Full Length Research Paper

Debt (a real hurdle in the economic growth of Pakistan): A time series analysis

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This study aims to highlight the problems created by the debt (external debt) to economic growth of Pakistan. Time series data from the FY1981 to FY 2008 is used. The analysis includes five variables. Growth rate of GDP per capita is taken as a dependent variable while external debt to GDP ratio, investment to GDP ratio, population growth rate and trade openness are independent variables. The ADF- Unit Root Test is applied to check the stationarity of data. The co-integration estimation is applied, which shows the long run relationship between external debt and growth rate of GDP per capita. Furthermore, the Granger Causality Vector Error Correction (GCVEC) method has proved uni-directional relationship between external debt and growth rate of GDP per capita. There is no doubt that other macroeconomic variables also affecting the economic growth but the long term relationship of debt and economic growth has proved that the main economic indicator behind the low economic growth is debt.

Key words: Debt, economic growth, Pakistan.

INTRODUCTION

Debt, domestic and external, is a major tool of removing saving-investment gap of developing countries like Pakistan. Country needs financial capital to fill its saving-investment gap, that is, to boost up its investment to attain economic growth. Unfortunately, economic facts of the country do not show such picture due to many reasons including lack of proper planning and it's in time implementation, liquidity problem, donor based strategies, political instability, large and persistent fiscal and current account balance of payments deficits, wasteful government spending, undertaking of low economic priority development projects, insufficient exchange rate adjustment, lack of international market competitiveness, weakening of terms of trade, higher interest rates, decline in external resource inflow, lower export earnings and lower domestic output. We can say that these financial and political factors are the main reason of country's high indebtedness.

Pakistan is facing two debt problems in the form of huge

domestic/internal debt and very large external debt. More than 50% of the debt is external in nature. We will discuss external debts separately because servicing of external debt is a huge burden on the economy. The way the debts are increasing whether pubic or external, is a threatening situation of a country's economic condition.

Many empirical findings have proved that, debt burden depresses the economic growth of the country because it affects many of the economic variables directly or indirectly. It also discourages the structural and fiscal reforms taken by the government which increases the level of economic growth of the country. This problem is not faced only by Pakistan, but by all the low income countries facing the same economic situation because of heavy external debt. We have quoted many of such findings in the literature review and methodology of this study.

Although, debt is very useful in financing the financial gaps especially in case of fulfillment of balance of payment financing needs but places the future repayment obligation on the economy. This obligation is very hard to meet for the developing countries like, Pakistan, because of weak macro-economic performance and many other

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reasons as earlier mentioned. These debt inflows create serious problems to the economy because it is not able to manage its debt obligations. Debt sustainability is the major issue for Pakistan, because of weak economic condition; the country is unable to repay its debt properly. This unsustainable debt situation forces to reallocate the resources of the country towards debt servicing. This situation definitely affects negatively investments, developmental programs and poverty reduction initiatives. This reallocation of resources depresses the economic growth.

Besides, all the economic and political factors discussed and faced by Pakistan and other developing countries, Pakistan has been facing a war situation since 9/11. The war of terrorism has affected the economic pillar of the country because we are fighting with the terrorists inside the country. This depresses the foreign as well as domestic investment incentives which in turn decreases the economic growth and affects the stability of other macroeconomic indicators negatively. Decrease in investment might be managed but a severe capital flight adversely affects the economy. The major portion of the revenue received by the government is used in defense expenditures which leave with a very nominal amount for the repayment of the debt, public investments and for other social works of the government.

Objectives and organization of the study

The purpose of the study is to highlight the impact of debt on growth of Pakistan, by finding the causality between them.

