreign grants. In this framework, $BD_t = 0$ implies that the government maintains a balanced budget while a negative number indicates a surplus and positive number implies deficit in the government's account.

There are two sources of financing BD_t, namely domestic loan (DL_t) including overdraft and foreign loan (FL_t) as follows.

$$BD_t = DL_t + FL_t \tag{7}$$

The domestic loan (DL_t) has important policy implications in the economy. A high level of domestic loans distorts macroeconomic stability, increases future liability of the government and *crowds-out* financial resources for private investment while a low level of domestic borrowings also minimizes scope of economic development through

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[1] Of course, this argument has to be supported by empirical analysis.

mobilizing possible available resources. For this reason, Fiscal Authority in many countries often limits the size of DL_t to a specific range of GDP or total expenditure or revenue. In Nepal, recent periodic plans and annual budgets show that government aims to keep annual domestic borrowing around 2.0 percent of GDP (NPC, 2011). In this context, we model DL_t as a positive fraction (β) of Y_t as given by Eq.(8).

$$DL_t = \beta \cdot Y_t , \qquad 0 < \beta < 1 \qquad (8)$$
$$FL_t = BD_t - DL_t \qquad (9)$$

Given the size of budget deficits and domestic borrowings, the foreign loan (FL_t) is then considered to be residual between budget deficit (BD_t) and domestic borrowings (DL_t) as given by Eq.(9). Under this framework, Fiscal Authority switches borrowing strategy between domestic sources and foreign sources by changing the parameter β.

The next step is to obtain the identity for government's total resources (Z_t) which is, in fact, the sum of total revenue (RV_t) and foreign grants (FG_t) as follows:

$$Z_t = RV_t + FG_t \qquad (10)$$

The total revenue (RV_t) which comprises both taxes and non tax revenue, is considered to be the function of GDP as depicted by Eq(11) (Paudel, 2006).

$$RV_t = f(Y_t) \qquad (11)$$

Foreign grant (FG_t) depends on various factors including commitment of donors, efficiency of the government for mobilizing foreign aid, development plan of the country and foreign relationships, among others. In order to capture those past behaviors in practice, we define FG_t as the function of its own lag as.

$$FG_t = f(FG_{t-1}) \qquad (12)$$

We then define the identity for total public expenditure (TE_t) which is considered to be the sum of recurrent[2] (RE_t) and capital (CE_t) expenditure (Ra and Rhee, 2005).

$$TE_t = RE_t + CE_t \qquad (13)$$

RE_t is popularly known as the consumption expenditure of the government that goes mostly on payments for employees' salary and benefits, general administration, security

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2   Include principal repayments of outstanding public debt.

and amortization (NRB, 2009). Therefore, it follows an autoregressive trend unless sudden policy changes take place.

$$RE_t = f(RE_{t-1}, Trend_t) \qquad (14)$$

Now, the final and crucial step is to determine capital expenditure. Theory suggests various ways of determining it but in practice it largely depends on whether Fiscal Authority aims to (a) control the size of budget deficit; or (b) adopt an aggressive investment plan without controlling budget deficit. The former option helps to maintain fiscal stability while the latter option promotes economic growth. In this context we propose three alternative propositions in order to reflect fiscal policy in practice.

Proposition 1: Fiscal Authority does not adopt ambitious expenditure plan so that capital expenditure follows a historical trend.

$$CE_t = f(trend) \qquad (15a)$$

It is a conservative scenario where the size of total expenditure and budget deficit depends on the historical growth of CE_t. This scenario does not care about the size of total expenditure and budget deficits.

Proposition 2: Fiscal Authority is cautious about the size of total expenditure while determining the capital expenditure.

$$CE_t = \lambda \cdot Y_t - RE_t \qquad 0 < \lambda < 1 \qquad (15b)$$

$$\text{Where, } \lambda \cdot Y_t = TE_t$$

Under this scenario, total expenditure is derived as the fraction of GDP $(\lambda \cdot Y_t)$ and then CE_t is obtained as residual after allocating recurrent expenditure (RE_t). This strategy is guided by international practices which states that the size of public expenditure should be at least 20 percent of GDP, i.e. λ should take a value of 0.2 in Eq. (15b) (Parker and Jespersen, 1994).

