Debt Laffer Curve for South
Asian Countries

M. ASLAM CHAUDHARY and SABAHAT ANWAR

I. INTRODUCTION

The inflow of foreign capital is generally seen as an accelerating force to economic growth, due to provision of additional resources, and these funds are considered complementary to local savings. It could also help to transfer technology and, therefore, increase productivity. Besides it enhances purchasing power of the recipients [Mullick (1988)] and as a result stimulates growth. The purpose of foreign debt is to increase real transfer of resources from the developed countries to the developing countries, so that these countries could pick up momentum of economic growth and as a result improve their welfare.[1]

The rapid increase in the external debt obligations of the developing countries, during the 1970s, had given rise to concerns about the dangers of increasing trend in interest and amortisation payments and, therefore, this situation posed a threat to debtor countries. The foreign debt of the developing countries has become a threat to their economic growth. The debt servicing of some of the LDC's exceeded to their growth rates.[2] Initially, most analysts believed that debt servicing problem would be temporary. It was hoped that creditworthiness and more normal growth of most of the countries would be restored with the influx of foreign resources. However, the debt crises have demonstrated that this assessment was optimistic and seemed never to be realised.[3]

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[1]Thirlwall (1999) pointed out that developed countries agreed, under UNO, to transfer 1 percent of their GDD as international aid to the developing world but it was never fulfilled.

[2]The debt servicing is double than the economic growth of developing countries. For details see Chaudhary and Anwar (2001).

[3]For details of present nature of foreign debt and recycling of debt [see Thirlwall (1999)].

The South Asian countries saw the inflow of foreign resources as to bridge the gap between their savings and investment.[4] It was thought that these funds were needed to accelerate their desired growth. It was also regarded as panacea for economic diseases, caused by the shortage of domestic resources. Thus, it was considered to supplement the desired investment. But the dream of achieving high economic growth through foreign aid started gradually falling apart, when foreign debt turned out to be growing encumbrance on the foreign exchange earnings of these countries. The year 1979-80 brought the world, particularly, the South Asian countries a set of economic problems—oil price shocks, reduction in primary products prices, budget deficit, balance of payments deficit, rising real interest rates and world wide recession, which made it difficult for them to service their debts [Smith and Cuddington (1989)].

Since the 1980s, the South Asian countries were trapped in a set of economic crisis. According to World Debt Tables (1996), during the five years (1982–1986) the decline of economic growth rate of per capita income from 4 percent to 1 percent between 1982 and 1986 further added to their problems. Besides the terms of trade for South Asia also deteriorated by a cumulative percentage of 15.4 points during the same period.

Several researchers have analysed the debt burden issue from different perspectives. Claessens and Diwan (1989) argue that the burden of foreign capital inflow can depress investment below its optimal level and thus leads to slow down economic growth of the recipient countries. This can occur through two channels; (i) inability to get desired foreign borrowing, a liquidity constraint, and debt overhang which is strong enough, therefore, (ii) expected future loss of output to foreign creditors. From the debtor country's perspective, the financing costs of voluntary debt reductions and transformations are likely to exceed the benefits. Thus, Pareto-improving scheme are difficult to find in practice—unless the debtor uses funds donated for this purpose, or that it gains in exchange some concession from creditor's group. Therefore, conventional debt rescheduling cannot efficiently reconstruct under a situation of debt overhang.

Increasing burden of foreign debt is becoming a threat to the developing economies of South Asia. Appropriate economic policies may help to improve the situation. Debt-ridden countries have paid little attention to the increasing dependency upon foreign resources. As a result, efforts are not made to generate or mobilise domestic resources; rather some of these economies have become consumption oriented. This situation leads to a topology of debt crisis. It defines a debt overhang, as a situation where outstanding debt is so large that investment will be inefficiently low without new foreign lending or debt and debt service reductions. A mild debt overhang can be resolved with new money approach alone [Sachs

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[4]The saving-investment gag was filled by borrowing from abroad, rather mobilising additional domestic resources.

(1989)]; which is called a liquidity trap. Otherwise, a debt overhang requires debt or debt service reductions unless the debtor uses a commitment mechanism. When a debtor experiencing a debt overhang, that is more severe than a liquidity trap, is willing to commit to an adjustment programmes against the provision of liquidity alone, the situation is called a 'weak' debt overhang. In such a situation, the commitment mechanism and new money creation resolve the crisis without the need to reduce debt and debt services. But a 'strong' debt overhang cannot be resolved without debt and debt service reductions; the debtor will be unwilling to commit to a large investment programmes without debt reduction, even if large amounts of liquidity are not available. Sustainability of debt may be evaluated by using Laffer Curve technique, developed by Sachs.

The concept of a Laffer curve for the value of claims on a developing country can be used as an argument for debt forgivingness. The logic implies that if a country is on the wrong (declining) side of the Debt Laffer curve, a reduction in nominal claims outstanding will lead to an increase in the value of outstanding claims and will thus benefit the both creditors and debtors. If the country is on the correct side of the Debt Laffer curve (right side), then, debt forgiveness will not increase the market value of debt, and creditors plus debtors as a whole, will lose. Thus, across-the-board debt forgiveness is only in the interest of the creditors and debtors when the debtor is on the wrong side of the Debt Laffer curve.

