Debt Dynamics and its Burden on National Economy:
A Case Study of Pakistan (1970-2005)

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Abstract

This paper examines the debt dynamics and its burden in Pakistan over the last three decades. Our results indicate that the rising level of twin deficits, exchange rate fluctuations and high interest rate payments are the three core variables responsible for the rise in public debt ratio and debt burden. Results reported reveal that the primary balances mainly contributed to the rise in public debt ratios, the exchange rate factor has also remained important throughout the period in raising the public debt ratio, where as the role of interest factor was insignificant in general. Similarly primary current account balances and depreciation of exchange rate played a critical role in raising the external debt ratios, whereas interest rate factor was marginally responsible towards the rise in external debt to GDP ratio in 1990s and 2000s.

Introduction

Ever since its inception, Pakistan continued to rely heavily on domestic and external resources to fill the increasingly high fiscal and external sector deficit. From the outset a sustainable pattern of public finance and external account was not maintained. One obvious consequence of continuous borrowing was the soaring public debt and continuous debt-servicing burden. Thus a high level of debt stock and debt servicing emerged in the decade of 1980s and continued to be so in the decade of 1990s and afterwards in the second half of 2000s.

In terms of percentage of GDP, public debt was 54.4 percent in 1980, which increased to 100 percent by 2000. The debt servicing liability also increased in Pakistan over time. In 1990, 41.4 percent of the total revenue was spent on the debt servicing obligations which reached to 74 percent in 2000. The ratio of debt service payment to foreign exchange earning rose even more sharply, from 16.5 percent in 1980 to 27.3 percent in 2002. Although the debt reduction strategy pursued in the beginning of the decade of 2000s brought some temporary relief in the form of restructuring and rescheduling of debt, yet in the financial year of 2007 alone, total debt and liabilities stock rose by 10 percent,

the share of short-term debt increased and the share of foreign debt at floating interest rates also increased.

The dynamics of public debt indicate that the change in debt to GDP ratio originated from large primary imbalances, interest rate relative to GDP and exchange rate fluctuations impacting the value of Rupee. Large primary imbalances were primarily led by slow growth in revenue mobilization, increasing government expenditure, slow and stagnant growth in export receipts and increasing payments for imports. Even the prolonged use of various IMF packages and structural reforms of 1990s which involved liberalization, privatization, deregulation, etc., could not restore the fiscal and current account balances.[1] In fact structural reforms were largely instrumental in raising the cost of borrowing sharply. It brought a shift towards a market based system of raising public debt which raised the interest rates on domestic borrowing. The exchange rate fluctuations stemming from structural reforms led to depreciation of value of rupee which increased the cost of borrowing. The reforms also did not have significant impact on export growth in fact imports grew sharply which led to primary current account imbalances. Thus public debt and public debt burden increased to unsustainable levels.

The prime objective of the paper is to develop a model to examine and identify the factors that are responsible for instability in debt position of Pakistan from the period of 1970s to first half of the decades of 2000s. It is important to distinguish between the various factors that led to change in debt to GDP ratio. Such an analysis is useful from public policy and debt management point of view.

Some preliminary studies undertaken by Faiz (2003), Pasha and Ghaus (2001) examined the evolution of public debt and the factors contributing towards its growth in Pakistan. Their findings are that rise in debt to GDP ratio was the result of cumulative effects of successive large primary budget deficit along with the non-interest current account deficit. A review of literature on debt dynamics indicate that the mounting debt stock and burden was the possible result of three core variables namely, the twin deficits, exchange rate fluctuations and high interest rate payments (IMF 2001, ADB 2002).

This paper is organized as follows: the introduction as dealt with above forms section I. The theoretical framework along with results of public debt dynamics and dynamics of public debt burden are discussed in section II, while the following section deals with the analysis of dynamics of external debt and external debt burden. The main conclusions of this analysis are presented in the final section of the paper.

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[1]The trade liberalization and devaluation was meant to increase exports and boost economic growth; in fact it raising the cost of imported inputs and slowed down the economic growth. Moreover exports remained stagnant and devaluation added to the rupee value of foreign debt resulting in an increase in debt service burden.

Theoretical Model and Results

The debt dynamics analysis in this paper is studied in two ways; firstly it examines the dynamics of public debt and public debt burden. Second, the paper also examines the dynamics of external debt and external debt burden separately. Public debt is the sum of domestic debt payable in Rupees and public and publicly guaranteed external debt payable in foreign exchange. The theoretical model of dynamics of public debt provides an overall assessment of the debt dynamics. The dynamics of debt payable in rupees are different from the dynamics of debt payable in foreign currency. For example, in case of public debt payable in Rupees, the domestic real interest rate, GDP growth, primary balances are the important variables, whereas for external debt, the relevant variables are current account balance, foreign interest rate and depreciation of Rupee against the foreign exchange. The main findings of the paper are based on accounting approach which summarizes the data based on International Financial Statistics for the period 1971-2005.

