

## Time Series Analysis of Indian External Debt, Total Reserves and Economic Growth Rates



### Economics

**KEYWORDS :** External debt, economic Growth, Total Reserve, short run external debt, long run external debt.

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### ABSTRACT

*This paper assesses the impact of total external debt, short term external debt, long term external debt and total reserve on economic growth by using time series data from 1980 to 2012 in case of India. According to ordinary least square method there is positive and significant impact of total external debt, short term external debt, long term external debt and total reserve on economic growth in India.*

### INTRODUCTION-

Sustainable economic growth is main objective of all economies mainly for developing economies like India, Pakistan, Bhutan, Nepal etc. These developing countries are facing the problems of fiscal deficit, high current account deficit, higher level of external debt, higher rate of inflation etc. researcher have to focus to explain the way through which external debt, and total reserve can possibly effect the economic growth. There are two competing hypothesis first debt overhang theory and second liquidity constrain hypothesis. Various studies try to explain the validity of these two hypotheses with different data and different analytical tools. This paper is also exploring that weather there any direct impact of external debt and total reserve on economic growth in India is a developing country. India position was fourth in terms of absolute external debt stock after China, Russian federation and Brazil in 2011. The ratio of India's external debt stock to gross national income is 18.3 percent. The external debt to GDP ratio was 17.3 percent at the end of 2011. The maturity pattern of debt indicates dominance of long term borrowings. At end September 2013 India's total external debt was 400.3 US\$ billion. The share of short term debt to total external debt decreased to 23.7 percent end September 2013. the ratio of short term external debt to foreign exchange reserve was 34.2 percent at end september 2013 as against 33.1 percent at end march 2013.

### REVIEW OF LITERATURE-

There are many studies which explain the effect of external debt on economic growth .some studies found that there is negative impact of external debt on economic growth while some shows that there is positive impact of external debt on economic growth. Some studies are based on time series data where as some are based on panel data. Some studies used simple regression analysis where as some are used granger causality test and co-integration test for analysis purpose.

Chowdhary (1994), examine the controversy of cause and effect relationship between external debt and economic growth with use of granger causality test. The study is based on Asian and pacific countries over a period of 1970 to 1980. The study found the both public and private external debt has very small impact on economic growth.

Were (2001), analyse the debt overhang problem of Kenya. The study finds evidence for its impact on economic growth with time series data from 1970 to 1995. The results show that there is not any adverse impact of debt servicing on economic growth.

Adepoju et al. (2007), examine the time series data for Nigeria. The study is based on time period from 1962 to 2006. The analysis reveals that accumulation of external debt effects the economic growth in Nigeria.

Hameed et al. (2008), studied the dynamic effect of external debt servicing, capital stock and labour force on economic growth in case of Pakistan based on time series data from 1970 to 2003. The study concludes that there is an adverse effect of external debt servicing on labour and capital productivity which effect the economic growth.

Bults (2009), examine the causal relationship between short term external debt and economic growth. The study is based on 27 Latin American and Caribbean countries over period of 1970 to 2003. The study concludes that there is evidence of granger causality in all these countries.

Pattillo, Ricci and Poirson (2002), examine the nonlinear impact of external debt with the use of panel data analysis. The study is based on 93 countries over a period of 1969 to 1998 with econometrics analysis. The study found that average impact of debt become negative at about 167-170 percent of export of 35-40 percent of GDP.

Karagol (2003), investigate the long run impact of external debt on gross national product in case of Turkey with use of multivariate co-integration technique and vector error correction model. The study analyse unidirectional negative relationship between these two variables.

Most of research done in this area based on broad time series data set. Few studies shows the country specific analysis. Most of studies show that higher external debt negative effect to economic growth.

### OBJECTIVE OF THE STUDY

1. To examine the impact of total external debt on economic growth in India.
2. To analyse the impact of short run external debt and long run external debt on economic growth in India.
3. To examine the impact of total reserve on economic growth in India.