Another aspect of Debt Laffer curve analysis is related to the price elasticity of the market value of the debt. Greater the price elasticity of the debt, greater will be the benefits to the debtor from a debt reduction. There is limited number of research that analysed the situation of debt overhang and the possibilities of debt reduction for indebted developing countries. Most of the studies are cross sectional. Claessens (1990) estimated the market value of the debt for 29 highly indebted countries and identified only five countries that were on the wrong side of the Debt Laffer curve.[5] Cohen (1989) estimated price elasticity of the debt for thirty developing countries that severe debt problem was only for four highly indebted countries. Thus the approaches help to identify the nature of debt problem.

Following Claessens (1990) and Cohen (1989) in this study, we have carried out a time-series analysis for seven countries of South Asia.[6] It will be interestingly important to find out whether these countries stand on the right or wrong side of Debt Laffer curve. The estimates of the price elasticities of debt will reflect the relative effectiveness of debt written off for south Asian countries. The policy description will be derived for meaningful evaluation of debt position in South Asia. So far hardly any study has analysed this aspect of foreign debt for the South Asian

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[5]Five countries are Bolivia, Sudan, Peru, Zambia and Nicaragua. See Claessens (1990). There is no such study pertaining to S. Asian countries, as per knowledge.

[6]These countries are Pakistan, India, Sri Lanka, Bangladesh, Maldives, Nepal and Bhutan. These countries are also member of South Asian Associations for Regional Cooperation (SAARC).

countries. After this, the study is organised as under. Part II provides discussion on methodology and empirical estimation, by using Debt Laffer curve. The discussion of the results is provided in this Section III. Conclusion and policy implications are given in Section IV.

II. DEBT LAFFER CURVE: METHODOLOGY

Figure 1 depicts the relationship, as postulated by Sachs (1989) and Krugman (1988), between the face value of debt and the market value of expected repayments. On the horizontal axis, the nominal face value of the external claims is measured while on the vertical axis; the nominal face Value of foreign debt by creditors is measured. Creditors expect that the nominal claims will be paid in full at low levels of external debt. The secondary market price will be one, and the value of the debt will lie along the 45-degree line. At higher levels of debt, however, the possibilities of partial repayments grow as the country has fewer incentives to invest and market value of debt falls increasingly below the 45-degree line. The secondary market price for debt, which is the slope of the line from the origin to point like A, will have a negative relationship with the amount of debt outstanding and it will fall increasingly below one as debt increases (Fig. 1). At point B, the debt outstanding becomes so large and the nominal debt acts as such a large disincentive on the debtor's effort to adjust, reform and invest, that the market value of debt starts to fall when the face value of debt increases further.[7]
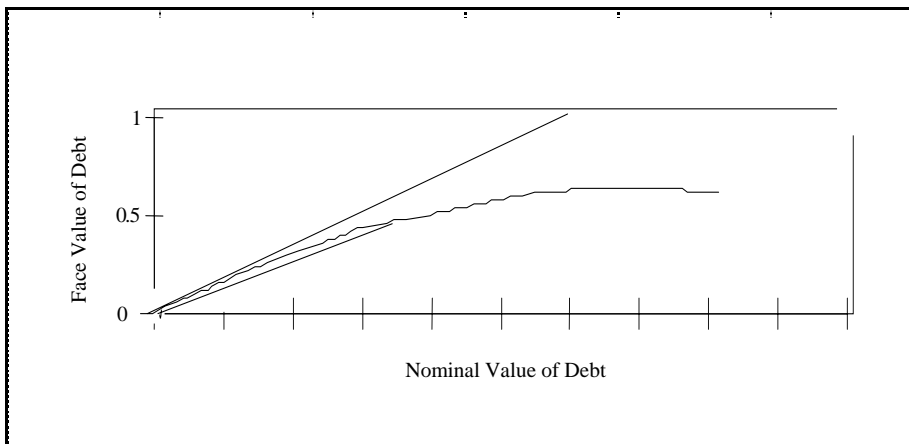

Fig. 1. Debt Laffer Curve.

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[7]Claessens and Diwan (1989); Krugman (1988) and Froot (1989) derive Debt Laffer curve through formal models of a country's investment and adjustment incentives.

The relationship between the nominal face value of the debt outstanding and the market value of the debt is related in the form of Debt Laffer curve. The market value of the debt of a country is determined by the secondary market price of the debt as postulated by Claessens (1990) and Cohen (1989). As market value of debt is dependent upon nominal amount of claims outstanding and other variables such as exports and with growth rate of exports which explains the country's ability to repay the debt. ("creditworthiness" indicators). To simplify assuming the real export growth rate as exogenous[8] and debt servicing is assumed to be payable in equal annual instalments. Further, assuming that the interest rate remains same during and after the grace period and this interest is payable after the end of the grace period. The secondary market price of debt involves three steps. Firstly, equal annual instalments payable on the external debt outstanding for South Asia, which are calculated by using the following formula.

$$EAI = [(i)\,(M)\,(1+i/100)^T\,(_1+P/100)^G\,]/100(1+i/100)^T \quad \ldots \quad \ldots \quad (1)$$

Where:

EAI = Equal annual instalments of debt servicing on a given amount of external debt outstanding.

i = Average rate of interest on foreign loans.

