

**A Dissertation Submitted in Partial Fulfillment of the Requirement for
the Degree of Doctor of Philosophy in Economics**

**Debt Sustainability and Dynamics in Pakistan
Theory and Evidence**

By

**Tahir Mahmood
PhD-22/2001**

Dr. Ather Maqsood Ahmed

**Supervisor
Member Fiscal Policy
Central Board of Revenue
Islamabad**

Dr. Shahnaz A Rauf

**Co-Supervisor
Team Leader
NIBAF, Islamabad**

**Pakistan Institute of Development Economics,
Islamabad**

Dedication

Dedicated to the memory of my loving (late) mother whose warm and tender love I can never forget (may Allah Almighty bless her soul) and to my loving Father

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Abbreviations Used

ADB:	Asian Development Bank
ADF:	Augmented Dickey Fuller
BOP:	Balance of Payment
CPIA:	Country Policy and Institutional Assessment
DFI:	Direct Foreign Investment
DRI:	Debt Relief International
EFF:	Extended Fund Facility
FEE:	Foreign Exchange Earning
GDF:	Global Development Finance
GDP:	Gross Domestic Product
GNI:	Gross National Income
GNP:	Gross National Product
GFSY:	Government Financial Statistics Yearly Book
HIPC:	Heavily Indebted Poor Countries
IBRD:	International Bank for reconstruction and Development
IMF:	International Monetary Fund
LIBOR:	London Inter Bank Offer Rate
LUMS:	Lahore University of Management Sciences
MILIC:	Moderately Indebted Low Income Countries
MEFMI:	Macroeconomic & Financial Management Institution
MTEF:	Medium Term Expenditure Framework
NPG:	Non-Ponzi Game
Non-ODA:	Non-Official Development Assistant
ODA:	Official Development Assistant
PPEC:	Oil and Petroleum Exporting Countries
PVBC:	Present Value Budget Constraint
PVC:	Present Value Constraint
PP:	Phillip Parron
PNG:	Private Non-Guaranteed
PPG:	Public and Publicly Guaranteed
PSPD:	Public Sector Development Program
PRGF:	Poverty Reduction and Growth Facility
SAL:	Structural Adjustment Loan
SAPs:	Structural Adjustment Program
SA & SP:	Structural Adjustment and Stability Program
SILIC:	Severely Indebted Low Income Countries
SME:	Small and medium enterprises
TVC:	Time Varying Coefficient

Abstract

Pakistan has experienced a mounting debt burden since the start of 1980s that was mainly the result of three core variables i.e. high interest rate payments, exchange rate fluctuations and the twin deficits¹. This raised the question of debt sustainability (i.e. whether the government intertemporal budget constraint holds in present value term without change in fiscal policy). The dissertation aims to address the sustainability issue by developing a theoretical framework in accordance with the prevailing patterns of public finance and derive debt sustainability conditions for the economy of Pakistan. The analytical framework developed is applied for empirical testing of debt sustainability, analysis of debt dynamics, simulation and sensitivity analysis to workout the most likely scenario of debt sustainability for the economy of Pakistan. These findings will also be aimed at comparing and validating the results obtained through the analysis of Traditional Debt Indicator Approach.

Results reported reveal that the primary balances mainly contributed to the rise in debt ratios whereas the exchange rate factor has remained important throughout in raising debt ratio and the role of interest rate factor was marginal. On the external front primary current balances played a critical role in the rise in external debt ratios, whereas interest rate factor is held responsible for contributing towards the rise in debt to GDP ratio through out the period. The explosive growth of public debt in 1990s coupled with low growth in the revenues, especially in second half of the decade, increased the debt burden tremendously.

By using various empirical approaches, it was found that both public and external debts remained Unsustainable during the period under consideration i.e. 1971-2005 and also validates the findings of the Traditional Debt Indicator Approach indicating debt ratio to be unsustainable.

¹ Twin Deficit i.e. fiscal deficit and current account deficit or we can define it mathematically as $S-I = G - T + (X - M)$

*“No borrowing, your majesty, because, after a while, too much borrowing
either call for bankruptcy or increase of taxes”*
Turgot to Louis XVI

Introduction

Background

The combination of fiscal indiscipline and unfavorable shocks resulted in stubbornly high fiscal and current account deficits during 1980s. The policy makers could not establish a sustainable pattern of public finance. Prior to 1990s administered interest rates allowed the government to borrow at significantly below-market rates from captive sources. With Structural Adjustment Program (SAP) of the IMF and financial sector liberalization, a market-based auction system for Government borrowing led to high rates on government securities. Further, high interest based non-bank borrowing by the government was preferred as it was outside the conditionality of the SAPs and was also non-inflationary. Apart from these factors inappropriate sequencing of financial reforms also sharply raised the government interest payments on domestic debt. On the external front, the external debt of Pakistan amplified primarily during 1990s because of heavy devaluation and trade liberalization that worsened current account balance instead of improving it². The massive depreciation in the exchange rate has also added to the Rupee value of public external debt.

Although the growth in public debt has been arrested due to recently launched debt reduction strategy yet the volume of debt is still very high. The relief achieved may be temporary as it is the result of changed global scenario and Pakistan’s unique front line position, improvement in external accounts as a result of increased access to world markets, rescheduling and re-profiling of debt and high remittances from expatriates. The study hypothesize that the mounting debt burden was the result of three core variables namely, high interest rate payments, exchange rate fluctuations, and the twin deficits. This raises the question of debt sustainability and its serious implication for the economy.

² The trade liberalization and devaluation was supposed to boost exports and stimulate economic growth; but these policy initiatives actually had a recessionary impact on the economy by raising the cost of imported inputs while export remained stagnant due to weak prices of low value added commodities abroad and non-availability of export surplus, the devaluation had directly added to the rupee value of foreign debt resulting in a dramatic increase in debt service burden and lower economic growth. Historically, devaluation process has only helped in maintaining export rather than increase in exports.

A debt position is considered sustainable when the government satisfies its intertemporal budget constraint (i.e. remains solvent) without a major correction in the future that would be unfeasible or undesirable for economic or political reasons³. This constraint requires that current debt be covered by future primary surpluses, violation of government intertemporal budget constraint would indicate that current account and budget deficits / debt is not sustainable and that fiscal policy must change.

The objective of this dissertation is to address the sustainability issue by developing a theoretical framework and to derive debt sustainability conditions for the economy of Pakistan in particular and developing countries in general. In the second step, the analytical framework developed is applied for empirical testing of debt sustainability, analysis of debt dynamics, and simulation and sensitivity analysis to workout the most likely scenario of debt sustainability. This model has a futuristic out look having predictive capability regarding future path of sustainable debt. In this way, the study is of its first kind theoretically and empirically in Pakistan that attempts to analyze the debt issue in a dynamic perspective on the basis of a sound theoretical framework -- a subject which was in the past approached only through static and ad hoc measures. The traditional debt indicators analysis often used in earlier studies not only lacked theoretical underpinning but also had limitations in terms of debt dynamics, predictive accuracy and comprehensiveness.

The results of the analysis reveal that the present public debt situation continues to be unsustainable despite consistent decline in the debt-to-GDP ratio from 80 percent in FY2002 to 61.5 percent in FY2005 reported in the "Debt Policy Statement" 2006-07. The analysis raises the possibility of an error committed while comparing the debt-to-GDP ratio for pre and post re-based GDP scenario. After making necessary corrections, the present analysis indicates that the debt-to-GDP ratio may actually be 74.6 percent, which is fairly higher than the reported statistics. This divergence could be due to absence of a coherent and well-integrated model of debt management and monitoring system, making the debt analysis

³ There are other definitions of debt sustainability also often used by the IMF and the World Bank. The present study covers these wide-ranging concepts in Chapter 5.

dubious.⁴ Moreover, the institutional weaknesses of the past in the management and handling of debt issues may also have contributed toward this problem.⁵

1.2 Objective of the Dissertation

To develop a theoretical framework for assessing debt sustainability and dynamics using a model primarily developed for the industrial countries⁶ and modifying it according to the prevailing patterns of public finance in Pakistan to test the followings:

1. To assess the sustainability of public and external debt by testing the validity of the Government Inter-temporal Budget Constraint or the Non-Ponzi Game Condition (NPG);
2. To analyze the issue of debt sustainability, using the Traditional Debt Indicator Approach, in order to make the meaningful comparison of pre and post 2000 debt ratios. These findings will also be aimed at comparing and validating the results obtained through Accounting and Present Value Budget Constraint [PVBC] approaches;
3. To test for structural breaks in fiscal policy. The break in fiscal policy may affect the test of debt sustainability that leads to biased inferences;
4. To analyze the dynamics of public and external debt and to determine the contributions of the factors to change in debt to GDP ratio, the study will test the following hypothesis;
 - Whether interest rate factor is major contributor to the change in debt to GDP ratio;

⁴ The figures regarding external debt contracted or repaid remain questionable on various counts, especially the non-revelation of the commercial debt contracted and commercial debt repayments etc. The ABN-Amro Bank report of 1999 has highlighted the possibility of camouflaging the figures of external debt. According to Rehman (2006), the expenditure side of the budget is also covered up by under-reporting of expenditures on defense, debt repayments and civil administration; development budget is being over reported; and the size of the national budget is under-reported since large amounts received by the government are not deposited in the federal consolidated funds and are thus excluded from the budget.

⁵ It is no secret that the aid inflows, debt servicing and the allocation of funds received are dealt by Economic Affairs Division. The policymaking and analysis is carried out in Finance Division. In addition the Central Bank also maintains debt related database and exercises its influence on debt situation in the country. Fortunately, a centralized Debt Office has been created that is expected to improve upon this situation in coming years.

⁶ The Present Value Constraint approach to sustainability of fiscal policy was initially developed for the industrial countries where it is assumed that seigniorage revenue was unimportant and all public debt was in domestic currency. In the context of developing countries, issues like reliance on Seigniorage to finance deficit, foreign currency borrowing, concessional lending and grants are also important. Hence, the model specification requires necessary improvement.

- Whether the contribution of primary fiscal balance to the change in debt to GDP ratio is significant;
 - Whether the exchange rate fluctuations contributes toward the change in debt to GDP ratios;
5. To undertake **simulation and sensitivity analysis of debt dynamics** using different scenarios of key macroeconomic variables to workout the most likely scenario for debt sustainability in relation to the economy of Pakistan; and
 6. Beside the model based analysis a complete debt profile is presented that gives the historical evolution, composition of debt and its maturity structure.

1.3 Methodology

Accounting Approach and Present Value Budget Constraint Approach (empirical) have been used to derive the conditions for debt sustainability. Both these approaches are based on government budget constraint reflecting Pakistan's macroeconomic framework. The theoretical framework employed for analyzing the sustainability of debt empirically is tested for public and external debt by developing two separate models.

The theoretical framework developed by using the Accounting Approach would result in derivation of conditions of debt sustainability that would be tested by using Pakistan data. These conditions are: (a) the debt is sustainable if the interest rate is lower than the growth rate of the variables used to measure payment capacity (GDP, Export, Revenues), and (b) primary balance are surpluses or equal to zero on average, if not in every period.

The model would further be evolved by using the PVBC [empirical] approach aims at employing the latest econometrics techniques/methods for testing the sustainability of debt.

- First method is to test the stationarity of the discounted debt series.
- The second method is the cointegration tests which would be looking for a cointegrating relationship between the revenue and Government expenditure inclusive of interest rate payments where the cointegration is a necessary condition, with cointegrating vector (1,0, -1), for the intertemporal Budget constraint to hold. In this exercise, the Dynamic OLS estimator is used for estimating the cointegrating equation.

As an important part of analysis and for meaningfulness of the results, the study undertakes the test for structural break in fiscal policy. The structural break in fiscal policy is examined using the Chi Square test by Quintos [1995].

Using Accounting Approach, the debt dynamics analysis is undertaken for determining the contribution by the interest rate-growth differential, primary balances and valuation effect of exchange rate to change in debt to GDP ratio. A simulation and sensitivity analysis is also conducted to workout the future path of debt using key macroeconomic variables in Pakistan such as real GDP growth, interest rate, inflation, exchange rate, primary balances and the stock of outstanding debt

The debt Indicator analysis would also be undertaken for making proper and meaningful comparison of pre and post 2000 debt to GDP ratios. This comparison is warranted because of the fact that the Debt Policy Coordination Office of the Government of Pakistan is now using GDP statistics **rebased** at FY2000 prices for calculating debt indicators. In this study the GDP statistics of pre-2000 would be converted at the new base i.e. at FY2000 prices, and the figures of post 2000 periods would be adjusted at the previous base for making the accurate comparison of debt ratios.⁷

1.4 Data Sources

The data sources for the study are “International Financial Statistics” and “Government Finance Statistics Yearbook” published by the International Monetary Fund [various issues and CDs], “Global Development Finance” and “World Debt Table” [various issue] published by the World Bank and “Annual Report” published by the State Bank of Pakistan. The time span covered in the study is 1971-2005.

1.5 Key Outcomes

The outcome of the empirical analysis undertaken, using present value budget constraint approach is that both the public and external debts have remained unsustainable through out

⁷Pakistan’s GDP has been rebased at FY 2000 a price that makes the comparison of debt indicators and ratios of post 2000 period with the same ratios of pre-2000 era improper and unrealistic.

the sample period 1971-2005 while using the Accounting Approach for debt sustainability the results remained the same except for the decade of 2000s.

The debt dynamics analysis shows that the debt interest dynamics did not contribute to the rise of public debt ratio except for the decade 2000s because of the low nominal interest rate and high inflation rate. The growth adjusted real interest rate effect is negative throughout. The primary balances along with exchange rate fluctuations remained the major contributors in the rise of public debt ratios up to 2000. Similarly, the rapid increase in external debt ratio was largely due to non-interest current account deficit and mildly interest rate factor in 1990s onward. The positive role of foreign exchange earnings in improving debt ratios was observed only after 2000. Finally, the Debt Indicators reveal that the levels of Public debt ratios have remained unsustainable during the last three decades including the period after 2000. However, on external front, these debt ratios have attained sustainability levels 2004 onwards.

1.6 Plan of the Study

The study is organized as follows; the introduction as dealt with above forms chapter one. The review of literature is presented in chapter two. While chapter three and four discuss macro-economic performance and debt profile of Pakistan, the debt Sustainability issue is discussed in chapter five. The theoretical framework on public and external debt is developed in chapter six and seven respectively. The dynamics of debt, simulation and sensitivity analysis are carried out in chapters eight and nine, respectively. The conclusions emerging from this study and policy recommendations are presented in the final chapter.

1.5 Annexure -A

Brief Summary of the Proposed Analysis on Public Debt

Time Span: 1971-2005

Model/ conditions/indicators	Data Required	Sources
<p>A: Trend analysis & complete profile of debt</p> <p>a. Public Debt</p> <p>b. External Debt⁸(used to finance fiscal deficit)</p>	<p>Public Debt</p> <ul style="list-style-type: none"> • Domestic debt • External Debt 	<p>IFS GFSY⁹ SBP</p>
<p>B: Examining Sustainability of Debt using:</p> <p>i) Traditional Indicator Approach</p> <p>Debt burden indicators are</p> <ul style="list-style-type: none"> • Stock measure • Flow measures • Net present values <p>All these measures are expressed in term of GDP and Revenues to see sustainability of public debt.</p> <p>ii) Accounting approach</p> <p>Sustainability conditions¹⁰ are derived under this approach. The conditions are:</p> <ul style="list-style-type: none"> • $r < g$ • $s \geq 0$ <p>if $r < g$ satisfy, debt is sustainable otherwise gap (primary gap & tax gap) indicators are derived using Equation (4).</p> <p>iii) Present value budget constraint approach (Empirical approach)</p> <p>Under this approach the derived cointegrating equation¹¹ is $\kappa_r = \alpha + \beta z_t + v_t$</p> <p>a. We shall estimate the Equation using Johansen co integration and Dynamic OLS technique to test the sustainability hypothesis i.e. (stationarity of v_t and $\beta = 1$)</p> <p>b. Test the sustainability hypothesis by examining stationarity of discounted debt series. The testable discounted equation is $B_t = E_t \sum_{j=1}^N s_{t+j}$</p>	<p>Stock of public Debt Debt servicing Interest payments, GDP GDP Deflator (2000=100) Revenues (including grants) Government Expenditure Primary surplus, Budget deficit, Bank borrowing Nominal interest rate Real interest rate, Inflation</p> <p><i>Data are computed according to requirement of the variables.</i></p> <p><i>Discounted debt series is calculated using formula</i></p> $\left(\frac{1}{1+r_t}\right) \left[\prod_{i=1}^t \frac{1}{(1+r_{t-i})} \right] (B/Y)_t$	<p>IFS And GFSY</p>
C. To Analyze the public Debt Dynamics		
D. Simulation/Sensitivity Analysis		

⁸ It exclude guaranteed and non-guaranteed private debt

⁹ GFSY stand for government finance statistics yearbook (IMF) & IFS for international financial statistics IMF)

¹⁰ Detailed derivation of sustainability conditions & gap indicators are given in section 6.2.1 .Gap indicators measures the magnitude of adjustment necessary to keep the debt/GDP ratio stable.

¹¹ Detailed derivation of equation and definition of the variables used are given in section 6.3.

Annexure-B

Brief Summary of the Proposed Analysis on External Debt

Time Span: 1971-2005

Model / Conditions/Indicators	Data Required	Sources
<p>A: Trend Analysis & Complete Profile of Debt¹² External Debt & components</p> <ul style="list-style-type: none"> • Long term • Short term • Use of IMF credit 	External Debt (stock), public and publicly guaranteed debt, Private non guaranteed debt, Long term debt, Concessional debt, Debt Servicing	GDF ¹³
<p>B: Examining Sustainability of Debt using:</p> <p>i) Traditional Indicator Approach Debt burden indicators are</p> <ul style="list-style-type: none"> • Stock measure • Flow measures • Net present values <p>All the measures are expressed as ratio to GDP & foreign exchange earning.</p> <p>ii) Accounting approach Sustainability conditions¹⁴ are derived under this approach. The conditions are:</p> <ul style="list-style-type: none"> • $r^* < g$ • $s \geq 0$ <p>if $r^* < g$ satisfied, debt is sustainable otherwise gap (Resources gap & export gap) indicators are derived using Equation (21).</p> <p>iii) Present value Current Account constraint approach (Empirical approach) Under this approach the derived cointegrating equation¹⁵ is $EX_t = \alpha + \beta MM_t + v_t$</p> <p>a) We shall estimate the Equation using Johansen co integration and Dynamic OLS technique to test the sustainability hypothesis (i.e., stationarity of v_t and $\beta = 1$)</p> <p>b) Test the sustainability hypothesis by examining stationarity of discounted debt series. The testable discounted equation is $d_t = E_t \sum_{j=1}^N s_{t+j}$</p>	Stock of External Debt Debt servicing Interest payments GDP GDP Deflator (2000=100) Exports of goods & services Imports of goods & services Trade balances Transfers Current Account Balances Change in Reserve Foreign exchange earning Nominal foreign interest rate Real interest rate Inflation rate	GDF
C. To analyze External Debt Dynamics		
D. Simulation/Sensitivity Analysis		

¹² I include public & publicly guaranteed and private non-guaranteed debt

¹³ GDF stand for Global Development Finance (The World Bank)

¹⁴ Detailed derivation of sustainability conditions & gap indicators are given in section 7.2.1.

¹⁵ Detailed derivation of equation and definition of the variables used are given in section 7.3.

Chapter: 2

Evaluation of Macro Economic Policies of Pakistan

The purpose of this chapter is to review macroeconomics performance of the economy of Pakistan to identify the changing trends of fiscal and other key indicators over the last few decades. It is also assessed how the changing trends in revenue, expenditure, budget deficits and its financing patterns along with changing volume of interest payments has contributed to the massive build up of public debt. The economy of Pakistan starting with small base could not perform well in 1950s mainly because of the absence of planning machinery for economic decision-making, absence of trader's class and predominance of Agriculture sector in the economy. The Agriculture sector remained stagnant and performed poorly throughout 1950's. The establishment and expansion of large scale manufacturing sector, predominantly agri based was the achievement of the decade. Of course the public sector institutions played a vital role for the promotion and development of this sector and huge foreign exchange reserves earned during Korean War were utilized. The growth rate of 3.1%, stagnant agriculture sector, stagnant exports and trade deficits throughout except during the Korean War were the main features of fifties. The food grain shortage in early 50's because of the poor performance of the agriculture sector, forced Pakistan to approach North Americans for having long term credits for imports of food grain and the request was positively responded i.e. the unending era of foreign loans and grants thus started.

2.1 Fifties and Sixties

During late fifties and early sixties government priorities shifted, i.e. pro – industrial bias diluted and realization to focus on agricultural sector emerged. The result was rapid growth in both the industrial and agriculture sector and consequently significant increase in per capita income. It was a period of sound and disciplined economic management. Strong planning and formal decision-making machinery culminated in the institutionalization of planning process. The era of post war 1965 was featured by marked decrease in foreign loans inflow, slow down in the industrial growth, and increase in defense expenditures and re-imposition of certain controls as foreign exchange constraints. The GDP growth rate remained 6.8% on average per annum. The large deficit

in the balance of trade throughout was financed by the increasing flow of foreign loans. In fact big foreign loans inflow helped accelerating the economic growth. The model of economic development during 1960's was featured by pro industrial bias but gradual emphasis on agricultural sector, neglect of social sector and huge contributions of vibrant private sector.

2.2 The Seventies

Pakistan after its reemergence in 1971 faced the challenges of rehabilitation of war shattered economy, high rate of inflation and stagnant agriculture and industrial sector. Finding new markets for the roughly 50% of the exports, that had previously been going to eastern wing, was also a big priority.

The fundamental structural reforms like Land reforms, Labor reforms, Nationalization of key industries like bank and insurance companies and devaluation of Pakistani currency were undertaken. The nationalization did break the link between the industrial and financial capital but at the same time it resulted in diminished industrial production. However the consumer goods orientation of the industrial sector was attempted to be transformed into basic industries & capital-intensive industrial sector through public sector expansion. Massive Devaluation in 1972, resulting in removal of subsidies to the industrialists in the form of over valued exchange rate, improved the terms of trade.

- The growth rate of economy remained at 5.0 percent on average.
- Fiscal deficit and primary deficit remained at 7.6% and 5.9% of GDP on average respectively, mainly due to large-scale investments in public sector, production subsidies and spending on social program. The huge expansion in public sector was not matched by the off setting rise in revenue which remained stagnant i.e. 14.2 percent of GDP. The fiscal deficit was financed mostly from external sources i.e. 50.9 percent, from bank borrowing and non-bank borrowing.
- The current account balance was in deficit of 5.2% of GDP on average. The deficit resulted from huge imports; even the boost in the exports as a result of massive devaluation of 131% in 1972 could not nullify the impacts. However the Government succeeded in winning the favor of Middle East countries for accepting Pakistan labor and consequently restrictions on outward migration of workers

were eased. The workers remittances enhanced during the decade that helped in improving the balance of payments position.

- Average investment rate and saving rate remained at around annual average of 17.1% and 11.2% of GDP respectively.
- The high inflation throughout i.e. 12.2% was the result of high oil prices, increase in remittances, and enhanced public consumption along with decreased production output.

The positive aspects of the period include setting up of basic industries bringing income redistributions and managing sending large number of people to Middle East. The policy makers tended to correct the excesses of the previous decades.

2.3 The Eighties

The period of 1980s was more focused towards denationalization and the role of public sector was to be reduced. In this context two agreements were on Extended Fund Facility (EFF) with IMF and Structural Adjustment Loan (SAL) with World Bank. These two agreements were the preconditions of USA for rescheduling Pakistan's \$160 millions debt, accumulated over the years. Exchange Rate Policy was revised in 1982 wherein Managed Float System was adopted and Rupees depreciated by 20 percent. The medium term Standby Extended Fund Facility (EFF) agreements with IMF were signed 1988. It had conditionalities regarding devaluation, import liberalizations, tariff reduction and financial sector reforms like deregulation of interest rate structure etc. Thus the era of structural reforms began in late 1980s.

- The Growth rate of GDP in 1980's remained at 7.1% on average.
- Fiscal deficit in 1980's remained at about 6.8% of GDP on average where as the primary deficit was recorded about 3.5% on average. Fiscal deficit was financed predominantly by non-bank borrowing i.e. 49.6% of the total. The external financing reduced to 22.6% of total deficit. Bank borrowing financed 27.8 % of the deficit. The non-bank borrowing helped government in avoiding inflationary pressures.
- The inflation rate remained 7.6% on average as compared to 12.2% in 1970s.
- The current account balance remained in deficit at an annual average rate of 2.8% of GDP throughout the decade. It was better than that of 1970s mainly because of

decreased imports and enhanced remittances during this decade. Substantial foreign assistance due to Afghan war also helped in improving the balance of payments position.

- The investments constituted 18.7% of the GDP per annum on average whereas savings during the decade fluctuated around annual average of 14.8%. These investments were mostly financed by external resources. The private investment remained very low despite the incentives by the government for restoring private sector confidence.

