Determining the Optimal Level of Taxes in South Asia

(An Unbalanced Budget Approach)

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Abstract

The optimal size of government, measured as a share of GDP, has been an important issue in recent decades. Handful of studies find threshold size of government under the assumption of balanced budget, an assumption only comprehendible, to some extent, in case of developed economies. However, this assumption becomes unrealistic regarding developing countries where high fiscal deficits persist. This requires the determination of optimal size of government assuming unbalanced budget.

In this backlight, this paper extends Scully (2006) model to estimate the optimal level of taxes, assuming unbalanced budget, in four South Asian countries-Pakistan, India, Sri Lanka and Nepal for the period 1975-2008. Ordinary Least Square method is used to estimate regression coefficients. It is found that the current level of taxes, measured as a share of GDP, is below the estimated threshold level in each country with varying degree which shows the inability of this region to raise tax to GDP ratio up to required level. This suggests that there exists substantial scope (10 to 30%) to increase tax to GDP ratio to attain the optimal level of taxes in the region. This may reduce the ever swelling deficit that in turn can stimulate economic growth. Restructuring and reorganization of the tax regime can help to attain the estimated threshold level in these economies.

Key Words: *Optimal, Taxes, Threshold, Deficit, Budget*

1- Introduction:

Finding the optimal size of government is an interesting topic and has gained paramount importance in recent years. Two models, Barro (1990) & Scully (2006), are much popular in literature to estimate the threshold size of government. The models differ in empirics despite similarity in assumptions. The difference in results is due to the subjectivity of the issue. Both models assume balanced budget, a critical assumption. This assumption is comprehendible, to

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some extent, in case of developed economies and does not have any critical concern unless used for developing countries. Application of this model on developing countries data raises serious theoretical concerns as balanced budget is a rare phenomenon in these economies. Roughly speaking deficit has affect, positive/negative, on economic growth. Incorporation of deficit into the model will certainly produce more reliable results. This paper has been designed to provide theoretical foundation, in addition to empirical estimation, to measure optimal level of taxes in the presence of fiscal deficit. For this purpose I, extend Scully model (2006)[1]. The rest of the paper proceeds as follow; Section 2 describes the meaning of optimal size of government, section 3 comprises analytical framework, section 4 deals with the data, estimation and results, the last section, 5, concludes with some policy implication.

2- Analytical Framework:

Assuming [2] that relative share of national income spent by government and private sectors contribute to economic growth of a country. Public expenditure [3] in previous period is assumed to determine output in current period. The share of private sector is equal to the product of *(1− −)* and the level of gross domestic product in that period. In addition, all other economic growth drivers (employment and productivity) are set equal to zero. The mathematical formulation of this relation is described by a non linear Cobb-Douglas production function [4] working under constant return to scale [5].

= −1 (−1) (1− − −1) ……(1)

Where

= Gross Domestic Product in current period

−1 = Gross Domestic Product in previous period

= Tax to GDP ratio

= Deficit to GDP ratio

= Total factor productivity

= Relative share of government taxes in total output

= Relative share of deficit in total output

= Relative share of private sector in total output

Growth rate of the economy can be defined as;

$= \quad - \quad -1 \quad -1$

Where is the growth rate

Rearranging terms we get

$1+ = \quad -1$ ……(2)

Substitution of equation (1) in equation (2) yields;

$1+ = \quad -1= \quad -1 \ (\quad -1) \ (1- \ - \quad -1) \ -1$ ……(3)

Rearranging terms

$1+ = \quad -1= \quad (\ ) \ 1- \ - \ ) \ (\quad -1 \ + \ + \ -1$ ……(4)

By definition $+ \ + \ =1$

Thus,

$1+ = \quad -1= \quad (\ ) \ 1- \ - \ ) \ (\quad -11-1$ ……(5)

Rearranging terms;

$1+ = \quad -1= \quad (\ ) \ (1- \ - \ )$ ……(6)

Taking natural log on both sides

$\ln 1+ = \ln \quad -1= \quad + \ln\tau + \ln \ + \ \ln(1- \ - \ )$ ……(7)

To find optimal tax rate that maximizes the growth, we differentiate equation (7) with respect to tax rate and set equal to zero.