M = The amount of the external debt outstanding.

T = The repayment period.

P = The rate of interest in the grace period.

G = The grace period.

After estimating the equal annual instalments present value of external debt outstanding is estimated by using equal annual instalments.

$$PV = \{(EAI)\,[1–1/(1+D/100)]\}/\{D/100[1+D/100]G\} \quad \ldots \quad \ldots \quad (2)$$

Where:

PV = present value of external debt outstanding.[9] D = discount rate.

Equation (2) can also be expressed as a price equation of external debt outstanding by dividing both sides by the amount of nominal claims outstanding. Since the market value of debt is defined in terms of the secondary market prices. Therefore, prices of debt can be determined by the following equation.

$$SMP = \text{cʒ}_0 + \text{cʒ}_1\,EXTD + \text{cʒ}_2\,GREXP \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

Where:

[8]The growth of real exports is likely to be dependent on the level of the external debt outstanding. [See Claessens (1990).]

[9]Present value of debt is the market value of the debt which depends on the secondary market prices of the debt.

   SMP = Secondary market price of the external debt outstanding.
   EXTD = Ratio of the external debt outstanding to exports.
   GREXP = Growth rate of exports.

To see whether a country is on the right side of the Debt Laffer Curve or not, the maximised value of external debt is estimated. The maximised value of external debt can be estimated by multiplying the nominal external debt outstanding with its secondary market price for each country, as follows:

$$MVD = (SMP)\,(M) \quad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (4)$$

The second approach pertains to price elasticity is estimated for which the following procedure is followed. Estimate the following equation.

$$LSMP = \beta_0 + \beta_1\,LEXTD + \beta_2 GREXP \qquad \ldots \qquad \ldots \qquad \ldots \qquad (5)$$

Where:

   LSMP = Log of secondary market price of the external debt outstanding.
   LEXTD = Log of external debt outstanding to exports ratio.
   GREXP = Growth rate of exports.

The impact of debt write off on the market value of the debt will depend on the marginal price of the debt. Thus, marginal price of the debt can be estimated by the following formula.

$$DMV = (SMP)\,(1-\eta)\,(DM) \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (6)$$

Where:

   η = Price elasticity of the debt.
   DMV = Change in the market value of debt.
   DM = The change in total external debt outstanding.

Now a country will stand to gain from a debt write off if and only if the following condition is fulfilled [Cohen (1988)].

$$\eta > (1-t_x)\,(S.E) \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (7)$$

Where:

   t_x = *t*-statistic corresponding to the *x*-degree of confidence.
   S.E = Standard error of the elasticity in Equation (5).

The price elasticity of external debt outstanding measures the responsiveness of demand of foreign debt to changes in its own price. If the price elasticity of external debt of a country is greater than the product of standard error and *t*-statistics corresponding to the *x*-degree of freedom, then a country gets benefit from debt reduction.

Table 1, presents the estimates of the market value and the secondary market price of external debt outstanding of seven countries of South Asia. As already mentioned in the methodology that market value of external debt is the present value of debt obtained from multiplying the nominal debt outstanding with its secondary market price for each year[10] [Claessens (1990) and Sachs and Hizinga (1987)].

The results of OLS estimate are obtained by applying a time series analysis for South Asian countries in this paper, which support the theoretical intuitions developed at the background of this model. Claessens (1990) and Sachs and Huizinga (1987) estimate the Debt Laffer curve with OLS technique, while Cohen (1988) attempts to find out the Debt Laffer curve problem with price elasticity approach, while we estimate the Debt Laffer curve problem for South Asian countries with applying both approaches. The sample size is taken from 1970-71 to 1994-95 and data for all the countries are in real terms (1990-91 prices). First of all, equal annual instalment are calculated for all the seven countries of South Asia, then through equal annual instalments we estimate the present value of debt outstanding by using Equation (2).

The results of the price equation indicated that the secondary market price of debt for Pakistan has negative association with the nominal debt outstanding (debt to export ratio). Then, this price equation is used to calculate the market value of external debt outstanding of Pakistan and other South Asian countries. The equation for the market value of external debt outstanding can now be used to derive the face value of debt (debt to export ratio) for which the market value of debt reaches its maximum, the top of the Debt Laffer curve.