The decade was featured by high public consumption without matching rise in tax revenue, change in deficit financing mix i.e. domestic non-bank borrowing replaced bank borrowing and external financing and controlled inflation rate because of high growth rate and huge non-bank borrowing.

2.4 The Nineties

The fundamental Structural and institutional reforms were initiated and pursued during this decade. The Privatization program started and institutionalized under Protection of Economic Reforms Act 1992. SBP Act 1956 was amended; Trade liberalization started in 1990 along with Tariff reforms. The external environment did not remain favorable as USSR disintegrated and Western Allies backed out; and the USA aid also ceased completely. Nuclear Test conducted in May 1998 led to further economic isolation of Pakistan as sanctions were imposed. The Freezing of Foreign Currency Accounts and consequently drastic decrease in workers remittance was another severe blow to the stagnant economy. The pursuance of deflationary policy and structural changes in the economy in pursuance to Structural Adjustment and Stabilization Program (SASP) were implemented during 1990s. The persistently high budget deficit and balance of payment worsening in 1980's and its then management through external financing and non bank borrowing had resulted in rising debt servicing expenditures in 1990's.

- The GDP growth rate remained about 4.4% on average throughout;

- The budget deficit and primary deficit¹⁶ remained 7.3% and 1.3% of GDP on average respectively in this decade. Thus the revenues remained stagnant; the non-developmental expenditures especially non-discretionary i.e. debt servicing expenditures rose considerably resulting in high fiscal deficit throughout. The deficit was financed by borrowing from banks i.e. 28.5% of overall deficit, from non-bank borrowing i.e. 40.8% and external resources i.e. 30.7% of total deficit. The reliance on non-bank financing was reduced a little bit and other resources were resorted to.
- The current account balance remained in deficit from an annual average of 4.1% of GDP. Removal of non-tariff barriers, tariff rationalization and exchange rates reforms during 1990's have implications for imports and exports. The significant decline in remittances and foreign grants were the main factors behind this high current account deficit.
- High fiscal deficit accumulated over time resulted in sharp growth of public debt. Increasing reliance on short/medium term financing, the sanctions imposed after nuclear blasts and the freezing of foreign currency accounts compounded the problem.
- The investment rate remained around annual average of 18.3% of GDP despite investment friendly policies in the early years. The foreign investment was encouraged through many incentives & measures like removal of restrictions on maximum holdings of equity by foreigners, remittance of dividend proceeds without the interference of State Bank of Pakistan, removal of restrictions on raising loans from domestic markets, relief from double taxation, however inconsistent economic policies, political uncertainties, ongoing process of structural adjustment and finally post explosion sanctions caused decrease in investment rate in later part of the decade. Further national saving was around annual average of 13.8% of GDP slightly less than that of 1980s rate.

¹⁶ **Fiscal Deficit:** When expenditure (including interest payments on public debt) exceeds the fiscal revenue, the fiscal deficit results that may be financed in a variety of ways.

Primary Deficit: The primary deficit is the difference between government expenditure exclusive of interest payments on public debt and revenue.

The decade witnessed vigorous pursuance of privatization / deregulation policies, implementation of Structural Adjustment and Stabilization Programs and the reliance on more stable, less volatile and sustainable sources of external capital inflows started. The structural reforms, though initiated and pursued vigorously, failed to achieve the objectives like low fiscal deficit and viable balance of payments situation during the decade.

2.5 The 2000s

The 2000s was featured by a more liberal outward oriented economic strategy aiming at enhancing exports and to get integrated into world economy. The structural reforms programs designed and initiated in 1990s, was continued and pursued during 2000s to put the economy on the path of recovery. Unpopular decisions like imposition of sale tax, raising prices of petroleum, withdrawal of subsidies were taken for bringing fiscal discipline. These were in fact conditionalities attached with IMF standby agreement executed in 2001 and three years Standby Poverty Reduction and Growth Facility (PRGF) were implemented during 2001-2004. Certain structural reforms i.e. financial sector restructuring, privatization, liberalization and deregulation of economy and bank reforms leading towards market led economy were under taken.

The privatization process was pursued; main focus was on banking, telecommunication, oil and gas and energy sector. Liberalization of Foreign exchange regime and macro economic stability helped boosting investor's confidence, which resulted in enhanced DFI flows and portfolio investment. Stock markets became extremely attractive for foreign investment. Huge public sector investment, especially in water and power sector, housing and physical infrastructure were undertaken in last 4–5 years. Economic governance also improved significantly and losses of public sector enterprises diminished dramatically.

The event of September 11, 2001 and Pakistan's alliance with coalition forces in fight against terrorism helped its economy in many ways. The rescheduling of \$12.5 billion bilateral and multilateral external debts resulted in about \$1.5 billion annual relief in shape of decreased debt servicing charges. Lifting of sanctions brought handsome foreign grants about \$1 billion to \$1.5 billion per annum during last four five years. Some external debt has been written off. The remittances amounting to \$18.5 billion during last

five years helped in building foreign exchange reserves, easing BOP position and in achieving good growth rate of economy. The greater access to the markets of USA and EU countries helped achieving significant upsurge in Exports.

- The GDP growth rate remained around annual average of 4.9% during 2000s.
- The Fiscal deficit remained around annual average of 4.5% of GDP while the primary balances remained surplus. The fiscal policy remained expansionary during 2000's i.e. huge PSDP during these years; however, reduction in debt servicing charges as a result of debt rescheduling did help in reducing this fiscal deficit. This deficit was financed by bank borrowing i.e. 5.8%, non-bank borrowing i.e. 62.4% and from external resources i.e. 31.8%.
- The current account balance remained surplus around an annual average of 1.9% of the GDP. The exports fluctuated around 18.4% of the GDP per annum where as the imports remained liberal and grew at a faster rate i.e. 40% annually. The rising oil prices also raised the import bill. The trade gap resulted but ever-rising remittances since Sep11, 2001 onward kept the current account balance in surplus.
- The external debt has raised to \$37 billion in 2005 that is 36.6% of the GDP as compared to 50.2% of GDP in 2000. In fact public Debt to GDP ratio has declined from 102.8% of the GDP in 2000 to 74.6.3% of the GDP in 2005 mainly because of healthy GDP growth rate and premature retirement of expensive debts to ADB. Some debts have also been written off while some has been converted into debt – social sector spending SWAP.
- Inflation rate remained below 4% in early years but later on has an upward swing to double-digit level in 2004-05 but annual average was 5.7% per annum.
- The period recorded investments around annual average of 17.3% of GDP where as saving rates remained around 17.8% of GDP on average.

Broad based recovery in the form of improvement of macro economic indicators since 2001-02 did not last long and the economy started flatterring in some areas i.e. inflation rate was on the rise and so was the trade deficit and current account deficit. Fiscal deficit was also on the rise. Soaring aggregate consumption necessitated demand management through tighter monetary policy.

2.6 Some Additional Observations

The growth rate of GDP remained quite high in 1980's and 2000's but lacked sustainability and equitable distribution of growth benefits.

The economic history of Pakistan further reflects the Governments inability to establish a sustainable pattern of public finance relying first on foreign grants, supplemented by non-bank borrowing and of late, even by borrowing from short-term private sectors. High current expenditures forced cuts in development expenditures thus retarding the infrastructural development. Similarly the resource mobilization had been much short of our requirements. An inelastic, non-progressive tax structure with narrow tax base and a big size ever developing black economy are the main structural weaknesses in the fiscal policy¹⁷. The tax to GDP ratio remained around 12.5% of the GDP over the last 3-4 decades, despite massive tax system reforms, in sharp contrast to industrial countries where this ratio is between 25% to 40% per annum on average.

The fiscal imbalances i.e. highly buoyant current expenditures but insufficient resource generation always resulted in budget deficit and it has been financed throughout from domestic borrowing and external finances instead of focusing on cut in expenditures and raising more tax revenues. The easiest recourse of monetizing the budget deficit and financing the expenditures by borrowing from abroad was adopted. The result was an ever-rising public debt and expenses on debt servicing.

The policy makers have always been enticed by the idea of maximizing foreign assistance for financing budget deficit and big investment lay out to achieve high growth. The domestic savings were too low to finance it. The persistent high Current Account Deficit, ever larger than the rapidly growing economies of East Asian countries further worsened when the percentage of concessional loans started decreasing in 1990's and the percentage of market based loans increased. External sources at concessional terms were not available in 1990s as these were in 1960's. These big inflows of concessional foreign aid facilitated the policy makers in avoiding the restructuring of economy and taking steps for correction of imbalances in fiscal and external accounts.

¹⁷ A recent study conducted at LUMS revealed that the current tax collection accounts for 38% of the total tax potential; remaining 62% is being pocketed by the tax payers, tax collectors and tax practitioners [The daily Dawn]

Instead of relying upon stable and sustainable sources of external financing like exports, FDI, portfolio investments and foreign assets of Pakistan for stimulating growth of economy, the policy makers remained dependent on unstable and less sustainable sources of external financing like loans, foreign aid, and remittances. Thus the marginal saving rate has been at about 15% of GDP over the last three decades whereas it was 25% in India and 35-40% in East Asian Countries in the 1973-93 periods.

Short-term foreign exchange liabilities in 1990s were a major reason behind debt crisis in that decade. These include \$ 6 billion Short terms borrowings bearing interest rate of 4% above LIBOR and \$10 billion were the deposits in foreign currency accounts.

The privatization process was pursued vigorously and is considered as the dominant factor of our economy in 2000's. DFI followed in through privatization. The rising DFI and portfolio investments are the encouraging signs for Pakistan economy.

Financial sector reforms resulted in a vibrant banking sector in Pakistan with improved regulatory and supervisory capacity of the central bank. Deregulation of interest structure, like auctioning of government securities through bids, discount rates and increased market share of foreign banks has made the banking sector competitive and capable of supporting growing economy. The decreased Borrowings by public sector have made credits available for consumer financing, micro financing and SME's resulted in healthy GDP growth rates in 2000's.

In sum, the evaluation of macro economic policies reveals that the growth rate of GDP remained quite high except in 1990s but lacked sustainability and equitable distribution of growth benefits. The fiscal imbalances always resulted in budget deficit. The economic managers failed to establish a sustainable pattern of public finance relying first on foreign grants, supplemented by non-bank borrowing and of late, even by borrowing from short-term private sectors to meet these deficits. The domestic savings were also low to meet these gaps. The twin deficits have been financed throughout from domestic borrowing and external finances instead of focusing on cut in expenditure and raising more tax revenue. The result was an ever-rising public debt and expenses on debt servicing.

Chapter 3

Review of Literature

Sustainability of debt became an important issue for economic policy makers mainly after 1980s, particularly after the debt crisis in Latin American countries. Since then this subject has been in limelight especially in Europe and in heavily indebted developing countries. The external as well as domestic debt in these countries has stimulated applied macroeconomic studies for analyzing debt sustainability using different methodologies.

Hamilton and Flavin (1986) tested the stationarity of budget deficit and discounted debt for USA. They used Dickey-Fuller tests for unit roots along with restricted and generalized Flood-Garber tests for stationarity. The premise was that the debt would be sustainable in long run if its discounted debt series remained stationary. Both the series in case of USA were found to be stationary.

Wilcox (1989) applied tests to the US data for the period 1960-84 to see whether the discounted debt series with zero mean was stationary. The stationarity of discounted debt series could not be established in this case leading to the conclusion that the fiscal policy was not sustainable.

Trehan and Walsh (1991) further expanded the Hamilton and Flavin work. Same US data set was used in two ways. Firstly, it was asserted that if expected real rates are constant, and then the existence of a stationary linear combination of the stock of debt and the net-of-interest deficit is necessary and sufficient for intertemporal budget balance. It was further asserted that stationarity of inclusive-of-interest deficit is sufficient to ensure intertemporal budget balance as long as the expected real rate remained positive. The test so developed was applied firstly for examining the data on federal government budget for testing whether a stationarity linear of the stock of debt and the net-of-interest deficit exists or does not exist. The existence of this stationarity could not be proved Secondly; the data on external investment position of the United States was also subjected to this test for finding out whether the foreigners now hold unsustainable U.S. assets. This hypothesis was also rejected. This test developed by Tehran and Walsh had the advantage of providing a straightforward way to impose intertemporal budget in empirical studies.

Ahmad and Roger's (1995) have tested U.S and U.K long run data to find out its consistency with the intertemporal government budget constraint and external borrowing constraint, both individually and simultaneously. A test was developed for ascertaining whether the present value constraints continue to hold despite unusual events, which causes a structural break in the short run dynamic behavior of the variables. The cointegration technique was applied using annual data. In both the cases of U.S and U.K it was found that the PVCs held over the whole sample period and it continued to hold despite the events that caused a structural break in the short run dynamics. Their stability results both in U.S.A and U.K showed that the cointegration vectors remained stable across the time and was consistent with the present value constraints (PVCs), holding for both the pre and post-split periods. However, the results of stability test in case of U.K did not completely support this conclusion.

Ghani and Zang (1995) analyzed debt sustainability using the Branson model. It was applied to a severely indebted country, Ethiopia. The model provided a simplified framework for debt sustainability. It was asserted that the interaction between different policy variables (debt, fiscal and interest rate policies), and outcome variables (GDP and Export growth), as well as international economic conditions (international interest rate) jointly defines debt sustainability. This framework can lead to the estimation of an equation for debt sustainability and in this sense it provided a good starting point for examining debt sustainability. The analysis undertaken stressed the need of a strong reform program for bringing the Ethiopian economy on a sustainable path.

Cuddington. J (1997) reviewed recent literature analyzing fiscal deficit (or in some cases current account) sustainability in U.S. and other developed countries. He used two conceptual approaches namely the Accounting approach and the Present Value Constraint (PVC). The financing constraint of the government is the starting point for both the approaches. The accounting approach focuses on steady states; it assumes that a fiscal deficit (or surplus) that leads to unchanging debt/GDP ratios over time is sustainable. The PVC approach is based on the premise that the sustainability of fiscal policy ultimately depends on the level of deficit that is finance able. These two approaches were tested empirically by using various techniques in order to find out whether maintenance of the current fiscal policy violates the present value constraint or equivalently the No Ponzi

Game condition. To use of the Econometric methods does require the long time series data over a constant fiscal regime.

Luporini.V (1999) analyzed the sustainability of the federal government debt since 1966 in Brazil. The standard unit root tests, i.e. Augmented Dickey Fuller (ADF) and Phillips Parron (PP) were applied and the results were mixed one about the stationarity of the mean- reduced discounted debt in Brazil. The test for the null of stationarity developed by Kwiatkowski, et al. (1992) showed that the government's budget constraint had been balanced in present value terms implying that the fiscal policy in Brazil remained sustainable since 1966. Two sub-samples of the same original data i.e. 1966-1980 and 1981-1996 were also examined for sustainability. The results indicated that the government fiscal policy was sustainable prior to 1980 but was unsustainable afterwards in the post-split period. These results are not surprising given the severe macro economic imbalances of the 1980s i.e. episodes of hyperinflation, stop-and-go economic growth policy etc

Santaella.J (2000) analyzed the sustainability of fiscal policy in Mexico from 2000 to 2025. Using the conventional methodology based on the dynamics of the public debt and the intertemporal budget constraint and two fiscal policy scenarios were simulated. In the first simulation, normal conditions of 2000 were assumed to be prevalent for the rest of the period. The fiscal policy in Mexico does not seem on the path of unsustainability. In fact, the stock of public debt as percentage of GDP appears to fall quite nicely with the assumed path of fiscal policy. The second simulation takes into account the more realistic possibility of contingent liabilities for the public sector. These liabilities were modeled with constant reduction of the primary deficits in each period. The outcome of this exercise is that the presence of contingent liabilities in future could divert the current stance of fiscal policy to an unsustainable path. The sensitivity analysis made there on confirms the previous results.

Luporini (2000) examined the sustainability of federal domestic debt of Brazil using quarterly data from 1981-1998. Actually he was inspired to under take the issue afresh because of the result of an earlier study (luporini1998) wherein it was reported that the Brazilian debt had assumed an unsustainable path after 1981. The Sustainability of debt

was analyzed both by standard unit root tests and by the procedure developed by Kwiatkowski, et al. (1992). The results by both sets of tests confirmed the previously made diagnosis that the federal domestic debt had assumed an unsustainable path during the period studied.

Marquez. N. (2000) examined the debt sustainability among the member countries of the Eastern Caribbean Central Bank (ECCB) area. He defined the debt sustainability, described its measurement and identified the factors that might affect debt sustainability among the member countries. He outlined the level of external debt outstanding, debt repayments, the debt service arrears and the level of concessional borrowing of these countries for the period between 1988 and 1998. The debt indicators were also analyzed. The recommendations for the development of debt management strategies that might have helped in maintaining sustainable debt levels were given.

Pedras (2000) analyzed the growth of public debt and its sustainability in Brazil. He derived the public debt solvency requirements that determined the macro economic conditions, essential to be met by various variables for keeping Brazilian debt sustainable. The fulfillment of these conditions would affect the average maturity of the debt and would improve the government ability to get financing from the market. These conditions were then applied using different scenarios for the relevant variables for obtaining estimated debt/ GDP for the years to come. Five possible scenarios for the macro economic variables were considered getting some insight about debt sustainability. This exercise made it possible to anticipate the country going into a vicious cycle or otherwise. He contended that fiscal discipline was extremely important for generating positive effects on the economy.

Jayme (2001) studied the sustainability of external debt in Brazil for the period 1969 to 2000. He employed three different methods for this purpose. The results of different tests under taken for different periods using different models and variables showed that external debt and current account deficits were not sustainable in the long run, confirming other studies that tested sustainability of the current account and external debt in Brazil. When tests were under taken for the sub samples it was found that for the period 1969 to 1983 the necessary condition for sustainability was satisfied but the sufficient condition

did not meet. He concluded that the crisis of early 1980s was closely related to the external vulnerability inherent by the indebtedness policy. The high stock of external debt facing the interest rate shock and the break in capital inflows made the management of current account deficits extremely difficult. At the same time making external debt repayments became impossible.

Islamov (2001) worked on the issue of external debt and its sustainability within systematic process for the Central Asian Economies in transition. He analyzed the structural problems and dynamics of external debt by using current statistical data. He also made some policy recommendations. To measure the external debt a basic transfer equation and two gap models were used. He attempted to focus on the specific causes i.e. the external debt itself and debt problem via balance of payments issue. He emphasized that the issue of external debt must be dealt through pursuance of compatible policies in all spheres of debt management i.e. foreign trade and the flow of international financial resources.

Raghbendra. J (2001) examined the macroeconomic effects of fiscal policy, particularly deficit in developing countries. He spelled out the conditions under which the internal and external debts are sustainable and also pointed out the role of “twin deficit”. Some evidence on the sustainability of the internal and external deficits in some of the developing countries have been quoted. Finally he developed the theme of money supply to fiscal policy and international capital flows and mentioned the difficulties faced by stabilization policy under these conditions.

Archibald and Greenidge (2003) examined the sustainability of policies for financing public expenditure and debt management in the post-independence era in Barbados. Two approaches have been used to evaluate sustainability, i.e. Accounting Approach and Present Value Budget Constraint (PVBC) Approach. For testing test the validity of the PVBC, they utilized the recently developed econometric technique in stationarity and cointegration analysis using both fixed and time varying coefficient. Their findings of sustainability tests, under both the “Accounting” and “PVBC” approaches, indicated that fiscal policy since independence had been sustainable. Even when the latter approach was

evaluated within a time varying coefficient model, results showed that the Time varying coefficient (TVC) remained close to one for the whole of the period under review.

Kedder. N (2003) analyzed the composition of the public sector debt stock of Turkey. He used the net public debt stock to GNP ratio as the starting point. He applied a modified version of the approach suggested by the World Bank (2000:16-18; 121-124) for evaluating sustainability of the debt stock. He estimated the primary surplus to GNP ratio that would be essential for debt sustainability by using different scenarios with respect to real interest rate, growth rate and inflation rate. Then he calculated the weighted average of real interest rate on the existing debt stock. The estimated primary surplus to GNP ratios required was then compared with the targeted primary surplus ratio for evaluating the sustainability of debt. As a whole he found that, Turkey's debt under adopted scenarios comes out to be sustainable only if the real interest rate is reduced to 15% or less.

Hinic and Pajic, (2004), made a study to identify the necessary macroeconomics and structural policies that contribute to enhance the efficiency for utilization of the committed resources or for securing the needed funds for development on favorable conditions. The study was based on the analysis of the factors predetermining the country's capacity to service its debt obligations regularly. A model was used for simultaneous projection of GDP, balance of payments, prices and exchange rate for making the subsequent analysis of the external debt sustainability. Various scenarios, based on the variation of the target variables representing alternative economic policies, were tested. The economic growth of 5 percent, export growth of 15 percent and financing the current account deficit mainly by FDI and concessional loans were the main assumptions made for external debt servicing to be sustainable and for avoiding external liquidity crisis. Such assumption would materialize only if adequate political conditions exist for pursuance of an efficient macroeconomic policy.

Arghyrou M. pointed out that non-linear public debt adjustment and structural break in fiscal policy might affect tests of public debt sustainability. These two issues have largely been ignored and were taken up only by a few researchers; even those who took up just aimed at finding out the affects of individual factor and no testing was done for all these

factors simultaneously for determining their combined effect. He focused one of the most highly indebted countries Greece for ascertaining the impacts of these two factors in a combined way. The debt of Greece was reported to be unsustainable in the previous studies. He found evidence of previously undetected non-linear fiscal adjustment and two structural breaks in fiscal policy. Excluding these from the analysis or allowing for non-linearities only affect the nature of the empirical findings. When both the factors were taken into account simultaneously by the author of the paper, he found Greek public debt to be sustainable in contrast to the previous findings. This analysis highlighted the risks of bias involved in existing tests of public debt sustainability when the set of structural breaks and non-linearities in fiscal policy is not accounted for.

Belloc and Vertova tried to redefine the concept of foreign debt sustainability. They suggested a long run dynamic approach based on a flow analysis rather than stock analysis. This approach aimed at resolving the issue of arbitrariness inherent in the traditional approach on foreign debt sustainability.

Zaaruka, B, Titus, N and Tjiveze, T (2004), examined the behavior of debt in Namibia for ascertaining whether it is consistent with a sustainable fiscal policy or not. The approaches developed by Ley and MEFMI were used for this analysis. Three scenarios i.e. historic scenario; MTEF Scenario (2003-2005) and MTEF worst-case scenario were studied along with several assumptions. The first two scenarios showed that the debt was sustainable and would remain sustainable if all the MTEF assumption holds. The Analysis indicated that the Namibian debt would become unsustainable if the macroeconomic indicators worsen i.e. inflation rate rises to more than 10 percent, Economic growth rate falls below 2 percent, Primary deficit goes up to 2 percent or more and initial debt as percent of GDP deteriorate to 33 percent. The analysis with MEFMI approach showed that the revenue and expenditure are cointegrated of order 1 and the cointegrating coefficient between revenues and expenditure is close to 1. It implies that the debt is sustainable in medium term. It was concluded that the fiscal stance of the government debt has been sustainable and would remain sustainable in medium term if all assumptions of MTEF hold.

Loser C. M studied the links of the economic crises to the external sector performance, including the external debt and its sustainability in developing countries. He observed that the debt burden remained high at 40 percent of the GDP and 113 percent of the Export. In all regions, developing countries have experienced net negative resource transfers because of low financing from multilateral institutions and also because the new flows were low and far from the original commitments. Poorer countries depended heavily on the support of official institutions and these donors have increased conditionalities on structural reforms, resulting in diminished aid to these countries. The simplest policy proposition he suggested would be that Debt to GDP ratio should either stabilize or decline. In a specific case of the public sector finances, the efforts to stabilize the ratio of debt/GDP would focus on the primary surplus. The impact of changes in sovereign credit ratings on the access of developing countries to capital markets is significant. Improved ratings will result in better terms of borrowing, while decline in these ratings can have devastating effects on these terms, which in term had adverse consequences on output and the sustainability of debt. The key policy recommendation included the pursuance of prudent macro-policies; subjecting public and private borrowing to strict scrutiny in term of its use and setting up contingent financing in preparation of short term crises.

In **Pakistan**, several studies have been under taken on the issues of debt. Burney, N (1988) examined the changes in the level of Pakistan's external indebtedness through various debt burden and debt service indicators. The analysis revealed that the country faced liquidity problem despite the fact that the lending countries had confidences in Pakistan's economy and the debt was being rolled over. He evaluated the factors influencing debt servicing in Pakistan and had reported that the efficiency of the economy, measured by incremental capital output ratio and external shocks had been the main factors. It was further contended that the terms of borrowing and growth rate of GDP had no significant impact on the variation in the debt service ratios. The liquidity and solvency problems associated with debt were reflective of extremely low debt servicing capacity of Pakistan as is also evident from low estimates of critical interest

rate. Increasing the marginal saving rate could enhance the long run debt servicing capacity of Pakistan's economy.

