



Targeting Public Expenditure for Fiscal Consolidation in India

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Abstract

The present economic scenario no more adheres to Ricardian Equivalence Hypothesis (REH) wherein we could be indifferent towards size of fiscal deficit. As such there is need to adjust the fiscal levers in a manner so as to ensure a moderate level of fiscal deficit. Although E. Domar suggests that economies need to take care only of growth rate which will stabilize the debt burden at its own, that does not mean fiscal deficit should be allowed to swell to any extent and people should be burdened with all ill effects of higher fiscal deficit. With this view being admitted by policy makers, a common remedy proposed for bringing down the fiscal deficit and consequent debt burden this is to bring about a reduction in various kinds of public expenditures. In this paper an attempt is made to develop a mathematical model to demonstrate the conditions and inequalities that will govern the behavior of fiscal deficit to GDP ratio with changes in public expenditures. Paper reveals that any decrease in various kinds of public expenditures brought about with an intention to bring down fiscal deficit to GDP ratio will ultimately result in increase in this ratio.

Keywords: Fiscal deficit, public expenditure, public finance, debt burden, GDP growth. JEL Classification: E 62, H 30, H 62, A 10.

Introduction

The Ricardian Equivalence Hypothesis (REH), which states that the size of a country's fiscal deficit or its national debt, at any point in time, is irrelevant in the world we live in¹. The borrowing constraints of present times, the size of fiscal deficit and its cumulated stock in fact matter significantly at macro level. In particular large fiscal deficits result in higher real rates of interest with consequent negative effects on investment expenditures, capital stock and future per capita national income levels². Large fiscal deficits also tend to lead to higher rates of inflation in the long run and sometimes in short run also³. As such in the present realm of fiscal policy, fiscal levers (expenditure, taxes, bonds, borrowings) of an economy need to be adjusted in a manner so as to ensure a moderate level of deficit that too without sacrificing the growth of economy. Indian Economy is at present is grappling with higher deficit levels and inflation rates while growth rate of economy is moving away from targeted double digit level. In fact when reforms were launched in the midst of balance of payment crises in 1990's the fiscal deficit of central government was equivalent to 8.3 per cent of GDP. According to Lahiri the reform and stabilization package launched had deficit reduction as one of its main objectives⁴. Consequent to this the Central Government's deficit was reduced from 8.3 per cent of GDP in 1990-91 to 5.9 per cent in 1991-92 and further to 5.7 per cent in 1992-93. Also the average annual inflation in wholesale prices which was 13.7 per cent in 1990-91 came down to 8.4 per cent in 1993-94. As Indian economy progressed in post reform period fiscal deficit to GDP ratio touched the low figure of 3.32 in 2006-07 but it rose again to 5.99 in 2008-09 and further to 6.46 in 2009-10 .

Present scenario of economy [with this ratio for 2012-13 shown as 4.9 and estimated value for 2014-15 as 4.1 in 2014-15⁵ makes fiscal consolidation as an important goal of Indian economy and recommends for strong implementation of fiscal responsibility and budget management act (FRBM, 2003). However, any programme of fiscal consolidation must be cast within an overall programme of tax and expenditure reforms. When we consider it in Indian context it becomes important to understand where efforts for fiscal consolidation should stand in India -on tax reforms or expenditure reduction. A common view that is being nursed in India is that government should go for reduction in its expenditures and it is in this context that planning commission of India had directed various ministries to curtail their expenditures. This paper takes one aspect of fiscal consolidation: reduction in public expenditure and tries to examine empirically how wise it will be to go for reduction in various kinds of expenditures with ultimate aim of bringing down the fiscal deficit to GDP ratio and consequent reduction in debt.

