Pattern of External Debt and its Impact on Macroeconomic Variables in India

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Abstract: External debt and its interest payments are important source of capital outflow from the economy. For developing nations like India it is important to make sure that capital is not flowing outward excessively such a way that it will drain out domestic savings and investments in the country. This paper shows the pattern of external debt in India since 1980s and verifies the impact of external debt on macroeconomic indicators. Annual time series data for the period 1980 to 2017 is used from the secondary sources. Time series properties have been checked with Augmented Dickey-Fuller Test and results are confirmed with Phillips-Perron Unit Root Test. Johansen co-integration techniques were used to check the long run relationship between the variables. Vector Error Correction Model (VECM) and Granger Causality test were used to observe short run and long run relationship. Fully Modified Ordinary Least Squires (FMOLS) techniques were used to find the long run coefficients of external debt on key macro variables. The co-integration results show that there is long run co-integrating relationship among the variables. The long run coefficients suggests that external debt is significantly and positively influencing inflation where as it is significantly and negatively influencing non-developmental expenditure. Similarly, external debt servicing coefficient emerged to be positive and significant for non-developmental expenditure, gross domestic savings and exports, and negative significant for inflation. There is a need to check external debt service and directing external debt for developmental spending in order to have desired effects of external debt.

Key Words: External Debt, developmental expenditure, Inflation, FDI inflow, Johansen Co-integration.

JEL Classification Codes: F34, H60, C32

INTRODUCTION

External debt is one of the important source to finance increasing state activities and deficit in developing nations like India. But it is also a source of outflows of domestic capital to foreign lender, unless care is taken for its appropriate use. Accumulation of debt is defined as a result of balance between cumulated primary deficits and cumulated weighted excess of growth of interest rate (Rangarajan and Srivastava, 2003). Sometimes it is not the debt but debt servicing matters for countries (Ghosh, 1993). For developing countries it is observed that a portion of rising external debt is also procured by debt service payments. Also a portion, may be higher than debt service is taken by process of procuring new external fund which is explained as roll-over process (Dhonte, 1975). During 1985-89 period India's external debt rate increased by a compound rate of 21 percentage per annum. Rate of growth of external debt was accelerated due to high interest payment burden, higher repayment and depreciation of Indian rupee (EPW, 1989). India had witnessed serious external debt and debt service problems before 1991 crisis period. Instead export promotion activities was not successful for many reasons . Financial market borrowings must be considered to tackle external resource gap (Verghese and Varghese, 1988). A study of debt, deficit and inflation suggest measures to tackle primary deficit is unavoidable because even maximum use of inflation taxing will not solve solvency problem for India (Buiter and Patel, 1992).

Current account deficit was an important cause of 1991 currency crisis of India.

Higher external debt servicing also significantly caused the crisis indirectly (Cerra and Saxena, 2002). Strengthening exports and domestic savings could tackle external debt issues of India (Bajpai, 1994). There is a financial revolving door relationship between capital flight and external debt in India (Chipalkatti and Rishi, 2001). Data from 1980 to 2011 reveals that India's growth is affected by central government debt, growth of Total Factor Productivity and debt servicing in the short run (Bal and Rath, 2014). Sometimes it is not the external debt but domestic debt has significant influence of economic growth (Singh, 1999). Switching towards more domestic borrowings from external loans can reduce the risk (Panizza, 2008). Analysis conducted for India for the period 1980 to 2017 to estimate the impact of various type of public debt on investment, interest rate, inflation and economic growth. No long-run relationship between variables have identified. But impulse response function captures short run relationship between variables. Public debt especially domestic debt should be administered strictly and used more efficiently in order to favour the economic growth of the country (Mohanty et al., 2019).

In another study external debt is found to be positive and significantly influencing economic growth of developing Asia. But at the same time debt servicing is affecting contribution of investment (Siddiqui and Malik, 2001). External debt causes real transfers of resources to increase from developed world to developing world. This will improve growth and welfare of developing world. But South Asians countries including India has utilised this opportunity but failed to utilise it in a very productive way. Since most of its debt are in much subsidised rate, external debt and debt servicing are not at very higher levels. But prevalence of current trend will bring these South Asian countries in to burden of debt and debt servicing (Chaudhary et al., 2001). Ahmed et al. (2000) through Granger Causality test suggest that for South Asian countries no significant Granger Causality test run from, foreign loan to economic growth except for the case of India where foreign loan is significantly increasing economic growth.