As indicated in Table 1, there is a negative relationship of debt to export ratio with secondary market price of debt outstanding for Pakistan and India, and have an insignificant effect on secondary market price of debt outstanding. Pakistan and India are agricultural based countries and its products contribute a small amount to GNP and on the other hand, they also face balance of payment problem. In 1994-95, exports as a percentage of GNP was 15.9 percent for Pakistan and imports as a percentage of GNP was 24.5 percent, these figures for India was 11.6 percent and 15.7 percent, respectively. The above figures indicate trade gaps for Pakistan and India respectively. Therefore, any increase in exports insignificantly decreases the market value of external debt outstanding, whereas Bangladesh has also negative relationship but it has a significant effect. The results show the same trend for Sri Lanka. Debt-to-export ratio of Nepal is also negative and shows insignificant effect on secondary market price of debt outstanding. An increase in exports insignificantly decreases the market value of debt.

[10]The maximum value of debt can be estimated through the maximisation of Eq. $MVD = (SMP)$ $(EXTD)$.

Table 1

Foreign Debt and Credit-worthiness
(Estimates of the Price Equation of External Debt Outstanding)

Dependent	Countries						
	PAK	IND	BANG	S.LAN	NEPAL	MALDI	BHUT
Const.	0.69	0.92	0.34	2.36	0.082	0.04	0.087
	(1.30)	(2.81)**	(5.70)**	(3.47)**	(2.83)**	(0.05)	(0.61)
Ext	–0.02	–0.07	–0.04	–0.61	–0.0095	0.27	0.03
	(–0.19)	(–0.73)	(–4.59)**	(–2.21)*	(–1.36)	(0.75)	(0.20)
Grexp	0.0018	–0.012	–0.009	–0.024	–0.0002	0.02	–0.002
	(0.35)	(–1.03)	(–0.02)	(–2.55)*	(–0.22)	(0.82)	(–0.29)
R^2	0.94	0.81	0.51	0.30	0.80	0.67	0.13
D.W	1.71	1.76	1.47	2.01	1.53	2.25	2.08

Figures in the parentheses refer to *t*-statistic.
*Significant at 5 percent. **Significant at 10 percent. Where PAK stands for Pakistan, IND for India, BANG for Bangladesh, S.LAN for Sri Lanka, MALDI for Maldives and BHUT for Bhutan.

Maldives and Bhutan are positive, but with insignificant relationship of debt-to-export ratio and with secondary market price of debt outstanding. Growth rate of exports is positive but it has insignificant effect on secondary market price of debt outstanding for Pakistan and Maldives. This means that one percent increase in growth rate of exports increases the SMP value by 0.002 in case of Pakistan and 0.02 in case of Maldives. Other five countries, India, Bangladesh, Sri Lanka, Nepal and Bhutan are negative and insignificant relationship of growth rate of exports with secondary market price of debt outstanding. This means that one percent increase in growth rate of exports decreases the SMP value by 0.012 for India, 0.009, in the case of Bangladesh, 0.024, in the case of Sri Lanka, 0.0002, in case of Nepal and in the case of Bhutan it is 0.002.

Except for Maldives and Bhutan the secondary market price of debt for Pakistan, India, Bangladesh, Sri Lanka, and Nepal has a negative association with the nominal debt outstanding (debt to export ratio) but Maldives and Bhutan have a positive relationship of face value of debt with secondary market price of debt. Pakistan and Maldives have a positive relationship between growth rate of exports and secondary market price of debt but other group of countries has the positive relationship.

In addition to the price equation, the maximised value of external debt is also estimated, which indicates whether the country is on the right side of the Debt Laffer curve or on the wrong side of the Debt Laffer curve. Estimates of the maximum market value of debt outstanding indicates that Pakistan is on the right side of the Debt Laffer curve because its current debt-to-export ratio in 1995 is 2.72 which is below the debt-to-export ratio for which its external debt reaches its maximum which is 3.44. India is also on the correct side of Debt Laffer curve and its current debt-to-export ratio is 3.63 and debt-to-export ratio for which its external debt reaches its

maximum is 5.12. Bangladesh, Sri Lanka and Nepal have debt to export ratios (in 1995) are 5.38, 2.18, 5.59, respectively and their debt-to-export ratio for which their external debts reach their maximum are 6.96, 2.55, 6.42, respectively. While in case of Maldives and Bhutan debt-to export ratios (in 1995) are 3.43 and 1.34, respectively which are above the debt-to-export ratio for which the external debt reaches their maximum which are 1.37 and 0.82, respectively, so they falls on the wrong side of the Debt Laffer curve. So Pakistan, India, Bangladesh, Sri Lanka, and Nepal stand on the right side of the Debt Laffer curve because their current debt to export ratio (in 1995) is below the debt to export ratio for which their external debt reaches their maximum (see Appendix) . The total debt stock of Pakistan, India, Bangladesh, Sri Lanka and Nepal has an increasing trend [World Debt Tables (1996)]. The external debt outstanding of Pakistan and India is bifurcated into private and public loans, in which private loans are hard loans and public loans are soft loans, while Bangladesh, Sri Lanka and Nepal have taken only public loans so foreign debt has a favourable impact on their economies. As for the case of Maldives and Bhutan, the both countries stand on the wrong side of the Debt Laffer curve because their current debt to export ratio, (in 1995) is far above to their debt to export ratio for which their external debt reaches their maximum level (see Appendix Table 1).