REVIEW OF THE LITERATURE

The debt burden of Pakistan is increased from $50 to $51 billion to $55 to $56 billion after receiving $5.28 billion from friends of Pakistan and donors' conference held in Tokyo on 17th April 2009, the analysis was made by Ahmed (2009). He further analyzed that the current account and budget deficit came down but this was as a result of the cut down of development projects and withdrawal of subsidies. Mustafa (2009), focused on the government's review of first nine months of the FY2008 to 2009, which showed a $3.4 billion increase in external debt and liabilities. Internal debt burden is also increased because of the lack of availability of external financing. Similarly, Almas (2008) highlighted that short term borrowing is the major cause of increase in debt burden. In addition, he analyzed that maturity of Sukuk and Euro bonds are another burden on the economy.

The multiple co-integration procedures were made by Hameed et al. (2008) which resulted in a negative long run relationship between debt and economic growth. The negative relationship between external debt and economic is confirmed by Presbitero (2007) after analyzing this relationship by using GMM methodology on two different models; one for economic growth and the other, for investment. The same analysis was made by Schclarek (2004) by exploring four different variables that is, GDP per capita growth rate, total factor productivity growth rate, capital accumulation growth rate, and private saving rate with data set of a panel of 59 developing and 24 industrial countries.

The improper utilization of the debt created debt crisis side by side the donor's agenda, corruption, capital flight and low saving rate has affected the growth rate of the country. Kemal (2005) was commented in his paper. Standard growth model and public investment model was used by Clements et al. (2005). They took data from 1970 to 1999 for 55 low income countries and analyzed strong and direct external debt-growth relationship than investment-growth relationship. Gill and Pinto (2005) suggested that developing countries should aim low public indebtedness, as sovereign debt dampens economic growth. He examined the growth, capital flow and crisis literature for the developing countries with access to international market.

Pattillo et al. (2004) used the data of 61 countries over the period of 1969 to 1998. They applied growth-accounting framework and found that doubling the average external debt level reduces growth of both per capita physical capital and total factor productivity by almost one percentage point. In other words, large debt stocks negatively affect growth by dampening both physical capital accumulation and total factor productivity. Pattillo et al. (2002) tested the impact of economic growth by using four different methodologies including OLS estimation, instrumental variables with lagged values, fixed effects and GMM with and without dummies and without investment. The analysis used 3 years average panel data of 93 developing countries and got the same result. In addition to that, Sidique and Malik (2001) examined the debt-growth relationship for South Asian countries by using Fixed Effect Model and got non-linear relationship between them.

The negative casual impact of the debt on economic growth was estimated by Chowdhary (2001) on both 35 HIPCs and 25 non-HIPCs through sensitivity tests and the mixed, fixed and random coefficient approach that allowed heterogeneity in the causal relationship between debt and growth. Increase in external debt obligations depresses investment and hence, the economic growth of the recipient countries. Chaudhary and Anwar (2001) estimated the Debt Laffer Curve (DLC) for South Asian countries by applying both Debt Laffer Curve with OLS technique and Debt Laffer Curve with price elasticity problem by using time series data with sample size from 1970 to 1972 to 1994 to 1995. Pakistan becomes a stateless nation, because of increase in debt, bureaucracy, war with India, nuclear explosion and military take-over as explained by Zaman (2001).

Table 1. Growth rate of GDP (%) at constant factor cost.

Variable	1960's	1970's	1980's	1990's	2000's
Growth rate of GDP (%)	6.8	4.8	6.5	4.6	4.8

Source: Economic Survey of Pakistan (2009 - 2010).

Table 2. Macroeconomic indicators (%).