Evsay Domar has established the relationship between tax rate representing the burden of national debt, percentage of national income borrowed (α), interest paid on bonds (i) and percentage rate at which national income increases (r) as

$$\text{tax rate} = \frac{\alpha}{r} \cdot i \quad (\text{B.1})$$

Implying thereby that burden of debt is directly proportional to α and i and inversely proportional to growth of income⁶. In his paper it had been successfully shown that for a growing economy tax income of government may very well increase

without any necessary increase in tax rate for the fact that former is positive function of income. He further argues that ratio of public debt to GDP would be stable in the long run if rate of growth exceeds the effective interest rate. As such the problem of debt Burden is a problem of expanding economies. In his own words, *"If all the people and organisations who work and study, write articles and make speeches, worry and spend sleepless nights –all because of fear of debt –could forget about it for a while and spend even half their efforts trying to find ways of achieving a of growing national income, their contribution to benefits and welfare of humanity –and to the solution of debt problem would be immeasurable"*.

However the equation derived by E. Domar misses an important linkage of actual macro economic framework - the effect of government expenditure on national income is not considered. In this paper we would like to show that growth in income as proxied by GDP growth rate is positively related with government expenditure and hence government expenditure can be thought as a factor that contributes to decreasing the debt burden. As such any idea of decreasing the public expenditure in order to decrease the fiscal deficit to GDP ratio will prove to be counterproductive. In fact in Indian scenario where huge involuntary unemployment and demand constraints are common features there is no reason to believe that because of increased public expenditure, price adjustments alone take place and real out put would not grow through Keynes-Kahn multiplier⁷. Growth of out-put would depend on public expenditure as long as economy is operating well below full employment level. In Indian context we have studies that show government investment strengthens the demand and crowds in private investment resulting in double effect on the output growth.

Considering the importance of public expenditure for growth of national income and significance of higher growth rate in reducing the burden of debt via Domar's argument, undertaking a contractionary fiscal policy by reducing the various components of government expenditure with the intention of reducing fiscal deficit to GDP ratio may not result in to ultimate reduction in the fiscal deficit to GDP ratio. In fact to decide whether public expenditure (resulting in deficits) is good or bad for health of economy will depend upon level of aggregate demand in economy. with due cognizance to this view we try to examine this empirically in Indian context and hence would like to make it clear that whether bringing down the expenditure will ultimately lead to decrease in fiscal deficit to GDP ratio.

Theoretical Background: Evsay Domar has established the relationship between tax rate representing the burden of national debt, percentage of national income borrowed (α), interest paid on bonds (i) and percentage rate at which national income increases (r) as

$$\text{tax rate} = \frac{\alpha}{r} \cdot i \quad (B.2)$$

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paper it had been successfully shown that for a growing economy tax income of government may very well increase without any necessary increase in tax rate for the fact that former is positive function of income. He further argues that ratio of public debt to GDP would be stable in the long run if rate of growth exceeds the effective interest rate. As such the problem of debt Burden is a problem of expanding economies. In his own words, *"If all the people and organisations who work and study, write articles and make speeches, worry and spend sleepless nights –all because of fear of debt –could forget about it for a while and spend even half their efforts trying to find ways of achieving a of growing national income, their contribution to benefits and welfare of humanity –and to the solution of debt problem would be immeasurable"*.

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In fact in Indian scenario where huge involuntary unemployment and demand constraints are common features there is no reason to believe that because of increased public expenditure, price adjustments alone take place and real out put would not grow through Keynes-Kahn multiplier. Growth of out-put would depend on public expenditure as long as economy is operating well below full employment level. In Indian context we have studies that show government investment strengthens the demand and crowds in private investment resulting in double effect on the out put growth.

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Outline of the Model and Methodology

In this section we discuss the necessary conditions and establish an inequality, empirical examination of which will help us in deciding whether a contractionary fiscal policy involving

reduction in some components of expenditure will lead to decrease in fiscal deficit to GDP ratio and hence a decrease in debt burden.

Assuming the following two simple standard transitive causalities: i. Government Expenditure (E) yields GDP(Y), ii. GDP yields Revenue (R) to the government.