In addition to the above, another approach is used to see whether a country uses a debt reduction scheme for or not for improving its economic position. To analyse the effect of a debt write-off on the market value of external debt outstanding, the price elasticity of the debt is estimated. The price elasticity of the debt is estimated through Equation 5 (mentioned above). The results of the equation are given in the Appendix.

As mentioned in Equation (7), a country can gain from debt write off if the following condition is fulfilled.

$$\mathbf{?} > (1 - t_x)\,(S.E)$$

Where '$\mathbf{?}$' is price elasticity of external debt outstanding and t_x is t-statistic of corresponding x degree of freedom and S.E is standard error of the estimate. Table 2 provides price elasticities of external debt for South Asian countries. The price elasticity of external debt for Pakistan is 0.39, which is less than $(1 - t_x)\,(S.E)$ so Pakistan does not gain from debt reduction. India has a price elasticity of (–1.22) which is also less than desired value. Bangladesh, Sri Lanka and Nepal have the values –0.66, –2.68 and –0.07 against the comparative values $(1 - t_x)\,(S.E)$, which are 1.51, 0.68 and 0.68, respectively. The values for Maldives and Bhutan are 0.14 and 0.07, where product of S.E are greater which are –0.15 and 0.05, which means that they gain from debt reduction. So it is concluded that Pakistan, India, Bangladesh, Sri Lanka and Nepal do not fulfil that above condition so we can say that debt reduction scheme for these countries will not benefit to them at this point.

But Maldives and Bhutan's results show that this condition is fulfilled so they gain from debt write off. As these results are rechecked again because from following the Claessens (1990) model, results show that debt reduction scheme is favourable for the both countries.

Table 2

Impact of Debt Reduction
(Estimation of Price Elasticity of External Debt)

	PAK	IND	BANG	S.LAN	NEPAL	MALDI	BHUT
Price Elasticities	0.39	–1.22	–0.61	–2.68	–0.07	0.14	0.07
$(1-t_x)$(S.E)	0.48	–0.35	1.51	0.68	0.68	–0.15	0.05

*Based on Appendix Table 2.

Figure 2 provides a picture of the estimates of the debt-to-export ratios at which the market value of debt reaches its maximum, EXT*, again the actual debt-to-export ratio (of 1995), EXT, using the Equation (3), for South Asian countries.[11] The 45-degree line in Figure 2 divides the countries into two portions. The right side of the Debt Laffer curve (above the 45-degree line) indicates that those are on the wrong side. Sri Lanka and Nepal are on the correct side of Debt Laffer Curve.
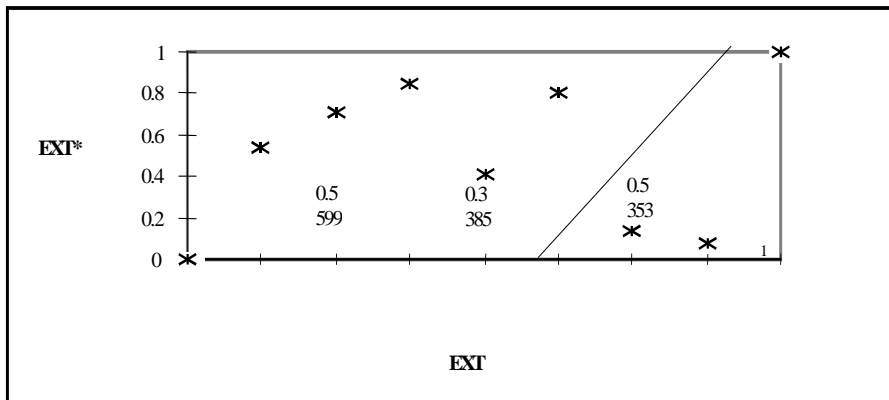
Fig. 2. EXT* versus EXT.

Laffer curve, the side where the face value of debt is bellows the level for which the market value of external debt starts to decline. The only country that is perceived by the market to be on the wrong side of the Debt Laffer curve are Maldives and Bhutan where the market value of debt is maximised at roughly the current debt level. This result implies that across-the-board debt forgiveness, through

[11]The scales are in logs.

the general reduction of the nominal claims outstanding, is not in the interest of the creditors for most highly indebted countries.

On the basis of above cited empirical evidences, it may be stated that Pakistan, India, Bangladesh, Sri Lanka and Nepal have faced debt condition that may create serious problem for them. However Maldives and Bhutan face the debt problem more severe than other South Asian countries. The external debt of Pakistan, India, Bangladesh, Sri Lanka and Nepal have been increasing one time but at relatively slower rate than the total debt of Maldives and Bhutan. The debt situation of Maldives and Bhutan has deteriorated during the second half of the 1980s [World Debt Tables (1996)], increases in interest rates and reduction in the maturity and grace periods in respect of new loan commitments added to their debt-servicing problem, while for Pakistan, India, Bangladesh, Sri Lanka and Nepal, terms and conditions of their new loan commitments maintained at favourable levels.