Variable	FY90	FY95	FY00	FY05	FY06	FY07	FY08
Inflation	6.0	13.0	3.6	9.3	7.9	7.8	12.0
GDP growth	4.6	5.1	3.9	9.0	5.8	6.8	5.8
Reserves	529.0	743.1	1352.3	12597.9	13122.0	15646.0	11378.2
FD/GDP	6.1	4.9	5.4	3.3	4.3	4.3	7.0
Exports	4,926.0	7,759.0	8,191.0	14,400.5	16,387.0	17,278.0	20,125.0
Trade balance	-2,485.0	-2,537.0	-1,411.0	-4,352.5	-8,237.0	-9,711.0	-15,285.7
Trade balance/GDP	-5.1	-3.5	-1.9	-3.9	-6.4	-6.7	-8.8
Money growth	17.5	17.2	9.4	19.3	14.9	19.3	15.3
M2/GDP	39.9		36.6	45.6	44.7	46.6	44.7
Reserve money growth	15.4	9.4	25.1	17.6	10.2	20.9	21

Source: State Bank of Pakistan. All values except exports and trade balance are in percentage while these are in billion US $.

Present debt situation

Debt burden creates a number of financial problems which led to persistent budget and current account deficit. Country's both real and fiscal sectors are suffering from internal and external debt. If we look at our economic condition, it appears that not only the budget deficit but deficiency in savings and its negative effect on balance of payment are the major causes of foreign debt burden. The absence of proper debt management is severely effecting the monetary and fiscal operations. This situation places an additional burden on external accounts as the greater amount of resources is diverted to debt servicing.

The external debt history of the country shows the ever-increasing debt burden of the country. The growth indicators also showed a decreasing trend (Table 1). The stagnant situation of government revenues and exports resulted in increasing debt burden. As seen from Figure 1, the debt burden became almost doubled from 1970 to 1978 to 1978 to 1983.

The growth situation of the country varied tremendously during this decade. It was at its highest in FY2004 to 2005 at 9% but fell drastically in FY2008 to 2009 to 1.2%. This situation affected all the economic indicators of the country.

The depressed economic growth throughout the decade did not allow the 7.5 and 9.0% growth rate in FY2003 to 2004 and 2004 to 2005 respectively to trickle down. A continuous fall in economic growth depressed almost all the economic indicators as shown in Table 2.

METHODOLOGY

Data and variables

The data used is time series of the sample size of 28 observations taken from 1980 to 1981 to 2007 to 2008. The data of growth rate of GPD, imports, exports, investment and population is taken from various issues of Pakistan economic survey (PES), while the data of growth rate of GDP is taken from the Statistical Periodicals of the State Bank of Pakistan. All the data taken is constant at the base year 1999 to 2000 and is in logarithmic form.

The model

The model used (Siddique and Malik, 2001) which relates the economic growth with investment, trade openness and population can be written as follows:

$$G_t = \alpha_0 + \alpha_1 ED_t + \alpha_2 INV_t + \alpha_3 PG_t + \alpha_4 OP_t + \varepsilon_t \qquad (1)$$

RESULTS INTERPRETATION

Augmented Dicky-Fuller unit root test is applied to the time series data to check the stationarity. Our results have shown that all the variables are non-stationary and have order of integration 1 as shown in Table 3. We applied the Johansen's Co-integration method to find out the long run relationship between the variables. The method introduced by Granger (1981) applied the Johansen's Cointegration method to find out the long run relationship between the variables after applying the ADF- Unit Root Test. We checked the order of integration

Table 3. Augmented Dicky-Fuller unit root test results.

Variable	Order of integration		Calculated	1% critical value	5% critical value
G_t	Level	Intercept	-2.241510	-3.7204	-2.9850
		Intercept and trend	-2.319	-4.374	-3.6027
		None	0.138799	-2.6603	-1.9552
	1st difference	Intercept	-5.1919	-3.7343	-2.9907
ED_t	Level	Intercept	-2.4332	-3.7076	-2.9798
		Intercept and trend	-0.4998	-4.355	-3.994
		None	-4.844	-2.656	-1.9546
	1st difference	Intercept	-5.027232	-3.7204	-2.985
INV_t	Level	Intercept	-1.9247	-3.7076	-2.9798
		Intercept and trend	-3.1323	-4.355	-3.394
		None	0.1147	-2.256	1.955
	1st difference	Intercept	-4.149	-3.72	-2.985
PG_t	Level	Intercept	0.0946	-3.7076	-2.979
		Intercept and trend	-2.1574	-4.355	-3.594
		None	-2.0166	-2.653	-1.9546
	1st difference	Intercept	-4.0147	-3.7204	-2.985
OP_t	Level	Intercept	-1.205961	-3.7076	-2.9798
		Intercept and trend	-1.5768	-4.355	-3.594
		None	0.458233	-2.6560	-1.9546
	1st difference	Intercept	-6.010937	-3.7204	-2.9850

Table 4. Normalized cointegrated coefficients.