Dynamics of Public Debt

To identify the core variables contributing towards high public debt to GDP ratio, our model is based on a model developed by John T. Cuddington (1996) and also draws upon the model developed by IMF (2001). This model expands the analysis to developing countries by incorporating seigniorage as well as external financing as the two important sources of financing fiscal deficit in developing countries. Based on the budget constraint for developing countries, change in public debt ratio between period t and t + 1 expressed in equation (1) is comprised of three core factors, *i.e.*, primary balances interest rate relative to GDP growth and the exchange rate effects.[2]

$$\Delta b_t = \left[\frac{(1+r_t)\varepsilon\alpha_{t-1}}{(1+g_t)} b_{t-1} + \frac{(r_t - g_t)}{(1+g_t)} b_{t-1} \right] - s_t \qquad (1)$$

A brief explanation regarding the linkage between these three key factors and the change in public debt to GDP ratio is given as below:

Exchange rate effect (ε_t): The exchange rate effect and its impact on foreign currency denominated debt component is measured by the first term on the right hand side of equation (1). It is expected that a depreciation of the exchange rate will raise the cost of borrowing and value of external debt in Rupee terms.

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[2]IMF (2001).

$$\left[\frac{(1 + r_t)\varepsilon\alpha_{t-1}}{(1 + g_t)} b_{t-1} \right]$$

Interest rate effect (r): The second term on right hand side of equation (1) measures the difference between interest payment and growth rate of GDP. Both have strong impact on debt dynamics. In particular, a positive difference between interest and growth rate will have destabilizing effect on debt dynamics through the inherent built in compounding interest rate effect.

$$\left[\frac{(r_t - g_t)}{(1 + g_t)} b_{t-1} \right]$$

Primary balances (S): The last term in the equation above represent the extent of budgetary financing required to meet for government expenditure. Primary budgetary balances have a strong bearing on debt dynamics, *i.e.*, primary surpluses help in reducing the change in debt to GDP ratio, where as primary deficit worsen the situation. In other words:

$S_t = (PS_t + \Delta H_t)$ where the $PS_t = R - G$ which denotes the non-interest primary surplus $(-PS_t$ and denotes the primary deficit, which in fact is the difference between government revenue (R) and expenditure (G) exclusive of interest payments on the debt) and H is change in monetary base for budgetary support. Thus, to determine the dynamics of public debt and to assess the contribution of the above mentioned three core variables in changing the public debt to GDP ratio, the accounting approach is adopted.

Results reported in **Table 1** show that the effect of exchange rate changes on public debt was a prominent factor and it was responsible for an increase in public debt ratio since 1980s. In fact, capital loss on external debt due to exchange rate depreciation made significant contribution towards increase in public debt to GDP ratio. In the first half of 2000s, as the Pak rupee appreciated against dollar, exchange rate effects were minimized.

The interest rate factor in debt dynamics was generally favorable and it did not contribute much to the rise in Pakistan's public debt ratio except in 2000s. The reasons were low interest rate on public debt, especially on external public debt, and relatively high rates of real GDP growth, which led to the negative growth, adjusted real interest rates. Nevertheless, the interest dynamics became increasingly less favorable in late 1990s, reflecting primarily the rising interest rates on domestic public debt and the growing debt stock.

Table 1

Dynamics of Public Debt

Decades	Changes in Public Debt Ratio PA % of GDP	Contribution of Determinants to change in Debt/GDP					Others
		Primary Balance Factor % of GDP	Interest Pay Factor	Growth Factor	Interest Factor % of GDP	Exchange Rate Factor % of GDP	
1970s	1.1	6.1	–6.3	–3.0	–9.4	3.5	0.8
1980s	1.5	3.5	–0.7	–3.7	–4.4	2.2	0.3
1980s-I	–1.2	3.3	–2.0	–3.5	–5.4	1.9	–1.0
1980s-II	4.3	3.6	0.5	–4.0	–3.4	2.5	1.6
1990s	2.3	1.3	–0.9	–2.9	–3.8	3.0	1.8
1990s-I	0.5	1.7	–1.2	–3.4	–4.6	2.4	1.0
1990s-II	4.0	0.9	–0.6	–2.4	–3.0	3.5	2.6
2000s	–3.9	–3.1	2.8	–4.5	–1.7	1.6	–0.7

Source: IFS CD ROM [2006] and estimated by authors from IFS data set.