Even though much sophisticated analysis were carried out on India's external debt, there are sparse studies analysis the pattern of external debt in Indian context. Besides there are limited studies those addresses impact of external debt on key macroeconomic indicators. The purpose of obtaining external debt is always either to finance developmental activities or for some export promotion activities. Sometimes excess external debt aggravates key macroeconomic indicators including inflation. In this context, the main objectives of this paper are (i) to verify the pattern of external debt and other related macroeconomic variables and (ii) to analyse the relationship between external debt, developmental expenditure, gross domestic capital formation, export and inflation.

The paper further proceeds by explaining the data and methodological framework applied in this study in the section 2 and then empirical analysis and results were discussed in section 3 and section 4 concludes the analysis.

DATA AND METHODOLOGY

Annual data have been collected for the period 1980 to 2017 from data base of Reserve Bank of India (RBI) and World Bank and Indian Public Finance Statistics. Key variables considered for the analysis are external debt, external debt service, gross domestic capital formation, gross savings, developmental expenditure, non-developmental expenditure, export, GDP deflator as a proxy for inflation and Foreign Direct Investment inflow.

Five year average of variables have been taken to control the yearly fluctuation and check the pattern of variables over the time. Augmented Dickey-Fuller Test and Phillips-Perron Unit Root Test have been used to check the time series properties of the variables. Johansen co-integration test has been used to check the long run relationship among the variables.

Vector Error correction model (VECM) is used to capture the short run dynamics of the variables. Granger causality test is applied to understand the short run relationship among the variable which is a modified version of estimates presented by Granger (1969).

Fully Modified Ordinary Least Squares (FMOLS) technique was used to measure the long run coefficient of impact of external debt and debt service on key macroeconomic variables such as development and non-developmental expenditures,

inflation, gross domestic savings and exports. The general functional relationship considered for of FMOLS equation are;

$$nde = f(exdbtser. exdbt, fdiin, gdcf, gdpde, exp) \qquad (1)$$

$$exp = f(exdbtser + exdbt, de, gdcf, gdpde, fdiin) \qquad (2)$$

$$gdpde = f(exdbtser, exdbt, fdiin, gdcf, de, exp) \qquad (3)$$

$$gds = f(exdbtser, exdbt, fdiin, de, gdpde, exp) \qquad (4)$$

$$de = f(exdbtser, exdbt, fdiin, gdcf, gdpde, exp) \qquad (5)$$

Where; exdbt: external debt, edbtSer: External Debt Service, gdcf: Gross Domestic Capital Formation, gds: Gross Domestic Savings, D.E: developmental expenditure, NDE: Non-developmental expenditure, exp: export, gdpde: GDP deflator, fdiin: FDI Inflow. All series except gdpde is taken as percentage to GDP. These notations were used for representing the respective variables throughout the study.

PATTERN OF EXTERNAL DEBT IN INDIA

Analysis of pattern of external debt and related variables will provide the dynamics of change of variable over time and their direction of change. Table 1 shows the five year average of the variables as percentage to GDP over time. Five year average is considered for the analysis to avoid the yearly fluctuations in the data.

Table 1: Pattern of External Debt of India

| Year	exdbt	edbtser	gdcf	gds	d.e	nde	exp	gdpde	fdiin
1980-1984	35.06	5.12	21.07	14.12	1.85	1.55	6.10	27.17	0.03
1985-1989	33.66	15.36	24.32	17.19	3.20	2.44	5.88	25.55	0.06
1990-1994	33.90	28.86	26.25	22.91	4.21	3.98	8.92	30.73	0.14
1995-1999	24.30	20.90	27.94	24.67	5.11	6.10	10.99	46.15	0.64
2000-2004	20.00	13.66	29.62	26.44	6.23	8.14	14.68	57.33	0.85
2005-2009	18.16	5.96	39.94	32.73	8.49	9.37	21.48	74.42	2.30
2010-2014	21.90	5.96	37.38	32.55	12.70	12.10	24.02	106.62	1.64
2015-2017	21.30	8.20	30.92	30.14	16.80	18.82	19.43	124.93	2.02

Source: Authors' calculation.