Also with change in the government expenditure Fiscal Deficit (F) also changes. So we could have $\frac{dF}{dE}$ representing change in fiscal deficit which results from a unit change in government expenditure and $\frac{dY}{dE}$ denotes change in GDP due to a unit change in government expenditure

Further we define total revenue of the government (R) as total revenue receipts plus total capital receipts minus the fiscal deficit.

$$R = RR + CR - F \quad (1)$$

$$F = E - R \quad (2)$$

Where: RR = Revenue receipts, CR = Capital receipts

$$\text{or } dF = dE - dR \quad (3)$$

$$\text{Let } g = \frac{F}{Y} \quad (4)$$

that is g represents ratio of fiscal deficit to GDP

Differentiating both sides of Equation (4) with respect to E

$$\begin{aligned} \frac{dg}{dE} &= \frac{d(F/Y)}{dE} \\ \Rightarrow \frac{dg}{dE} &= \left\{ Y \cdot \frac{d(F)}{dE} - F \cdot \frac{dY}{dE} \right\} \cdot \frac{1}{Y^2} \\ \Rightarrow \frac{dg}{dE} &= \left\{ Y \cdot \frac{F}{E} \cdot \frac{d(F)}{dE} \cdot \frac{E}{F} - F \cdot \frac{Y}{E} \cdot \frac{dY}{dE} \cdot \frac{E}{Y} \right\} \cdot \frac{1}{Y^2} \\ \Rightarrow \frac{dg}{dE} &= (F/(Y \cdot E)) \{ (d(F)/dE) \cdot E/F - dY/dE \cdot (E/Y) \} \\ \Rightarrow \frac{dg}{dE} &= \left(\frac{F}{Y \cdot E} \right) \{ \Pi_E^F - \Pi_E^Y \} \end{aligned} \quad (5)$$

Where: Π_E^F represents government Expenditure elasticity of fiscal deficit and Π_E^Y represent GDP elasticity of government expenditure.

Taking the amount of fiscal deficit as a positive figure we have

$$\frac{F}{E \cdot Y} > 0, \text{ Whenever there is fiscal deficit.}$$

$$\text{So } \frac{dg}{dE} > 0 \quad (6)$$

is possible if and only if $\Pi_E^F > \Pi_E^Y$.

$$\text{Similarly, } \frac{dg}{dE} < 0 \quad (7)$$

if and only if $\Pi_E^F < \Pi_E^Y$ and for $\Pi_E^F = \Pi_E^Y$ g will remain constant implying that with one unit increase in government expenditure ratio of fiscal deficit to GDP will remain constant.

$$\text{For } \Pi_E^F < \Pi_E^Y \quad (8)$$

$$\text{We have } \frac{\frac{dF}{dY} \cdot \frac{Y}{E}}{\frac{F}{Y}} < \Pi_E^Y$$

$$\text{Or } \Pi_Y^F \cdot \Pi_E^Y < \Pi_E^Y \quad (9)$$

$$\text{Or } \Pi_Y^F < 1 \quad (10)$$

It implies that elasticity of fiscal deficit with respect to GDP must be less than one if g has to decrease with increase in the Government expenditure. In other words if due to increase in government expenditure if Y increases more than proportionately compared to F then ratio of fiscal deficit to GDP will actually fall.

$$\text{Again } \Pi_Y^F < 1 \text{ implies } \frac{dF}{dY} \cdot \frac{Y}{F} < 1$$

$$\text{or } \frac{d(E-R)}{dY} \cdot \frac{Y}{(E-R)} < 1$$

$$\text{or } \left(\frac{1}{E-R} \right) \left\{ \frac{d(E)}{dY} \cdot \frac{Y}{E} \cdot E - \frac{dR}{dY} \cdot \frac{Y}{R} \cdot R \right\} < 1$$

$$\left(\frac{1}{E-R} \right) \left\{ E \cdot \frac{1}{\Pi_E^Y} - R \cdot \Pi_Y^R \right\} < 1 \text{ or } \left\{ E \cdot \frac{1}{\Pi_E^Y} - R \cdot \Pi_Y^R \right\} < (E-R) \quad (11)$$

Dividing throughout by GDP (Y) we have final inequality as

$$\left\{ E^* \cdot \frac{1}{\Pi_E^Y} - R^* (\Pi_Y^R) \right\} < E^* - R^* \quad (12)$$

Where: asterisk stands for ratio to GDP of corresponding variable and $E^* - R^*$ is nothing but ratio of fiscal deficit to GDP because $E - R = F$.