In addition to the price equation, the maximised value of external debt is also estimated, which indicates whether the country is on the right side of the Debt Laffer curve or on the wrong side of the Debt Laffer curve. Estimates of the maximum market value of debt outstanding indicates that Pakistan is on the right side of the Debt Laffer curve because its current debt-to-export ratio in 1995 is 2.72 which is below the debt-to-export ratio for which its external debt reaches its maximum which is 3.44. India is also on the correct side of Debt Laffer curve and its current debt-to-export ratio is 3.63 and debt-to-export ratio for which its external debt reaches its maximum is 5.12. Bangladesh, Sri Lanka and Nepal have debt to export ratios (in 1995) are 5.38, 2.18, 5.59, respectively and their debt-to-export ratio for which their external debts reach their maximum are 6.96, 2.55, 6.42, respectively. While in case of Maldives and Bhutan debt-to export ratios (in 1995) are 3.43 and 1.34, respectively which are above the debt-to-export ratio for which the external debt reaches their maximum which are 1.37 and 0.82, respectively, so they falls on the wrong side of the Debt Laffer curve. So Pakistan, India, Bangladesh, Sri Lanka, and Nepal stand on the right side of the Debt Laffer curve because their current debt to export ratio (in 1995) is below the debt to export ratio for which their external debt reaches their maximum. The total debt stock of Pakistan, India, Bangladesh, Sri Lanka and Nepal has a increasing trend. The external debt outstanding of Pakistan and India is bifurcated into private and public loans, in which private loans are hard loans and public loans are, relatively, soft loans. Bangladesh, Sri Lanka and Nepal have taken only public loans so foreign debt has a favourable impact on their economies. As far as the case of Maldives and Bhutan is concerned, the both countries stand on the wrong side of the Debt Laffer curve because their current debt to export ratio, is far above to their debt to export ratio for which their external debt reaches at the maximum limit (see *Appendix*, Table 1).

III. CONCLUSION

The main focus of this paper was to highlight and analyse the problem of rising debt burden of South Asia. The increasing dependency of South Asian economies on foreign resources is evident by their debt and debt servicing ratios of the South Asian countries, which is very high. The figures are alarming which indicated that the countries were on the verge of liquidity or solvency. The ratios of debt to GNP and foreign exchange earnings both showed rising trends.

To see whether debt reduction is favourable to the economies of South Asia, Debt Laffer curve is estimated. The estimates of the Debt Laffer curve reveal that Pakistan, India, Bangladesh, Sri Lanka and Nepal lie on the right side of the Debt Laffer curve because their current level of debt outstanding is below that level of debt at which the market value of debt would be maximised. But the difference between the current level of debt outstanding and that level of debt at which market value of debt would be maximised is not significant. Projection of these economies shows that if the same trend of borrowing continues, they may face a rising burden of debt and debt servicing. On the other hand, Maldives and Bhutan lie on the wrong side of the Debt Laffer curve. They can gain from debt write off. The rapid increase in the foreign debt of other South Asian countries also indicates that they will also reach at the maximum level of debt. Thus, there is a need for them also to better manage their debt.

Appendix Table 1

The Secondary Market Prices of External Debt Outstanding of South Asian Countries

(Millions, Real)[*]