Ahmad. E (1996) tried to explore the effects of two different policies for attracting foreign investment and external debt in Pakistan. He used three gaps model. The analysis showed that increase in rate of return could reduce foreign debt only when foreign capital is sufficiently responsive to changes in its rate of return. The improvement in foreign debt is accompanied by a deteriorating position of the domestic debt. The policy of selling the public assets abroad to attract foreign capital appears fruitless. The benefit of this policy occurs mainly in term of reduced primary fiscal deficit and the resulting decrease in domestic debt, which can better be achieved by selling public assets domestically. Thus the premise that selling public sectors enterprises to foreign investors could reduce the burden of foreign debt does not hold much ground.

Arby. F (1997) examined various issues of public debt and proposed measures for avoiding the debt burden becoming unmanageable. He noticed decreasing trends in Pakistan's debt to output ratio indicating that Pakistan's debt was sustainable. He pointed out a number of problems regarding capability to manage the debt, which include scarcity of low cost loans, mounting debt servicing burden and wastage of mobilized funds in non-developmental activities, which add nothing in the resources generating capacity of the economy. It was opined that the probability is there that in future the public debt might become unsustainable if these debt management problems persisted. The need to pursue prudent macroeconomic policies and to observe tight fiscal discipline was stressed for better debt management process.

Ahmad. E and Ayaz. A (1998) examined the nature of debt crisis in Pakistan using stock flow consistence three gaps simulation model. The study predicted that debt crisis in Pakistan would be worsened if the interest rate on debt, growth rate of GDP, money supply, price level, foreign capital flows, exchange rate, the parameters of saving rate and productivity remained unchanged. Resultantly internal as well as external borrowing and public debt would grow to unmanageable level. The paper recommended a policy mix that is designed to have the balanced effects on all the key indicators of resources deficiency as a single policy instrument would be insufficient for producing the desired

results. The policy mix is envisaged a number of measures including an increase in tax rate, a cut in government expenditure, increase in growth rate of GDP and foreign exchange reserve. It was claimed that the said policy mix had achieved favorable effects on many accounts in the long run especially in term of reduced need for internal and external borrowing, and reduced risk of default. Although the study was based on simulation experience yet it provides useful insights in to the complicated nature of the debt problem in Pakistan.

Hasan. P (1999) examined the debt indicators normally used for measuring the debt burden. He outlined the variables that explained the buildup of debt, in the past explored economic policy implications of the debt overhang and discussed the debt reduction strategies using different scenarios.

Anwer. T (2000) analyzed the debt problem of Pakistan and reported that heavy reliance on IMF and World Bank by entering SAPs agreements for financing Current Account deficit resulted in enhanced external financial vulnerability, buildup of debt and recession leading to debt rescheduling. The frequent devaluation 19990s for enhancing exports added directly to the rupee value of foreign debt. The debt service burden increased dramatically eventually leading to debt crisis. The policy failure triggered because of over looking the persistent large Current Account deficits. The designing of a debt reduction strategy should address the fundamental causes that triggered the debt build-up. He emphasized the need for adopting an integrated approach that might focus on the recovery of economic growth, reduction in stock of debt and the debt servicing. The fiscal consolidation was considered essential for effective debt management in achieving debt sustainability.

Kemal. A.R. (2001) examined evolution of debt problem and the mechanism, through which it had impacts on the poverty in Pakistan. The analysis showed that Pakistan with the existing debt profile and level of indicators did not qualify for debt writes off. Implying that Pakistan has the capacity for servicing its debt. Thus, long term rescheduling for avoiding liquidity crisis through re-profiling of debt is of great significance.

Pasha H and Aisha G examined the evolution of public debt, factors contributing to its growth and its sustainable level in Pakistan. The analysis showed that current public Debt to GDP ratio is 87 percent; the share of external debt is comparatively higher while its growth rate is much lower than that of domestic debt. The major factors contributing to the build up of debt include cumulative effects of successive large primary budget deficit and capital losses on external debt due to the real exchange rate depreciation. The Domestic debt to GDP ratio increased very rapidly during 1980s, especially up to 1986-87; from thereon it remained almost constant. The external Debt to GDP ratio continued to increase throughout 1980s at rather moderate rate. The analysis indicated that the change in the external Debt/GDP ratio could be attributed to the increase in non-interest current account deficit and capital loss on external debt due to real exchange rate depreciation. However, the availability of concessionary financing from multi and bilateral agencies has helped restricting the level of external Debt / GDP ratio. Actually the difference in the rate of real exchange rate depreciation changed the pattern of public debt growth during two decades of 1980s and 1990s. It was suggested that the key policy objective of fiscal management must be to keep the primary budget deficit at a level that would ensure a constant levels of the public Debt to GDP ratio. Exchange rate policy, at the same time, will have to be tailored for keeping current account deficits at a sustainable level and for limiting capital losses on external debt.

Bilquees. F (2003), studied for the contribution of the various factors to the acceleration of debt burden in 1980s and 1990s. The factors responsible for the high budget deficit consequently resulting in debt accumulation have also been outlined. The analysis revealed that persistently high budget deficit and the strategy adopted to finance it have caused the deterioration in the macro indicators. The excessive domestic borrowing at high rate for financing the budget deficit over a longer period without making efforts for enhanced domestic resource mobilization absorbed all available domestic and external resources. The increased external borrowing at high rates with short-term maturity coupled with massive exchange rate depreciation caused rapid debt accumulation. It was opined in the paper that The Pakistan would have to generate sustained primary surpluses in coming years in order to entangle itself out of the debt trap; only a slight fiscal

improvement would not suffice. It was asserted that the element of proper fiscal governance must have to be put in place.

We can conclude from the review of literature that growing debt is a worldwide phenomenon. It has become a common feature of the fiscal sectors in most of the developing economies. The prevalence of high fiscal deficit over the years has increased borrowing from both internal and external sources to cover the resources gap. In most of the developing countries debt accumulated at a massive rate due to persistent fiscal deficits and inadequate improvement in their repayment capacities. In developed countries, the issue of sustainability was examined by using econometric techniques of unit roots and cointegration. In Pakistan, it transpires that the studies carried out earlier on the subject debt were examined only in terms of certain traditional debt indicators, without particularly deriving any conditions of debt sustainability on the basis of some theoretical framework. The dissertation aims to develop a theoretical framework for analyzing and testing of debt sustainability comprehensively and empirically and which is very much needed in Pakistan.

Chapter: 4

Debt Profile

4.1 Overview of Debt

Since signing the first ever loan agreement with USA in 1950s to sponsor the imports of food grains, Pakistan has continued relying heavily on external resources. The policy makers could not establish a sustainable pattern of public finance relying first on foreign grants, supplemented by non-bank borrowing and of late, even by borrowing on short term from private sector. Hard decisions for correction of fiscal imbalances were avoided. Pakistan experienced persistently high budget deficit and current account deficits especially in 1980s and 1990s. Heavy reliance on borrowing to finance fiscal as well as the current account deficits led to rapid growth of public debt.

Data analysis reveals that public debt was 54.4 percent of the GDP in 1980s, which reached ¹ to 74.6 percent of the GDP in 2005 after touching all time high of 102.3 percent of GDP in 2001. The external debt on the other hand, was 40 percent of the GDP in 1980s rose to the maximum 57 percent of the GDP in 2000 and has declined to 36.8 percent of the GDP in 2005.

4.1.1 Components of Debt

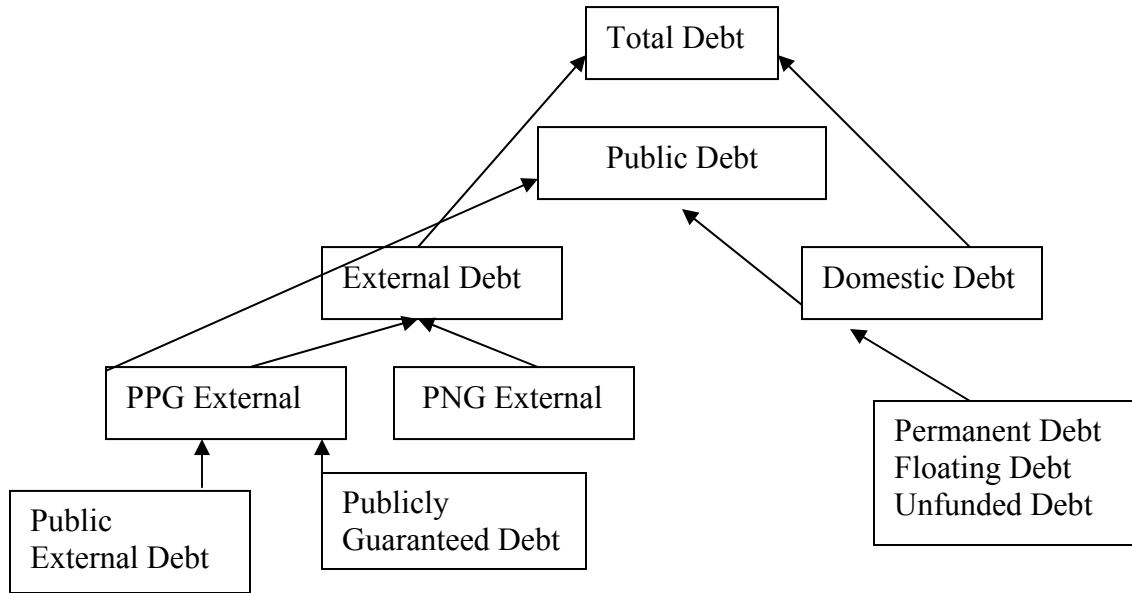
It is pertinent to have a look at the components of Total debt i.e. External debt and Domestic debt. A detailed chart regarding the components of debt is shown below.

External Debt: refers to the liabilities that are owed by resident to non-residents of an economy and that require payment of principal and/or interest rate at some point in future. It includes public and publicly guaranteed debt and private non-guaranteed debt.

Domestic Debt: it is the debt issued by the government to banks, non-bank institutions and general public [Residents of the country]. It also includes the borrowings of the state enterprises and private non-guaranteed domestic borrowing. The debt is denominated in local currency.

Public Debt: It is the sum of public and publicly external debt and public domestic debt. These debts are used to finance the budget deficits.

Structure of Debt



Where

PPG: Public and publicly guaranteed debt

PNG: Private non-guaranteed debt

4.2 Public Debt Trend Analysis

By late 1990s, Pakistan already entered into a debt trap situation. The causes of rapid growth in domestic and external debt are multifaceted. These include: persistence of large fiscal deficit (7 percent of GDP) and current account deficit (almost 4 percent of GDP); imprudent use of borrowed resources by undertaking of low priority development projects and poor implementation of foreign aided projects; rising real cost of government borrowing (both domestic and foreign); stagnant exports and government revenues. Moreover the rising proportion of hard loans and ever declining grants and soft terms assistance also worsened the debt situation

Public debt increased from Rs.127 billions in 1980 to Rs.674 billions in 1990 and to Rs.3266 billions in 2000 and peaked at Rs, 4092 billions by June 2005. It grew by an average rate of 21.9 percent in 1970s and 17.6 percent per annum in the decades of 1980s and 1990s while it grew at an average rate of 6.0 percent during 2000s [see **Table: 4.1** and **Table: 4.2**].

Table: 4.1
Structure of Public Debt

Year	Public Debt (RS.mls)			External \$mls Total	As Percent of GDP		Growth Rate	
	Domestic	External	Total		Public	External	Public	External
1971	12873	13223	26096	3635	51.7	34.4		
1972	16667	32604	49271	2860	91.1	30.8	88.8	-21.3
1973	17818	32329	50147	4552	75.0	71.9	1.8	59.1
1974	17426	38049	55475	4845	63.9	55.2	10.6	6.4
1975	21245	37857	59102	5438	53.2	48.4	6.5	12.2
1976	27420	46728	74148	6278	56.9	47.7	25.5	15.5
1977	32700	53579	86279	7184	57.6	47.5	16.4	14.4
1978	38530	59435	97965	7947	55.6	44.6	13.5	10.6
1979	49371	67983	117354	8625	60.2	43.8	19.8	8.5
1980	56754	70738	127492	9425	54.4	39.8	8.6	9.3
1981	60088	73924	134012	10256	48.2	36.5	5.1	8.8
1982	76656	101172	177828	10452	54.9	34.3	32.7	1.9
1983	87856	110726	198582	11869	54.5	41.5	11.7	13.6
1984	106554	121240	227794	12524	54.3	40.3	14.7	5.5
1985	143930	140155	284085	12594	60.2	40.7	24.7	0.6
1986	193385	167003	360388	14064	70.0	44.1	26.9	11.7
1987	225246	187030	412276	15881	72.0	47.7	14.4	12.9
1988	284492	207744	492236	16983	72.9	44.2	19.4	6.9
1989	327534	253658	581192	16855	75.6	42.2	18.1	-0.8
1990	376596	297652	674248	19402	79.0	48.7	16.0	15.1
1991	441580	335003	776583	21195	76.4	46.8	15.2	9.2
1992	527595	375233	902828	24233	74.9	49.9	16.3	14.3
1993	612642	446040	1058682	25400	79.4	49.5	17.3	4.8
1994	695972	523891	1219863	25853	78.1	50.1	15.2	1.8
1995	800464	600083	1400547	30292	75.1	50.0	14.8	17.2
1996	915180	658158	1573338	31796	74.2	50.6	12.3	5.0
1997	1050221	813108	1863329	31160	76.7	50.2	18.4	-2.0
1998	1183230	934390	2117620	30492	79.1	49.3	13.6	-2.1
1999	1392463	1494966	2887429	31479	98.3	50.2	36.4	3.2
2000	1578809	1687434	3266243	35306	102.8	57.5	13.1	12.2
2001	1730991	1769233	3500224	29878	102.3	51.1	7.2	-15.4
2002	1717934	1822163	3540097	32465	97.6	54.9	1.1	8.7
2003	1853675	1916478	3770153	35033	93.8	51.0	6.5	7.9
2004	1978969	1999757	3978726	36035	85.9	44.8	5.5	2.9
2005	2129100	1962797	4091897	34037	74.6	36.8	2.8	-5.5

Sources: IFS -CD
GDF-CD

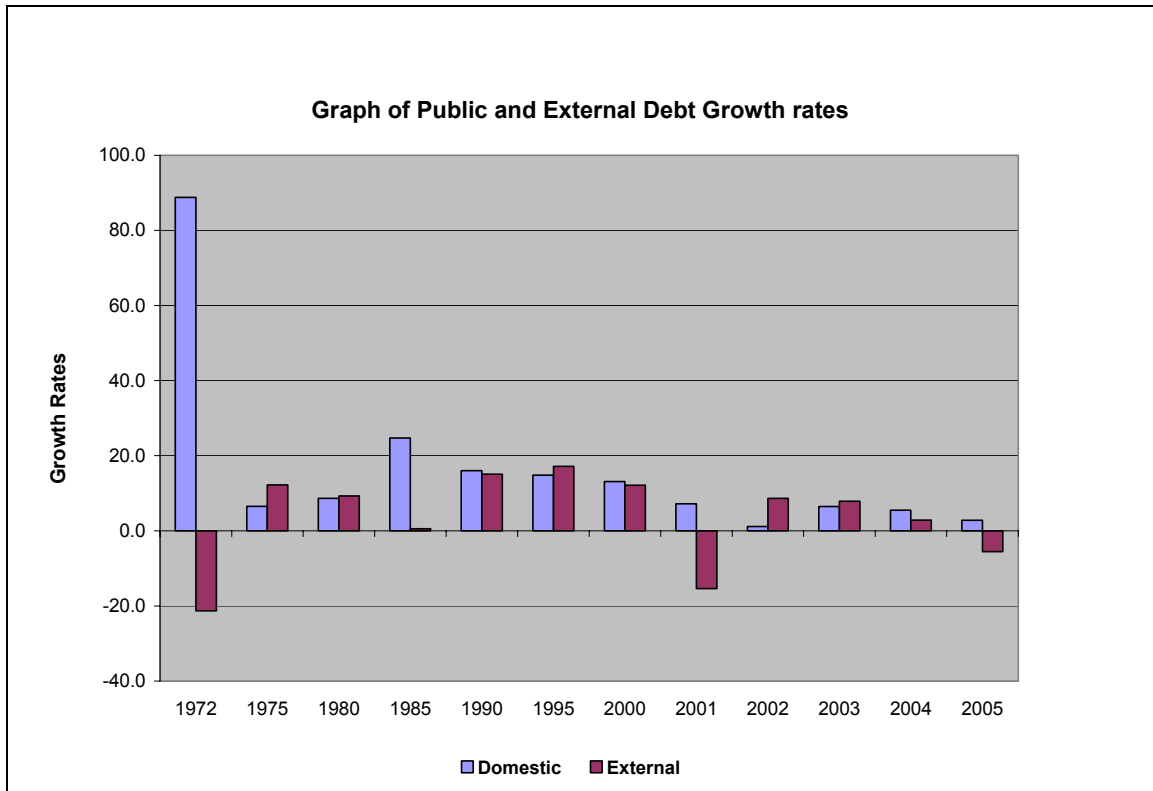


Table: 4.2
COMPOSITION OF PUBLIC DEBT of PAKISTAN

Years	1970	1980	1990	2000	2001	2002	2003	2004	2005
	As Percent Of GDP								
Domestic Debt payable in Rupee	23.9	24.2	44.1	49.7	50.6	47.3	46.1	42.7	38.8
External Debt payable in foreign exchange	23.9	30.2	34.9	53.1	51.7	50.2	47.7	43.2	35.8
Total Public Debt	47.9	54.4	79.0	102.8	102.3	97.6	93.8	85.9	74.6
	Shares of total Debt								
Debt payable in Rupee	50.0	44.5	55.9	48.3	49.5	48.5	49.2	49.7	52.0
Debt payable in foreign exchange	50.0	55.5	44.1	51.7	50.5	51.5	50.8	50.3	48.0
Total Public Debt	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: CD _ ROM IFS [2004]

The share of public domestic debt increased from 44.5 percent in 1980 to 52 percent by June 2005 whereas the share of public external debt declined from 55.5 percent to 48% during the same period [See **Table: 4.2**]. The public external debt stood at Rs.71 billions in 1980, increased to Rs.298 billions in 1990 and rose to Rs.1963 billions by June 2005. It is worthwhile to note that the share of external debt in total public debt was the minimum in 1980s obviously because of the interests of the donor countries during the Afghan war. Late 1980s however witnessed the reverse trend i.e. share of external debt declined because of its lesser availability, primarily because of tougher conditionalities of the donor agencies like IMF, IBRD and on account of channeling of loan able funds to Central Asian and Baltic States. Of course non-concurrence of the donors to the policies of Pakistan was also a big factor, as a result the share of external debt reduced to 44.1 percent of the total public debt in 1990. It is because of these developments that average annual growth rate of public external debt was lower (14.4 percent) as compared with public domestic debt (21.2 percent) in 1980s [see **Table: 4.3**].

Table: 4.3
Annual compound Growth Rate

Years	1970s	1980s	1990s	2000s
Domestic Debt payable in Rupee	18.1	21.2	15.6	7.4
External Debt payable in foreign exchange	26.9	14.4	20.1	4.7
Total Public Debt	21.9	17.6	17.6	6.0

Source: CD-ROM IFS [2004]

The persistence of large fiscal budget deficit i.e. 7 percent of GDP in the 1990s has caused domestic debt to grow at an enormous rate of 16 percent per annum. The domestic debt comprises of three components i.e. permanent debt (medium and long term), floating debt (short terms) and unfunded debt (non-bank borrowing). The permanent debt is secured mostly by issuing long-term bonds, with a maturity of 3 to 10 years i.e. federal investment bonds and prize bonds with no fixed maturity. Its share increased from 24.3 percent in 1980s to 25.1 percent in early 1990s. During the second half of 1990s, its share decreased significantly and became 16.4 percent in 2000 and from thereon its share increased once again and was 24.4 percent in 2005.

The share of Floating debt, raised through the sale of government treasury bills and Short Term Federal Bonds, has decreased considerably from 57 percent in 1980 to 38.3 percent in 1990 and from thereon rose to 42.6 percent in 2001 and then declined to 27.5 percent in 2004. Its share was 36.1 percent of the domestic debt in 2005. These fluctuations in its share were due to the variations in market interest rates as these loans were available at cheaper rate prior to the era of financial liberalization. However, after the introduction of financial liberalization, which included the rationalization of interest rates and promulgation of auction system of treasury bills, the cost of floating debt increased considerably. This is why the share of floating debt had a tendency to fall as against the other components of domestic debt.

Table: 4.4									
Structure of Domestic Debt									
Years	1972	1980	1990	2000	2001	2002	2003	2004	2005
Billion Rupees									
Permanents	9.027	14.97	95	259.6	281.1	368	427.9	536.8	526.2
Floating	4.933	35.08	145	647.4	737.8	557.8	516.3	542.9	778.2
Unfunded	2.631	11.43	138	671.8	712.1	792.1	909.5	895.6	854.0
Total Domestic Debt	16.59	61.47	378	1579	1731	1718	1854	1975	2158.4
Growth Rates									
Permanents	3.60	11.18	23.48	1.04	8.27	30.92	16.28	25.45	-1.97
Floating	73.64	12.57	7.20	15.28	13.95	-24.39	-7.45	5.17	43.33
Unfunded	16.54	14.29	15.08	17.05	6.01	11.23	14.82	-1.53	-4.65
Total Domestic Debt	20.10	12.50	13.80	13.38	9.64	-0.75	7.90	6.56	9.27
Shares of Total Debt									
Permanents	54.41	24.35	25.1	16.44	16.24	21.42	23.08	27.17	24.4
Floating	29.73	57.06	38.3	41.01	42.62	32.47	27.85	27.49	36.1
Unfunded	15.86	18.59	36.6	42.55	41.14	46.11	49.06	45.34	39.6
Total Domestic Debt	100	100	100	100	100	100	100	100	100
Sources: Pakistan Economic Survey [Various Issues]									

The unfunded debt entirely based on National Savings Schemes, grew at high rate and this high growth is primarily attributed to Defense Savings Certificate (DSC) that was the most buoyant in terms of mobilization of resources. The annual compound growth rate of unfunded debt during 1980s was 29.9 percent compared with 20 percent and 16.2 percent growth of permanent and floating debt respectively. The share of unfunded debt in total domestic debt increased from 18.6 percent in 1980 to 36.6 percent in 1990 and 42.55

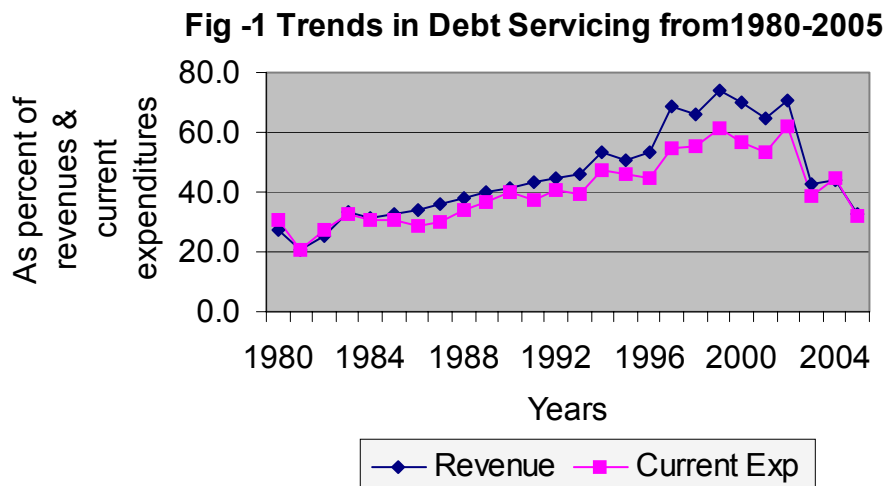
percent in 2000. The unfunded debt grew at an average rate of 25 percent during the second half of 1990s, followed by 17 percent increase in floating debt and 1 percent increase in permanent debt. The Attractive returns on the National Savings Schemes, emphasis on non-bank budgetary financing and the added advantage of tax exemption brought a sharp rise in the unfunded debt and it became at par with floating debt. The with drawl of tax exemptions and the rationalization of interest rate in various instruments of the National Saving Schemes in 2000 and subsequent periods resulted in decrease in its share i.e. 39.6 percent of the domestic debt in 2005.

The rising stock of public debt has serious implications in terms of debt servicing obligations. In 1980, 24.5 percent of total revenues were used for debt servicing which reached 43.24 percent in 1990 and 62.8 percent of total revenues in 2000 were being consumed for debt servicing, leaving only 37 percent to be spent on development programme. During the last couple of years the debt serving liabilities have declined sharply from 62.8 percent of total revenues and 50.7 percent of the current expenditure in 2000 to 54.5 percent of revenue and 52.3 percent of current expenditure in year 2005. The reduction in interest payment burden is the outcome of careful design and implementation of debt reduction strategy, debt rescheduling and the premature payment of expensive debt amounting to US\$1.17 billion to ADB.