Within the simple framework assumed holding of the inequality (12) implies that $\frac{dg}{dE} < 0$ or $\Pi_Y^F < 1$. In simple words this implies that due to an increase in govt. expenditure fiscal deficit rises less proportionately than GDP that causes the ratio of fiscal deficit to GDP to decrease. Using same logic it could be inferred that if Government expenditure decreases then proportionate decrease in fiscal deficit will be less as compared to decrease in GDP, consequent to which ratio of fiscal deficit to GDP will actually increase. Thus above mathematical analysis boils down to the conclusion that holding of inequality (12) in any economy implies that decrease in the government expenditure will actually lead to the increase in fiscal deficit to GDP ratio. Same could be derived if we just consider that holding of inequality implies $\frac{dg}{dE} < 0$, that is, with decrease in E, g will actually increase. So Before reducing the public expenditure in any economy with the intention to bring down the fiscal deficit to GDP ratio we should test the validity of above inequality. If it holds then it implies that reducing the public expenditure will actually end with increase in fiscal deficit to GDP ratio.

Empirical Examination of the Inequality in Indian context

In this paper the inequality (12) is tested for various types of central government expenditure to find out the nature of expenditures the decrease in which may ultimately lead to desired effect of decrease in fiscal deficit GDP ratio. The important expenditures considered are: i. Total government Expenditure (E), ii. Capital expenditure (CE), iii. Revenue expenditure (RE), iv. Development expenditure (DE), v. Non-development expenditure (NDE), vi. Revenue Expenditure

without interest payment (RIN), vii. Total expenditure without interest payment (EIN)

For testing of inequality annual data for various kinds of expenditures incurred by central Government data we use 32 years annual data (1980-81 to 2011-12) from Hand Book of statistics on Indian Economy⁹. In the inequality $\{E^* \cdot \frac{1}{\prod_Y^R} - R^* (\prod_Y^R)\} < E^* - R^* \cdot \prod_Y^R$ is obtained using log linear model $\ln(R) = a + b \ln(Y)$ (1.1)

The estimated value of b will represent the GDP elasticity of total revenue in notational terms it will be \prod_Y^R value. Regression results are presented in Table-1.

The estimate value of b is 1.037 with high value for adjusted R-Square (0.99), thus $\prod_Y^R = 1.037$. It implies that a one per cent increase in GDP leads to more than one per cent increase in Revenues.

R* values are obtained using the average of last five years (2007-08 to 2011-12) of revenue to GDP ratio and actual values are shown in Table-2.

Similarly values of E* are obtained by calculating the average of five years of expenditure GDP ratio for various kinds of Central Government Expenditures and are given individually with their respective tables in this section. The results for Different expenditures are represented individually as follows;

Total Expenditure: To have an idea about responsiveness of GDP to total expenditure we estimate the log linear model $\ln(y) = \alpha + \beta \ln(E)$ (1.2)
The results for which are presented in Table-3.

The adjusted R-sqaure is 0.995 and estimated value of β is 1.039 implying thereby that Expenditure elasticity of GDP ie, $\prod_E^Y = 1.0398$. In other words if public expenditure increases by 1 per cent GDP increases by more than one percent. Using this value the holding of inequality is presented in Table-4.