$\ln \partial 1+ \ \partial \ = \quad - \ 1- \ - \ =0$

$= \ 1- \ -$

$- \quad - \quad =$

Rearranging terms

$+ \quad = \ - \quad `$

$+ \ = \ (1- \ )$

$* = \ (1- \ )(\ + \ )$ ……(8)

3- What Does the Optimal Size of Government Mean?

Main stream economic theory of the relationship between government spending and economic growth suggests that the negative effects are expected in the economies where the size of government, measured as a percent of gross domestic product, exceeds a certain level (Barro 1991). The hallmark of endogenous growth models is that they first investigated the non linear relation between public spending and economic growth. For example in an endogenous framework, Barro (1990) shows that public spending enhances the marginal productivity of capital which in turn raises economic growth. At the same time an increase in taxes retards economic growth through crowding out effects. However, the first positive effect remains dominant when the government is small while the negative effects of taxes dominate when the size of government becomes larger. Thus, there is an evidence of a non-linear relation between government size and economic growth and there exist a point that maximizes the growth. He states that this point occurs where the marginal product of government services equals unity.

Latter a few studies also verified the non monotonic relationship between government size and economic growth. For example Yavas (1998) pointed out that an increase in public spending will lower the study state level of output if the economy is already at high steady state and vice versa. He supports his argument by saying that in less developed countries, bulk of the government expenditure is allocated towards the building of primary infrastructure that enhances productivity of the private sector. On the other hand in developed countries a large portion of government spending is spent on social security services as these countries are already rich in infrastructure. Therefore, expenditure on infrastructure has more positive effect on private output than if this expenditure is made on social security services.

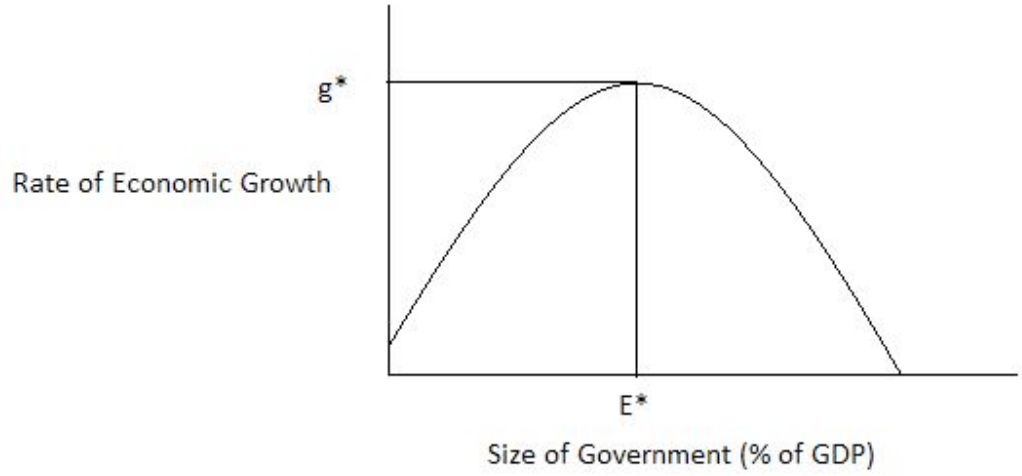
Borrowing a graphical technique from Laffer, Army popularized the notion of optimal size of government by developing a so-called Armey curve in (1995). He states that the absence of government, zero percent government, creates threat of expropriation that restricts incentive to work, save and invest. On the other hand when all decisions are monopolized by the government, hundred percent governments, the level of per capita output remains low. However, when private and public sector share the decision making in allocation of resources

and play their respective role in economic activity, the output level is higher than the previous two extremes.