Table: 4.5
Composition of public debt servicing

Years	1980	1990	2000	2001	2002	2003	2004	2005
Interest payments	Billion Rupees							
Domestic	1.786	31.2	184.2	259.5	267.3	208.3	271	299.3
External	3.084	16.93	52.34	53.18	51.42	49.15	46.69	48.89
Total	4.87	48.13	236.6	312.7	318.7	257.4	317.7	348.2
Amortization	4.47	22.71	96.81	116.2	126.4	123.2	167.6	112.4
Debt Servicing	9.34	70.83	333.4	428.9	445.1	380.7	485.3	460.6
	As percentage of							
Tax Revenue	29.88	62.13	86.37	101.4	96.95	72.4	83.66	70.04
Total Revenue	24.51	43.24	62.75	80.16	71.9	54.26	63.78	54.51
Current Expenditure	27.53	41.69	50.7	66.05	62.74	49.22	64.7	52.31
Grand Expenditure	17.53	32.61	44.97	57.74	50.21	42.32	51.13	41.41
GDP	3.988	8.296	10.49	12.53	12.27	9.474	10.47	8.398

Sources: Economic Survey of Pakistan [Various Issues]



4.3 External Debt Overview

Pakistan has been relying on external borrowing since early 1950s. Initially external borrowing was meant to meet the shortage in domestic savings and to accelerate the pace of economic development. Inadequacy of domestic resources mobilization, however, persisted that led to continuous dependence on foreign borrowing. The external resources, mainly in the form of loans, were also utilized as balance of payment support to cover the gap between total foreign exchange earning and total import bill.

4.3.1 External Debt Trend Analysis

Pakistan’s total outstanding stock of external debt amounted to \$34.03 billions, equivalent to 36.8 percent of GDP and 158 Percent of total foreign exchange earning by end June 2005. As indicated in the **Table: 4.6** it has increased from \$9.43 billions in 1980 to \$19.40 billions in 1990 and \$ 35.3 billions in 2000.

In terms of the external debt profile, medium and long-term debt dominates the outstanding stock, accounting for almost 91 percent of the total by end period 2000s. The average share in 1990s declined to 84.2 percent from 90.9 percent during 1970s. The share of public and publicly guaranteed external debt (PPG) on average accounted for 81.3 percent of the total debt in 1980 and was as high as 85.3 percent in the year 2005, indicating that the dominance of public external debt remained unchanged over the decades in the composition of external debt. The share of private non-guaranteed external

debt was increasing in 1990s as compared to the share in earlier decades, but it had always been below 10 percent of the total external debt. The private sector share in external debt was 0.3 percent in 1980s, 4.6 percent in 1990s, and 5.7 percent in 2000s. The share of short-term debt was remained high at 11.1 percent during 1990s [see **Table 4.7**].

The Share of official creditors in public and publicly guaranteed external debt was 92.6 percent on average during 1980s; it however increased from 94 percent in 1990s, to 92.2 percent in 2000s on average. The bulk of increase over the period 1980-2005 has been recorded under multilateral debt. The average share of multilateral in official creditor has increased from 25.4 percent in 1980s to 48.1 percent in 1990s and further increased to around 50.9 percent in 2000s where as share of bilateral creditors decreased from 67.2 percent in 1980s to 44.3 percent in 2000s. On the other hand, the public and publicly guaranteed external debt owed to private creditors declined to 4.8 percent in 2000s from 7.4 percent in 1980s in general. The average share of private creditors constituted 6.2 percent of the public and publicly guaranteed external debt in 1970s but it declined to 4.8 percent during 2000s [see **Table 4.8**].

Table: 4.6								
COMPOSITION OF EXTERNAL DEBT (mls\$)								
Years	1980	1990	2000	2001	2002	2003	2004	2005
Long Term	8213	15562	31832	27017	29143	31565	32798	32155
Public and Publicly Guaranteed	8196	15425	29288	24863	27106	29752	31220	30813
Private Non-Guaranteed	17	137	2545	2154	2037	1813	1578	1342
Use of IMF	624	879	1708	1550	1906	2072	1991	1611
Short Term	589	2963	1766	1311	1416	1396	1246	271
Total External Debt	9425	19403	35306	29878	32465	35033	36035	34037
Total External Debt As %								
GDP	39.8	48.7	57.5	51.1	54.9	51.0	44.8	36.8
Foreign Exchange Earning	204.3	234.2	334.3	263.9	237.1	196.5	185.4	158.0
Sources: Globle Development Fianace [CD-ROM]								

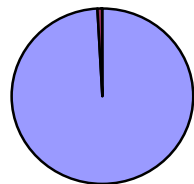
Table: 4.7

COMPOSITION OF EXTERNAL DEBT (mls\$)

Years	1970s	1980s	1990s	2000s
	Share in total Debt			
Long term	90.9	81.6	84.2	91.0
Public and Publicly Guaranteed	90.6	81.3	79.6	85.3
Private Non-Guaranteed	0.3	0.3	4.6	5.7
Use of IMF	6.0	8.7	4.7	5.3
Short Term	3.1	9.7	11.1	3.7
	Growth rate			
Long term	12.2	6.0	7.6	2.7
Public and Publicly Guaranteed	12.2	6.0	6.8	3.4
Private Non-Guaranteed	19.0	23.4	40.4	-8.0
Use of IMF	41.9	4.0	8.1	2.7
Short Term	17.2	24.7	0.5	-19.1
Sources: Globe Development Fianace [CD-ROM]				

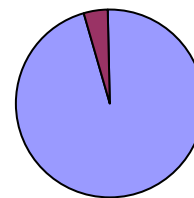
Figure: 2

Composition of External Long term debt 1990



■ Public & Publicly Guaranteed
 ■ Private Non-Guaranteed

Composition of External Long Term Debt 2005



■ Public & Publicly Guaranteed
 ■ Private Non-Guaranteed

Table: 4.8				
PUBLIC & PUBLICLY GUARANTEED DEBT				
Years	1970s	1980s	1990s	2000s
	Share in PPG			
Official Creditor	93.8	92.6	94.0	95.2
Multilateral	17.4	25.4	48.1	50.9
Bilateral	76.3	67.2	46.0	44.3
Private Creditor	6.2	7.4	6.0	4.8
	Growths Rates			
Official Creditor				
Multilateral	11.3	13.8	11.2	5.5
Bilateral	14.3	4.5	1.7	6.7
Private Creditor	2.4	10.5	12.3	-17.4

Over the years, share of concessional debt in total external debt has declined from a peak of 71.1 percent in 1970s to 62 percent in 2000s, having minimum share of 54.1 on average during 1990s as shown in **Table 4.9**. On a point-to-point basis (i.e. 1980s versus 2000s), 20.7 percent of the total concessional loans were owed to multilateral creditors and 79.3 percent to bilateral creditors in 1980s. The share of multilateral creditors in concessional loans increased up to 45 percent in 2000s and share of bilateral creditors went up to 55 percent at the same point of time, with wide variations in the intervening years. Thus the share of bilateral creditors in concessional loans has steadily decreased; from 79.3 percent in 1980s to 55 percent in end period 2000s. The total capital inflows in form of aids and concessional loans from Pakistan Aid Consortium and OPEC countries were about \$ 23 billions from 1973-1990.

Table: 4.9				
SHARE IN CONCESSIONAL LOAN				
Years	1970s	1980s	1990s	2000s
	Share in long term debt			
Concessional	71.1	66.3	54.1	62.0
Non-Concessional	19.5	15.1	25.5	22.2
	Share in concessional			
Multilateral	12.8	20.7	40.4	45.0
Bilateral	87.2	79.3	59.6	55.0

The aid flows during 1980s and 1990s were not utilized to build up the productive capacity of the economy. No single big productive project was setup during 1988-1999. The loans disbursed in this era were meant to help Pakistan repay past loans and for

undertaking massive structural changes and fiscal adjustments. These loans were in fact exclusively related to social sectors and were not meant to create any productive capacity for earning financial returns and for serving external debt. It is worth mentioning that Pakistan was under debt relief during March 1972- May 1982 and it was after when the relief expired that debt payments started mounting to alarming proportions. As shown in **Table 4.10** debt servicing increased from \$763 millions in 1980 to \$ 1850 millions in 1990 and reached to \$2883 millions in year 2000; registering an average increase of 9.5 percent and 7.3 percent per annum respectively during the decades of 1980s and 1990s. On average \$1.8 billions were paid annually in debt servicing during 1990s¹⁸. The Terms of the loans contracted during this period were extremely unfavorable i.e. high interest rates, short maturity period and declining percentage of grant element¹⁹. The increased resort to short term commercial borrowing contributed towards buildup of debt servicing payments.

The increased liability of debt servicing payments had squeezed the net inflow of foreign resources. The net transfer of external resources were \$554 millions in 1990 and from thereon it started declining till mid 1990s and then turned negative amounting to US \$-877 in 2000 and -1674 millions US \$ in 2004, this could possibly be the result of lower Disbursement of loan/aid.

Table: 4.10
Debt Servicing (mls \$)

Years	1970	1980	1990	2000	2001	2002	2003	2004	2005
Interest Payments	106	312	790	1012	908	837	841	811	824
Long Term	94	231	480	901	792	736	762	754	801
IMF	12	29	53	46	50	46	33	23	23
Short Term	0	52	257	64	66	55	45	34	0
Principal Repayment	139	452	1060	1872	1984	2058	2108	2912	1894
Long Term	125	330	872	1613	1763	1840	1677	2320	1494
IMF Repurchases	14	122	188	259	221	218	431	592	400
Total Debt Servicing	244	763	1850	2883	2892	2895	2948	3723	2718
Net Transfers	793	646	554	-877	-849	-376	-994	-1674	

¹⁸ Total debt repayment during 1991-1999 were about \$32 billions [Pakistan economy during 1990s by ABN AMRO Bank]

¹⁹ On average Grant elements were 86% of Total ODA in 1952-53, 66% in 1954-55, 23% during 1978-88 and 12% during in 1989-2000[Economic Survey of Pakistan]

Disbursement of loan/aid

The disbursements declined from \$2600 million in 1995 to \$1428 millions in 2000 as indicated in **Table: 4.11**. The occurrence of 9/11 resulted in the restoration of relationship with the international institutions, the aid disbursements (program loans) since then improved and outcome was steady increase in disbursement amount since 2000. During seventies and earlier part of the eighties, Pakistan received a very small amount of aid except that received from the Islamic countries. However, it stepped up in 1980s due to Afghan war and then in 2000s after 9/11 occurred. The position of disbursement by type and use is summarized in **Table: 4.11**

Table: 4.11
DISBURSEMENTS OF LOAN/AID BY USE (\$ mls)

	1970	1980	1985	1990	1995	2000	2002	2004	2005
Project Aid	323	808	903	1312	2079	1110	640	497	741
Non-Project Aid	241	662	354	1030	521	318	1676	745	1534
Food	83	21	79	287	258	191	31	0	0
Non-Food	158	161	125	386	23	0	0	0	0
BOP	0	419	0	217	211	125	1624	741	1532
Relief	0	61	150	140	29	2	21	4	2
Total Disbursement	564	1470	1257	2342	2600	1428	2316	1242	2275

Source:

- 1) Statistical Supplement
- 2) Economic Survey of Pakistan 2004-05

Sources of Foreign Economic Assistance:

The major sources of foreign economic assistance to Pakistan have been the Consortium, Non- consortium and Islamic countries. The Aid-to-Pakistan consortium constituted in 1960 has been main source of economic assistance to Pakistan during the fifties; its share declined in the seventies and earlier part of eighties i.e. the period when Islamic countries provided the much-needed assistance. In initial stages the contribution of multilateral

institutions was smaller and bilateral donors accounted for major share in assistance, especially USA donated generously in fifties and sixties. Later on assistance from USA has fluctuated. Japan has also provided significant assistance since 1990. Similarly the role of multilateral institutions has increased significantly [see **Table: 4.12**] and its share has accounted for half of the total loans and credits of the outstanding disbursed debt since 1990.

Table: 4.12
PUBLIC & PUBLICLY GUARANTEED DEBT BY CREDITOR (mls\$)

	1975	1980	1985	1990	1995	2000	2004	2005
1-Consortium	4124	6549	7704	13471	20714	23565	26633	27448
USA	1856	2416	2699	3070	2675	2672	2104	1597
Germany	454	860	608	1310	1730	1268	1629	1630
Japan	232	598	794	1915	4087	4591	5552	5339
Others	812	1096	1053	1493	2211	1843	3101	3006
Financial Institutions	771	1579	2550	5683	10012	13191	14247	15877
IDA	463	786	1357	2014	3032	3853	6020	7019
IBRD	232	466	352	1605	2822	3773	2526	2170
ADB	72	316	731	1932	4001	5398	5554	6367
Others	4	12	110	132	157	168	148	321
2-Non-Consortium	230	565	531	571	847	1567	1849	1829
USSR	90	296	230	227	129	202	148	130
China	53	127	158	192	464	358	670	815
Switzerland	24	41	26	35	64	68	85	86
Others	63	101	116	117	190	939	946	799
3-Islamic Countries	441	1312	1304	684	574	361	296	251
Iran	250	714	389	28	0	0	0	0
Kuwait	1	21	114	106	84	65	59	82
Saudi Arabia	0	317	406	286	244	80	44	49
Others	190	259	394	264	246	216	194	120
4-IMF Trust	0	286	194	368	0	0	0	0
Total	4795	8711	9732	15094	22135	25493	28778	29528

Source:

- 1) Statistical Supplement
- 2) Economic Survey of Pakistan 2004-05

Terms and conditions of new commitments

The Terms and conditions of new commitments from official creditors are becoming harder as is reflected in **Table 4.13**. The interest rate has increased to 6.2 percent in 2000, from a level of 2.5 percent in 1980, which remained stable in the range of 5 to 5.5 percent from 1985 up to 1995. The average maturity of new lending dropped from over 35 years in 1980 to 13 years in 2000 and increased to 20 years in 2003, the average grace period declined from over 8 years to 4.7 years in the same period. More over the grant element in new lending decreased from 62 percent in 1980 to less than 21 percent by 2000 and then increased again up to 52 percent in 2003.

Table: 4.13
Average Terms Of New Commitments

Years	1975	1980	1985	1990	1995	2000	2003
All Creditors							
Interest rate (%)	7	4.4	5.6	5.3	5.2	6.3	1.7
Maturity Years	14	30.1	26.8	22.5	17.4	12.5	19.9
Grace Period	4.3	6.6	6.4	6.1	5	3	4.8
Grant Elements (%)	17.8	47.9	34.4	34.6	30.5	19.9	52.7
Official							
Interest rate (%)	5.6	2.5	5.4	5.2	5	6.2	1.7
Maturity Years	23.9	35.5	27.9	22.9	18.7	12.8	19.7
Grace Period	6.3	8.2	6.7	6.1	5.5	3.1	4.7
Grant Elements (%)	32.8	62.2	36.4	35.5	32.8	20.7	52.4
Private Creditors							
Interest rate (%)	7.6	11.3	8.6	8.8	7.0	8.0	1.8
Maturity Years	9.5	10.8	10.4	11.3	4.4	5.3	30.0
Grace Period	3.4	0.9	2.4	4.8	0.9	1.0	9.0
Grant Elements (%)	11.0	-4.0	5.5	5.1	8.1	4.5	66.5

4.3.2 Rescheduling of Debt

The economic history of Pakistan is full of requests made for debt relief. Pakistan got a debt relief for the first time in May, 1971 when debt amounting to \$273 millions, due between May, 1971- June 1974, was rescheduled. The debt to the tune of \$ 650 millions, which was due between July 1974 – June 1978 was rescheduled by Paris club in June 1974. Third Rescheduling was affected in June 1978 when consortium granted one-year interim relief for 1978-79 periods, during the same period IMF also provided a stand by loan. In January 1981 fourth debt relief was granted to Pakistan by Rescheduling 90% of the debt payments due within next 18 months. Three packages were also concluded with IMF during 1988-1999 and these were signed in December 1988, April 1994 and 1997. Fifth and sixth debt relief was secured in 1999 and January 2001 when agreements were negotiated resulting in rescheduling of arrears of debt service payments amounting to \$3.4 billions and \$0.91 billions respectively. Both these rescheduling were flow rescheduling wherein the debt servicing due within a specified period (consolidation period) was deferred for payment in future dates.

The seventh and last rescheduling agreement was negotiated with the Paris Club in December 2001 wherein the rescheduling, of entire outstanding stock (principal plus accumulated arrears) was agreed. This stock treatment provided a rescheduling and reprofiling of Pakistan's total bilateral public and publicly guaranteed debt of over one year maturity, outstanding as on November 30, 2001. The total stock of bilateral debt rescheduled was \$12.5 billion (including the debt service payments in arrears and the amount of previously rescheduled debt), and it contains the Official Development Assistance [owed directly by the governments or their public sector agencies] debt of \$ 8.73 billion and Non-Official Development Assistance [advanced by financial institutions, suppliers/exporters and the private sector of the donor countries] debt of \$ 4.1 billion. The ODA rescheduled debt will be repayable over a period of 38 years including 15 years of grace period with same interest rate as provided in the original contracts. The Non-ODA rescheduled debt is to be repaid over a period of 23 years including 5 years of grace period at an appropriate market rate. The total cancellation of

debt comes to \$1.062 billions. Thus total amount of \$ 11.80 billions stood rescheduled. It includes the debts from non-Paris Club creditors.

The last debt rescheduling resulted in an estimated relief of \$ 1.2 billion to \$ 1.5 billion annually in payments of debt servicing from 2001-02 to 2004-05. It was contended that this relief coupled with fresh disbursements from multilateral and bilateral creditors' donors would have favorable effect on the balance of payments, foreign exchange reserve position and credit rating of the country.

Table:4.14 Debt Restructuring mls US \$					
	1974	1999	2000	2001	2002
Total Amount	650	3399	919	12852	145
Debt Stock Rescheduled		615	29	11398	
Principal Rescheduled		2158	653	1325	0
Official		1453	575	1187	
Private		705	78	138	
Interest Rescheduled		626	237	129	145
Official		508	200	109	145
Private		118	37	20	

4.3.3 Sovereign Comparisons

All the South Asian countries pursued and followed the Development strategy based on foreign Economic assistances. Foreign inflows of resources were considered essential to bridge the gap between country's own resources and necessary funds needed to accelerate growth and investment. These foreign debts continued engulfing the foreign exchange earning and were in fact the main cause of their *Chronic External Deficits*. As shown in **Table 4.15** the outstanding debt of South Asia has increased from \$ 65.3 billions in 1985 to \$168.2 billions in 2002 where as GDP has gone from \$287.5 billions in 1985 to \$ 636.8 billions in the same period. Thus 157.6 percent increase in debt is accompanied by 121.5 percent growth in GDP. The debt servicing has gone up from 5.65 percent of GDP in 1985 to 17.54 percent in 2002. Their debt servicing expenditures have increased at much faster rate then their debt outstanding; the reason being the hard terms and conditions of foreign commercial banks from whom they borrowed. **Table: 4.15** shows a comparison of debt indicators of low income developing countries and middle income

developing countries of South Asia covering the period from 1990-2004 .The main findings of this comparison are as follows:

- Pakistan 's stock of external debt as percent of exports of goods and services was higher than the average of the developing countries as a group, low-income developing countries and South Asian countries during the period 1990 and 2004.
- Pakistan's stock of external debt as a percentage of GNI remained above the average of the developing countries as a group, middle-income developing countries and South Asian countries in years 1990, 2000 and 2004.
- Pakistan Debt servicing indicators are higher than the average of all other country groups in 2000 where as it remained lower than the average of Low Income Countries and SAARC Countries in 2004. But it was still higher than the average of developing countries as a group. Pakistan's interest payments on the external debt as ratio of exports of goods and services were higher as compared to those of other country groups
- Comparison of the debt indicators show that these indicators improved in 2004 in comparison with the levels of those in 1990 and 2000 in favor of all groups.

In conclusion, the analysis presented indicates a modest improvement in the debt to GDP ratio, debt to revenue ratio and debt to tax ratio, further significant improvement in the growth rate of debt is observed and fair improvement in debt servicing to revenue ratio regarding public debt. Similarly, on the external front the terms and conditions for new debt commitments remained unfavorable throughout, however the recent rescheduling and restructuring of debt has provided some relief in terms of debt servicing and repayment. Also the share of multilateral debt has increased against the bilateral debt and the share of concessional and non-concessional debt has remained more or less unchanged. Finally, unlike other country groupings Pakistan's debt stock indicators worsened during 1990 but improved in 2004. In fact, the growth in Pakistan's overall debt stock has slowed down significantly in recent years, driven primarily by the government's improved fiscal position, pre-mature payments of the expensive debt and the strengthening of domestic currency.

**Table 4.14: A Cross-Country comparison of
External Debt Indicators**

Debt Ratios/Years	1990	2000	2004
Total External Debt (% of Gross National Income)			
Pakistan	49.5	45.9	45.5
All Developing Countries	36.1	40.2	35.2
Low-income Developing Countries	56.8	45.7	40.1
Middle-income Developing Countries	32.1	39.3	38.3
South Asia	31.3	26.8	22.5
External Interest payments (% of Gross National Income)			
Pakistan	2	1.4	1.1
All Developing Countries	1.7	2.1	1.7
Low-income Developing Countries	1.9	1.1	0.9
Middle-income Developing Countries	1.7	2.3	1.6
South Asia	1.7	0.9	1.6
Total External Debt (% of Exports of goods & services)			
Pakistan	231.2	289.8	191.5
All Developing Countries	178.3	121.4	87
Low-income Developing Countries	350.1	186.2	147.9
Middle-income Developing Countries	152.9	113.3	98.6
South Asia	303	155.3	112.7
Total External Debt Service (% of Exports of goods & services)			
Pakistan	21.3	25.2	16
All Developing Countries	19.7	20	12.5
Low-income Developing Countries	22.9	13.1	17.3
Middle-income Developing Countries	19.3	20.8	18.9
South Asia	27.5	15	18.8
External Interest payments (% of Exports of goods & services)			
Pakistan	9.3	8.7	4.5
All Developing Countries	8.5	6.4	3.5
Low-income Developing Countries	11.6	4.6	3.4
Middle-income Developing Countries	8.1	6.6	4.2
South Asia	14.7	5.5	3.5

Source: Global Development Finance [CD-2005]

International Bank for Reconstruction and Development/World Bank. Global Development Finance: Financing the Poorest Countries. 2002, February. Washington, DC.

Chapter: 5

Debt Sustainability Issues

5.1 Debt Sustainability Concepts

Debt sustainability generally refers to the ability of a country to service its debt. The concept was originally defined by HIPC Initiative as the fiscal position that maintains debt at a level that can be serviced without an undue burden of adjustment. In the literature, the analysis of fiscal sustainability has been based on both net and gross debt.²⁰ The IMF and the World Bank define debt sustainability of a country as its ability and willingness to meet current and future debt servicing obligations in full, without recourse to debt rescheduling or accumulation of arrears and without compromising growth.²¹ The three closely interrelated key determinants of debt sustainability are; (a) the existing stock of debt and its repayment terms, (b) development of a country's repayment capacity determined by economic growth, exports, and total revenues, and (c) growth and terms of new borrowing (IMF and World Bank, 2001). The starting point for determining long-term debt sustainability is existing stock of debt and its repayment terms. The Development of the repayment capacity in terms of growth in incomes and exports is also very significance. The new borrowings along with its terms are also very vital in the subsequent growth of debt through returns on investment and the impact on taxation. For examining the sustainability, **specifying** the norms for prudent levels of borrowing in terms of one or more indicators of debt burden is the foremost step. The indicators²², for carrying out the debt sustainability analysis include Stock Measures and Flow Measure. ***(a) Stock measures***, these interrelate the value of a stock of outstanding debt and the annual level of key economic aggregates and these are usually used for analyzing solvency (a situation in which the present discounted values of governments current and future primary expenditures is no greater than the present discounted value of current and

²⁰ **Gross debt** is defined as the stock of outstanding Government financial liabilities and it is used in the analyses of debt sustainability in developing countries. **Net debt** is defined as gross Government debt minus liquid assets of the Government.

²¹ Debt sustainability incorporates several sub components: Solvency, Liquidity and vulnerability. Solvency mean a situation in which the present discounted values of the government's current and future primary expenditure is no greater than the present discounted value of its current and future revenue, net of any initial indebtedness.

²² Zaaruka Benethelin; Ndove Titus, and Tjipe Tjiveze (2004), "Central Government Debt Sustainability", WP 1/2004 Bank of Namibia Research Department, Namibia

future income, net of any initial indebtedness). Stock measures of the external debt burden are generally expressed in terms of ratios to GDP and ratio to foreign exchange earnings. However the payments like the interest rate payable on debt and the maturity structure of the debt is not taken into account by the stock measures. Debt to GDP, Debt to Revenue, and Debt to Exports earnings ratios are some of the stock measures **(b)** Flow measures; these relate the value of annual debt service payments to the key economic aggregates. It measures liquidity (a situation in which the liquid assets and available financing are sufficient to meet the maturing liabilities). These measures show the current capacity of a country to pay its debt obligations. These include Debt servicing as percent of GDP, Debt servicing as percent of Revenue and Debt servicing as percent of Export earnings.