Table-1
Estimated results for GDP elasticity of Total revenue

Lnr	Coefficient	Std. Error	t	P	95% Conf. Interval
LnY	1.0376	0.0142	73.03	0.00	1.0078 1.0658
Cons	-2.61168	0.1328	-19.65	0.00	-2.883 -2.3403
No. of Observations 32		Adjusted R Squared 0.994		Root MSE 0.096	

Table-2
Mean value for revenue to GDP ratio

2007-08	2008-09	2009-2010	2010-2011	2011-12	R*
0.13376	0.09486	0.09942	0.11246	0.09629	0.10736

Table-3
Estimated results for responsiveness of GDP to total expenditure

LnY	Coefficient	Std. Error	T	P	95% Conf. Interval
LnE	1.0398	0.0132	78.51	0.00	1.0127 1.0668
Cons	1.4595	0.1008	14.48	0.00	1.2536 1.6654
No. of Observations 32		Adjusted R Squared 0.995		Root MSE 0.086	

Table-4
Testing the established inequality in case of total expenditure

\prod_Y^R	\prod_E^Y	E*	R*	$E^* \cdot \frac{1}{\prod_E^Y}$	\prod_Y^R	$E^* \cdot \frac{1}{\prod_E^Y} - R^* \cdot \prod_Y^R$	E*-R*	Result
1.0367	1.0398	0.162	0.1073	0.1559	0.111	0.0446	0.055	valid

Since E^*-R^* is greater than $E^* \cdot \frac{1}{\prod_E^Y} - R^* \cdot \prod_Y^R$ inequality holds good for this kind of expenditure. As such any decrease in total expenditure of central Government will actually end up with decrease in g that is fiscal deficit to GDP ratio will decrease.

Revenue expenditure: The revenue expenditure elasticity of GDP is estimated by log linear regression model

$$\ln(y) = \alpha + \beta \ln(RE) \quad (1.3)$$

Table-5 shows the results of above regression for chosen period of 32 years.

The value of B coefficient estimated is 0.9447 implying that revenue expenditure elasticity of GDP ie, $\prod_{RE}^Y = 0.9447$. A one percent increase in revenue Expenditure will lead to less than one percent increase in GDP. To examine the validity of inequality Table-6 presents the necessary values in summarized form.

The results of above Table show that inequality does not hold good and we have E^*-R^* is less than $E^* \cdot \frac{1}{\prod_{RE}^Y} - R^* \cdot \prod_Y^R$ that implies $\frac{dg}{dE} > 0$. in other words if revenue expenditure is decreased it will lead to decrease in g or ratio of fiscal deficit to GDP.

Capital expenditure: Responsiveness of GDP to this kind of Expenditure is estimated by running the log linear regression model

$$\ln(y) = \alpha + \beta \ln(CE) \quad (1.4)$$

Results are presented in Table-7 so as to obtain for \prod_{CE}^Y

Table 7 shows that a 1 percent increase in capital expenditure leads to more than one percent (1.48) increase in GDP and vice versa and adjusted R - square is also high (0.95). Value for \prod_{CE}^Y is 1.48 . With regard to holding of inequality important values are summarized in Table-8.

Table-5
Estimated results for responsiveness of GDP to Revenue expenditure

LnY	Coefficient	Std. Error	T	P	95% Conf. Interval
Lnre	0.945	0.0108	86.93	0.00	0.9226 0.9669
Cons	2.442	0.0798	30.57	0.00	2.2791 2.6055
No. of Observations 32		Adjusted R Squared 0.995		Root MSE 0.0782	

Table-6
Testing the established inequality in case of Revenue expenditure

\prod_Y^R	\prod_{RE}^Y	E^*	R^*	$E^* \cdot \frac{1}{\prod_{RE}^Y}$	$R^* \cdot \prod_Y^R$	$E^* \cdot \frac{1}{\prod_E^Y} - R^* \cdot \prod_{RE}^Y$	E^*-R^*	Result
1.0367	0.9447	0.1418	0.107	0.1501	0.111	0.03876	0.034	Not valid

Table-7
Estimated results for responsiveness of GDP to Capital expenditure

LnY	Coefficient	Std. Error	T	P	95% Conf. Interval
Lnce	1.483	0.0627	23.62	0.00	1.3549 1.6115
Cons	0.352	0.3813	0.92	0.36	-0.4263 1.1312
No. of Observations 32		Adjusted R Squared 0.947		Root MSE 0.281	