The Army curve describes that output increases with the increase in government size up to a certain level and then decreases. Why this happens? Chao and Grubel (1998) explain this phenomenon. They argue that with the growth of government size law of diminishing returns operates. More and more resources are withdrawn from private sector to upgrade already existing primary infrastructure that has no additional positive effect on output. Besides, to finance increased government expenditure low tax rates have to be increased which impose increasing burden by stifling the spirit of private sector's incentive to save and invest.

Figure 6.1

Army Curve, 1995



4- Data, Estimation and Results:

Three series- GDP, Tax to GDP ratio and public expenditure measured as a share of GDP are taken from World Development Indicator (2009). From these series, three variables, GDP growth rate, deficit to GDP ratio and private share in GDP are constructed. The data spans from 1975 to 2008 for each country. Ordinary Least Square method is used to estimate equation (7). The OLS results are reported in table 1.

Table 1

OLS Estimation Output for Selected South Asian Countries

Δ is the Dependent Variable

Variables	**Pakistan**	**India**	**Sri Lanka**	**Nepal**
C	0.007* [2.50]	0.001 [0.559]	0.016* [3.213]	0.016 [0.136]
Δln	0.110* [3.091]	0.110* [2.120]	0.166* [4.177]	0.112* [3.955]
Δln	0.051* [2.447]	0.048* [3.589]	0.071* [3.766]	0.036* [4.403]
Δln(– –)	0.781* [4.988]	0.831* [3.735]	0.762* [2.806]	0.849* [3.762]
R-Square	0.987	0.950	.989	0.971
DW	2.15	1.996	2.29	2.25

Note: *Δ is the first difference operator. t- Statistics are in parenthesis. *mean significantly different from zero (two tailed test) at the 1% level.*

The OLS estimation output presented in table 1 clearly brings out that all the regression coefficients are highly significant. The optimal level of taxes is obtained for selected South Asian countries by using the values of regression coefficients in equation 8 [7]. The estimated optimal levels of taxes with current sizes of taxes are given in table 2.

Table 2

Threshold and Current Level of Taxes in Pakistan, India, Sri Lanka and Nepal

Country	Optimal level of taxes (%) Of GDP When Deficit is 1.5% of GDP	Current size of taxes in 2008 (%) of GDP	Percentage scope to increase taxes
Pakistan	12.16	9.64	+26.14
India	11.51	8.92	+29.04
Sri Lanka	17.62	15.96	+10.40
Nepal	11.48	10.39	+10.49
Average	**13.19**	**11.23**	**+17.45**

Table 2 highlights a common trend regarding estimated optimal and current level of taxes in South Asia. In all countries the estimated threshold level of taxes is higher than the current size of taxes. This suggests a scope for each country to increase level of taxes to maximize the growth. In India and Pakistan there is a scope of more than 25% to increase taxes. However, in Sri Lanka and Nepal the scope to increase taxes is only 10%. On average, in this region, 18% increase has been suggested to attain the growth maximizing tax rate.

It is interesting to note that estimated threshold level of taxes in South Asia is less than the developed countries. This suggests that taxes become counterproductive at a lower level than in advanced countries. Inefficient tax systems, low per capita GDP, bad governance and many other economic and non economic factors are held responsible for this low threshold level of taxes in this region.

Historical look at the tax scenario of this region reveals that these countries have lost much in respect of economic development by not maintaining the level of taxes to the required level. Low tax to GDP ratio forced these governments to run budget deficits that led to mounting debts. Costly debts suppressed economic development in this region.

Our findings under the assumption of unbalanced budget are contrary to the findings regarding developed economies on the issue. The study suggests increase in taxes while in developed economies decrease in taxes is suggested to achieve the growth maximizing tax rate. This

shows that governments in developed economies are taking much of the private incomes in shape of taxes that hurts spirit to work, save and invest. On the other hand, like other developing economies of the world in South Asia, tax to GDP ratio is very small and needs to be increased systematically.