External debt was at higher level before liberalisation. External debt as percentage of GDP was 35.06% during 1980-84, which has declined to a level of 21.30% during

2015-17. External debt servicing as percentage to GDP was only at 5.12% during 1980-84 and it reached to a higher level of 28.86% in the period 1990-94. At current level, external debt servicing is around 8% of GDP which is very high. After 1994 it can be observed that both external debt and debt servicing are controlled, still external debt is in higher side.

Gross domestic savings and gross domestic capital formation have increased from 14.12% and 21.07% respectively during 1980-1984 to 30.14% and 30.92% respectively in 2015-2017 which indicate a slow but stable growth among the variables over the period. Developmental expenditure was higher than non-developmental expenditure in pre-liberalisation period. But it reversed in postliberalisation period. But real growth of both development and non-developmental expenditure are good. Exports levels also improved over the period but it is not a rapid improvement. Foreign Direct Investment (FDI) inflow is almost stagnant prior to 2005 and slightly improved after that.

Figure 1: Pattern of India's External Debt
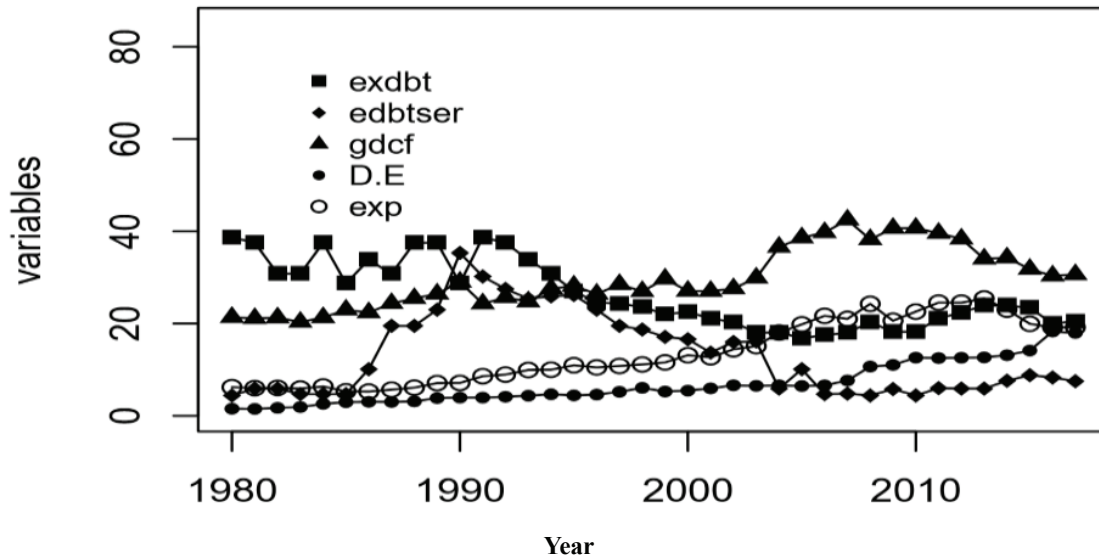
Source: Authors' Calculation, Plotted using R:::plot()

Figure 1 shows the movement of external debt and related variables over time. The figure shows how the pattern of macro variables change before and after liberalisation. Higher external debt, debt service and lower domestic capital formation were clustered in a point in 1991. After that it can be observed that significant reduction in external debt and debt service and significant improvement in gross domestic capital formation have taken place.

From figure 1, it is observed that the gross capital formation follows a negative pattern corresponding to the pattern of external debt and debt servicing.