Table-8
Testing the established inequality in case of Capital expenditure

\prod_Y^R	\prod_{CE}^Y	E^*	R^*	$E^* \cdot \frac{1}{\prod_{CE}^Y}$	$R^* \cdot \prod_Y^R$	$E^* \cdot \frac{1}{\prod_E^Y} - R^* \cdot \prod_{CE}^Y$	E^*-R^*	Result
1.0367	1.4832	0.1418	0.1073	0.1025	0.1113	-0.0085	0.045	valid

As inequality stands to be valid as per data it implies any decrease in capital expenditure will lead to a proportionately more decrease in GDP than in fiscal deficit as such fiscal deficit to GDP ratio will increase on the whole. So going for cut in the capital expenditure component of the central government may not lead to goal of fiscal deficit to GDP ratio decrease.

Development Expenditure (DE): This kind of expenditure is of utmost importance for a developing country like India and this view is strengthened further by the regression results of log linear model

$$\ln(y) = \alpha + \beta \ln(DE) \quad (1.5)$$

Results (Table-9) of which show that a one per cent increase in development expenditure leads to more than one per cent increase in GDP ie $\Pi_{DE}^Y = 1.9$. Further to check the validity of inequality $\{E^* \cdot \frac{1}{\Pi_E^Y} - R^* (\Pi_Y^R)\} < E^* - R^*$ necessary values are presented in Table-10 showing that it holds well in Indian

economy. From this one could infer that there is little scope to decrease this kind of expenditure in order to bring out the fiscal consolidation.

Non-Development expenditure (NDE): Responsiveness of this non-development expenditure which includes interest payments also is estimated through log linear model

$$\ln(y) = \alpha + \beta \ln(NDE) \quad (1.6)$$

results of which are presented in Table-11

With adjusted R-Square equal to 0.99 the value of Π_{NDE}^Y comes out to be equal to 0.98 implying that a one percent increase in this kind of expenditure leads to less than one percent increase in GDP(y). Further on checking the inequality using relevant variables for this kind of expenditure as presented in Table-12 it is found that inequality holds good in this case as such decrease in this may also not lead to a desirable effect upon the fiscal deficit to GDP ratio.

Table-9
Estimated results for responsiveness of GDP to Development expenditure

LnY	Coefficient	Std. Error	T	P	95% Conf. Interval
Lnde	1.091	0.025	42.67	0.00	1.0391 1.1436
Cons	1.813	0.177	10.23	0.00	1.4516 2.1757
No. of Observations 32		Adjusted R Squared 0.983		Root MSE 0.158	

Table-10
Testing the established inequality in case of Development expenditure

\prod_Y^R	\prod_{DE}^Y	E*	R*	$E^* \cdot \frac{1}{\prod_{DE}^Y}$	$R^* \cdot \prod_Y^R$	$E^* \cdot \frac{1}{\prod_{DE}^Y} - R^* \cdot \prod_Y^R$	$E^* - R^*$	Result
1.0367	1.0913	0.0304	0.1073	0.1025	0.0278	-0.0834	-0.07696	valid

Table-11
Estimated results for responsiveness of GDP to Non Development expenditure

LnY	Coefficient	Std. Error	T	P	95% Conf. Interval
Lnde	0.988	0.011	85.79	0.00	0.9649 1.011
Cons	2.519	0.080	31.47	0.00	2.355 2.682
No. of Observations 32		Adjusted R Squared 0.995		Root MSE 0.079	

Table-12
Testing the established inequality in case of Non Development expenditure

\prod_Y^R	\prod_{NDE}^Y	E*	R*	$E^* \cdot \frac{1}{\prod_{NDE}^Y}$	$R^* \cdot \prod_Y^R$	$E^* \cdot \frac{1}{\prod_{NDE}^Y} - R^* \cdot \prod_Y^R$	$E^* - R^*$	Result
1.0367	0.988	0.080	0.107	0.0818	0.111	-0.02948	-0.0266	valid

Revenue Expenditure less interest payments: To have an idea about responsiveness of GDP revenue expenditure we estimate the equation

$$\ln(y) = \alpha + \beta \ln(RINT) \quad (1.7)$$

The results of which are presented in Table-13.