5- Concluding Remarks:

The focus of the study was to determine the optimal level of taxes in Pakistan, India, Sri Lanka and Nepal using data from 1975 to 2008 under the assumption of unbalance budget. Ordinary Least Square Method is used to estimate regression coefficients. It is found that current tax to GDP ratio is below the estimated optimal level of taxes in each country with varying degree which shows the inability of this region to raise tax to GDP ratio up to required level. This has widened the gap between public expenditure and public revenues and reduced fiscal space. Therefore, swelling deficit and mounting debts are the outcomes that have halted growth over the years. The major factors behind this low tax to GDP have been tax evasion, narrow tax base, ineffective tax system, corruption, political concerns of the authorities and some other non economic factors like anarchy that persists in the region.

It is interesting to note that there exists substantial scope (10 to 30%) to increase tax to GDP ratio to attain the optimal level of taxes in the region. This may reduce the ever swelling deficit that in turn can stimulate economic growth. Restructuring and reorganization of the tax regime in addition to documentation of the economy can help attain the estimated threshold level of taxes in these economies. This requires determination and will on the part of policy makers. However, if achieved it can be a panacea to the economic worries of the region.

End Notes:

[1] Professor Scully has also used this model in many of his other studies.

[2] I also borrow some help from Heerden & Scheoman (2008)

[3] Public expenditure is sum of taxes and deficit.

[4] Cobb-Douglas production function is widely used in economics because of its ability to show accurately many empirical phenomena and its convenient mathematical properties (Chao and Grubel, 1998).

[5] Constant returns are necessary for the model to have the constant growth rate characteristic of an equilibrium growth path (McCann, 1998; Philips, 1998).

[6] "So called Barro rule"

[7] The value of , deficit to GDP ratio, is arbitrary. However, Adam and Beven (2005) estimate the threshold level of deficit for 45 developing countries as 1.5% of GDP. Therefore, we also use value of equal to 1.5%.

References:

Adam, C. S. and Bevan, D. L. (2005), "Fiscal Deficits and Growth in Developing Countries", Journal of Public Economics, Vol. 89, pp. 571-597.

Armey, R. (1995), "The Freedom Revolution", Washington: Regnery Publishing.

Barro, R. J. (1990), "Government Spending in a Simple Model of Endogenous Growth", Journal of Political Economy,Vol. 98, No.5, pp.103-125.

Barro, R. J. (1991), "Economic Growth in a Cross-Section of Countries", The Quarterly Journal of Economics, Vol. 106, No.2, pp. 407-443.

Chao, J. C. P. and Grubel, H. (1998), "Optimal Levels of Spending and Taxation in Canada", In H. Grubel (Ed.), How to Use the Fiscal Surplus (53-68). Vancouver: Fraser Institute.

Heerden, Y. and Scheoman, N. (2008), " Finding the Optimal Level of Taxes in South Africa: a Balanced Budget Approach", Working Paper,University of Pretoria, Department of Economics.

McCann, E. (1998), "An Error in Professor Scully's WP14. Appendix 2 in Supplementary Briefing Papers (Vol. 2). Report on Research Commissioned by Inland Revenue, New Zealand, November 1999. Available at www.taxpolicy.ird.govt.nz/publications/files/volume2.pdf.

Philips, P. C. B. (1998), "Report on E. McCann (1998) 'An Error in Professor Scully's WP14", Appendix 2 in Supplementary Briefing Papers (Vol. 2). Report on Research Commissioned by

Inland Revenue, New Zealand, November 1999. Available at www.taxpolicy.ird.govt.nz/publications/files/volume2.pdf.

Scully, G. W. (2006), "Taxes and Economic Growth", National Center for Policy Analysis, Policy Report No.292.

Yavas, A. (1998), "Does too Much Government Investment Retard Economic Development of a Country?, Journal of Economic Studies, Vol. 25, No. 4, pp.296-308.