EMPIRICAL RESULTS

In this section an attempt is made to empirically verify the relationship between the variables under consideration. Stationarity of the variable have been checked before proceeding to other estimations. Further, long-run relationship and short run dynamics of the variables have been verified using Johansen co-integration analysis and Vector Error Correction model respectively. Granger Causality test is carried out to see the direction of short run relationship among the variables. FMOLS coefficients were further used to explain the impact of external debt and debt service over key macroeconomic variables.

UNIT ROOT ANALYSIS

Stationarity of the variables were checked using Augmented Dickey-Fuller Test and results were confirmed with Phillips-Perron Unit Root Test. Results of unit root analysis are provided in the Table 2. Results confirm that variables are non-stationary at level and stationary at first difference. Hence the order of integration of the variables are I(1). Then the appropriate analysis for verifying long long run relationship is to examine the co-integrating relationship among the variables.

Table 2: Unit Root Test

| | Variables at level | | | | First Difference of Variables | | | |
| | ADF Test | | PP Test | | ADF Test | | PP Test | |
Variable	Stat	P.Val	Stat	P.Val	Stat	P.Val	Stat	P.Val
exdbt	-1.56	0.75	-14.07	0.24	-8.78	0.01	-47.39	0.01
edbtSer	-2.66	0.32	-5.22	0.80	-6.07	0.01	-40.67	0.01
gdcf	-1.94	0.60	-12.44	0.34	-6.47	0.01	-37.99	0.01
gds	-2.94	0.21	-12.99	0.30	-6.19	0.01	-43.67	0.01
D.E	0.09	0.99	-1.22	0.98	-6.06	0.01	-44.32	0.01
NDE	-0.86	0.95	-1.75	0.97	-5.07	0.01	-37.31	0.01
exp	-2.17	0.51	-7.85	0.63	-6.12	0.01	-43.28	0.01
GDPdef	-1.11	0.91	-2.03	0.96	-8.99	0.01	-56.17	0.01
fdiin	-3.37	0.08	-16.63	0.09	-6.88	0.01	-41.86	0.01

Source: Authors' calculation using R:::tseries::adf.test(), R:::tseries::pp.test()

CO-INTEGRATION

Johansen Co-integration test is used to check the long run relationship among the variables like external debt, external debt servicing, gross domestic capital formation, gross domestic savings, developmental expenditure, non-developmental expenditure, export, GDP deflator and FDI inflow. Trace statistics are reported in table 3 suggests five co-integrating relationship when maximum eigenvalue (table 4) suggests two co-integrating relationship at 5% level of significance. Findings suggest there is long run equilibrium relationship among the external debt, external debt servicing, gross domestic capital formation, gross domestic savings, developmental expenditure, non-developmental expenditure, export, GDP deflator and FDI inflow variables.

Table 3: Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.949409	337.4283	197.3709	0.0000
At most 1 *	0.874999	230.0053	159.5297	0.0000
At most 2 *	0.715104	155.1457	125.6154	0.0002
At most 3 *	0.641618	109.9430	95.7506	0.0037
At most 4 *	0.598078	73.00137	69.81889	0.0272
At most 5	0.358312	40.18744	47.85613	0.2159
At most 6	0.342067	24.21595	29.79707	0.1915
At most 7	0.143242	9.144484	15.49471	0.3522
At most 8	0.094632	3.578889	3.841466	0.0585

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level, **denotes rejection of the hypothesis at the 0.05 level, ***MacKinnon-Haug-Michelis (1999) p-values Source: Authors' Calculation using Eviews10

Table 4: Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.949409	107.4230	58.43354	0.0000
At most 1 *	0.874999	74.85967	52.26100	0.0001
At most 2	0.715104	45.20268	46.23142	0.0642
At most 3	0.641618	0.94162	40.07757	0.1082
At most 4	0.598078	32.81394	33.87687	0.0666
At most 5	0.358312	15.97149	27.58434	0.6683
At most 6	0.342067	15.07146	21.13162	0.2840
At most 7	0.143242	5.565595	14.26460	0.6694
At most 8	0.094632	3.578889	3.84146	0.0585

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level, ** denotes rejection of the hypothesis at the 0.05 level, ***MacKinnon-Haug-Michelis (1999) p-values Source: Authors' Calculation using Eviews10

VECTOR ERROR CORRECTION MODEL

Vector error correction model captures the short run dynamics among the variables.