G_t	ED_t	INV_t	PG_t	OP_t	C
1.000000	0.781755 (0.11309)	-2.51082 (0.41047)	5.470588 (2.00170)	0.629635 (0.30902)	-4.04729
Log likelihood	214.0255				

Table 5. Correlation matrix.

Variable	G_t	ED_t	INV_t	PG_t	OP_t
G_t	1	-0.69004	0.626016	0.419777	0.003262
ED_t	-0.69004	1	-0.76974	-0.86098	0.424606
INV_t	0.626016	-0.76974	1	0.526181	-0.15624
PG_t	0.419777	-0.86098	0.526181	1	-0.69219
OP_t	0.003262	0.424606	-0.15624	-0.69219	1

of the data which is I (1) from the co-integration results shown in Table 4. As such, we can write the equation as:

$$G_t = -0.781755ED_t + 2.510822INV_t - 5.470588PG_t - 0.629635OP_t \qquad (2)$$

Equation 2 indicates that growth rate of GDP per capita has negative relationship with external debt, population growth and trade openness while positive with investment (Hameed et al. (2008). Equation 2 has proved that increase in external debt depresses economic and similarly the population growth. The trade openness is effecting negatively because of the larger portion of imports comparative to the exports. The investment is showing a strong and positive relationship with growth rate of GDP per capita.

In Table 5, results of correlation matrix has shown strong but negative correlation of growth rate of GDP per

Table 6. Granger Causality tests: Pairwise Granger causality tests.

Null hypothesis	Obs	F-Statistic	Probability
ED_t does not Granger cause G_t	24	6.68447	0.00350
G_t does not Granger cause ED_t		0.50310	0.68522
INV_t does not Granger cause G_t	24	1.10280	0.37521
G_t does not Granger cause INV_t		3.89071	0.02761
LPGR does not Granger cause G_t	24	1.57548	0.23203
G_t does not Granger cause LPGR		1.05713	0.39314
OP_t does not Granger cause G_t	24	0.43459	0.73103
G_t does not Granger cause OP_t		0.66783	0.58331
INV_t does not Granger cause ED_t	25	0.13941	0.93511
ED_t does not Granger cause INV_t		3.70177	0.03100
PG_t does not Granger cause ED_t	25	4.92439	0.01138
ED_t does not Granger cause PG_t		1.78358	0.18633
LTOP does not Granger cause ED_t	25	3.16992	0.04955
ED_t does not Granger cause OP_t		3.94576	0.02517
PG_t does not Granger cause INV_t	25	1.78496	0.18607
INV_t does not Granger cause PG_t		1.25805	0.31845
OP_t does not Granger cause INV_t	25	0.21746	0.88299
INV_t does not Granger cause OP_t		0.39620	0.75731
OP_t does not Granger cause PG_t	25	1.61645	0.22063
PG_t does not Granger cause OP_t		0.92434	0.44909

Sample: 1981 2008; Lags: 3.

capita with external debt to GDP ratio as the value of correlation coefficient is 0.7 approximately and is negative, investment to GDP ratio and population growth rate has moderate and positive correlation. The values of their correlation coefficients are 0.626 and 0.419 respectively. In spite of cointegration test, the correlation among the trade openness and growth rate of GDP per capita has shown positive but weak correlation. The causality test of the said data has shown that external debt is the only factor that is affecting the GDP growth rate in the long run. This is showing the impact of debt overhang to the GDP. The remaining variables show short run relationship between them. From Table 6, by taking 3 years lag value, the long run relationship is observed between the external debt to GDP ratio and growth rate of GDP per capita as its F-stat is 6.68447 which is significant at 5% level of significance. The null hypothesis which states that external debt to GDP ratio does not Granger cause is rejected. As such, there is no causality among all the other variables.