5.2 Assessing Debt Sustainability – Equations and Thresholds

Two methods of examining the debt sustainability issue have been suggested in the literature. These are²³:

- Equations that attempt to measure the debt dynamics or sustainability
- Analysis which attempts to set thresholds of debt indicators, above which the debt is deemed to be unsustainable.

5.2.1 Debt Dynamics and Equation:

To assess the debt sustainability through theoretical framework, the dynamic debt equation is an accounting approach that states that the debt would be sustainable if the following two conditions are fulfilled; firstly, the interest rate is lower than the growth rate of the variables like GDP, Revenue and Export i.e. the variables used to measure payment capacity and secondly, the primary balances (fiscal or current account) is sufficient to finance the interest rate – growth rate differential. The other alternative for examining the debt sustainability EMPIRICALLY is the Present Value Budget Constraint approach [PVBC] wherein Present Value of Budget Variables are used along with consideration of Financing options for the Budget and Balance of Payments. This Empirical analysis through formulation of model is the focus of the instant study.

²³ Martin, Mathew “Has Debt Relief Made Low Income Countries Debt Sustainable”, Debt Relief International (2004).

5.2.2 Debt Sustainability Thresholds

Various International Institutions like IMF, World Bank, and Debt Relief International has developed independently the debt sustainability thresholds²⁴ for solvency and liquidity as reported in the **Table 5.1** below.²⁵ These levels can be used for early warning signals for debt sustainability. The methods for setting these thresholds fall into two groups.

1. Those, which use “events” such as arrears, Paris Club rescheduling or IMF programmes to judge the level at which debt becomes unsustainable.
2. Those, which use econometric tests., which can be used as early warning signals for debt sustainability.

For instance, the Debt Indicators are compared to Indicative Debt-Burden Thresholds and if a Debt indicator level exceeds its indicative threshold, it may indicate that a country is becoming vulnerable as for as its solvency is concerned. It is therefore to be ensured that the debt ratios of the country stay below these thresholds and variables

TABLE: 5.1 SUSTAINABLE DEBT THRESHOLDS

Institutions	Present Value of Debt as % of Exports	Present Value of Debt as % of total Revenue	Additional Criteria
HIPC Initiative (2004)	150	250	Debt servicing / Exports ratio is 15-20%
DRI	140	151	Debt Servicing / Exports ratio is 12% and Debt Servicing / Revenue ratio is 13 %
IMF	180	201	PV/GDP is 42% and Debt Servicing/Revenue is 30%
World Bank* (2004)	190	189	[PV/Exports is 220% and PV/GNI is 80 %]* [Also Debt stock/GDP is 50%, Debt stock/Exports is 275%, Debt Servicing /Exports is 30%]**

* (Global Development Finance 2004)

** (From World Debt Tables, 1990)

²⁴ The threshold level of IMF and World Bank is almost the same; where as the threshold levels reported by a few studies vary depending upon the conditions and assumptions.

²⁵ Martin, Mathew, (2004) “Has Debt Relief Made Low Income Countries Debt Sustainable”, Debt Relief International.

The Maastricht Treaty of the European Union, the Commonwealth Secretariat, and the Debt Relief International has also developed various sustainability ratios²⁶. The levels of the debt ratios of a country should not exceed the upper limits of these key Indicative Thresholds levels as given below, if the debt is to remain sustainable.

Debt Ratios	Sustainability Indicative Threshold Limits
Fiscal Deficit as % of GDP	3 Percent of GDP
Debt Servicing as % Revenue	15 Percent of total Revenue
Public Debt as % of GDP	25 Percent of GDP
External Debt as % of GDP	5 Percent of GDP
External Debt as % of Exports	10 Percent of Exports

The debt sustainability particularly in developing countries should not be viewed in isolation from quality of general economic management and policies and standard of their institutions as it has been established empirically that low-income country having weaker policies and institutions tend to face debt-servicing problems at lower levels of debt than countries having strong institutions. The reason perhaps is that a weak institutional setup and low standard of economic governance is more likely to encourage the misuse and mismanagement of funds. These sorts of economies have demonstrated enhanced level of vulnerability to exogenous shocks like drought, floods, and pest's attacks. It is because of these factors that the indicative debt-burden thresholds are considered to be very much dependent upon a country's quality of policies and institutions. These are therefore measured in the light of the Country Policy and Institutional Assessment (CPIA) index of the World Bank. The CPIA index rates countries on the basis of their standard of economic and public sector management, quality of structural and social policies and strength of institutions²⁷. The index is updated annually. The indicative thresholds in the

²⁶ See Johnson (2001) for a detailed discussion of these ratios.

²⁷ World Bank (2005), "How to Do a Sustainability Analysis for Low-Income Countries" available via Internet (Washington, DC).

Table 5.2 have been suggested by taking into account the quality of policies and strength of institutions of the countries.

**Table 5.2 Indicative External Debt Burden Indicators
(In percent) in light of CPIA**

	Quality of Policies and Institutions*		
	Poor	Medium	Strong
Net Present value of debt in percent of			
Export	100	150	200
GDP	30	40	50
Revenue	200	250	300
Debt service in percent of:			
Export	15	20	25
Revenue	25	30	35

*Countries with a CPIA below or equal to 3.25 are defined to have a poor quality of policies and institutions, while a CPIA above 3.75 indicating strong institutional. Pakistan has medium quality of policies as its CPIA index is within 3.25-3.75

The World Bank has also acknowledged the role of CPIA, which actually reflects the quality of a country's policies and Institutions, in deciding the above referred target thresholds for analyzing the debt sustainability of a particular country (IMF/World Bank 2004). It, however, has stressed that the debt indicators and thresholds should be interpreted in the light of other ratios ensuring the use of broadest possible range of indicators. The crux of the matter is that debt sustainability should be analyzed using the broadest possible range of indicators, but at the same time the analysis should be customized and indicators be prioritized according to circumstances of country and the policies pursued by it.

5.2.3 Criteria of Present Value Term:

The idea of judging the indebtedness of a country in term of present value (PV) was introduced in 1990 for the reason that it reflects the concessionality of the debt owed by

low-income countries. Present value of external debt is calculated both as a percentage of GDP and as a percentage of foreign exchange earnings. Use of a discount rate reduces the burden of real debt payments in the outer years and also takes account of the concessionality of the various interest rates, the grace period, and maturity period. The lower the interest rate the more is the grant element. Similarly the longer maturity period and grace period also increase the grant element of the loan. The grant element also increases if the repayment profile is more back loaded.

The World Bank classifies the countries on the basis of critical values of two ratios, the ratio of present value of debt to GNI and the ratio of present value of debt to export²⁸. These critical values are 80 percent and 220 percent respectively. A country is categorized as Severely Indebted Low Income Country [SILIC] if either of the two ratios is above the critical values. To be a Moderately Indebted Low Income Country [MILIC], one of two ratios must exceed 60 percent of the critical values.

	Severely Indebted	Moderately Indebted	Less Indebted	Pakistan in 2003
Debt/GDP=x	x>80%	48<x<80	x<48	41
Debt/Exports=y	y>220%	132<y<220	y<132	234

5.3 Traditional Debt Indicators for Pakistan:

At present the debt indicators / Indicative debt burden thresholds are being applied in Pakistan to test the debt sustainability. The sustainability of debt has been examined in this chapter by focusing on the debt indicators benchmarks and comparing these with the ratio of Pakistan's public as well as external debt.

²⁸Pakistan appears bad in “y” because the y depicts Debt/Exports and weak and stagnant exports earnings had been the dominant feature of Pakistan through out its Economic history, especially the period under review of this dissertation. The reason is that the exports comprise of a few commodities (cotton yarn, sports goods and rice); lacking value addition and remained vulnerable to shifts in the world demand and to domestic shocks. The diversification of manufactured exports was lacking i.e. Pakistan has 1% share of the total manufactured exports of the world. The weak exports base is one of the major factors in the genesis of debt trap.

The widely used measure in Pakistan and elsewhere to judge the stock of public debt (including public portion of external debt) is its ratio to GDP. Though it is a common practice to measure the burden of public debt (as well as that of external debt) as a proportion of GDP, it however makes more sense to use the yardstick of government revenues for monitoring changes in public debt burden. It is the growth in revenues which provides the capacity to service future debt payments. After all, GDP changes do not automatically translate into revenues, particularly in developing countries like Pakistan where the taxation machinery is weak and the taxation systems are inelastic.

The best stock measures like total public debt as a proportion of revenues and the present value of external debt as a percentage of exports of goods and services are also being supplemented by appropriate flow measures. In the case of external debt, the most frequently used measure is total annual debt service as a percentage of exports of goods and services. It is worth mentioning that the creditors widely use ratio of external debt to GNP and external debt to exports earnings while making judgments about country's creditworthiness and during making decision of rolling over or rescheduling of debt payments.

5.3.1 Observations Regarding Debt of Pakistan

The results reported in **Table 5.3 and 5.4** regarding the debt indicators of Pakistan since 1970s onward are summarized below;

1. The public debt stock was at a level of 54.4 percent of the GDP in 1980; it rose to 79% of the GDP in 1990 and 102.8% of the GDP in 2000. Since then it has started declining and became 74.6% of the GDP in 2005²⁹.
2. The public debt stock was at a level of 335 percent of the Revenues in 1980; it rose to 412 percent of the revenues in 1990 and 615 percent of the revenue in 2001. Since then it has started declining and became 484 percent of the revenue in 2005.

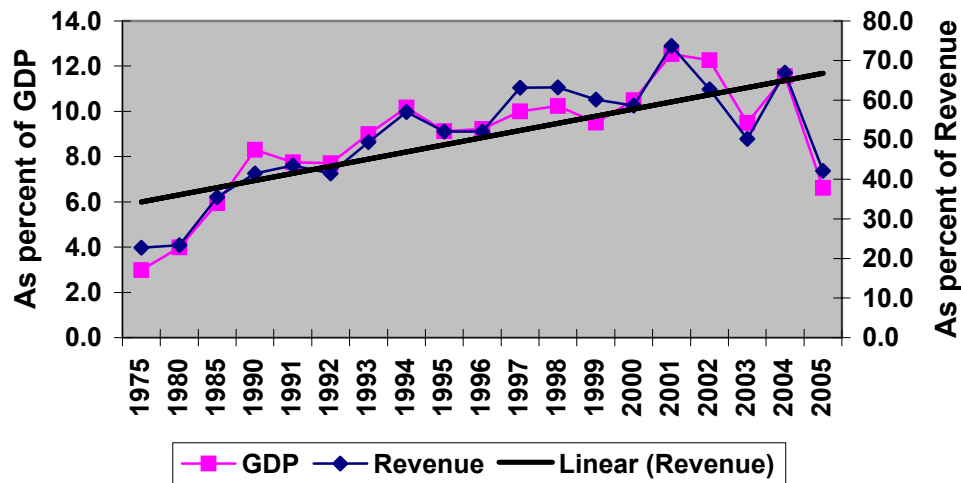
²⁹ For FY2004, computed value of Public Debt to GDP ratio is 85.9 per cent, whereas in Debt Policy Statement [2006-07] it is 67.1 per cent and 85 per cent in a "report of activities" by Economic Affairs Division [2002-04]. Therefore, the measured value in this study is consistent with the value shown in the report of activities. The Debt Policy Statement figure is a statistical artifact of changing GDP base at FY2000 prices.

3. The interest payments on public debt have consumed 12.8 percent of the Revenues in 1980; it rose to 29.4 percent of the revenues in 1990 and 44.5 percent of the revenue in 2000. Since then it has started declining and became 41.8 percent of the revenue in 2004. It has gone up to 41.2 percent of the revenue in 2005. During this period, interest payments on public debt rose from 5.6 percent to 6.3 percent of GDP by end 2005, after reaching a peak level of 9.1 percent of GDP in FY2001.
4. The debt servicing on public debt consumed 24.5 percent of the Revenues in 1980; it rose to 43.2 percent of the revenues in 1990 and 80.2 percent of the revenue in 2001. Since then it has started declining and became 54.5 percent of the revenue in 2005 with slight upward fluctuations in 2004. These figures present a steep deterioration in public debt servicing burden.

Table: 5.3								
Indicators of Public Debt Sustainability								
Years	1980	1990	2000	2001	2002	2003	2004	2005
Total Public Debt (Rs. Bils)	127	674	3266	3500	3540	3770	3979	4092
Public Debt as % of								
Gross Domestic Product [1995]	54.4	79.0	102.8	102.3	97.6	93.8	85.9	74.6
Gross Domestic Product [2000]	45.6	66.1	86.1	85.6	81.7	78.6	71.9	62.5
Revenue	334.6	411.6	614.8	654.1	571.8	537.4	522.8	484.3
Interest payment % of								
Gross Domestic Product	2.1	5.6	7.4	9.1	8.8	6.4	6.9	6.3
Revenue	12.8	29.4	44.5	58.4	51.5	36.7	41.8	41.2
Debt Servicing % of								
Gross Domestic Product	4.0	8.3	10.5	12.5	12.3	9.5	10.5	8.4
Revenue	24.5	43.2	62.8	80.2	71.9	54.3	63.8	54.5
Sources: Government Finance various issues								

Table: 5.4								
Indicators of External Debt Sustainability								
Years	1980	1990	2000	2001	2002	2003	2004	2005
External Debt	9425	19403	35306	29878	32465	35033	36035	34037
External Debt as % of								
Gross domestic Product	39.8	48.7	57.5	51.1	54.9	51.0	44.8	36.8
Export of Goods & Services	329	306	369	292	287	258	232	196
Foreign exchange earning	204	234	334	264	237	197	185	158
Debt Servicing as % of								
Gross domestic Product	3.2	4.6	4.7	4.9	4.9	4.3	4.6	2.9
Export of Goods & Services	26.6	29.2	30.1	28.3	25.6	21.7	23.9	15.6
Foreign exchange earning	16.5	22.3	27.3	25.5	21.1	16.5	19.2	12.6
Sources: Global Development Finance[Various Issues]								

Fig-1: Public Debt Servicing Indicators



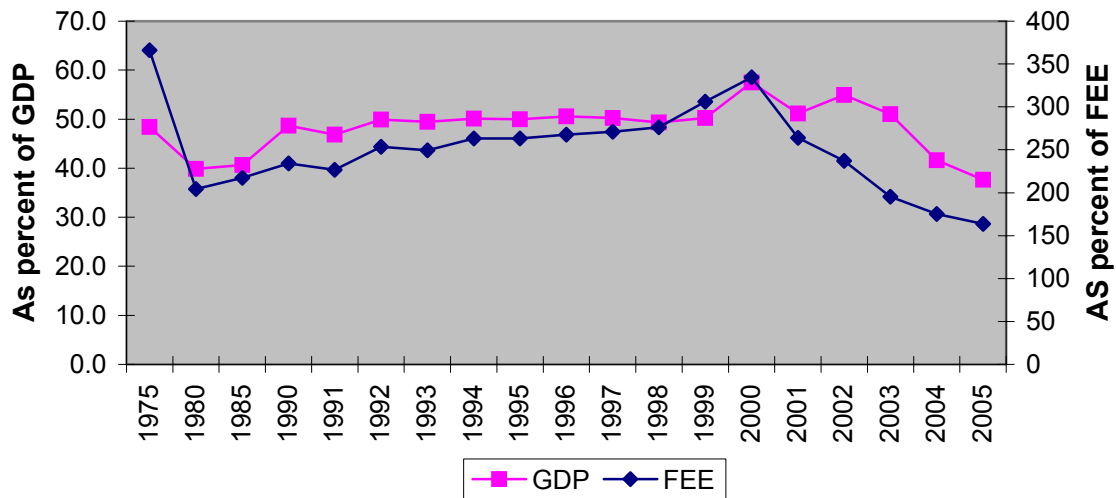
5.3.2 Observation Regarding External Debt:

On the external front, Pakistan accumulated; disbursed and outstanding debt by end 2005 was \$34.07 billions. It was \$9.4 billions in 1980, \$ 19.40 billions in 1990 and reached to \$ 35.30 billions in 2000. It grew at an average rate of 7.0 per cent and 6.0 percent during the decades of 1980s and 1990s. The growth rate of external debt in first half of 1990s was 9.1 % while in second half it was 4.2% per annum which was mainly due to large current account deficit and heavy reliance on short term borrowing.

1. The external debt to GDP ratio has remained stable around 50 percent in the second half of 1990s. It was 40 percent in 1980 but increased to 57.5 percent in 2000 and declined to 36.8 percent by end 2005.
2. Similarly, external debt as percentage of foreign exchange earning was 334 percent in 2000 in comparison to 204 percent 1980 and 234 percent in 1990. It declined to 184 percent in 2004 and further to 158 percent in year 2005. The debt as percentage of exports of goods and services was 196 percent in 2005 as compare to 369 percent in 2000 [figure: 2, Table 5.4].
3. The debt servicing on external debt as a percent of GDP has increased to 5.2% during the second half of 1990s as compared to 4.7% of GDP in first half of 1990s. It has declined to 4.7 percent during 2000s on average due to the debt

relief resulting from the rescheduling of debt from Paris Club and Non- Paris Club donors.

Fig-2 External Debt Indicators



4. The debt servicing on external debt as percentage of exports earning has declined from 30 percent in 2000 to 21.7 percent in 2003. It then went down to 23.9 percent in 2004 and finally declined to 15.6 percent of exports earning in 2005. Similarly, external debt servicing as percentage of foreign exchange earnings rose from 22.3 percent in 1990 to 27.3 percent in 2000, and declined to 12.6 percent in 2005.

5.3.3 Observations by using PV concept

The analysis of the critical ratio i.e. PV of debt to GNI and PV of debt to export on the basis of World Bank Criterion reflects Pakistan as Highly Indebted Country in 2003 as shown in table below.

Table:5.5 Present Value Indicators of Debt Sustainability

	1990	2000	2001	2002	2003
Indebtedness Classification		S	S	M	S
PV of External Debt/GNI		45	44	45	41
PV of External Debt/EGS		249	222	238	234
PV of Debt Servicing/GNI	4.9	4.8	5.1	3.5	2.4
PV of Debt Servicing/EGS	25.1	26.8	21.3	16.8	12.7

Source:

Global Development Finance(2005)

World Development Indivcators(various Issues)

Indebtness classification of the country:

S: Stand for Severly Indebted

M: Stand for Moderately Indebted

Income Group: Low Income Group

5.4 Inferences

After analyzing the data /observations regarding progression of Pakistan debt, both Public and External, over the last few decades it is inferred that;

- Fiscal deficit as percentage of GDP ratio remained above the target level throughout. It appears to be 4.4 percent in 2000s. It is above 3 percent of GDP- the standard agreed by International bodies. Such a high fiscal deficit definitely leads to debt acceleration and impairs the Repayments Capacity.
- Debt is said to be sustainable if debt to GDP ratio is stationary or declining in the long run. Pakistan's debt to GDP ratio remained always above the critical level of 25 percent. It is at 74.6 percent of GDP in 2005. It is apparent that debt to GDP ratio continued climbing till 2000 but has slightly declined in 2005.
- In term of budgetary revenues, the public debt is 484 percent of revenue in 2005 as compared to 412 percent in 1990 and 601.1 percent in 2001. Despite its recent declining trend, it always exceeded the prescribed debt sustainability limits of 350 percent set by the Debt Reduction and Management Committee in their report [Mach 2001].
- The Public Debt Servicing to Revenues ratio remained above the target level of 15 percent, as is the version of the Maastricht Treaty of the European Union, the Commonwealth Secretariat, and the debt Relief international.

- The ratio of external debt stock to GDP remained 40 percent in 1980, 57.5 percent in 2000 and 51 percent in 2002. Since then there is a downward trend i.e. 44.8 percent and 36.8 percent in 2004 and 2005 respectively.
- The external debt to Exports earning remained 329 percent in 1980 and 369 percent in 2000. During 2000s it declined quite sharply and its values in 2005 are just 196 percent. The target value for external debt sustainability should have been 275 percent as per the World Bank Criteria and of course the present level fulfills these criteria.
- Debt Servicing to Export Earning remained 26.6 percent in 1980, 30.1 percent in 2000 and then it declined consistently to 15.6 percent in 2005. The target value should have been 30 percent as per the World Bank Criteria and of course the present levels fulfills not only this world Bank criteria but is also within the limits prescribed by DRI and HIPC Initiative [2004] i.e. 12 percent and 15-20 percent respectively.
- The present values of external debt to export/foreign exchange earning³⁰ are 249 percent in 2000 and 234 percent in 2003 [see **Table 5.5**]. These values are significantly higher than the Sustainability thresholds set by the DRI, IMF and World Bank [2004].
- It is also pertinent to mention that the definition of debt sustainability advocates that a country must not resort to debt rescheduling or other forms of debt relief if that country is classified as having attained the debt sustainability. Pakistan approached the Paris Club thrice i.e. in 1999, Jan, 2001 and Dec, 2001 for seeking debt relief/debt rescheduling on its external bilateral debt and as such does not qualify for being declared as a country enjoying debt sustainability.

It can be concluded that the levels of Public debt indicators have been far from the Debt Sustainability levels since the last three decades. As far as the external debt ratios are concerned these have just attained sustainability levels in late 2000s and one must not ignore the role of massive debt rescheduling at the end of year 2001 in bringing these external debt ratios at sustainable levels. The present value of Debt to Export Earning and

³⁰ Foreign exchange earning is equal to export of goods and services including worker remittances

Debt to foreign Exchange earning are also quite above the critical level and do not pleasantly support the assumption of having attained sustainability levels as implied from recent external debt ratios levels. Even the sustainable limits [Public debt as percent of government revenues: 350, External debt as percent of foreign exchange earnings: 200] as suggested by Debt Reduction and Management Committee [Mach 2001], after taking into account the concessionality element of 25 percent in Pakistan's external debt, could not be achieved except that the external debt ratio did touch target level in late 2005. It is further observed that persistence of high fiscal deficit and current account deficit, disappointingly low tax to GDP ratio through out and lack of diversity in exports and its unimpressive growth rate has made the **Repayment Capacity** of Pakistan undependable even in 2005.

Chapter: 6

Theoretical Framework

6.1 Public Debt

This chapter presents the main approaches used to assess debt sustainability issues. Debt sustainability and Dynamics are studied under two approaches in the literature: Accounting Approach and Present Value Approach. Accounting approach involves the use of conditions of debt sustainability while present value budget constraint (PVBC) approach is used to evaluate debt sustainability through econometric testing of the validity of PVBC or No-Ponzi Game (NPG) conditions. The starting point of both the approaches is consolidated public sector or government budget constraint.

6.2 Accounting Approach to Debt Sustainability

The analysis of debt sustainability begins with budget/financing constraint of the government. This constraint relates the conventional budget deficit to the sources of financing. When expenditure (including interest payment on public debt) exceeds the fiscal revenues, the government incurs a deficit that may be financed in a variety of ways. The consolidated public sector budget constraint helps in understanding the relationship between monetary and fiscal policies, and more generally the macroeconomic effects of fiscal deficit. The government can finance its budget deficit by borrowing from domestic sources i.e. non-bank and/or bank and from foreign sources.

The starting point of accounting approach is the consolidated public sector budget constraint. In developed countries, it is assumed that the seigniorage revenue and external financing are unimportant. Thus the budget constraint for the developed countries³¹ is given as;

$$G_t - R_t + i_t B_{t-1} = \Delta B_t$$

Where B_t represents public debt including domestic debt only

The sustainability analysis for developing countries will involve issues that are not particularly important in the industrial countries i.e. Reliance on Seigniorage,

³¹ This chapter heavily drawn from the studies, Cuddington J, (1996) and Sidiropoulos and Papadopoulos (1999)

concessional lending and grants to finance deficit. Thus the deficit financing in developing countries like Pakistan is different than the financing patterns in developed countries that necessitates the modification of above equation for its application in debt sustainability analysis of the developing countries, which is the main contribution of this dissertation.

Pakistan, like other developing countries, is financing a major proportion of its fiscal deficit with these two sources i.e. 38 percent of overall budget deficit is met by these financing on average since 2000. Out of these 32 percent is external financing while 6 percent is bank financing which is much less in 2000s as compared to 1990s. Thus the budget constraint for developing countries in real term is given as:

$$G_t - R_t + r_t B_{t-1} = \Delta B_t + \Delta H_t \quad (1)$$

$$B_t = B_t^D + \varepsilon_t B_t^F$$

R = Tax revenue + Non-tax revenue + surcharges + Grants.³²

G = government expenditure (exclusive of interest payments). It includes current and development expenditure

B_t = Public Debt

B_t^F = External Debt (excluding guaranteed & non-guaranteed private debt):

ε_t = Nominal exchange rate

B_t^D = Domestic Debt

H_t = Monetary Base for budgetary support.

The constraint shows the components of the conventional deficit, i.e., primary deficit plus the nominal interest rate, and identifies the sources of financing of the fiscal imbalances.