Table 5 to table 10 reports normalised co-integrating vector and speed of adjustment parameters.

Table 5: Normalised co-integrating vector and the speed of adjustment parameters for developmental expenditure Normalized co-integrating coefficients (standard error in parentheses)

d e	edbtser	exdbt	exp	fdiin	gdcf	gdpdef
1	-0.0234***	0.0235	0.0822	2.2401***	-0.2382***	-0.1280***
	(-0.0108)	(-0.0226)	(-0.0949)	(-0.3522)	(-0.0543)	(-0.0124)
	[-2.1718]	[1.0424]	[0.8664]	[6.3597]	[-4.3875]	[-10.3528]
Adjustment coefficients (standard error in parentheses)						
-0.0348 0.6723	0.0123	-0.1044		-0.4029***	0.3381	1.7515***
(-0.1426)(-0.7226)	(-0.7434)	(-0.2016)		(-0.0624)	(-0.4546)	(-0.6442)
[-0.2442][0.9304]	[0.0165]	[-0.5180]		[-6.4546]	[0.7438]	[2.7187]

Note: *p<0.1; **p<0.05; ***p<0.01. standard error() and t value[] in the parenthesis respectively. Source: Authors' Calculation using Eviews10

Table 6: Normalised co-integrating vector and the speed of adjustment parameters for non-developmental expenditure. Normalized co-integrating coefficients (standard error in parentheses)

nde	edbtser	exdbt	exp	fdiin	gdcf	gdpdef
1	-0.1029***	0.0290	0.0806	-1.2598***	0.1181***	-0.1741***
	(-0.0119)	(-0.0228)	(-0.1063)	(-0.2633)	(-0.0598)	(-0.0168)
	[-8.6381]	[1.2724]	[0.7582]	[-4.7838]	[1.9737]	[-10.3837]
Adjustment coefficients (standard error in parentheses)						
-0.5434***	-1.2343	0.2053	0.7365***	0.1590	0.7603	-1.51389***
(-0.1432)(-0.8384)	(-0.8664)	(-0.1887)		(-0.1122)	(-0.5140)	(-0.7921)
[-3.7945][-1.4723]	[0.2369]	[3.9038]		[1.4174]	[1.4793]	[-1.9111]

Note: *p<0.1; **p<0.05; ***p<0.01. standard error() and t value[] in the parenthesis respectively.
Source: Authors' Calculation using Eviews10

After normalising the developmental expenditure, the co-integrating relationship suggests that, external debt, export and FDI inflow exhibits a positive relationship where only FDI inflow is statistically significant. On the other hand external debt service, gross domestic capital formation and inflation (GDP deflator) shows a statistically significant negative relationship which means an increase in these variables will bring down the developmental expenditure of the country. From the speed of adjustment parameter, it is evident that inflation corrects the short run disequilibrium more quickly than other variables and then FDI inflow (see table 5).

The non-developmental expenditure being normalised, it's identified that external debt, export, gross domestic product have a positive co-integrating relationship where external debt and export are not significant. External debt service, FDI inflow and inflation are found to be significantly and negatively co-integrated to non-developmental spending. Speed of adjustment parameters identified that inflation and then external debt service corrects the short run disequilibrium more quickly (see table 6).

Inflation(GDP deflator) being normalised, external debt service and gross domestic capital formation have a positive significant relationship which means when these variables increase, inflation also goes up. On the other hand, external debt, export, FDI inflow and developmental expenditure have a negative co-integrating relationship with normalised inflation in which coefficient of external debt is not significant. Inflation is correcting the short run disequilibrium more quickly.