The VECM results in Table 7 shows negative and long run relationship between debt and growth rate of GDP per capita. It is the case with population growth rate, but investment and trade openness are showing shot run relationship with growth rate of GDP per capita.

Conclusion

The main focus of the study is to highlight the impact of external debts on the economic growth of the country. The magnitude of the debt burden is increasing day by day which is increasing the dependency of Pakistan on external resources. The economic situation is getting worse with the passage of time; therefore Pakistan will not be able to stand on its feet, if same situation of external borrowing will prevail. This situation has been very clearly highlighted and the unit root test results confirmed that all the variables are integrated of the same order. The cointegration has shown the long run relationship
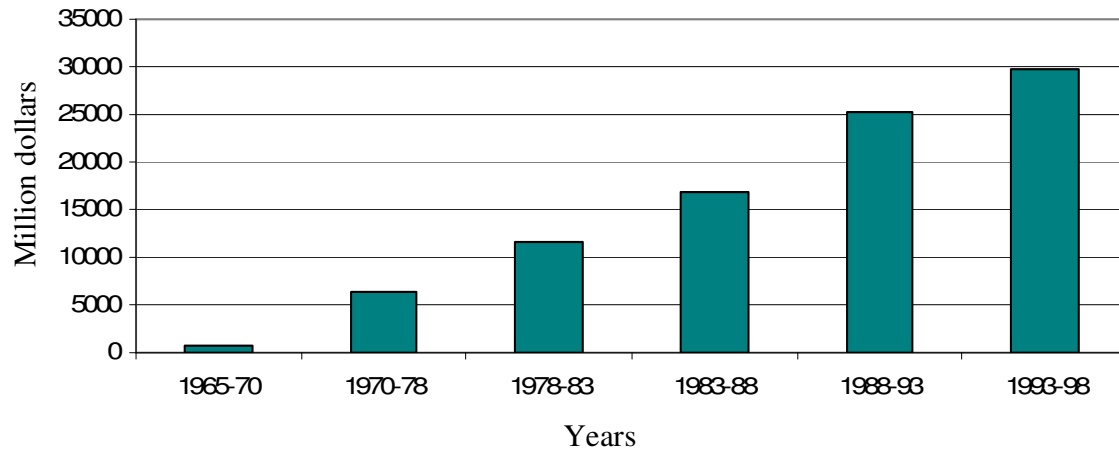
Figure 1. External debt in million dollars.

Table 7. Vector error correction estimates (VECM).