So far as the primary deficit is concerned, despite seigniorage the cumulative effect of continuous large primary deficits was the most important factor behind the increase in the public debt to GDP ratio during 1970s and 1980s. Increase in the level of public debt during this period is attributed mostly to the increase in domestic debt. However, the contribution of primary deficit to the public debt dynamics began to decrease in 1990s but it remained the major contributor in enhancing the debt ratios. In 1998, a primary surplus was recorded for the first time and it remained surplus in 2000s. The decreasing contribution of the primary balances towards increase in the debt ratio resulted from fiscal adjustment efforts during 1990s and 2000s.

THE DYNAMICS OF PUBLIC DEBT BURDEN

The real growth in the public debt burden, measured as real annual growth in debt less real annual growth in revenues, was caused largely by strong real growth in public debt. Where as explosive growth in the public debt during the decades of 1980s and 1990s, particularly in the second half of both the decades is attributed to a large extent to three factors, *i.e.*: firstly, deteriorating and stagnant growth in government revenues was one of the primary factors causing high growth in public debt burden. **Table 2** shows that although real growth in revenue in the first half of 1980s led to negative growth of debt burden, the situation reversed during the early 1990s. In other words the real growth of debt was modest while the real growth in revenues declined sharply causing high real growth in debt burden during the second half of 1990s.

Moreover, a boost in real growth of revenues was observed in the year 2000 but again turned negative in 2003 and 2005. This negativity was off set by extremely low growth in public debt and the result was negative real growth of public debt burden.

Secondly, the real cost of borrowing rose steeply to 5.3 percent in the second half of 1980s and touched the minimum level of two percent in first half of 1990s. Thereafter, it went up on average to 4.5 and four percent in second half of 1990s and in 2000s, respectively. The real debt rose because of two main reasons in 1980s and 1990s. Firstly, prior to the financial sector reforms in 1989, interest rates were controlled and Government could borrow at significantly below-market rates. Secondly a substantial portion of the public debt raised during the 1980s was through the National Savings Schemes.[3]

Table 2

Dynamics of Debt Burden

Decades	Primary Fiscal Balance	Real cost of Borrowing*	Real Growth of Public Debt	Real Growth in Revenue	Real growth Debt Burden
1970s	6.1	−1.8	9.7	6.5	3.3
1980s	3.5	3.0	10.0	9.7	0.3
1980s-I	3.3	0.6	5.4	10.2	−4.8
1980s-II	3.6	5.3	14.6	9.1	5.5
1990s	1.5	3.2	7.5	2.6	4.9
1990s-I	1.7	2.0	5.9	3.9	2.0
1990s-II	0.9	4.5	9.1	1.3	7.8
2000s	−3.1	4.0	0.3	4.9	−4.6

Source: IFS CD ROM 2006 *Includes capital loss on external debt

In contrast to the above, the move to a market-based auction system[4] for raising public debt, initiated in 1989 as a part of financial sector liberalization program, nearly trebled the interest payments on domestic debt. As a consequence, reduction in the fiscal deficit became difficult and interest payment was largely instrumental in a shaping the growth in public debt.

Finally, the third factor that became increasingly relevant especially for the second half of the 1990s was the frequency and extent of currency devaluation,

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[3]Asian Development Bank, "Escaping the Debt Trap: An Assessment of Pakistan's External Debt Sustainability", Working Paper No. 1, (2002)

[4]Without introducing fiscal discipline in the public sector and structural improvement in public finances as pre requisite, which would have led to a reduction in the fiscal deficit and a lowering of the annual quantum of government borrowing, this move appears to have been incorrectly sequenced and somewhat premature in its timing.

which led to, increased debt burden in Rupee terms. Table 3 provides a clear picture of average annual devaluation of Pak rupees and increase in Pakistan's external debt services. From Table 3 it can be concluded that there is a significant additional burden on the budget and also on fiscal balances due to the impact of currency depreciation.