Table 7: Normalised co-integrating vector and the speed of adjustment parameters for GDP deflator Normalized cointegrating coefficients (standard error in parentheses)

gdpdef	edbtser	exdbt	exp	fdiin	gdcf	d e
1	0.1831***	-0.1837	-0.6421	-17.4938***	1.8600***	-7.8092***
	(-0.0913)	(-0.1709)	(-0.5688)	(-2.5556)	(-0.3947)	(-0.5677)
	[2.0043]	[-1.0746]	[-1.1288]	[-6.8453]	[4.7124]	[-13.7558]
Adjustment coefficients (standard error in parentheses)						
-0.2243	-0.0861	-0.0016	0.0134	0.0516***	-0.0433	0.0045
(-0.0825)	(-0.0925)	(-0.0952)	(-0.0258)	(-0.0080)	(-0.0582)	(-0.0183)
[-2.7187]	[-0.9304]	[-0.0165]	[0.5180]	[6.4546]	[-0.7438]	[0.2442]

Note: *p<0.1; **p<0.05; ***p<0.01. standard error() and t value[] in the parenthesis respectively.
Source: Authors' Calculation using Eviews10

Table 8: Normalised co-integrating vector and the speed of adjustment parameters for gross domestic capital formation. Normalized co-integrating coefficients (standard error in parentheses.)

gdcf	edbtser	exdbt	exp	fdiin	gdpdef	d e
1	0.09843*	-0.098756	-0.345208	-9.4054***	0.5376***	-4.1985***
	(-0.0575)	(-0.1058)	(-0.2939)	(-1.6223)	-0.1060	-0.6694
	[1.7130]	[-0.9336]	[-1.1747]	[-5.7977]	[5.0702]	[-6.2723]
Adjustment coefficients (standard error in parentheses)						
-0.0805	-0.1601	-0.0029	0.0249	0.0960***	-0.4172***	0.0083
(-0.1083)	(-0.1721)	(-0.1771)	(-0.0480)	(-0.0149)	(-0.1534)	(-0.0340)
[-0.7438]	[-0.9304]	[-0.0165]	[0.5180]	[6.4546]	[-2.7187]	[0.2442]

Note: *p<0.1; **p<0.05; ***p<0.01. standard error() and t value[] in the parenthesis respectively. Source: Authors' Calculation using Eviews10

Table 8 shows the normalised co-integrating vector for gross domestic capital formation. Gross domestic capital formation being normalised, external debt servicee and inflation shows a positive long run co-integration where only inflation

is statistically significant. On the other hand external debt, export, FDI inflow and developmental expenditure shows a negative co-integrating relationship in which FDI inflow and developmental expenditure are significant which means when FDI inflow and developmental expenditure increases, gross domestic capital formation will go down. From the speed of adjustment parameter it is evident that gross domestic capital formation corrects the short run disequilibrium faster than other variables.

After normalising gross domestic savings it is found that there is a positive co-integrating relationship with external debt and inflation and they are significant at 5% level. Gross domestic savings being normalised, external debt service, export, FDI inflow and developmental expenditure have significant and negative co-integrating relationship. Gross domestic savings corrects the short run disequilibrium more quickly (seee table 9).

Table 9: Normalised co-integrating vector and the speed of adjustment parameters gross domestic savings Normalized cointegrating coefficients (standard error in parentheses)

gds	edbtser	exdbt	exp	fdiin	gdpdef	d e
1	-0.1047***	0.2718***	-0.6143***	-1.6889***	0.2812***	-2.1537***
	(-0.0229)	(-0.0386)	(-0.1128)	(-0.6121)	(-0.0397)	(-0.2611)
	[-4.7402]	[7.0454]	[-5.4458]	[-2.7590]	[7.0830]	[-8.2480]
Adjustment coefficients (standard error in parentheses)						
-0.2884	-0.1441	-0.5457	-0.0481	0.2428***	-0.1226	0.1092
(-0.1076)	(-0.4314)	(-0.4122)	(-0.1298)	(-0.0333)	(-0.4105)	(-0.0774)
[-2.6793]	[-0.3341]	[-1.3238]	[-0.3709]	[7.2896]	[-0.2987]	[1.4119]

0*Note:* *p<0.1; **p<0.05; ***p<0.01. standard error() and t value[] in the parenthesis respectively. Source: Authors' Calculation using Eviews10