### HYPOTHESIS

H1: Indian total external debts have significant impact on Indian economic growth rates.

H1a: Indian short term external debts have significant impact on Indian economic growth rates.

H1b: Indian long term external debts have significant impact on Indian economic growth rates.

H2: Indian total reserves have significant impact on Indian economic growth rates.

### METHODOLOGY

The study is based on secondary data. Annual time series data collected from World Bank. Study covers the period from 1980 to 2012. Ordinary least square method has been used for analysis purpose. Study based on these three models. To solve the problem of high variance all the variables are taken in the log form.

### Model 1

$$\text{LN GDP} = a + b_0 \text{LN SHORT} + b_1 \text{LN LONG} + \mu$$

Where

LN GDP= Log Value of Gross Domestic Product

LN SHORT= Log value of short run external debt

LN LONG =Log value of long run external debt

a, b0,b1 = coefficients

**μ=Error Term**

**Model 2**

LNGDP = a + b0 LNTORES + μ

Where

LNGDP= Log Value of Gross Domestic Product

LNTORES =Log value of total Reserve

a, b0,b1 = coefficients

**μ=Error Term**

**Model 3**

LNGDP = a + b0 LNTOEXDT + μ

Where

LNGDP= Log Value of Gross Domestic Product

LNTOEXDT =Log value of total External Debt

a, b0, b1 = coefficients

**μ=Error Term**

**RESULTS OF EMPIRICAL ANALYSIS-**

**Model 1**

**Table-1 Results of model 1.**

variable	Coefficient	Std. Error	t-Statistic	Prob.
Cons	-6.1295	0.8619809	-7.11	0.000
LNSHORT	0.0855243	0.0368904	2.32	0.027
LNLONG	0.4159022	0.0552967	7.52	0.000
No of observation	33			
F(2 ,30)	131.33			
Prob.>F	0.000			
R Squared	0.8975			
Adj. R squared	0.8907			
Root Mean Squared	0.13477			
Durbin Watson d-statistic	0.1204343			

LNGDP = -6.1295 + 0.0855243LNSHORT + 0.4159022 LNLONG

The Table 1 shows the results of regression analysis of model no 1. In model 1 the dependent variable is log value of gross Domestic product and independent variables are log value of short term external debt and log value of long term external debt. Results show that both the variables are significant at 5 percent level of significant because the probability value is less than .05. It shows that both short and long run external debt have significant impact on gross domestic product. Results shows high value of R squared which indicate that model is good fit. In this model value of R Square is 0.8975 it indicate that 89.75 percent of variation in GDP is explained by both short and long run external debt.

**MODEL 2**

**Table-2 Results of model 2.**

variable	Coefficient	Std. Error	t-Statistic	Prob.
Cons	-.6604186	0.3367667	-1.96	0.059
LNTORES	0.2849	0.0138667	20.55	0.000
No of observation	33			
F(1 ,31)	422.32			
Prob.>F	0.000			
R Squared	0.9316			
Adj. R squared	0.9294			
Root Mean Squared	0.10828			
Durbin Watson d-statistic	0.3566614			

LNGDP = -.6604186 + 0.2849 LNTORES

The Table 2 shows the results of regression analysis of model no 2. In model 2 the dependent variable is log value of gross Domestic product and independent variable is the log value of total reserve in India. Results show that the variable is significant at 5 percent level of significant because the probability value is less than .05.It shows that total reserve have significant impact on gross domestic product. Results shows high value of R squared

which indicate that model is good fit. In this model value of R Square is 0.9316. It indicates that 93.16 percent of variation in GDP is explained by total reserve.