Error correction	D(G$_t$)	D(ED$_t$)	D(INV$_t$)	D(PG$_t$)	D(OP$_t$)
	-1.134577	-0.030798	0.203612	-0.077553	-0.032792
CointEq1	(0.50962)	(0.11687)	(0.09377)	(0.02600)	(0.08343)
	(-2.22633)	(-0.26352)	(2.17141)	(-2.98255)	(-0.39302)
	-0.082858	0.028698	-0.132755	0.065485	0.000396
D(G$_t$(-1))	(0.40122)	(0.09201)	(0.07382)	(0.02047)	(0.06569)
	(-0.20651)	(0.31190)	(-1.79826)	(3.19885)	(0.00602)
	0.005807	0.052106	-0.093552	0.024636	0.027463
D(G$_t$(-2))	(0.26970)	(0.06185)	(0.04962)	(0.01376)	(0.04416)
	(0.02153)	(0.84246)	(-1.88517)	(1.79030)	(0.62196)
	-2.463829	0.407044	-0.035481	0.089757	-0.485873
D(ED$_t$(-1))	(1.20197)	(0.27564)	(0.22116)	(0.06133)	(0.19679)
	(-2.04983)	(1.47671)	(-0.16043)	(1.46355)	(-2.46904)
	-3.181019	0.238919	-0.193351	0.026694	-0.078511
D(ED$_t$(-2))	(1.39596)	(0.32013)	(0.25685)	(0.07123)	(0.22855)
	(-2.27873)	(0.74632)	(-0.75276)	(0.37478)	(-0.34352)
	-0.683163	-0.099492	0.325175	-0.171440	0.138019
D(INV$_t$(-1))	(1.66979)	(0.38293)	(0.30724)	(0.08520)	(0.27338)
	(-0.40913)	(-0.25982)	(1.05837)	(-2.01226)	(0.50486)
	-3.820465	-0.324311	-0.002430	0.129275	-0.231316
D(INV$_t$(-2))	(1.46836)	(0.33673)	(0.27018)	(0.07492)	(0.24040)
	(-2.60185)	(-0.96311)	(-0.00899)	(1.72550)	(-0.96221)
	3.015626	-0.083025	-0.478817	-0.370289	0.708842
D(PG$_t$(-1))	(4.38520)	(1.00564)	(0.80687)	(0.22375)	(0.71795)
	(0.68768)	(-0.08256)	(-0.59342)	(-1.65496)	(0.98732)

Table 7. Contd.

D(PG$_t$ (-2))	-0.356436	-1.074190	0.364986	0.043120	-0.241976
	(4.56890)	(1.04777)	(0.84067)	(0.23312)	(0.74802)
	(-0.07801)	(-1.02522)	(0.43416)	(0.18497)	(-0.32349)
D(OP$_t$ (-1))	0.116537	0.185625	-0.307245	-0.166967	0.014619
	(1.80709)	(0.41442)	(0.33250)	(0.09220)	(0.29586)
	(0.06449)	(0.44792)	(-0.92404)	(-1.81086)	(0.04941)
D(OP$_t$ (-2))	-1.628275	-0.073192	0.014068	0.005792	-0.164618
	(1.74649)	(0.40052)	(0.32135)	(0.08911)	(0.28594)
	(-0.93231)	(-0.18274)	(0.04378)	(0.06500)	(-0.57571)
C	0.420073	0.013548	0.009122	-0.017165	0.057593
	(0.18406)	(0.04221)	(0.03387)	(0.00939)	(0.03013)
	(2.28226)	(0.32096)	(0.26934)	(-1.82777)	(1.91121)
R^2	0.790036	0.289633	0.445264	0.721816	0.552042
Adj. R^2	0.597569	-0.361536	-0.063245	0.466813	0.141414
Sum sq. resids	1.506131	0.079209	0.050991	0.003921	0.040371
S.E. equation	0.354275	0.081245	0.065186	0.018076	0.058002
F-statistic	4.104788	0.444789	0.875627	2.830623	1.344384
Log likelihood	-0.832408	34.51016	39.79540	70.57912	42.59790
Akaike AIC	1.069367	-1.875847	-2.316284	-4.881593	-2.549825
Schwarz SC	1.658394	-1.286820	-1.727257	-4.292566	-1.960798
Mean dependent	-0.023968	0.072970	-0.004494	-0.009541	0.011331
S.D. dependent	0.558464	0.069628	0.063218	0.024755	0.062597

Determinant residual covariance	1.24E-14
Log likelihood	214.0255
Akaike information criteria	-12.41879
Schwarz criteria	-9.228226

Sample (adjusted): 1985 to 2008; Included observations: 24 after adjusting endpoints; Standard errors and t-statistics in parentheses.

between debt and economic growth that is proved further through Granger causality and Vector Error Correction Estimates that there is a unilateral relationship between debt and economic growth.

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