Estimated value of β coefficient comes out to be less than one with adjusted R square equal to 0.99 implying thereby that one percent increase leads to less than one percent increase in GDP or simply $\Pi_{RINT}^Y = 0.967$

Table-14 reveals that inequality under consideration is valid for this kind of expenditure as such its decrease may not lead to decrease in fiscal deficit to GDP ratio.

Total Expenditure less interest component: Elasticity of GDP with respect to this kind of expenditure is estimated by running the log linear model

$$\ln(y) = \alpha + \beta \ln(EINT) \quad (1.8)$$

results of this regression for chosen period are presented in Table-15.

As revealed by result Table $\Pi_{EIN}^Y = 1.081$ implying thereby that one percent increase in total expenditure less interest payment leads to more than one per cent increase in GDP. Other figures to check the validity of Inequality for this kind of expenditure are summarized in Table-16. Again inequality holds good implying that reducing this kind of expenditure will mean $\Pi_Y^E < 1$. As such any decrease in this kind of expenditure will ultimately result in increase in fiscal deficit to GDP ratio.

Table-13
Estimated results for responsiveness of GDP to Revenue expenditure less interest payments

LnY	Coefficient	Std. Error	T	P	95% Conf. Interval
Lnrint	0.967	0.015	63.26	0.00	0.9362 0.998
Cons	2.613	0.107	24.40	0.00	2.394 2.832
No. of Observations 32		Adjusted R Squared 0.992		Root MSE 0.1073	

Table-14
Testing the established inequality in case of Revenue expenditure less interest payments

\prod_Y^R	\prod_{RINT}^Y	E*	R*	$E^* \cdot \frac{1}{\prod_{RINT}^Y}$	$R^* \cdot \prod_Y^R$	$E^* \cdot \frac{1}{\prod_{RINT}^Y} - R^* \cdot \prod_Y^R$	E*-R*	Result
1.0367	0.9674	0.107	0.107	0.11074	0.1113	-0.0005	-0.0002	Valid

Table-15
Estimated results for responsiveness of GDP to Revenue expenditure less interest payments

LnY	Coefficient	Std. Error	T	P	95% Conf. Interval
Lneint	1.081	0.019	56.21	0.00	1.0423 1.1209
Cons	1.421	0.141	10.05	0.00	1.1324 1.7103
No. of Observations 32		Adjusted R Squared 0.990		Root MSE 0.120	

Table-16
Testing the established inequality in case of Total expenditure less interest payments

\prod_Y^R	\prod_{EIN}^Y	E*	R*	$E^* \cdot \frac{1}{\prod_{EIN}^Y}$	$R^* \cdot \prod_Y^R$	$E^* \cdot \frac{1}{\prod_{EIN}^Y} - R^* \cdot \prod_Y^R$	E*-R*	Result
1.0367	1.0816	0.1274	0.1073	0.1178	0.1113	0.0065	0.0201	valid

Conclusion

From above analysis, it is obvious that in Indian context we have empirical evidence, using annual data for a period of 32 years (1980-81 to 2011-12), for significant elasticities of national income with respect to various kinds of public expenditures. Also government revenues have shown high elasticity with national income with fairly high value for adjusted R square. Since the inequality established holds for various kinds of expenditures including revenue expenditures less interest payment but does not hold good for revenue expenditures including interest payment it implies that there is scope for bringing down the fiscal deficit to GDP ratio through reduction in interest payments. Reducing any other kind of expenditure will ultimately result in increase in fiscal deficit to GDP ratio as has been proved by validity of inequality in various kinds of expenditures. So any idea of bringing about the fiscal consolidation through reduction in public expenditure should be preceded by an analysis of responsiveness of national income to various kinds of expenditures through Keynes –Kahn multiplier. Presence of higher elasticity is indicative of the fact that reducing any such component will ultimately result in higher fiscal deficit to GDP ratio by bringing larger proportionate decrease in national income. As empirical verification for Indian economy proves it Indian planners need to desist from their decision of decreasing public expenditure at this stage.

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