Proposition 3: Fiscal Authority is sensitive with the size of budget deficit irrespective to the demand for expenditure.

$$CE_t = Z_t + \psi \cdot Y_t - RE_t \qquad 0 < \psi < 1 \qquad (15c)$$

$$\text{Where, } \psi \cdot Y_t = BD_t$$

Under this scenario Fiscal Authority sets budget deficit to a fraction of GDP without considering the size of total expenditure and revenue mobilization. Then, capital expenditure is obtained as residual after allocating RE_t from available total resources at disposal. Generally, International Monetary Fund suggests to keep ψ under 0.055.

III. DATA GENERATING PROCESS AND EMPIRICAL STRATEGY

As quarterly GDP series is unavailable in Nepal, we use annual time series data from 1992/93 to 2009/10 to estimate the model. There are several reasons for choosing a short sample period starting from 1992/93 although most of the annual times series data are available from 1974/75 onwards. First, this period avoids structural break in most of the time series data that appears in early 90s or late 80s (Shrestha, 2008). Second, the exchange rate of the Nepalese currency vis-à-vis Indian currency has remained unchanged since February 1993 which gives a meaningful sample period for our analysis. And finally, fiscal policy is consistent towards achieving fiscal stability since early 1990s. The model contains 16 variables. All variables except for employment and interest rate are obtained from Economic Survey, 2011 (MoF, 2011) and converted them into constant price of 2009/10 using GDP deflator. As time series data for employment is unavailable in Nepal, we interpolate discrete data obtained from population census 1991 and 2001 to obtain annual series from 1991 to 2001 (CBS, 1991 and CBS, 2001). Likewise, annual employment data from 2002 to 2010 is derived by extrapolating the same information but using a revised labour growth as depicted from Nepal Living Standard Survey, 2011 (CBS, 2011). In the case of lending interest rate, we use average lending rate of agriculture, industrial and commercial loans obtained from Quarterly Economic Bulletin (NRB, 2011). Besides, time dummy variables are also used while estimating the model in order to correct data outliers.

Although most of the macroeconomic variables in Nepal are considered to be non-stationary (Shrestha, 2008), combinations of those variables may also produce co-integrating relationship (Kharel and Koirala, 2011). Due to this fact and considering the objective of this paper, we use variables at level but take care with residual of estimated equations. Depending upon the nature and specification of the behavioral equation, we introduce a first order autoregressive process [AR(1)] and alternatively a first order moving average process [MA(1)] to correct serial correlation in the residual (Ra and Rhee, 2005).

IV. EMPIRICAL ESTIMATES

There are two blocks and 14 equations[3] in the system including 6 behavioral equations and 8 identities. While real sector block comprises 2 behavior equations and 3 identities, public sector block contains 4 behavioral and 6 identities. We estimate all behavioral equations using common sample period starting from 1992/93 to 2009/10.

The estimate of Eq (1b) is presented in the second row of Table 1. We include time dummy for 2001 to estimate this equation in order to correct data outlier which was generated due to the change in labour growth between 1991-00 and 2001-10. This dummy also captures the change in the base year of GDP. The estimate is robust as parameters are taking expected sign and are significant at 5 percent. Further, the

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[3]   Excluding double counting of BD_t.

predicting power of the estimated equation is very high as indicated by $\overline{R}^2$. The Durbin Watson (D-W) statistics remain in the acceptance region while LM test rejects the null hypothesis that residual is serially correlated.

The estimate of Eq (4) is presented in the third row of Table 1 where private investment (PI_t) is determined by nominal interest rate (r_t) and capital expenditure CE_t. The estimate shows that one percent rise in r_t reduces PI_t by 0.17 percent while the same percent rise in CE_t increases PI_t by 0.67 percent, *ceteris paribus*. In this equation the first order moving average, MA(1), is introduced in order to correct serial correlation in the residual. The estimate justifies the fact that public capital expenditure *crowds-in* private investment in Nepal.

The time dummy variable (D_t) is also used for estimating Eq(11), (12) and (15a) subsequently as depicted by 4th, 5th and 7th row of Table 1 respectively. Eq.(11) estimates government's total revenue (RV_t) while Eq.(12) estimates foreign grants (FG_t). Eq(14) estimates recurrent expenditure (RE_t) which is explained by both lag dependent and trend. Finally, Eq(15a) estimates capital expenditure (CE_t) for scenario 1 while it is assumed to be policy variable in other scenarios. All estimates are robust with taking very high explanatory power as indicated by $\overline{R}^2$. There is no sign of autocorrelation in the residuals as suggested by D-W statistics and LM test.