Table 3

Average Annual Devaluation of the Pakistan Rupee
and Increase in Pakistan External Debt Service

Years	Debt service $ mls	Year on Year change	Debt service (Rs. mls)	Year on Year change
1995	3364.9	18.0	103.6	20.2
1996	3267.0	–2.9	110.2	6.4
1997	3659.0	12.0	143.2	30.0
1998	3131.0	–14.4	135.7	–5.3
1999	2652.3	–15.3	124.4	–8.3
2000	2883.5	8.7	149.1	19.9
2001	2892.0	0.3	169.4	13.6
2002	2895.2	0.1	177.8	5.0
2003	2948.4	1.8	172.5	–3.0
2004	3723.0	26.3	214.3	24.3
2005	2718.0	–27.0	161.3	–24.8

Source: IFS CD ROM 2006

Theoretical Model and Results for External Debt

The theoretical model of dynamics of external debt exclusively identifies variables that are relevant to the external sector accounts and assess their significance in contributing to external sector imbalances. The external debt includes public and publicly guaranteed and public non-guaranteed debt.

Dynamics of External Debt

To identify and assess the magnitude of the factors that contributed to the evolution of the external debt in the past is essential for policy makers. This section deals with this issue. The change in external debt as percent of Gross Domestic Products (GDP) between period t and t+1 can be decomposed into the following factors, *i.e.*, primary current account balance (pcb), foreign interest & growth rate factor (r* and g, respectively) and change in foreign exchange reserves (res) (International Monetary Fund, 2001). The link and direction of

association between the three key factors influencing change in external debt to GDP ratio is briefly mentioned as below:

$$\Delta d_t = -pcb_t + (\frac{r*-g}{1+g})d_t + \Delta res_t \qquad (2)$$

- **Primary current account balance (pcb):** the first term of equation (2) given above measures the primary current account balances. A negative primary current account indicates the extent of external financing required to meet the excess of imports payments over the receipts from exports and transfers. Therefore a high current account deficit is closely associated with increase in external borrowings and external debt dynamics.

- **Interest factor (r)**: the second term of the above equation is represented by the growth adjusted interest factor. It arises from the difference between foreign interest rate on the external debt and the GDP growth. If this difference is positive, it means the compounding effect of interest can lead to continued increases in the external debt unless net exports are, on average, positive and large enough to offset the interest payment bill.

- **Foreign exchange reserves (res):** the last term of equation (2) shows that foreign exchange reserves accumulated through foreign borrowing lead to accumulation of external debt and impact the change in debt to GDP ratio adversely.

Besides the above three factors, other factors that may have impact on the external debt to GDP ratio, include capital inflows such as foreign direct investment or portfolio inflows, etc., as both reduce the need of foreign borrowing and external debt.

A disaggregated view of Pakistan's external debt dynamics during 1980s and 1990s is given in **Table 4**. In general, large external primary imbalances between the exports and imports undoubtedly were the most important factors behind the increase in external debt to GDP ratio. As shown, the primary current account balances have contributed to the debt ratio significantly in 1970, whereas its impact was observed to be the modest in 1980s. This was mainly so due to initiation of development projects in the period of 1970s and availability of funds during the Afghan war in the 1980s. During 1990s, the foreign exchange earnings from exports and workers' remittances of 3.4 percent on average were disappointing which pushed up the external debt ratios. Later on, during 2000s, these ratios turned negative due to improved primary current account balances as a result of exceptional financing, access to the European market and grants received.

The impact of interest payments on change in external debt ratio was not significant in contributing towards increase in external debt ratio. Rather, the

interest factor contributed negatively towards debt ratios in the early decade of 1970s and 1980s whereas it impacted external debt ratio marginally decreased in the period of 1990s and 2000s. This finding may possibly be the result of significant share of concessional debt in total external debt.

As the foreign exchange reserves were quite often needed for the balance of payments support during 1990s, change in reserves at times acted as a push factor and sometimes as a pull factor. On the whole, the accumulation of reserves leads to an increase in external debt. During 2000s, there were significant changes observed in reserves. Because of having front line position against terrorism the inflow of funds into Pakistan increased sharply which reduced the burden of external debt.

Similarly, other determinants including foreign direct investment, portfolio inflows and privatization proceeds, etc., also contributed substantially towards improving the balance of payments position and therefore, reduced the pressure of increase in external debt to GDP ratios.

Table 4

External Debt Dynamics

Decades	Changes in External Debt ratios % of GDP	Contribution of Determinants to Change Ext Debt/GDP			
		Primary CAB Factor % of GDP	Interest Rate Factor % of GDP	Change in Reserve Factor % of GDP	Others
1970s	5.9	5.2	−1.2	1.0	1.0
1980s	2.7	2.8	−1.1	0.2	0.9
1980s-I	2.8	2.7	−2.1	0.9	1.3
1980s-II	2.6	2.8	−0.1	−0.6	0.4
1990s	2.9	4.1	0.7	0.3	−2.2
1990s-I	4.0	3.9	0.2	0.6	−0.9
1990s-II	1.8	4.2	1.2	−0.1	−3.5
2000s	0.7	−1.7	0.6	2.6	−0.8

Primary Balance: Non-interest current account balance

Source: IFS CD ROM 2006

The Dynamics of External Debt Burden

The changing dynamics of external debt as presented in Table 5 shows an increase in debt burden during 1980s and 1990s. The main reason of an

increase in real debt burden in the second half of 1990s is the slower real growth in foreign exchange earnings.