With a little manipulation we get

³² Grants proceeds are a financing component. It is not a debt generating one. So we include it in the revenue receipt.

$$-PS_t + (1+r_t)B_{t-1} = B_t + \Delta H_t$$

$$B_t = (1+r_t)B_{t-1} - (PS_t + \Delta H_t) \quad (2)$$

$$B_t = (1+r_t)B_{t-1} - S_t \quad (3)$$

Let B_t denote the stock of public debt at the end of year t , r_t be the effective real interest rate, H_t denote the Monetary base for budgetary support. Where $PS_t = R_t - G_t$ denotes the non-interest primary surplus ($-PS_t$ denotes the primary deficit, that is, the difference between government expenditure exclusive of interest payments on the debt and revenue) The primary balance $PS_t < 0$ simply states that the Government will meet its debt obligations either financed by new debt issues, or monetized, or a mix of the two. In contrast, a surplus, $PS_t > 0$, can be used to reduce the stock of debt and $S_t = (PS_t + \Delta H_t)$.

Therefore, expressing (2) in terms of real GDP ratio

$$\frac{B}{Y} = (1+r_t)\frac{B_{t-1}}{Y} - \frac{PS_t}{Y_t} + \frac{\Delta H_t}{Y_t}$$

$$\frac{B_t}{Y_t} = (1+r_t)\frac{B_{t-1}}{Y_t} - \frac{S_t}{Y_t}$$

Let $g_t = \frac{Y_t - Y_{t-1}}{Y_{t-1}}$ is real GDP growth

$$ps_t = \frac{PS_t}{Y_t}$$

$$h_t = \frac{H_t}{Y_t}$$

$$-ps_t + \frac{(1+r_t)}{(1+g_t)}b_{t-1} = b_t + \mu h_{t-1}$$

Let $s_t = ps_t + \mu h_{t-1}$ is government surplus interpreted as the primary surplus inclusive of seignorage revenue (i.e. budgetary support from central bank).

$$b_t = \frac{(1+r_t)}{(1+g_t)} b_{t-1} - s_t \quad (4)$$

Where r_t is the real interest rate, h_t is the seigniorage revenue, g_t is the real economic growth, b_t is stock of public debt to GDP, ps_t is the primary balance to GDP, and the factor $(1+r_t)/(1+g_t)$ is defined as discount factor. **Equation (4) is the fundamental fiscal-sustainability identity.**

Most developing countries have a positive interest rate differential ($r_t > g_t$). If the interest—growth differential is positive then the debt dynamic would be explosive. Explosive Debt-Dynamics i.e $r_t > g_t \Rightarrow (1+r_t)/(1+g_t) > 1$. It means Debt-to-GDP will below up unless the last term in equation (4) i.e. S_t , the primary surplus inclusive of seigniorage revenue, is large enough to compensate for the explosiveness of the debt stock. If the interest-growth differential is negative i.e. $r_t < g_t$ then debt dynamic would be Convergent i.e. $(1+r_t)/(1+g_t) < 1$. Subtract b_{t-1} on both sides of equation (4) to obtain an expression for the change in the Debt-to-GDP ratio:

$$b_t - b_{t-1} = \frac{(1+r_t)}{(1+g_t)} b_{t-1} - b_{t-1} - s_t$$

$$b_t - b_{t-1} = \left(\frac{(1+r_t)}{(1+g_t)} - 1 \right) b_{t-1} - s_t$$

$$\Delta b_t = \frac{(r_t - g_t)}{(1+g_t)} b_{t-1} - s_t$$

It follows immediately that if the primary surplus to GDP ratio is equal to zero ($s_t=0$), then debt /GDP ratio will grow at the rate $(r-g)/(1+g)$; and if the government runs a primary surplus (deficit), the debt /GDP ratio will grow at the rate less (exceeding) than $(r-g)/(1+g)$.

6.2.1 Conditions of Debt Sustainability

Equations (4) can be used to derive conditions/indicators of debt sustainability, depending on the relative values of r_t and g_t To derive these conditions two cases are taken as below

Case 1: $r_t < g_t$

In equation (4), the debt ratio will stabilize and the economy will remain solvent if³³:

- $r_t < g_t$ So that the debt ratio stabilizes rather than explodes and
- $(s_t) \geq 0$ on average, if not in every period, so that the debt burden is ultimately liquidated.

These two conditions are necessary and sufficient to ensure that the current debt, no matter how large, can be paid off through tax increases or expenditure cuts or by being liquidated through enhanced growth or controlled inflation. This condition, $r_t < g_t$ is called sustainability constraint, that is, any stable path of the primary balances is consistent with a stable public Debt- to-GDP ratio. Thus, the government is solvent.

Case 2: $r_t > g_t$

In this case the debt is unsustainable no matter what sequence of primary deficit are chosen unless the debt itself can be offset by matching the sequence of increasing but discounted primary surplus in the future. A primary surplus would be needed for compensating insufficient GDP growth and to maintain a constant Debt-to GDP ratio.

The level of public debt may be stabilized around a chosen steady state value ($\bar{b} = b_t = b_{t-1}$) by selecting a primary surplus. Using equation below we have:

$$\Delta b_t = \frac{(r_t - g_t)}{(1 + g_t)} b_{t-1} - s_t$$
$$0 = \frac{(1 + r_t)}{1 + g_t} b_{t-1} - s_t$$
$$s_t = \frac{(r_t - g_t)}{1 + g_t} b_{t-1} \quad (5)$$

This is the level of the primary surplus inclusive of seignorage revenue $\bar{s} = (ps_t + \mu_t h_{t-1})$ that would be required to keep the debt/GDP ratio constant.

³³ If $r < g$, but $s < 0$, then the debt cannot be liquidated.

6.3 The Present Value Budget Constraint Approach (PVBC)

Empirically, the PVBC approach is more meaningful in examining the debt sustainability issue. Consider again equation (1) for present value budget constraint approach:

$$G_t - R_t + r_t B_{t-1} = \Delta B_t + \Delta H_t$$

With a little manipulation we get,

$$-PS_t + (1 + r_t)B_{t-1} = B_t + \Delta H_t$$

$$B_t = (1 + r_t)B_{t-1} - (PS_t + \Delta H_t)$$

$$B_t = (1 + r_t)B_{t-1} - S_t$$

$$B_{t-1} = (1 + r_t)^{-1}B_t + (1 + r_t)^{-1}S_t$$

Iterating above equation N periods forward to get the intertemporal budget constraint,

$$B_t = (1 + r_{t+1})^{-1}B_{t+1} + (1 + r_{t+1})^{-1}S_{t+1} \quad (6)$$

$$B_{t+1} = (1 + r_{t+2})^{-1}B_{t+2} + (1 + r_{t+2})^{-1}S_{t+2}$$

Substituting values of B_{t+1} in equation (6) and taking expectation and then applying limit N tends to infinity, we have

$$B_t = \lim_{N \rightarrow \infty} E_t \prod_{j=1}^N (1 + r_{t+j})^{-1} B_{t+N} + \lim_{N \rightarrow \infty} E_t \sum_{N=0}^{\infty} \prod_{j=1}^N (1 + r_{t+j})^{-1} S_{t+N} \quad (7)$$

$\prod_{j=1}^N (1 + r_{t+j})^{-1}$ is time-varying real discount factor. Thus, a necessary and sufficient condition for sustainability is that as $N \rightarrow \infty$, the present discounted value of the Debt to GDP ratio converges to zero. This is also known as the government solvency constraint or transversality condition, and can be expressed as;

$$E_t \lim_{N \rightarrow \infty} \prod_{j=1}^N (1 + r_{t+j})^{-1} B_{t+N} = 0 \quad (8)$$

Equation (8) implies that a government is solvent if the transversality condition guarantees the non-explosiveness of its public debt. Similarly if No Ponzi Game (NPG) condition exists then it means no new debt is issued by a government to meet its interest payments. It means that the current debt is offset by the sum of current and future discounted surpluses, implying that the budget constraint hold in present value term.

$$B_t = E_t \sum_{N=0}^{\infty} \prod_{j=1}^N (1 + r_{t+j})^{-1} S_{t+N} \quad (9)$$

As per equation (9), if it holds then the present value of all future debt balances must be zero.

If $\lim_{N \rightarrow \infty} \prod_{j=1}^N (1 + r_{t+j})^{-1} B_{t+N} < 0$, then the discounted future primary surpluses exceeds the present value of a government's debt meaning that the Government is accumulating tax revenues that could have been translated into higher disposable income for households and therefore, it may have resulted in increased consumption level at all periods³⁴.

In contrast to above if $\lim_{N \rightarrow \infty} \prod_{j=1}^N (1 + r_{t+j})^{-1} B_{t+s} > 0$ then present value of the government debt exceeds expected primary surpluses. It implies that the government is continually borrowing to meet interest payments on its debt.

6.3.1 Testing for Sustainability of Public Debt

The conditions of debt sustainability as derived from PVBC approach can be tested empirically by using time series data on revenue, expenditure, and debt. If the PVBC holds for the data then the null hypothesis $\lim_{N \rightarrow \infty} \prod_{j=1}^N (1 + r_{t+j})^{-1} B_{t+N} = 0$ will not be rejected. For simplicity it is assumed that the real interest rate r_t is stationary with an unconditional mean r . With the constant discount factor the equation (7) can be rewritten as:

$$B_t = E_t \sum_{N=0}^{\infty} (1 + r)^{-(N+1)} \bar{S}_{t+N} + \lim_{N \rightarrow \infty} (1 + r)^{-(N+1)} E_t B_{t+N}$$

$$B_t = E_t \sum_{N=0}^{\infty} (1 + r)^{-(N+1)} (\kappa_{t+N} - z_{t+N}) + \lim_{N \rightarrow \infty} (1 + r)^{-(N+1)} E_t B_{t+N} \quad (10)$$

The variable z_t is government expenditure inclusive of interest rate payments and κ_t stands for the revenue along with seignorage revenue.

³⁴ Luporini, V. (2000), "Further Investigation into the Sustainability of Brazilian Federal Domestic Debt". Texto para discussão; 131.

A testable equation is derived following Papadopoulos and Sidiropoulos (1999) by taking first difference of equation (10) and then substituting ΔB_t from equation (1).

$$\Delta B_t = E_t \sum_{N=0}^{\infty} (1+r)^{-(N+1)} (\Delta \kappa_{t+N} - \Delta z_{t+N}) + \lim_{N \rightarrow \infty} (1+r)^{-(N+1)} E_t \Delta B_{t+N} \quad (11)$$

According to No-Ponzi Game condition, the limit terms on the right hand side of the equation (11) are zero and we have;

$$z_t - \kappa_t = \sum_{N=0}^{\infty} (1+r)^{-(N+1)} E_t (\Delta \kappa_{t+N} - \Delta z_{t+N}) \quad (12)$$

Consequently, it is stated that Equation (11) defines the basis for this empirical analysis. More precisely, if the government satisfies its intertemporal budget constraint, then the expected limit term in equation (11) is zero, implying that the sum of present value of current budget surplus and the future surplus will equal the amount required to repay the principal and interest payments. When this condition holds, it means that the current path of government spending and revenue are sustainable. As Papadopoulos and Sidiropoulos (1999) demonstrate, if the limit terms in equation (11) are zero, then a certain cointegration relationship emerges. *It means to hold the government intertemporal budget constraint a cointegration is a necessary condition for.* To testify the sustainability condition in equation (8), we examine stationarity of Discounted Debt Series (B_t) or to test for the cointegration between the variable $z_t - \kappa_t$ through cointegration equation. Thus the cointegrating regression would take the following form:

$$\kappa_t = \alpha + \beta z_t + v_t \quad (13)$$

The null hypothesis $\beta = 1$ and stationary of the error term v_t is to be tested here, implying that κ_t and z_t are co-integrated variables of order one with the cointegrating vector being (1, -1) for holding the PVBC. If this null hypothesis is not rejected then the public debt is sustainable.

6.4 Testing the Stationarity of the Discounted Debt Series

We examined the sustainability of public debt via another empirical approach. This approach consists of testing the stationarity of the discounted debt series³⁵. Derive a second testable equation of the discounted debt series using;

³⁵ This methodology of discounted debt series is derived using Luporini.V (1999)

$$B_t = (1 + r_t)B_{t-1} - S_t \quad (14)$$

Q_t is the Discount factor

$$Q_t = \prod_{j=0}^{t-1} (1 + r_j)^{-1}; \quad Q_0 = 1$$

Multiplying (14) by discounted factor we get:

$$\begin{aligned} Q_t B_t &= Q_{t-1} B_{t-1} - Q_t S_t \\ b_t &= b_{t-1} - s_t \end{aligned} \quad (15)$$

Where $b_t = B_t Q_t$

Applying recursive substitution to equation (15), and obtain the government intertemporal budget constraint.

$$b_t = \sum_{j=1}^N s_{t+j} + b_{t+N} \quad (16)$$

It shows that the debt is sustainable if the government's budget is balanced in present value term. Taking expectations at time t and applying limit as N tends to infinite, and leading to equation (17)

$$b_t = E_t \sum_{j=1}^N s_{t+j} + \lim_{N \rightarrow \infty} E_t b_{t+N} \quad (17)$$

The government's budget is balanced in present value terms if its debt can be offset by the sum of discounted future primary surpluses, it implies that $\lim_{N \rightarrow \infty} b_{t+N} = 0$

From equation (17) we have as follows:

$$b_t = E_t \sum_{j=1}^N s_{t+j} \quad (18)$$

It is discounted debt equation that is to be tested. Econometrically, the hypothesis of debt sustainability is the stationarity of the discounted debt series. It implies *that debt will be sustainable if series of discounted debt is stationary.*

6.5 Estimation Methodology

In this section we will discuss the methodology being used to assess the debt sustainability issues. The PVBC approach to evaluate debt sustainability involves econometric testing of the validity of the PVBC equation (9) or the NPG condition

equation (8) for a set of time series. In this context, two empirical approaches have been used to test the validity of PVBC or the NPG condition, which is given by equation below:

$$E_t \lim_{N \rightarrow \infty} \prod_{j=1}^N (1 + r_{t+j})^{-1} B_{t+N} = 0$$

The first methodology is to apply unit root tests on the series of discounted market value of public debt; where sustainability implies a stationary process [see Hamilton and Flavin (1986)].

The second approach involves using cointegration tests looking for a co-integrating relationship linking revenue, expenditure and interest payments. Therefore, the estimated cointegration regression is as:

$$\kappa_t = \alpha + \beta z_t + v_t$$

If κ_t and z_t are both I (1) then a necessary and sufficient condition for sustainability is that κ_t and z_t are co-integrated variables of order one with the co integrating vector (1, 0, -1) for holding PVBC.

In addition to above, methodologies for testing the validity of PVBC or NPG conditions we used the *Dynamic OLS (DOLS)*³⁶ estimator technique for estimation, which is asymptotically equivalent to Johansen's (1988) maximum-likelihood (ML) estimator and having a superior performance in a small samples. Since our system is bivariate, so the issue of multi-cointegration does not exist. In term of DOLS regression equation can be written as:

$$\kappa_t = \alpha + \beta z_t + \sum_{i=-k}^k \gamma_i \Delta z_{t-i} + v_t \tag{19}$$

Equation (19) augments the standard OLS estimator by adding a number of lead and lag differences of the regressors which control for any endogenous feed back from the dependent to independent variables and result in consistent estimates of the cointegrating

³⁶ See Arghyrou Michael G for detail of this methodology

vectors. The estimated cointegrating vector is given by $CV_t = \kappa_t - \alpha - \beta z_t$, which is interpreted as a measure of fiscal equilibrium. We test the cointegrating hypothesis between κ_t and z_t applying unit root test on CV_t . By applying Wald test, linear restrictions on the cointegrating parameters are then tested.

If κ_t and z_t are cointegrated then Error Correction Model (ECM) is applied to examine the short run fiscal adjustment, as shown in Equation (20)

$$\Delta \kappa_t = \lambda + \sum_{i=1}^k \gamma_k \Delta \kappa_{t-i} + \sum_{j=1}^m \lambda_j \Delta z_{t-j} + \varphi CV_{t-1} + v_t \quad (20)$$

In equation (20), CV is an estimated cointegrating vector obtained by equation (19) and v_t is a random term. Another way to test for public debt sustainability is to estimate equation (20) and test whether parameter φ is significant or not. A non-significant parameter φ suggests lack of cointegration between κ_t and z_t resulting the rejection of the sustainability hypothesis.

6.6 Model for Testing Structural Breaks

A Unit root test is biased in rejecting stationarity if the deterministic components of the series tested having the structural breaks (Perron, 1989). The problem becomes even more complex when the dates of the breaks are unknown. We test for structural breaks in fiscal policy endogenously using the Chi-square test proposed by Quintos (1995). For this test, DOLS estimator in equation (19) is augmented as shown by equation (21):

$$\kappa_t = \alpha + \beta z_t + \sum_{j=1}^m \gamma_j \Delta z_{t-j} + \lambda (Dz)_t + v_t \quad (21)$$

$$D_t = 1 \text{ if } t \in (1, \dots, T) \\ = 0 \text{ if } t \in (T+1, \dots, N)$$

In this equation $(Dz)_t$ is a slope dummy variable, taking the value of z_t up to the date of the tested break point (T) and zero afterwards, and N is the last sample observation. The test involves estimating Equation (21) consecutively. By following Andrews (1993) we trim 15% of the initial and final parts of the sample. In each estimation round, the sample size remains constant but the definition of $(Dz)_t$ changes: for the first estimation round, the last observation in $(Dz)_t$ set to be zero; the rest of the observations are set to be equal

to z_t . The estimation is repeated, substituting in each estimation round the values of z_t by zero backwards. For the last estimation round, only the first observation of Dz_t takes the value of z_t ; all the rest set to zero. In each estimation round, we test the statistical significance of the dummy variable by using a Wald test. The null hypothesis describes the structural stability ($H_0: \lambda = 0$). Structural breaks are identified in those dates for which the estimated Wald statistic is higher than the 5% critical value of $\chi^2(1)$. If the structural breaks are found, the sustainability analysis has to be augmented to account for them. Assuming that the number of structural breaks that have been identified is j , the DOLS estimator in equation (19) can be as follows:

$$\kappa_t = \alpha + \beta z_t + \sum_{i=1}^j \lambda_i D_{it} z_t + \sum_{i=-k}^k \gamma_i \Delta z_{t-i} + v_t \quad (22)$$

In this equation $i=1 \dots j$; $D_{it}=0$ if $t \in (1, \dots, T_i)$; and $D_{it}=z_t$ if $t \in (T_i+1, \dots, N)$

Where T_i is the date on which the i^{th} identified structural break occurs. Equation (22) picks up the long run (total multiplier) effect of structural breaks in fiscal policy. A significant and positive (negative) coefficient of slope dummy implies a movement towards (away from) debt sustainability. The cointegrating vector with structural breaks

is given by $CVB\kappa_t = \kappa_t - \alpha - \beta z_t - \sum_{i=1}^j \lambda_i D_{it} z_t$. Debt sustainability is consistent with

$CVB\kappa_t$ being stationary; the β coefficient (adjusted for dummies) being equal to one

($\beta + \sum_{i=1}^j \lambda_i = 1_t$); and $\alpha = 0$.

6.7 Results of Sustainability Tests

Empirically we have examined the debt sustainability issue using accounting approach and present value budget constraint approach.

First, using the data, we have computed the different sustainability indicators presented in the theoretical analysis. Secondly, we have applied unit root for various time series (Revenue, Expenditure and debt). Thirdly, we have tested the cointegration between revenue and expenditure inclusive of interest payments. Finally, stability tests are applied to detect the stability of the cointegration vector overtime in the presence of structural breaks.

Using **Accounting approach** for examining debt sustainability issue of Pakistan we have calculated the necessary and sufficient conditions regarding the sustainability. The **Table: 6.1** shows a synopsis of different sustainability indicators derived from the theoretical analysis. These results show that the public debt is sustainable for the FY2005 as well as for the period 2000s. However, these assessments don't provide a firm conclusion but give a rough indication of debt sustainability.

Stationarity of the Series:

At first step, we draw the visual plot of the time series under consideration. The plots of the series seem trending upward as shown in the figure 6.1. Visually these series are non-stationary. Dickey –Fuller and Phillips-Perron (1988) tests are employed for testing of unit root in each of the series used to consider the time series properties. The test statistics are performed for the whole sample period. The results of these tests are reported in **Table 6.2** that indicate the existence of unit root at levels for each variable but rejection at the first difference. The results show that each variable being stationary in first difference with integrated order 1.

We employed the second empirical methodology involving the testing of **cointegration** between variables κ_t and z_t . The unit root tests for the series suggest that both these series are I (1). We estimated the equation (19) using DOLS. We set a lag and leads order of three in view of data frequency. DOLS result shows no autocorrelation problem in the error term. The results are reported in **Table: 6.3**. The reported ADF & PP statistics show the stationarity of the error term at level. After testing for the liner restrictions on the parameter using Wald test, the parametric restrictions for sustainability ($\alpha = 0$ and $\beta=1$) are not satisfied. It implies that there exists un-sustainability of public debt in Pakistan.

We, then, tested for **structural breaks** in fiscal policy; the exact timing of the break is selected by the observation having the highest test value. Considering this we have identified two structural breaks for the years 1993 and 1998. We then investigated the effect of two breaks on Pakistan's public debt. **Table: 6.3** reports the estimates of equation (21) with and without breaks. The dummy referring to 1993 and 1998 has negative sign but dummy of 1998 is significant at (10 percent), suggesting a move away from the sustainability. The second finding is that the accounting for the structural breaks

in the analysis has made no change in the result reported in **Table: 6.3**. It implies that Pakistan's public debt remains unsustainable within the given time span.

We have also applied ADF and PP test on the **Discounted Debt**³⁷ series with the model, which includes constant, constant and trend. The results are reported in **Table: 6.4**. Both these tests reject stationarity, suggesting non-sustainability of Pakistan's public debt.

Having examining the time series properties of the data, the multivariate cointegration technique proposed by Johansen (1988) and Johansen & Juselius are employed to see the cointegration among the variables. Equation (13) is used for estimating and hypothesis testing to investigate the sustainability of public debt. The results reported in **Table: 6.5** show non-existence of the co integrating vector that also implies the non-sustainability of public debt in Pakistan, as both the necessary (existence of cointegration) and sufficient ($\beta=1$) condition for sustainability are not met.

In conclusion, the analysis of the data proves that the levels of Public debt ratios are far from the sustainability levels in terms of Indicative Debt Burden Thresholds since last three decades. The situation did not change even in 2000s. By using empirical approaches it was found that the Public Debt remained unsustainable during period under consideration. Moreover, the results of empirical analysis with structural breaks remained unchanged. These results have supported the conclusion obtained through Traditional Indicator Approach.

³⁷ The standard way to calculate the discounted market value of debt-to- GDP series in period t is defined as $\left(\frac{1}{1+r_t}\right) \left[\prod_{i=1}^t \frac{1}{(1+r_{t-i})} \right] (B/Y)_t$, where r_t is the real interest rate, $\left[\prod_{i=1}^t \frac{1}{(1+r_{t-i})} \right]$ which is the discount factor, taking value 1 for the year 1972.