Year	Pakistan			India			Bangladesh			Sri Lanka			Nepal		
	SMP	MV	EXT	SMP	MV	EXT	SMP	MV	EXT	SMP	MV	EXT	SMP	MV	EXT
1970-71	0.180	2876.5	7.99	0.218	12966.04	3.92	0.125	1258.2	2.58	0.677	1833.49	1.33	0.181	5.15	0.07
1971-72	0.628	10433	4.92	0.437	28880.35	4.34	0.142	258.2	1.54	1.436	4769.42	1.63	0.382	32.11	0.17
1972-73	0.629	14712	2.73	0.189	14259.89	4.07	0.177	156.1	0.44	1.114	4278.64	1.91	0.105	12.39	0.20
1973-74	0.448	20851	4.57	0.250	20561.47	3.65	0.493	1887.3	1.38	1.524	7377.62	1.84	0.009	1.79	0.30
1974-75	0.343	16325	4.62	0.191	18601.13	3.07	0.427	4245.9	3.53	2.359	14314.47	1.73	0.021	6.10	0.41
1975-76	0.573	32543	5.04	0.222	25468.54	3.14	0.103	1651.9	4.35	0.530	3549.17	1.69	0.026	9.11	0.32
1976-77	0.845	53109	5.56	0.569	71053.30	2.51	0.138	4207.5	5.19	1.405	12955.8	1.91	0.025	14.80	0.48
1977-78	0.454	32350	5.48	0.215	28561.46	2.38	0.107	4034.9	5.17	0.272	4122.20	2.31	0.018	23.23	1.25
1978-79	0.126	9792.	4.56	0.122	16512.50	2.48	0.082	3667.2	5.45	0.158	3381.1	1.62	0.016	23.49	1.30
1979-80	0.301	25811	3.66	0.491	70932.39	2.28	0.048	2300.2	4.66	0.643	15551.7	1.58	0.032	56.37	1.34
1980-81	0.421	36546	2.96	1.563	253514.6	2.40	0.055	3432.3	5.33	0.568	17285.0	1.73	0.013	33.64	2.55
1981-82	0.454	42190	3.53	1.450	292032.9	2.81	0.094	6842.1	5.15	1.843	79287.9	2.04	0.042	139.3	1.93
1982-83	3.866	457494	3.44	1.933	509702.0	2.98	0.036	3642.0	5.94	4.468	244097.	2.55	0.025	114.2	3.93
1983-84	0.791	101068	3.42	1.093	359664.9	3.56	0.039	5013.2	7.29	0.116	7905.3	2.70	0.016	99.98	4.59
1984-85	0.752	111018	3.88	1.091	439096.9	3.75	0.027	3753.8	5.92	0.951	72352.6	2.04	0.007	55.15	3.40
1985-86	1.056	189389	3.62	1.251	625723.7	4.42	0.023	3859.0	6.07	0.168	16156.3	2.65	0.031	324.7	3.60
1986-87	1.140	235585	3.26	0.722	446271.3	5.22	0.018	4213.5	8.79	0.469	53376.6	3.34	0.049	708.3	4.77
1987-88	0.444	101102	2.9	0.420	303240.3	4.94	0.012	3500.9	9.01	0.148	20645.0	3.39	0.212	4473	6.42
1988-89	0.542	147784	3.02	0.676	571965.0	4.60	0.020	6349.2	7.8	0.044	7181.87	3.52	0.009	225.8	5.79
1989-90	0.357	115868	3.40	0.334	408171.2	4.75	0.009	3109.1	8.17	0.201	37479.9	3.32	0.008	290.0	8.05
1990-91	0.399	138469	2.51	0.202	297420.0	4.68	0.042	17041.	6.96	0.020	4721.45	3.06	0.006	287.9	7.59
1991-92	0.398	171835	2.51	0.392	807755.5	5.13	0.007	3651.9	7.44	0.005	1359.20	3.29	0.006	329.8	5.62
1992-93	0.121	60066	2.79	0.181	431805.7	4.68	0.010	5074.4	6.17	0.025	7201.01	2.61	0.004	296.6	4.78
1993-94	0.067	41406	2.98	0.151	433581.8	4.38	0.001	5343.8	6.08	0.018	5775.17	2.37	0.004	392.6	4.81
1994-95	0.126	86451	2.72	0.124	352769.5	3.63	0.013	7572.6	5.38	0.016	5507.70	2.18	0.002	270.3	5.59

[*]In country's respective currency.

Appendix Table 2

The Secondary Market Prices of External Debt Outstanding (SAARC)

	Maldives			Bhutan		
Year	SMP	MV	EXT	SMP	MV	EXT
1976-77	0.027	0.023	0.02	–	–	–
1977-78	0.007	0.420	1.34	–	–	–
1978-79	0.054	4.326	1.24	–	–	–
1979-80	0.007	0.638	1.20	–	–	–
1980-81	0.102	22.416	2.02	0.028	0.067	0.01
1981-82	0.068	19.984	2.46	0.043	0.112	0.02
1982-83	0.409	190.954	3.76	0.037	0.395	0.06
1983-84	0.359	195.228	3.90	0.034	0.630	0.09
1984-85	5.360	3129.123	3.58	0.030	0.931	0.11
1985-86	0.909	536.078	3.26	0.026	2.858	0.25
1986-87	0.666	327.451	2.55	0.024	6.419	0.37
1987-88	0.016	10.908	2.09	0.014	7.440	0.50
1988-89	1.154	722.962	1.60	1.117	1043.309	0.82
1989-90	0.104	62.705	1.30	0.011	13.166	0.92
1990-91	.007	5.392	1.34	0.014	19.165	0.90
1991-92	5.179	4312.226	1.37	0.007	14.492	1.13
1992-93	0.013	13.138	1.90	0.035	75.887	1.20
1993-94	0.078	97.866	2.98	0.004	10.026	1.37
1994-95	0.115	166.176	3.43	0.007	19.223	1.34

Where: SMP = secondary market price of the debt. MV = Maximised value of external debt outstanding.
EXT = External debt outstanding to export ratio.