**MODEL 3**

**Table-3 Results of model 3.**

variable	Coefficient	Std. Error	t-Statistic	Prob.
Cons	-14.0033	2.633913	-5.32	0.000
LNTOEXDT	0.8347588	0.1085483	7.69	0.000
No of observation	33			
F(1 ,31)	59.14			
Prob.>F	0.000			
R Squared	0.6561			
Adj. R squared	0.6450			
Root Mean Squared	0.24284			
Durbin Watson d-statistic	0.0970783			

LNGDP = -14.0033 + 0.8347588 LNTOEXDT

The Table 3 shows the results of regression analysis of model no 3. In model 3 the dependent variable is log value of gross Domestic product and independent variable is the log value of total external debt in India. Results show that the variable is significant at 5 percent level of significant because the probability value is less than .05.It shows that total external debt have significant impact on gross domestic product. In this model value of R Square is 0.6561. It indicates that 65.61 percent of variation in GDP is explained by total external debt.

**CONCLUSION-**

The study analyse that how external debt affects to economic growth in India. The study tries to investigate the linkage between economic growth and external debt by using the time series data of total external debt and total reserve.

The results indicate that there is positive impact of short and long term external debt on gross domestic product. The study indicate that total reserve and total external debt are positively and significantly affect the economic growth in India

**APPENDIX**

Year	GDP	Externaldebtshortrun	Externaldebtlongrun	Totalreserve	Totalexternaldebt
1980	291.816	1.30E+09	1.90E+10	1.20E+10	1.60E+10
1981	302.362	1.60E+09	2.00E+10	8.10E+09	1.60E+10
1982	305.882	2.40E+09	2.20E+10	8.20E+09	1.60E+10
1983	320.92	3.30E+09	2.40E+10	8.20E+09	1.70E+10
1984	325.878	3.70E+09	2.60E+10	8.50E+09	1.70E+10
1985	335.547	4.40E+09	3.20E+10	9.50E+09	2.00E+10
1986	344.003	4.90E+09	3.80E+10	1.00E+10	2.10E+10
1987	350.027	5.70E+09	4.60E+10	1.20E+10	2.50E+10
1988	375.671	6.40E+09	5.30E+10	9.20E+09	2.50E+10

1989	389.813	7.50E+09	6.70E+10	8.00E+09	3.60E+10
1990	403.09	8.50E+09	7.40E+10	5.60E+09	4.00E+10
1991	399.327	7.10E+09	7.60E+10	7.60E+09	3.90E+10
1992	413.109	6.30E+09	7.90E+10	9.50E+09	4.10E+10
1993	424.581	3.60E+09	8.50E+10	1.50E+10	4.20E+10
1994	444.483	4.30E+09	9.10E+10	2.40E+10	4.50E+10
1995	469.47	5.00E+09	8.80E+10	2.30E+10	4.40E+10
1996	495.914	6.70E+09	8.70E+10	2.50E+10	4.20E+10
1997	506.979	5.00E+09	8.90E+10	2.80E+10	3.90E+10
1998	529.098	4.30E+09	9.40E+10	3.10E+10	4.10E+10
1999	566.199	3.90E+09	9.50E+10	3.60E+10	4.50E+10
2000	578.217	3.50E+09	9.70E+10	4.10E+10	3.90E+10
2001	596.248	2.70E+09	9.60E+10	4.90E+10	3.70E+10
2002	609.039	4.10E+09	1.00E+11	7.20E+10	4.00E+10
2003	646.654	6.30E+09	1.10E+11	1.00E+11	4.30E+10
2004	687.306	6.90E+09	1.20E+11	1.30E+11	4.40E+10
2005	740.114	8.80E+09	1.10E+11	1.40E+11	4.10E+10
2006	797.258	2.50E+10	1.30E+11	1.80E+11	4.30E+10
2007	863.463	3.60E+10	1.70E+11	2.80E+11	4.50E+10
2008	885.171	4.40E+10	1.80E+11	2.60E+11	4.70E+10
2009	947.746	4.70E+10	2.00E+11	2.80E+11	4.80E+10
2010	1034.24	5.60E+10	2.30E+11	3.00E+11	5.20E+10
2011	1085.73	7.80E+10	2.50E+11	3.00E+11	5.50E+10
2012	1106.79	9.30E+10	2.80E+11	3.00E+11	5.40E+10

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