Table 1: Estimate of the model (Sample period: 1992/93 to 2009/10)

Estimated Equation	Estimates	$\overline{R}^2$	D-W test	LM test*
1b	$\log(Y_t / L_t) = 3.014 + 0.251\log(K_t / L_t) - 0.015 D_t$ $\quad\quad\quad (0.053)\quad\quad (0.009)\quad\quad\quad\quad (0.004)$	0.98	1.76	0.18
4	$\log(PI_t) = 7.155 - 0.166 r_t + 0.671\log(CE_t) + [MA(1) = 0.697]$ $\quad\quad\quad (1.775)\quad (0.021)\quad\quad (0.163)$	0.93	1.79	0.59
11	$\log(RV_t) = 5.005 + 1.355 Y_t - 0.130 D_t$ $\quad\quad\quad (0.702)\quad\quad (0.051)\quad\quad\quad (0.024)$	0.98	1.71	0.42
12	$\log(FG_t) = 1.451 + 0.472\log(FG_{t-1}) + 0.689\log(FG_{t-2}) - 0.415 D_t$ $\quad\quad\quad (0.081)\quad (0.116)\quad\quad\quad\quad (0.113)\quad\quad\quad\quad (0.075)$	0.93	1.91	0.89
14	$\log(RE_t) = 4.680 + 0.504\log(RE_{t-1}) + 0.382 Trend_t$ $\quad\quad\quad (1.916)\quad\quad (0.212)\quad\quad\quad\quad (0.018)$	0.96	1.88	0.71
15a	$\log(CE_t) = 2.171 + 0.802\log(CE_{t-1}) - 0.201 D_t$ $\quad\quad\quad (0.865)\quad\quad (0.079)\quad\quad\quad (0.026)$	0.92	1.87	0.49

* *F statistics of Breusch-Godfrey's serial correlation LM test. Figures in parenthesis are standard error of parameters. All parameters are significant at 5 percent.*

Once the model is calibrated and estimated, the next step is to examine whether the model as a whole is stable and it produces a reliable out-sample forecast (Ra and Rhee, 2005).

To check this, we compile the model and generate in-sample forecast using Gauss-Siedel algorithm to compute Root Mean Square Percentage Error (RMSPE) as:

$$RMSPE = \sqrt{\frac{\sum [(y^s - y^a)/y^a]^2}{n}} * 100$$

> *Where n is the number of periods, y^s is the forecasted value of variable Y, and y^a is the actual value of variable Y.*

Annex 2 presents RMSPE of 15 variables, out of which six variables contain the values less than 5 percent while remaining nine variables take values between 5 to 10 percent. Given the size of model and objective of the paper, we conclude that the model is robust and it provides a reliable out-sample forecast.

V. POLICY SIMULATION AND OUT-SAMPLE FORECAST

One of the major objectives of the current Three Year Plan (2010/11 to 2012/13) is to attain a high, broad based and inclusive economic growth in which the average annual GDP growth at producer price is targeted to be 5.9 percent at 2009/10 constant price. The average size of total public expenditure is projected to be 25.5 percent of GDP while total resource mobilization (revenue and foreign grants) is expected to be 21.4 percent of GDP during the plan period (NPC, 2010), creating annual average budget deficit as high as 4.1 percent of GDP.

Given this context, the model is run to generate out-sample forecasts starting from 2010/11 to 2012/13. One of the prerequisites for out-sample forecast is to set assumptions for exogenous variables as interest rate and employment are determined exogenously in this model. We assume that employment (L_t) grows by the same rate as it was during in-sample period and interest rate (r_t) remain the same at the level of 2009/10 for the entire out sample forecasting period.

Table 2 depicts out sample forecasts of GDP growth (Y_t), total expenditure (TE_t) and total resources (Z_t) for three alternative propositions. Proposition 1 is based on historical growth of capital expenditure while proposition 2 sets total expenditure to be 25.5 percent of GDP ($\lambda = 0.255$) as per the allocation of existing plan. Likewise, proposition 3 sets budget deficit to be 5 percent of GDP (ψ =0.05). The size of domestic borrowing is fixed at 2 percent of GDP ($\beta = 0.02$) for all scenarios, implying that foreign borrowing is residual after budget deficits.

Under the first proposition, the average growth of total expenditure would be 24.5 percent of GDP and creates the budget deficit as high as 5.6 percent of GDP during the plan

period. The average GDP growth rate, however, will short fall by 1.5 percent than the target growth of 5.9 percent.