Appendix Table 3

Estimates of the Price Equation of External Debt Outstanding

Dependent	Countries						
Variable	PAK	IND	BANG	S.LAN	NEPAL	MALDI	BHUT
CONST.	–1.24	0.36	–1.29	3.07	–3.56	–2.51	–3.93
	(–1.43)	(0.42)	(–2.37)*	(1.71)**	(–14.4)*	(–4.43)*	(–7.23)*
LEXT	0.26	–0.85	–1.20	–5.66	–0.52	0.0.58	–0.19
	(0.40)	(–1.22)	(–3.89)	(–2.78)*	(–3.28)*	(1.34)	(–0.79)
GREXP	0.004	–0.016	–0.004	–0.03	–0.05	0.09	–0.003
	(0.75)	(–0.83)	(0.62)	(–0.93)	(–0.57)	(0.35)	(–0.01)
R^2	0.02	0.15	0.44	0.26	0.33	0.11	0.05
D.W	0.89	0.79	0.82	1.50	1.09	2.41	2.28

Figures in parentheses refer to t-statistics.
*Significant at 5 percent. ** Significant at 10 percent.

REFERENCES

Chaudhry, M. Aslam, and Sabahat Anwar (2001) Foreign Debt, Dependency, and Economic Growth in South Asia. *The Pakistan Development Review* 39:4, 551–570.
Claessens, S. (1990) The Debt Laffer Curve: Some Estimates. *World Development*. 18:12.

Claessens, Stijn, and Ishac Diwan (1989) Market-Based Debt Reduction. *Dealing with the Debt Crisis*. Washington, D. C. (World Bank Discussion Papers.)

Claessens, Stijn, and Ishac Diwan (1989a) Liquidity, Debt, and Conditionality. *Dealing with the Debt Crisis*. Washington, D. C. (World Bank Discussion Papers.)

Cohen, Daniel (1989) How to Cope with a Debt Overhang: Cut Flows Rather Than Stocks. *Dealing with the Debt Crisis*. Washington, D.C. (World Bank Discussion Papers.)

Cuddington, John T. (1989) The Extent and Causes of the Debt Crisis of the 1980s. *Dealing with the Debt Crisis*. Washington, D. C. (World Bank Discussion Papers.)

Froot, K. (1989) Buybacks, Exit Bonds, and the Optimality of Debt and Liquidity Relief. *International Economic Review* 30: February, 49–70.

Krueger, Anne O. (1987) The International Debt Crisis Debt, Capital Flows, and LDC Growth. *The American Economic Review* 77:2.

Krugman, Paul (1988) Financing vs. Forgiving a Debt Overhang. *Journal of Development Economics* 29:3.

Mullick, Hussein M. A. (1988) Is Foreign Aid an Obstruction to Democracy and Development in the Third World? *The Pakistan Development Review* 27: 4, 529–534.

Pakistan, Government of (1996) *Economic Survey*: 1995-96. Islamabad: Finance Division, Economic Advisory Wing.

Sachs, Jeffrey (1989) Efficient Debt Reduction. *Dealing with the Debt Crisis*. Washington, D.C. (World Bank Discussion Papers.)

Sachs. J., and H. Hizinga (1987) U. S. Commercial Banks and the Developing Country Debt Crisis. *Brookings Papers on Economic Activit* 2: November, 55–606.

Thirlwall, A. P. (1999) *Growth and Development with Special Reference to Developing Countries*. London: Macmillan Press Limited.

World Bank (Various Issues) *World Tables.* Washington, D. C.

Comments

The paper entitled, "Debt Laffer Curve for South Asian Countries", by M. Aslam Chaudhary and Sabahat Anwar deals with an important issue affecting the economy of South Asian countries. Utilising the data for the period 1976-77–1994-95, the study concludes the following:

(1) The debt servicing ratios are alarmingly high in the South Asian Countries.
(2) The estimates of laffer curve show that Pakistan, India, Bangladesh, Sri Lanka and Nepal lie on the right side of the debt laffer curve whereas Bhutan and Maldives are on the wrong side of the laffer curve. Thus, Bhutan and Maldives can benefit from the debt reduction.
(3) The rapid rise in debt indicates the need for better management of debt in South Asian countries.

The first and the third points are not surprising conclusions. The second point is expected to be sensitive to the selection of period of study. Extending the time period to the year 2000 may change the conclusions significantly as the data shows deterioration in the debt situation of Pakistan. Extending the analysis to the year 2002 will also change the analysis significantly. The analysis will be more meaningful if critical debt ratios are analysed by sub periods.

The results of the price equation, reported in Table 1, indicate that the effect of debt-export ratio and growth rate of exports on secondary market price of external debt in South Asia are not statistically significant, except for Bangladesh and Sri Lanka. This raises the questions about the usefulness of reported results and specification of the model. Dummy variables, for the different time periods, and other variables like debt-GDP ratio, growth rate of gross domestic product can also be incorporated in price equation. This will give us more meaningful results. For example, the coefficient estimates of dummy variables will be useful in analysing the structural changes in price behaviour.

The study seems to suggest that only the countries lying on the wrong side of the debt laffer curve will benefit from debt reduction. This is a surprising conclusion because reduction in debt will be beneficial to all the countries, irrespective of their position on the debt laffer curve.

The main contribution of the authors is computation of EAI, i.e., equal annual installments of debt servicing on a given external debt outstanding. It will be useful to those working on this important topic if the authors add this series in the data appendix along with the critical ratios of debt to export, debt to GDP and export growth.

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