Figure 6.1 Visual Graph of Series K_t and Z_t

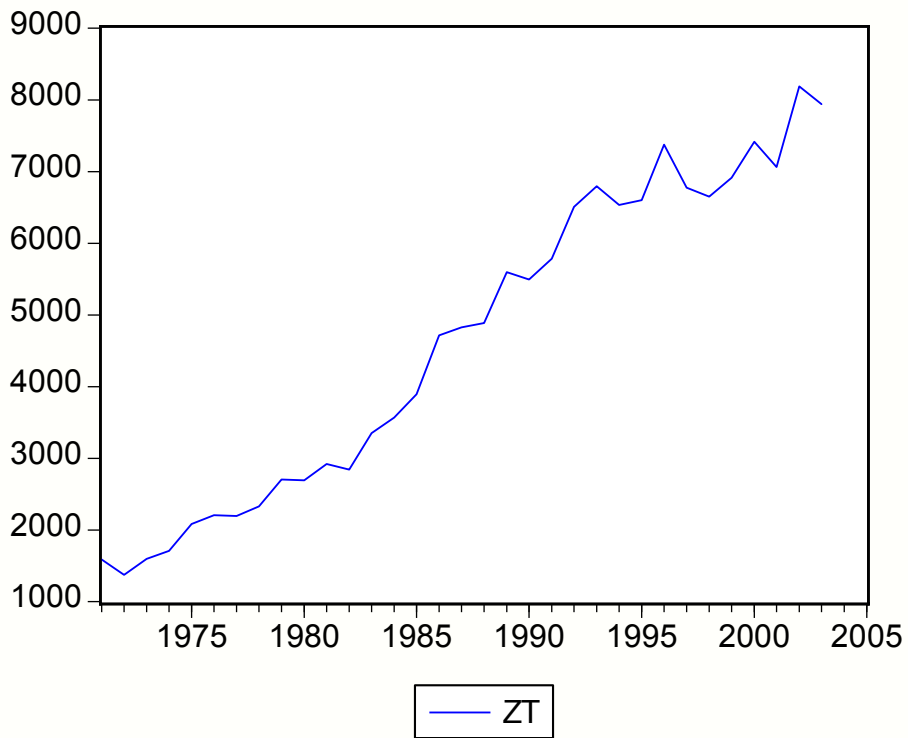
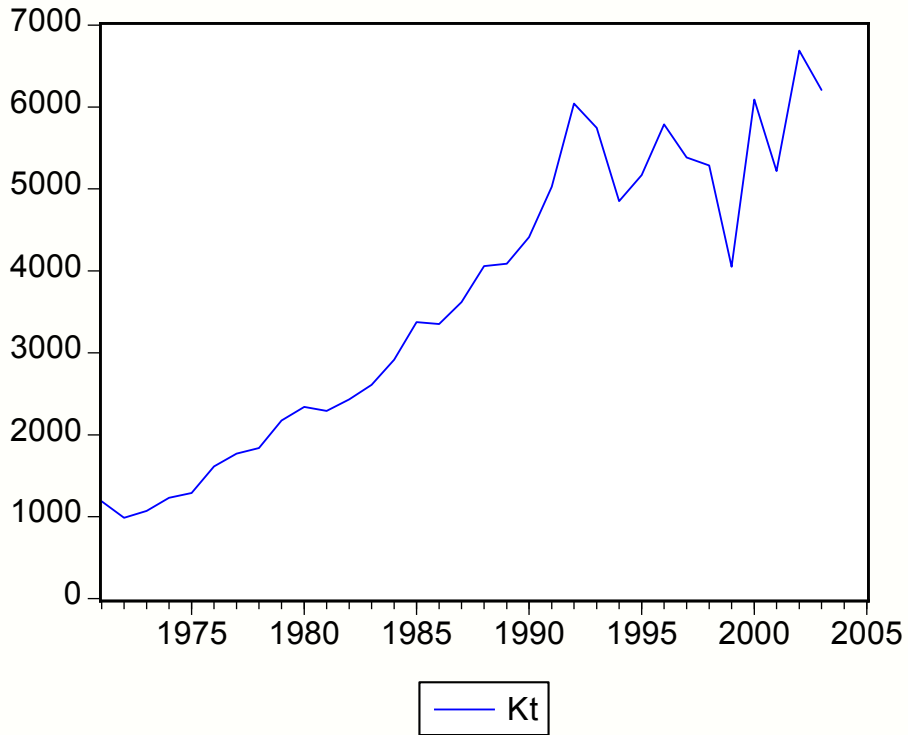


Table: 6.1

Condition for Debt Sustainability

Decade	r	g	ps	r<g	ps>0	Conclusion
1970s	-9.8	4.8	-6.1	r<g	ps<0	Unsustainable
1980s	-1.4	6.6	-3.5	r<g	ps<1	Unsustainable
1990s	-1.2	4.0	-1.3	r<g	ps<2	Unsustainable
2000s	1.9	4.6	2.6	r<g	ps>0	Sustainable
FY2005	-4.5	5.8	0.734	r<g	ps>0	Sustainable

TABLE: 6.2

Unit Root Test (Level & Ist Difference)

Variables (Real)		ADF	ADF (1)	ADF (2)	PP (3)
K _t	Level	-0.855	-0.366	-0.636	-0.424
Z _t		0.794	-1.013	-1.022	-0.777
K _t	First Difference	-10.255*	-4.485	-4.493	-11.201*
Z _t		-7.485*	-5.303	-3.335	-7.777*

MacKinnon critical values for rejection of a unit root at 1% and 5% levels are -3.657, -2.959.

*Significant at 1% level

** Significant at 5 percent

Table: 6.3
Results of Estimation using Dynamic OLS

Variables	Model without break	Model with break
Dependent: K_t		
Constant: C	-46.720[-0.228]	-308.71[-1.52]
Repressors: Z_t	0.806[22.62]*	0.87[17.25]*
D11993X z		-0.053[-1.45]
D21998X z		-0.065[-1.69]**
H0: $\alpha=0$	0.05(0.82)	
H0: $\beta=1$	29.32(0.000)*	
H0: $\alpha=0$		2.33(0.12)
H0: $\beta+\delta_1+\delta_2=1$		8.34(0.003)
Unit Root on $U_t(CV)$	-4.858*	
Unit Root on CVBR)		-4.55*
ADF critical at 1%	(-3.64)	-2.64

t-values in square bracket, p-values in parenthesis.

*(**) Denotes the significance at 1 percent & 10 percent level

TABLE: 6.4
Unit Root Test (Level)

Variables (Real)		ADF	ADF (1)	ADF (2)	PP (3)
DISD _t Discounted debt (r)	Level	--1.694	-1.764	-1.462	-1.711
DIDR _t Discounted debt(r-g)	Level	0.046	0.101	-1.276	0.149

MacKinnon critical values for rejection of a unit root at 1% and 5% levels are -3.657, -2.959.

*Significant at 1% level

** Significant at 5 percent

TABLE: 6.5
Johansen Co integration Test
For the relationship between κ_t & z_t

Eigen Values	Likelihood ratio	Critical values		Hypothesized NO. of CE(s)	Number of CV	β
		5%	1%			
0.307	19.65	19.96	24.60	0		0.68
0.209	7.528	3.76	12.97	1	0	

L.R rejects any co integrating at 5% significance level

Optimal lag length is one, selected through AIC.

A long span of data is more appropriate to test sustainability by mean of Co integration

Chapter: 7 External Debt

7.1 The Model of External Debt

As Pakistan is a small open economy and has resorted to external borrowing to finance its savings-investment gap, it makes sense to study the external debt separately from public debt. For this purpose, we have developed a separate model, which starts from the balance of payment identity. The model for external debt has also been built up in the framework of two approaches, i.e., Accounting Approach and Present Value Current Account Constraint Approach.

7.2 The Accounting Approach to External Debt

Consider the following basic identity of external debt³⁸;

$$D_t - D_{t-1} = r_t^* D_{t-1} - CAB_t \quad (23)$$

Where D_t is external debt r^* is foreign interest rate, and CAB is current account balance exclusive of interest payments. All the variables are in nominal form. We can write equation (23) in real form as;

$$D_t - D_{t-1} = r_t^* D_{t-1} - CAB_t$$

We can express above equation in term of ratio of GDP as;

$$\frac{D_t}{Y_t} = \frac{(1+r_t^*)D_{t-1}}{Y_t} - \frac{CAB_t}{Y_t}$$

Rearrange ratios to GDP in lower case

$$d_t = \frac{1+r_t^*}{1+g_t} d_{t-1} - cab_t \quad \text{Where } g \text{ is real GDP growth}$$

(24)

$$d_t - d_{t-1} = \left(\frac{1+r_t^*}{1+g_t} - 1 \right) d_{t-1} - cab_t$$

$$\Delta d_t = \frac{r_t^* - g_t}{1+g_t} d_{t-1} - cab_t \quad (25)$$

³⁸ See Jayme Frederico G (2001) for methodology

7.2.1 Conditions for External Debt Sustainability

On the basis of the above model, we derive the conditions of external debt sustainability as given below;

Case 1: $r_t^* < g_t$

In equation (25), the debt ratio will stabilize ($\Delta d_t = 0$) and the economy will remain solvent if: $\lim_{t \rightarrow \infty} E_t(d_t) = 0$, this requires two conditions.

- $r_t^* < g_t$ so that the debt ratio stabilizes rather than explodes.
- ($cab_t \geq 0_t$) on average, if not in every period, so that the debt burden is ultimately liquidated.

Case 2: $r_t^* > g_t$

- Debt accumulation is explosive and will grow faster than the growth rate of the economy; this implies that stabilization measures are needed.

The level of external debt may be stabilized around a chosen steady state value ($d = d_t = d_{t-1}$) by selecting a primary current account balance and using equation (25):

$$\Delta d_t = 0 \Rightarrow \frac{(r_t^* - g_t)}{(1 + g_t)} d_t = \overline{cab} \quad (26)$$

This is the level of the primary current account balances \overline{cab} that would be required to keep the external debt/GDP ratio at a steady state level d .

7.3 The Present Value Current Account Constraint (PVCAC) Approach

The estimation equation for testing the external debt sustainability is based on the work of Sawada (1994), Wilcox (1989), and Hamilton and Flavin (1986). We start from the basic balance of payment identity for an open economy³⁹ during period t:

$$CAB_t = -(KAB_t - \Delta RES_t)$$

³⁹ See Jayme Frederico G (2001) for methodology used for examining the external debt sustainability

Where CAB is current account balances; KAB is the capital account balances and ΔRES_t is change in foreign reserves. Using the ingredients of current and capital accounts we get;

$$TB_t + TR_t - r_t^* D_{t-1} = -(D_t - D_{t-1}) + \Delta RES_t \quad (27)$$

Where

D_t = external debt

TB = balance of goods and services

TR = Transfers

ΔRES = Change in Reserve

$$(D_t - D_{t-1}) = -S_t + r_t^* D_{t-1} \quad (28)$$

$$S_t = (X_t - M_t + TR_t + \Delta RES_t),$$

Where

X = Export

M = Import

Since equation (28) is a differential equation and we can solve it recursively to get the forward-looking solution in terms of the external debt.

$$D_t = \lim_{N \rightarrow \infty} \prod_{j=1}^N (1 + r_{t+j}^*)^{-1} D_{t+N} + \sum_{N=0}^{\infty} \prod_{j=1}^N (1 + r_{t+j}^*)^{-1} S_{t+N} \quad (29)$$

We take expectations at time period t of equation (29) to determine the solvency condition. The solvency condition is satisfied when;

$$\lim_{N \rightarrow \infty} E_t \prod_{j=1}^N (1 + r_{t+j}^*)^{-1} D_{t+N} = 0$$

It means that “No Ponzi Game” condition is a necessary condition for external debt sustainability implying that a country’s external debt cannot grow faster than the foreign interest rate. Using sustainability condition below

$$D_t = E_t \sum_{N=0}^{\infty} \prod_{j=1}^N (1 + r_{t+j}^*)^{-1} S_{t+N}$$

It shows that the amount which a country borrows in international market equals to the present value of future external surpluses.

If $\lim_{N \rightarrow \infty} E_t \prod_{j=1}^N (1 + i_{t+j})^{-1} D_{t+N} > 0$, it means that the country is paying the old maturity debt by issuing new debt, revealing that external debt is not sustainable in the long run.

7.3.1 Testing for Sustainability of External debt

The PVCAC approach to evaluating external debt sustainability involves econometric testing of the validity of the PVCAC or of the NPG condition for a set of time series data on exports and imports. With the constant discount factor, the equation (29) can be written as:

$$D_t = \lim_{N \rightarrow \infty} \prod_{j=1}^N (1 + r_{t+j}^*)^{-1} D_{t+N} + \sum_{N=0}^{\infty} \prod_{j=1}^N (1 + r_{t+j}^*)^{-1} S_{t+N} \quad (30)$$

To derive the testable equation, we follow the technique developed by Papadopoulos and Sidropoulos (1999). By using equation (30) we have;

$$\begin{aligned} \Delta D_t = MM_t - EX_t = & \sum_{N=0}^{\infty} (1 + r^*)^{-(N+1)} E_t (\Delta EX_{t+N} - \Delta MM_{t+N}) \\ & + \lim_{N \rightarrow \infty} (1 + r^*)^{-(N+1)} E_t D_{t+N} - \lim_{N \rightarrow \infty} (1 + r^*)^{-(N+1)} E_{t-1} D_{t+N-1} + r^* \lim_{N \rightarrow \infty} (1 + r^*)^{-(N+1)} E_t D_{t+N-1} \end{aligned} \quad (31)$$

Where $EX_t = X_t + TR_t + \Delta RES_t$ and $MM_t = M_t + r^* D_{t-1}$

With the NPG condition, the limit term in equation (31) becomes zero, if the external intertemporal budget constraint holds.

$$MM_t = EX_t + \sum_{N=0}^{\infty} (1 + r^*)^{-(N+1)} E_t (\Delta EX_{t+N} - \Delta MM_{t+N})$$

Assuming that the two variables EX and MM follow a random walk with drift. It implies that both the series are non-stationary and having intercept term; then we get an empirical testable equation as below:

$$EX_t = \alpha + \beta MM_t + v_t \quad (32)$$

We can test this proposition empirically by applying cointegration and DOLS technique as in the case of public debt. The null hypothesis to be tested is that MM and EX are cointegrated variable of order 1 and $\beta = 1$. If test shows existence of co-integration

between MM_t and EX_t , and $\beta = 1$. It implies that both the necessary and sufficient conditions will hold for sustainability of debt.

7.4 The Model of Discounted Debt Series

Another empirical approach can be used to examine the sustainability of external debt. This approach is based on testing the stationarity of the discounted debt series. We derive a second testable equation using below

$$D_t - D_{t-1} = r_t^* D_{t-1} - S_t$$

$$D_t = (1 + r_t^*) D_{t-1} - S_t \quad (33)$$

Assuming that $Q_t = \prod_{j=0}^{t-1} (1 + r_j^*)^{-1}$; $Q_0 = 1$

Multiplying equation (33) by a discounted factor we get:

$$D_t Q_t = Q_{t-1} D_{t-1} - Q_t S_t$$

$$d_t = d_{t-1} - s_t \quad (34)$$

Where $d_t = D_t Q_t$

$$s_t = Q_t S_t$$

Applying recursive substitution to equation (34) and obtain the government intertemporal current account constraint, which is given as:

$$d_t = \sum_{j=1}^N s_{t+j} + d_{t+N} \quad (35)$$

Taking expectations as of time t and applying limit as N goes to infinity on equation: (35) that leads to equation given below

$$d_t = E_t \sum_{j=1}^N s_{t+j} + \lim_{N \rightarrow \infty} E_t d_{t+N} \quad (36)$$

Assuming $\lim_{N \rightarrow \infty} d_n = 0$, we have discounted equation which is to be tested, given as:

$$d_t = E_t \sum_{j=1}^N s_{t+j} \quad (37)$$

Equation (37) implies *that debt will be sustainable if series of discounted debt is stationary*. Thus a unit root test on the series of d_t will serve as a test of sustainability.

7.5 Estimation Methodology and Results

To analyze the external debt sustainability, we have performed the same procedure and methodology as for public debt sustainability in previous Chapter:

To examine the debt sustainability using accounting approach, we have made the calculations from the data set and applied the condition of debt sustainability described in section 7.2.1 The results of these calculations are shown in **Table: 7.1** i.e. $r^* < g$ for the entire period of 2000s but the current account balances are positive for the same period. It implies that external debt is sustainable but it will not be liquidated being trade balances as negative. These assessments don't provide valid conclusion regarding sustainability issue.

In empirical analysis, using Present Value Current Account Constraint (PVCAC) approach, we applied ADF and Phillip-Parren test for unit root analysis for the time series being under consideration i.e. (Ex and MM); Ex is the export of goods and services plus net transfers plus change in reserves made real by unit value index of exports; MM is imports of goods and services plus interest payments on average rate made real by unit value index of imports.

The results of ADF and Phillip-Parren tests are reported in the **Table: 7.2** and indicate that all variables are first difference stationary having same order of integration I (1).

In Pakistan, to examine the sustainability of external debt by using Present Value Current Account Constraint (PVCAC) approach, equation (32) is estimated for testing the hypothesis of sustainability i.e., ($\alpha = 0$ and $\beta = 1$) and also stationarity of error term at level, using DOLS technique. The results of this estimation are reported in **Table: 7.3**. The stationarity of error term (CV) is tested using ADF and PP test and it is found that the CV is stationary at level. It implies that the variables are cointegrated and meet the necessary condition of debt sustainability hypothesis. While $\beta = 1$ should be statistically equal to 1 in order to warrant a sustainable path of debt. The coefficient of the estimated Equation (using DOLS methodology) is $\beta = 1.20$ and according to Wald test of coefficient

it is not equal to 1 which implies that the sufficient condition for the sustainability of external debt is not fulfilling.

In analyzing the debt sustainability issue using PVCAC approach, we have also examined for the structural breaks. A model is formulated to consider structural breaks and two such breaks found in 1990 and 1998. Equation (28) is estimated taking into account the two breaks with defined variables for testing the sustainability hypothesis of external debt. The results of these estimation and hypothesis testing are reported in **Table: 7.3** and show no change in the previous results.

To analyze the sustainability of external debt using Discounted Debt series, we have applied the ADF and Phillip-Parren test on the discounted debt series (DISD). The result of ADF and Phillip-Parren applied on the discounted debt series is reported in **Table: 7.4** indicating that discounted debt series (DISD) is not stationary at level. It implies the rejection of sustainability hypothesis.

The multivariate cointegration technique developed by Johansen (1988) and Johansen & Juselius are employed to see the cointegration among the defined variables. The Johansen cointegration test was performed to examine the debt sustainability issue using the variables in equation (32). The results of the regression equation reported in **Table: 7.5** show existence of one co integrating vector. The normalized coefficient in the co integrated equation show that coefficient $\beta=1.13$ that it is not equal to one statistically by Wald test. It implies that the external debt of Pakistan is not sustainable.

In conclusion, it is reported that the analysis of external debt sustainability issue using Accounting approach and the Present value Constraint Approach are consistent. The accounting approach suggests that debt is sustainable only in the period of 2000s; however debt will not be liquidated, as trade balances are negative. Similarly, with the Present value constraint approach using various econometric techniques, it is found that the external debt is unsustainable through out the sample period and these results validate the findings of the Accounting approach

Figure: 7.1 Visual Graphs of Time Series Ext and MMt

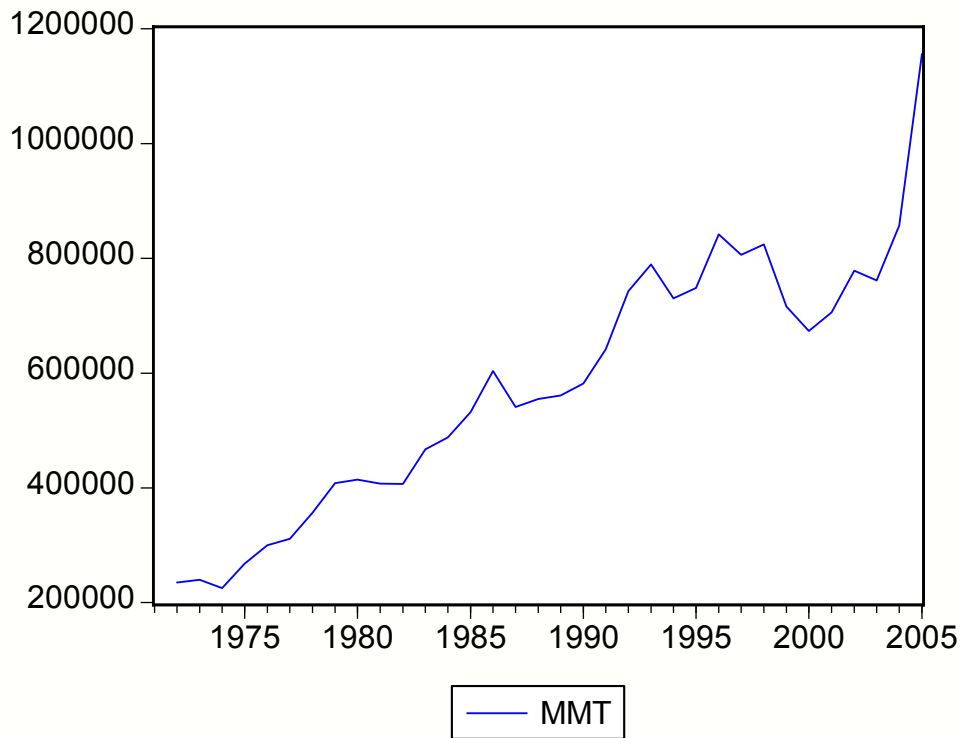
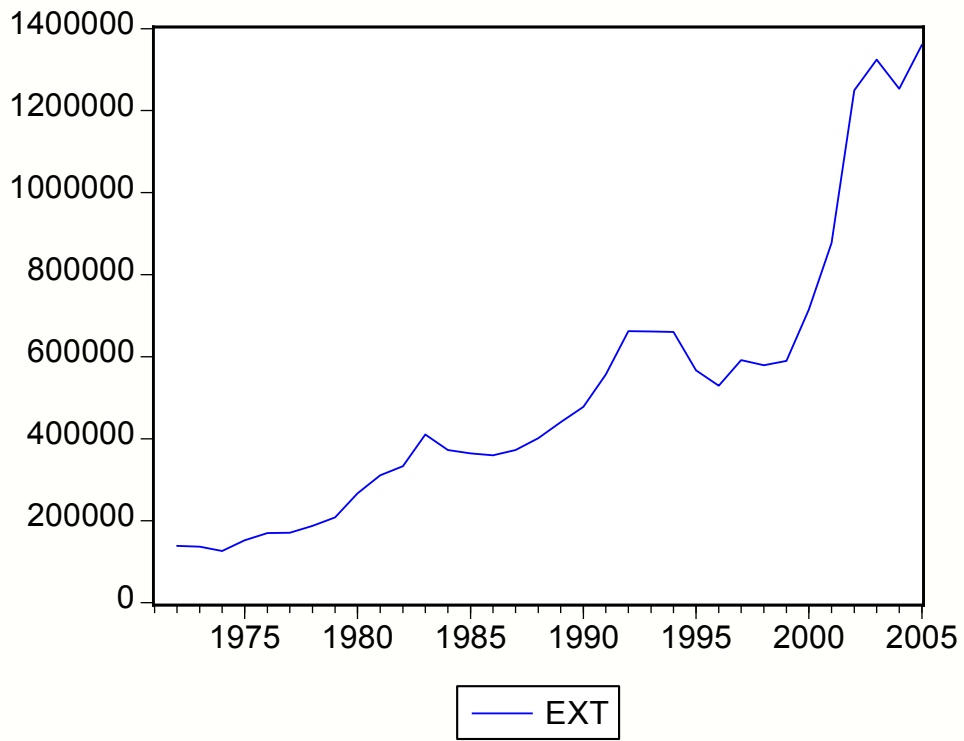


Table: 1 Conditions for Debt Sustainability

Decades	Interest Rate	Growth of GDP	Trade	Primary CAB	Conditions for		Outcome
	Real	Real	Balances	% of GDP	Debt Sustainability		
	r^*	g	tb	cab	$r^* < g$	cab	
1970s	-10.7	5.5	-8.4	-4.1	$r^* < g$	$cab < 0$	Unsustainable
1980s	-3.5	7.1	-10.5	-1.2	$r^* < g$	$cab < 0$	Unsustainable
1990s	-3.6	4.4	-6.5	-1.1	$r^* < g$	$cab < 0$	Unsustainable
2000s	0.9	5.1	-3.6	4.4	$r^* < g$	$cab > 0$	Sustainable
2005	-3.4	8.3	-8.9	0.3	$r^* < g$	$cab > 0$	Sustainable

TABLE: 7.2

Unit Root Test for Ex_t and MM_t (Level & 1st Difference)

Variables (Real)		ADF	ADF (1)	ADF (2)	PP (3)
Ex_t	Level	1.315	0.422	1.036	1.315
MM_t		0.483	0.292	0.138	0.345
Ex_t	First Difference	-3.716**	-3.512**	-2.507	-3.671**
MM_t		-2.706***	-2.640	-1.581	-2.794

MacKinnon critical values for rejection of a unit root at 1% and 5% levels are -3.695, -2.975.

With intercept & trend these are values -4.308 and -3.573.

*Significant at 1% level

** Significant at 5 percent

*** Significant at 10 percent

Table: 7.3
Results of Estimation Using Dynamic OLS

Variables	Model with out break	Model with break
Dependent: Ex_t		
Constant: C	-26757.7[-4.05]*	-153490.21]
Regressors: MM_t	1.20[12.75]	-0.02[-0.16]
D11990X MM_t		0.005[0.082]
D21998X MM_t		0.006[0.098]
H0: $\alpha=0$	16.12[0.0000]	
H0: $\beta=1$	4.626[0.044]	
H0: $\alpha=0$		2.33(0.12)
H0: $\beta+\delta_1+\delta_2=1$		8.34(0.003)
Unit Root on U_t (CV)	-3.409	
Unit Root on CVBR)		-1.212
ADF critical at 1%	(-2.979)	-2.65

t-values in square bracket, p-values in parenthesis.

*(**) denotes the significance at 1 percent & 10 percent level

TABLE: 7.4
Unit Root Test of Discounted Debt Series (Level)

Variables (Real)		ADF	ADF (1)	ADF (2)	PP (3)
DISD _t	Level	-1.179	-0.198	-0.107	-1.148
DISDG _t	Level	2.678	1.807	1.731	2.229

MacKinnon critical values for rejection of a unit root at 1% and 5% levels are -3.657, -2.959.

*Significant at 1% level

** Significant at 5 percent

TABLE: 7.5
Johansen Co integration Test
for the relationship between Ex_t & MM_t

Eigen Values	Likelihood ratio	Critical values		Hypothesized NO. of CE(s)	Number of CV	β
		5%	1%			
0.594	28.36	15.41	20.04	0		1.13
0.013	0.418	3.76	6.65	1	1	

L.R. rejects any co integrating at 5% significance level.

Optimal lag length is one, selected through AIC.