Table 2: Out sample forecast of key variables (as % of GDP)

Year\Propositions		Proposition 1 [$\beta = 0.02$]			Proposition 2 [$\lambda = 0.255$ $\beta = 0.02$]			Proposition 3 [$\psi = 0.05$ $\beta = 0.02$]		
		Y_t^*	TE_t	Z_t	Y_t^*	TE_t	Z_t	Y_t^*	TE_t	Z_t
Base year	2009/10 *(Actual)*	4.6	22.2	18.6	4.6	22.2	18.6	4.6	22.2	18.6
Out-Sample Forecast	2010/11	4.8	23.1	18.7	5.1	25.5	19.8	4.6	23.1	18.1
	2011/12	4.3	24.6	18.9	5	25.5	20.1	3.9	23.7	18.7
	2012/13	4.1	25.8	19.1	5.3	25.5	20.4	3.8	24.1	19.1
	Annual Average	4.4	24.5	18.9	5.1	25.5	20.1	4.1	23.6	18.6

* *Growth rate in percent.*

Under the second proposition, when the size of public expenditure is fixed at 25.5 percent of GDP in each year for the entire plan period, the average GDP growth goes up to 5.1 percent but still remains below the target. This scenario will also threat fiscal stability as the size of budget deficit will be as high 5.4 percent of GDP. Finally, if the government maintains the budget deficit at 5 percent of GDP for the entire plan period as depicted by proposition 3, the annual GDP growth will be maintained at 4.1 percent of GDP. Under this scenario, the size of total expenditure will increase marginally to 23.6 percent of GDP compared to 22.2 percent in the base year.

The forecast results, therefore, suggest that the average annual GDP growth of 5.9 percent as targeted by the Three Year Plan is unlikely to be attained even if the planned fiscal outlay is realized.

VI. CONCLUSION

This paper develops a comprehensive, consistent and robust macroeconomic forecasting model focusing on fiscal policy and economic growth in Nepal. It provides policy options for choosing fiscal stability and promoting economic growth and also provides options for switching borrowings between domestic loan and foreign loans. The model is estimated using annual data from 1992/93 to 2009/10 and provide out sample forecasts for three years starting from 2010/11, which is consistent with the existing Three Year Plan period.

The empirical evidences suggest that (a) fiscal policy has a positive impact on economic growth, supporting the view of Endogenous Growth Models (Romer, 1986 and Kneller and Gemmell, 1999), (b) the Three Year Plan is ambitious in achieving it targeted growth from the planned fiscal outlay even if it is realized, (c) public investment *crowds-in* private investment, and finally, (d) fiscal policy promotes economic growth but there

exists a trade-off between maintaining fiscal stability and accelerating economic growth in Nepal.

The present work can be extended in many ways. First, labour supply and interest rates are considered to be exogenous in this model. Thus, the performance of the model can be improved by making them endogenous. Likewise, the model can be extended by incorporating major sectors of the economy in order to analyze multi-dimensional policy impact on economic growth.

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Annex 1: Description of Variables used in the Model

Serial Number	Variables	Description	Type
1	Y_t	Gross Domestic Product at Basic Price	Endogenous
2	L_t	Total Employment in Million	Exogenous
3	K_t	Capital Stock	Endogenous
4	r_t	Average Nominal Lending Rate of Agriculture, Industry and Commercial Loan (in Percent)	Exogenous
5	I_t	Total Investment	Endogenous
6	GI_t	Government Investment	Endogenous
7	PI_t	Private Investment	Endogenous
8	Z_t	Total Resources	Endogenous
9	RV_t	Government Revenue	Endogenous
10	FG_t	Foreign Grants	Endogenous
11	TE_t	Total Expenditure	Endogenous
12	RE_t	Recurrent Expenditure	Endogenous
13	CE_t	Capital Expenditure	Endogenous
14	BD_t	Budget Deficit	Endogenous
15	FL_t	Foreign Loan	Endogenous
16	DL_t	Domestic Loan	Endogenous

 Note: Variables other than total employment and interest rate are measured in million of NRs. at 2009/10 price.

Annex 2: Root Mean Square Percentage Error (RMSPE)
(Sample period: 1992/93 to 2009/10)

Serial Number	Variables	RMSPE
1	Y_t / L_t	3.58
2	K_t	4.98
3	r_t	6.21
4	I_t	4.72
5	GI_t	2.57
6	PI_t	7.83
7	Z_t	5.01
8	RV_t	3.99
9	FG_t	9.54
10	TE_t	7.04
11	RE_t	6.22
12	CE_t	8.88
13	BD_t	9.56
14	FL_t	4.65
15	DL_t	9.43