Table 10: Normalised co-integrating vector and the speed of adjustment parameters for exports Normalized co-integrating coefficients (standard error in parentheses)

exp	edbtser	exdbt	fdiin	gdcf	gdpdef	d e
1	-0.2851*	0.2861	27.2455***	-2.8968***	-1.5574***	12.1623***
	(-0.1670)	(-0.2980)	(-4.2488)	(-0.4664)	(-0.2425)	(-1.8571)
	[-1.7070]	[0.9599]	[6.4124]	[-6.2111]	[-6.4214]	[6.5490]
Adjustment coefficients (standard error in parentheses)						
-0.0086	0.0553	0.0010	-0.0331***	0.0278	0.1440***	-0.0029
(-0.0166)	(-0.0594)	(-0.0611)	(-0.0051)	(-0.0374)	(-0.0530)	(-0.0117)
[-0.5180]	[0.9303]	[0.0165]	[-6.4546]	[0.7438]	[2.7187]	[-0.2442]

Note: *p<0.1; **p<0.05; ***p<0.01. standard error() and t value[] in the parenthesis respectively.

Source: Authors' Calculation using Eviews10

Table 10 explains the normalised co-integrating vector for exports. Export being normalised, external debt, FDI inflow and developmental expenditure have a positive co-integrating relationship in which coefficient of external debt is not significant. External debt service, gross domestic capital formation and inflation have a negative co-integrating relationship with export when it is normalised. Speed of adjustment parameter suggests that inflation is correcting the short run disequilibrium more quickly.

It is evident from our VECM analysis that it is not the external debt but external debt service which has a strong and significant long run impact on macroeconomic variables such as developmental expenditure, non-developmental expenditure, inflation, gross capital formation, gross domestic savings, FDI inflow and exports.

GRANGER CAUSALITY TEST

Granger causality test is employed to identify the short run granger causation between the variables. Significant relationships from the analysis are reported in the table 11.

Table 11: Granger Causality Test

Null Hypothesis.	F.Statistic	Prob.
EXDBT does not Granger Cause EXP	4.74	0.02
EXP does not Granger Cause GDCF	4.40	0.02
GDCF does not Granger Cause D E	3.03	0.06
GDCF does not Granger Cause EXP	4.03	0.03
GDCF does not Granger Cause FDIIN	4.55	0.02
GDCF does not Granger Cause GDPDEF	3.63	0.04
EXP does not Granger Cause D E	12.46	0.00
EXP does not Granger Cause NDE	2.86	0.07
EXP does not Granger Cause FDIIN	4.80	0.02
EXP does not Granger Cause GDPDEF	6.96	0.00
FDIIN does not Granger Cause D E	2.93	0.07
FDIIN does not Granger Cause EXP	10.05	0.00
FDIIN does not Granger Cause GDPDEF	3.71	0.04

Source: Authors' Calculation using Eviews10

A few granger causality reported in table 11 is quite interesting. Even though external debt is not causing exports in the long run, it's granger causing in the short run. Export is granger causing the gross domestic capital formation in the short run where as it is not the case for long run. Gross domestic capital formation is causing developmental expenditure, export, FDI inflow and Inflation in short run as well as in the long run. Export is causing inflation, development and non-developmental expenditure, FDI inflow and inflation in the short run where it is not the case of long run. FDI inflow is granger causing exports, inflation and developmental expenditure in the short run and long run.

FULLY MODIFIED ORDINARY LEAST SQUARES (FMOLS)

Long run co-integrating regression method is applied to check the long run impact of external debt and external debt service on the key macroeconomic variables such as non-developmental expenditure, gross domestic savings, inflation (GDP deflator), export and developmental expenditure. Results of FMOLS regression is reported in the table 12.

The FMOLS results suggests that external debt is significantly and positively influencing inflation where as it is significantly and negatively influencing non-developmental expenditure. External debt service has much more impact than external debt. External debt servicing has its positive and significant impact on non-developmental expenditure, gross domestic savings and exports whereas negative and significant impact on inflation.