During 2000s real growth of external debt burden witnessed massive decline of -10.8 percent per annum on account of almost 9.2 percent real growth in foreign exchange earnings, and marginal decline of –1.6 percent in real growth of external debt. It may also be noted that Pakistan maintained a primary current account surplus to an average of 5.9 percent per annum during 2000s that helped in reducing the country's debt burden at a relatively faster pace.

Table 5

Dynamics of External Debt Burden

Decades	Primary[a] CAB % of GDP	Real cost[b] of borrowing % per Annum	Real Growth of External Debt % per Annum	Real Growth[c] in FEE %per Annum	Real Growth of Ext. Debt Burden % per Annum
1970s	−4.1	0.4	0.1	6.8	−6.7
1980s	−1.2	5.1	−0.6	0.6	−1.2
1980s-I	−1.5	2.9	−1.4	3.2	−4.6
1980s-II	−0.8	7.4	0.2	−1.9	2.1
1990s	−1.1	3.8	−3.4	−6.6	3.3
1990s-I	−1.2	2.5	−1.0	−4.6	3.5
1990s-II	−0.9	5.1	−5.7	−8.7	3.0
2000s	5.9	0.1	−1.6	9.2	−10.8

GDP: Gross domestic products

a: Indicates current account balance excluding interest payments

b: Include capital losses on external debt

c: Foreign exchange earning includes exports of Gds and services plus remittances.

The real cost of foreign borrowing includes interest cost and cost of capital loss on external debt of Pakistan economy. It was on average 5.1 and 3.8 percent per annum in 1980s and 1990s respectively. So it can be concluded that fluctuations in exchange rate and inflation rate in 1990s and 2000s caused sharp fluctuations in the cost of borrowing which exerted a significant impact on the external borrowing of the economy.

However, during the second half of the 1990s, nominal interest rate was as high as high 15.1 percent with the inflation rate of 10 percent, along with sharp depreciation of exchange rate which led to a substantial rise in real cost of borrowing. The situation changed to the other extreme during 2000s when real cost of borrowing declined to an average of 0.1 percent per annum on account of benign interest and inflation rate (5% and 4.9%) along with the appreciation of exchange rate. As a result of the sharp fluctuations in the real cost of

borrowing, the dynamics of external debt burden also changed over the last two decades.

Implications and Conclusions

Results reported for debt dynamics confirm that the primary balances both fiscal and current account deficit and exchange rate factor were largely responsible for worsening of the debt ratios. The interest rate factor was in general modest and was not primary source of any positive contribution towards the change in debt to GDP ratio.

Decade wise assessment of debt dynamics show that explosive growth in debt was recorded particularly in the decade of the 1990's, which led to increase in debt to GDP ratios and the debt burden of the country. Despite several reforms, structural adjustments and prolonged use of IMF funds, fiscal imbalances and primary current account imbalances remained high. Fiscal imbalance could not be restored; revenue mobilization and domestic savings as a percentage of GDP continue to be low. A similar situation is observed in case of external balances where export receipts are not sufficient to meet the growing import payments. Even trade liberalization and huge exchange rate depreciation could not improve the terms of trade. Although, emphasis on reforms, debt management and debt restructuring brought some temporary relief in the first half of the decade of 2000s, government borrowing requirements remained high. Declining debt to GDP ratio in the first half of the decade of 2000s has currently reversed and it seems that the benefits of restructuring were short lived as the government has once again resorted to borrowings both from domestic and eternal sources.

One implication of the reforms and adjustment policies is that domestic policies could not be developed to stabilize the debt dynamics and ensure decline in debt to GDP ratio. Fiscal and current account balances need to be restored by addressing the root cause of imbalances rather than a mere shift in policy towards reforms, liberalization and deregulation. Revenue mobilization, export growth, exchange rate stability and improvement in terms of trade are of utmost importance for the stability of debt dynamics and debt to GDP ratios. This situation also reflects that the country needs to address its energy issue to cut on the import of oil which is a major source of current account imbalance. Some specific measures need to be adopted in this regard.

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