Table 12: Fully Modified Ordinary Least Squires (FMOLS)

	Dependent Variable				
	nde	gds	gdpde	exp	de
edbtser	0.10***	0.18***	-0.43***	0.01	0.06***
	(0.02)	(0.03)	(0.08)	(0.03)	(0.02)
	[5.14]	[5.23]	[-5.34]	[0.23]	[3.40]
exdbt	-0.14***	-0.09	0.35***	0.01	0.04
	(0.03)	(0.06)	(0.17)	(0.05)	(0.03)
	[-4.30]	[-1.62]	[2.04]	[0.27]	[1.26]
exp	-0.28***	1.13***	2.11***		-0.31***
	(0.10)	(0.12)	(0.33)		(0.08)
	[-2.93]	[9.74]	[6.46]		[-3.73]
fdiin	0.77**	0.10	-3.68**	0.91*	0.88***
	(0.32)	(0.51)	(1.36)	(0.48)	(0.28)
	[2.39]	[-0.21]	[-2.70]	[1.90]	[3.13]
gdcf	-0.05		-0.40	0.52***	0.12**
	(-0.06)		(0.27)	(0.06)	(0.06)
	[-0.72]		[-1.46]	[8.82]	[2.11]
gdpde	0.18***	-0.12**		0.18***	0.17***
	(0.01)	(0.05)		(0.03)	(0.01)
	[15.41]	[-2.40]		[5.83]	[16.38]
de		0.15	2.23***	-0.67***	
		(0.23)	(0.63)	(0.22)	
		[0.63]	[3.51]	[-3.09]	
C	3.88***	12.29***	3.29	-8.84***	-4.54***
	(1.88)	(1.98)	(9.08)	(2.53)	(1.65)
	[2.06]	[6.20]	[0.36]	[-3.50]	[-2.75]
R sq	0.98	0.97	0.99	0.96	0.97
Adj. R Sq	0.97	0.96	0.98	0.96	0.96
S.E	0.84	1.28	4.16	1.44	0.92

Note: *p<0.1; **p<0.05; ***p<0.01. standard error() and t value[] in the parenthesis respectively.

Source: Authors' Calculation using Eviews10

CONCLUSION

The paper aimed to analyze the pattern of external debt and its impact on key macroeconomic variables. From the pattern analysis it is observed that though there is a significant reduction in external debt and debt service after liberalization period, still the ratio of external debt to GDP and debt servicing to GDP are high. Further, after reform period there is significant improvement in savings and gross domestic capital formation. It's evident form the co-integration analysis that their exist long run relationship between external debt, external debt servicing, gross domestic capital formation, gross domestic savings, developmental expenditure, non-developmental expenditure, export, GDP deflator and FDI inflow. Our error correction model and granger causality test suggests that, even though external debt is not causing exports in the long run it's granger causing in the short run. Export is granger causing the gross domestic capital formation in the short run where as it is not the case for long run. Gross domestic capital formation is causing developmental expenditure, export, FDI inflow and Inflation in short run as well as in the long run. Export is causing inflation, development and non-developmental expenditure, FDI inflow and inflation in the short run where it is not the case of long run. FDI inflow is granger causing exports, inflation and developmental expenditure in the short run and long run.

Further, the FMOLS results suggest that external debt is significantly and positively influencing inflation whereas significantly and negatively influencing non-developmental expenditure. External debt is contributing marginally to developmental expenditure which is not come significant in our result. But the fact that external debt is bringing down the non-developmental expenditure is because of its accountability to the foreign agent and better monitoring actions. External debt service has much more impact on key macro variables than external debt. External debt servicing has its positive and significant impact on non-developmental expenditure, gross domestic savings and exports whereas negative and significant impact on inflation. External debt service is bringing the inflation down and external debt service is increasing non-developmental expenditure is a normal phenomenon. But it is interesting to note that domestic savings is going up as a precautionary action when external debt service is increasing which will ensure macroeconomic stability for the country.

From the policy perspective it must be noted that external debt is not significantly contributing to the developmental expenditure of the country where as it is contributing negatively to the non-developmental expenditure. Therefore appropriate actions must be taken in order to channelize external debt funding towards more developmental activities. Also external debt is not significantly contributing to the exports of the country as expected. Required attention must be given to enhance more export promotion activities with the external debt fund so that the country would be more capable of meeting its debt and debt service burden in the future.

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