A long span of data is more appropriate to test sustainability by mean of Co integration

Chapter: 8 Dynamics of Debt

8.1 Public Debt Dynamics

Identification of the factors and magnitude of their contribution to the alarming level of public debt ratios in the past provide useful insights for policy purpose as well as some guideline with regard to the future prospects of debt and its management⁴⁰. Three core factors i.e. primary fiscal balances, interest factor and exchange rate factor determine the change in debt to GDP ratios between t and $t+1$ ⁴¹

- **Primary balances** determine the budgetary financing requirement for government expenditure. Debt dynamics is closely linked with primary budgetary balances i.e. in case of Primary surpluses the debt burden is alleviated and reduced where as primary deficit aggravate the situation adversely.
- **Interest factor:** it is the difference of interest payment and growth rate factor. Both have central and fundamental impact on debt dynamics. If this difference is positive then it has implications of unstable debt dynamics as the compounding interest rate effect is imbedded in instability of debt dynamics.
- **Exchange rate effect:** Any nominal change in the exchange rate will impact foreign currency denominated debt. A depreciation of the exchange rate will raise the value of external debt in rupee term and vice versa. Thus exchange rate depreciation results in loss of capital on external debt.

It would be pertinent to distinguish between the push and pull factors. Push factors are factors that would have contributed to increase in external debt ratio if all other factors remained unchanged. Pull factors are factors that would have pulled down the external debt ratio.

The **Table 8.1** reflects that historically the cumulative effect of successive large primary fiscal deficits was the most important push factor behind the increase in the public debt to GDP ratio during 1970s and 1980s. Big increase in public debt during this period is

⁴⁰For detail of debt dynamics: see International Monetary Fund (2001),” Pakistan: Selected Issues and Statistical Appendix, Country Report No. 01/11(2001).

⁴¹ for details sees **Annexure 8.1**

attributed mostly to the increase in domestic debt. However, the contribution of primary deficit to the public debt dynamics began to decrease noticeably 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 as well. The decreasing contribution of the primary fiscal balances towards increase in the debt ratio resulted from more determined fiscal adjustment efforts along with structural adjustment program during 1990s and 2000s.

The interest rate factor in debt dynamics was generally favorable and is the most important pull factor. 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 intrinsic interest dynamics became increasingly less favorable in late 1990s, reflecting primarily the steadily rising interest rates on domestic public debt and the growing debt stock.

The exchange rate related revaluation effect on public debt was another important push factor behind the increase in the public debt ratio since 1980s. During each five years period the depreciation of the Pakistani rupee against major currencies raised the debt to GDP ratio. In fact capital loss on external debt due to exchange rate depreciation made significant contributions towards increase in public debt to GDP ratio. More recently exchange rate revaluation effect has minimized as a result of appreciation of the Rupee against US \$.

Table:8.1 Dynamics of Public Debt

Decades	Changes in Public Debt Ratio P.A	Contribution of Determinants to change in Debt/GDP					
		Primary Balance Factor	Interest Rate Factor	Growth Rate Factor	Interest-growth Differential	Exchange Rate Factor	Others
	% of GDP	% of GDP			% of GDP	% 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

8.1.1 Dynamics of public Debt Burden

The real growth in the debt burden, defined 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, predominantly in second half of both the decades is attributed to a large extent to the following factors:

First, deteriorating and stagnant growth in government revenues was one of the factors causing high growth in public debt burden. As shown in **Table: 8.2** although real growth in revenue in the first half of 1980s caused negative growth of debt burden. However, the situation reversed during the early 1990s, the real growth of debt moderated somewhat while the real growth in revenues declined sharply and by 1997 turned negative resulting in 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, as far as the real cost of borrowing for public debt is concerned it rose steeply to 5.3 percent in the second half of the decade 1980s, it touched the minimum level of 2% in first half of 1990s, went up to 4.5 percent in second half of the decade and was 4.0 percent in 2000s on average. Thus the real cost of borrowing was somewhat contained in

relative terms in 1980s and early 1990s mainly because of high inflation rates and two distinct features of debt raised by the Government during this period. Firstly, prior to the start of financial sector liberalization in 1989, interest rates were administered and financial repression enabled the Government to borrow at significantly below-market rates i.e. the yield on the benchmark six-month Treasury bill was fixed at 6 percent where as Central Bank financing to the Government was available at 0.5 percent. Secondly an increasingly substantial portion of the public debt raised during the 1980s was through the National Savings Schemes.⁴² This instrument is a five or ten-year zero-coupon bond, where the interest is recorded at the time of redemption. Hence, interest costs were not being recorded in the same proportion as debt rose.

In contrast to the above during the decades of 1990s, the move to a market-based auction system⁴³ for raising public debt, initiated in 1989 as a part of financial sector liberalization program under the aegis of the IFIs, nearly trebled the interest payments on domestic debt. As a consequence of the quantum jump in interest payments, a reduction of the fiscal deficit became difficult to achieve, thus providing a sharp impetus to public debt growth.

The other factors that became increasingly relevant especially for the second half of the 1990s were the frequency and magnitude of currency devaluation, which led to, increased debt burden in Rupee terms. **Table 8.3** gives a comparison of the annual change in public external debt service payments in Pakistan Rupee terms (as provided for in the budget) and the actual change in US dollar terms. The figures reported clearly indicate that until FY2005, the annual growth in public external debt service valued in US dollars was outstripped by the yearly change in debt servicing in Pakistan Rupee terms indicating the significant additional burden on the budget and subsequently on fiscal balances due to the effect of currency depreciation.

⁴² Asian Development Bank (2002), "Escaping the Debt Trap: An Assessment of Pakistan's External Debt Sustainability", Working Paper No. 1.

⁴³ 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.

Table: 8.2
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

*Includes capital loss on external debt

Table: 8.3
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

8.2 External Debt Dynamics:

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:

- **Primary current account balance:** it determines the need for external financing of imports given overall receipt from the exports of goods & services and transfers. The larger the deficit in the current account of the balance of payments, excluding interest payments, the greater would be the increase in external debt due to large borrowing to meet the current account deficit.
- **The interest factor,** it arises from the difference between interest rate on the external debt and the GDP growth. If this difference is positive, the dynamics of the interest compounding applies, which can lead to continued increases in the external debt unless net export are, on average, positive and large enough to offset the interest payment bill.
- **Accumulation of foreign exchange reserves,** which results from foreign borrowing leading to accumulation of external debt.
- **Others factors,** including capital inflows such as foreign direct investment, portfolio inflows, contribution of remittances and other inflows which reduce the need of foreign borrowing,

The decomposition of Pakistan's external debt dynamics during 1980s and 1990s is given in **Table: 8.4**. In general, large imbalances between the exports and imports unambiguously were the most important push factors behind the increase in the 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 too moderate in 1980s. This was mainly due to initiation of development projects in the period of 1970s and Afghan war in the 1980s. During the 1990s, the foreign exchange earnings performance from exports and workers remittances of 3.4 percent on average was disappointing, Thus again pushing up the external debt ratios.

Table: 8.4 External Debt Dynamics

Decades	Changes in External Debt Ratio /PA % 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

This phenomenon reflects insufficient stabilization efforts and lack of determination in carrying the structural reforms to reduce the external imbalances. Later during 2000s these ratios turned negative due to improved primary current account balances as a result of exceptional financing and access to the European market and grants received as a result of coalition with the allied forces against war on terrorism.

Interest payments on the external debt were not a push factor as it contributed to the change in external debt ratio insignificantly. The interest factor contributed negatively towards debt ratios in the early decade of 1970s and 1980s whereas it impacted External debt ratio marginally in the period of 1990s and 2000s. This finding may be the result of significant share of concessional external debt in external debt.

As the foreign exchange reserves were quite often needed for the balance of payments support during 1990s, change in reserves some times act as a push factor and sometimes as a pull factor. On the whole, the process of accumulation of reserves contributed to the increase in external debt although the magnitude remained small. During 2000s, change in reserve was highly significant, and the increase in external debt was partly being offset by increase in remittances and inflow of funds to Pakistan for adopting the front line position against war on terrorism.

Similarly, other determinants include foreign direct investment, Portfolio inflow e.g. privatization proceeds etc, that contributed substantially as a pull factor in improving the balance of payments position in the recent years.

8.2.1 Dynamics of External Debt Burden

The changing dynamics of external debt burden as documented in **Table: 8.5** shows that external debt burden grew at average rates of (-1.2%) percent and (3.3%) percent respectively during the 1980s and 1990s. Further disaggregation of results by time period reveals that during the first half of the 1990s, although external debt in real terms grew by (-1%) percent per annum it did immediately lead to a sharp increase in external debt burden because the debt carrying capacity (real growth in foreign exchange earnings) of the country was decreasing by (-4.6 percent) percent per annum. Therefore, the real growth of external debt burden rose to 3.5 percent% on average in the first half of 1990s. However, the real growth in foreign exchange earnings slowed substantially to an average of (- 8.7 percent) percent per annum in the second half of the 1990s causing debt burden growth at almost 3 percent per annum during the same period. Thus, slower real growth in foreign exchange earnings has therefore been mainly responsible for the rise in real debt burden in the second half of the 1990s.

As stated earlier, during 2000s real growth of external debt burden witnessed massive decline (-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.

The real cost of foreign borrowing which include interest cost as well as the cost of capital loss on external debt was on average 5.1 percent and 3.80 percent per annum in the 1980s and 1990s respectively. However, it is much higher in the second halve of 1980s and 1990s in comparison with the average of the entire two decades.

Table 8.5: Dynamics of External Debt Burden

Decades	Primary CAB % of GDP	Real cost of borrowing %per Annum	Real Growth of External Debt %per Annum	Real Growth in FEEc %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

Further, by disaggregating the data according to the time period the results reveal that the real cost of borrowing declined, on average, by 2.9 percent and 2.5 percent per annum during the first half of 1980s and 1990s. This was mainly on account of relatively lower real interest rate i.e. 2.5 percent (nominal implied interest rate was 12.6 percent and inflation rate was 10.1 percent).

However, during the second half of the 1990s nominal interest rate was high (15.1 percent) with an 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 percent and 4.9 percent) environment 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.

In conclusion, the analysis of debt dynamics provides useful lesson for the policy-makers to manage country's debt burden: First, the primary balances contributed to the rise in

debt ratios only uptill 2000 after that it played a negative role, the exchange rate factor has throughout contributed to the rise in debt ratios, while interest rate factor was not responsible for any positive contribution towards the debt ratios except for the period of 2000s. On the external front primary current balances played a significant role in contributing to rise in external debt ratios except for the period 2000s, whereas interest rate factor is marginally responsible for contributing towards the rise in debt to GDP ratio in the decades of 1990s and 2000s.

8.3 Annexure

Annexure A: Decomposing the public debt Dynamics

Dynamics of debt are analyzed under two approaches in the literature; these are Accounting approach and Present Value budget constraint approach. To derive the equation for examining the contributions of the determinants change in public debt ratio we start with the consolidated public sector budget constraint. In developed countries, it is assumed that the seigniorage revenue and external financing are unimportant. Thus the budget constraint for the developed countries⁴⁴ is given as;

$$G_t - R_t + i_t B_{t-1} = \Delta B_t$$

Where B_t is public debt including domestic debt only

In developing countries seigniorage as well as external financing is significant and important sources of financing fiscal deficit. Thus the budget constraint for developing countries is given by:

$$G_t - R_t + r_t B_{t-1} = \Delta B_t + \Delta H_t \quad (A)$$

$$B_t = B_t^D + \varepsilon_t B_t^F$$

R = Tax revenue + Non-tax revenue + surcharges + Grants.⁴⁵

G = government expenditure (exclusive of interest payments). It includes current and development expenditure

B_t = Sum of debt denominated in domestic currency and debt denominated in foreign currency

B_t^F = External Debt (excluding guaranteed & non-guaranteed private debt):

B_t^D = Domestic Debt

⁴⁴ Papadopoulos and Sidiropoulos (1999)

⁴⁵ Grants proceeds are a financing component. It is not a debt generating one. So we include it in the revenue receipt.

ϵ_t = Nominal exchange rate

H_t = Monetary base [budgetary support]

The constraint shows the components of the conventional deficit, i.e., primary deficit plus the nominal interest rate, and identifies the sources of financing the fiscal imbalances. With a little manipulation we get

$$-PS_t + (1 + r_t)B_{t-1} = B_t + \Delta H_t$$

$$B_t = (1 + r_t)B_{t-1} - (PS_t + \Delta H_t)$$

$$B_t = (1 + r_t)B_{t-1} - S_t \quad (B)$$

Where $PS_t = R - G$ denotes the non-interest primary surplus ($-PS_t$ denotes the primary deficit, that is, the difference between government expenditure exclusive of interest payments on the debt and revenue) and $S_t = (PS_t + \Delta H_t)$.

Therefore, expressing (3) in term of ratio of output (Real GDP)

$$\frac{B}{Y} = (1 + r_t) \frac{B_{t-1}}{Y} - \frac{PS_t}{Y_t} + \frac{\Delta H_t}{Y_t}$$

$$\frac{B_t}{Y_t} = (1 + r_t) \frac{B_{t-1}}{Y_t} - \frac{S_t}{Y_t}$$

Let $g_t = \frac{Y_t - Y_{t-1}}{Y_{t-1}}$ is real GDP growth

$$ps_t = \frac{PS_t}{Y_t}$$

$$h_t = \frac{H_t}{Y_t}$$

Let $s_t = ps_t + \mu h_{t-1}$ is government surplus interpreted as the primary surplus inclusive of seignorage revenue (i.e. budgetary support from central bank).

$$b_t = (1 + r_t) \frac{B_{t-1}}{Y_t} - s_t$$

$$b_t = (1 + r_t) \left[\frac{B_{t-1}^D + \varepsilon_t B_{t-1}^F}{Y_t} \right] - s_t$$

$$b_t = (1 + r_t) \left[\frac{B_{t-1}^D + \varepsilon B_{t-1}^F}{Y_{t-1}} \times \frac{Y_t}{Y_{t-1}} \right] - s_t$$

$$b_t = (1 + r_t) \left[\frac{B_{t-1}^D}{Y_{t-1}} + \frac{\varepsilon_t B_{t-1}^F}{Y_{t-1}} \right] \frac{1}{(1 + g_t)} - s_t$$

Where $\frac{Y_t}{Y_{t-1}} = (1 + g_t)$

$$b_t = (1 + r_t) \left[\frac{B_{t-1}^D}{Y_{t-1}} + \frac{\varepsilon_{t-1} B_{t-1}^F}{Y_{t-1}} \times \frac{\varepsilon_t}{\varepsilon_{t-1}} \right] \frac{1}{(1 + g_t)} - s_t$$

$$b_t = (1 + r_t) \left[b_{t-1}^D + (1 + \rho) b_{t-1}^F \right] \frac{1}{(1 + g_t)} - s_t$$

Where $(1 + \rho) = \frac{\varepsilon_t}{\varepsilon_{t-1}}$

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

Where $\alpha = \frac{b_t^F}{b_t}$

By solving equation we have

$$b_t = \frac{1+r_t}{1+g_t} \left[1 - \alpha_{t-1} + \alpha_{t-1} + \rho \alpha_{t-1} \right] b_{t-1} - s_t$$

$$b_t = \frac{1+r_t}{1+g_t} \left[1 + \rho \alpha_{t-1} \right] b_{t-1} - s_t \quad (C)$$

$$b_t - b_{t-1} = \frac{1+r_t}{1+g_t} \left[1 + \rho \alpha_{t-1} \right] b_{t-1} - b_{t-1} - s_t$$

$$b_t - b_{t-1} = \frac{1}{1+g_t} \left[1 + \rho \alpha_{t-1} + r_t + r_t \rho \alpha_{t-1} \right] b_{t-1} - b_{t-1} - s_t$$

$$\Delta b_t = \frac{1}{1+g_t} \left[1 + \rho \alpha_{t-1} + r_t + r_t \rho \alpha_{t-1} - 1 - g \right] b_{t-1} - s_t$$

$$\Delta b_t = \frac{1}{1+g_t} [(1+i_t)\rho\alpha_{t-1} + (r_t - g_t)]b_{t-1} - s_t$$

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

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

Where

$$\left[\frac{(1+r_t)\rho\alpha_{t-1}}{(1+g_t)} b_{t-1} \right] \text{ is Exchange rate effect}$$

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

This Equation (D) shows the contribution of factors i.e. exchange rate, interest rate and the primary balances inclusive of seignorage revenue to the change in public debt to GDP

ratio. The term $\left[\frac{(r_t - g_t)}{(1+g_t)} b_{t-1} \right]$ can be decomposed into interest factor and the growth factor.

Annexure - B

Decomposing the External debt Dynamics

To determine the factors responsible for the change in external debt to GDP between the period $t-1$ and t , we start from the basic balance of payment identity for an open economy. The change in stock of external debt denoted by $(D_t - D_{t-1})$ must be equal to current account balance exclusive of interest payments on external debt and the change in reserve assets

$$CAB_t = (KAB_t + \Delta RES_t)$$

Where CAB is current account balances; KAB is the capital account balances and ΔRES_t is change in foreign reserves. Using the ingredients of current and capital accounts we get;

$$CAB_t + r^* D_{t-1} = (D_t - D_{t-1}) + \Delta RES_t$$

$$D_t = CAB_t + (1 + r^*)D_{t-1} - \Delta RES_t$$

Where CAB is current account balance exclusive if interest rate payments. Taking above equation in term of GDP ratio we get

$$d_t = cab_t + (1 + r^*)d_{t-1} - \Delta res_t$$

To determine the change in debt to GDP ratio, subtract d_{t-1} from both side of the equation we have

$$\Delta d_t = cab_t + \left(\frac{r^* - g}{1 + g}\right)d_t - \Delta res_t$$

The decomposed equation shows that three-core variable is responsible for the change in external debt to GDP ratio. These factors are Primary current account balance, interest rate factor and the change in foreign reserve.

Chapter: 9

Simulation and Sensitivity Analysis

The framework developed above for debt sustainability has been used to undertake simulation and sensitivity analysis for debt dynamics using different scenarios for the relevant variables i.e. changes in fiscal deficit, current account balance, real economic growth and interest rates to see their impact on Debt/GDP ratio. This exercise involves the following variables;

- i) The initial stock of public debt outstanding (as on End June 2005)
- ii) The primary deficit (average of last five years)
- iii) Real GDP growth (different scenarios)
- iv) The nominal rate of interest (different scenarios)
- v) Inflation (different scenarios)
- vi) Current Account Balance (average of last five years)
- vii) Exchange rate (different scenarios)

By changing the values of the above variables, we shall determine the future path of public and external debt. The values of the basic macroeconomic variables taken in the following table have been worked out by taking their five years averages⁴⁶. The results of the simulation have been described in the following sections.

9.1 Baseline Scenario

Using the above mentioned baseline values of parameter, we have first projected the Debt-to-GDP ratio for the next fifteen years on the basis of existing trend of key variables, assuming that no shocks occur to these variables and there is no change in public policy affecting their trend. The projected values of public debt and external debt to GDP ratios are worked out by using the following formulas as already derived in Chapter 6 and 7:

⁴⁶ During this period i.e. 2001-05, the policies of the government remained consistent, being the same government and having same team of economic managers.

Variables Name	Values in case of Public Debt	Values in case of External Debt
GDP growth	5.1 percent	5.1 percent
Inflation	6.1 percent	6.1percent
Tax/GDP Ratio	16.4 percent	
Current Expenditure/GDP Ratio	18.3 percent	
Defence Expenditure/GDP Ratio	3.9 percent	
Development Expenditure/GDP Ratio	3.2 percent	
Interest payments/GDP ratio	7.5 percent	
Average Interest Rate	8.6 percent	
Primary Budget Surplus / GDP Ratio	3.3 percent	
Overall Budget deficit / GDP Ratio	4.2 percent	
Export / GDP Ratio		15.6 percent
Import / GDP Ratio		17.7 percent
External Interest Payment / GDP Ratio		3.2 percent
Average Interest Rate on External Debt		6.7 percent
Exchange Rate		Rs.60 per dollar
Trade Balance / GDP Ratio		-3.5percent

For Public Debt / GDP Ratio (b_t):

$$b_t = \frac{(1 + r_t)}{(1 + g)} b_{t-1} - s_t$$

For External Debt / GDP ratio (d_t):

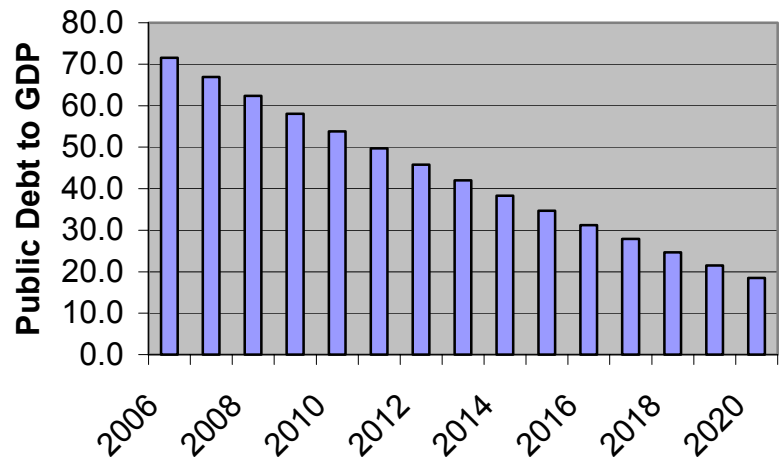
$$d_t = \left(\frac{(1 + r_t \varepsilon_t)}{(1 + g)} d_{t-1} \right) - tb_t$$

The Results reported in **Table 9.2** show that if no policy action to reduce debt is taken and no shock occurs to any of the key variables, then public debt will reduce to 53.8 percent of GDP in year 2010, and 34.7 and 18.5 percent of GDP in years 2015 and 2020 respectively.

Table 9.2:
Results of Baseline Scenario

Debt-to-GDP		
Years	Public	External
2006	71.5	39.9
2007	66.9	41.8
2008	62.4	43.6
2009	58.0	45.4
2010	53.8	47.1
2011	49.7	48.7
2012	45.8	50.3
2013	42.0	51.8
2014	38.3	53.2
2015	34.7	54.6
2016	31.2	56.0
2017	27.9	57.3
2018	24.7	58.5
2019	21.5	59.7
2020	18.5	60.8

Figure: 1 Projection of Debt-to-GDP Ratio with Baseline Scenario



Now in order to examine the sensitivity of the debt ratios to different variables, we change these variables one-by-one and by keeping the other variables unchanged we estimate the future value of Debt-to-GDP ratios. The results are given as below.

9.2 Impact of Change in GDP Growth Rate

GDP is an important variable that affects the debt ratio. Higher growth in GDP leads to lower value of debt as percent of GDP. We have undertaken two simulations analysis: one by raising the GDP growth above the baseline scenario, and second by lowering the GDP growth below the base line. When GDP growth is raised to 6 % (above baseline) then public Debt-to-GDP ratio works out as 68.8 percent in year 2006, 47.5 percent in year 2010, 24.6 percent in year 2015 and only 5.2 percent in year 2020 (see **Table 9.3**).

These debt ratios are significantly lower than those in case of baseline scenario as given above. On the other hand, if GDP growth rate is assumed at 4.0 percent (below baseline) then Debt-to-GDP ratio works out to be as 70.2 percent in 2006, 53.2 percent in 2010, 33.3 percent in 2015 and 14.8 percent in the year 2020. These ratios are considerably higher than the baseline scenario.

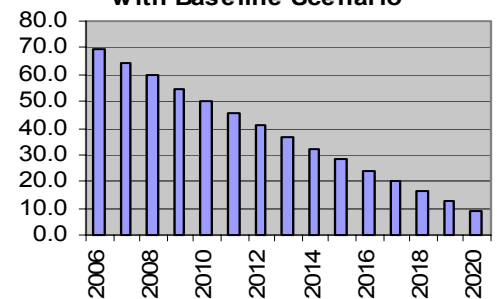
Turning towards the external debt, it is found that if GDP growth is 6 percent (above baseline), then external Debt-to-GDP ratios work out to be as 38.7 percent in years 2006, 44.5 percent in 2010, 50.2 percent in 2015 and 54.6 percent in 2020. These ratios are rising over time; however, the rate of increase is lower than that in baseline scenario. On the other hand, if GDP growth is assumed at 4 percent, then external Debt-to-GDP ratio work out to be 39.4 percent in 2006, 47.9 percent in 2010, 57.1 percent in 2015 and 64.9 percent in 2020. These ratios are not only higher but their rate of increase is also higher as compared to the baseline scenario.

Figure: 2

Table9.3: Impact of Change in GDP Growth

Years	Public Debt to GDP		External Debt to GDP	
	6percent	4percent	6percent	4percent
2006	68.8	70.2	38.7	39.4
2007	63.2	65.9	40.2	41.6
2008	57.8	61.6	41.7	43.8
2009	52.6	57.4	43.1	45.9
2010	47.5	53.2	44.5	47.9
2011	42.6	49.1	45.7	49.9
2012	37.9	45.1	46.9	51.8
2013	33.3	41.1	48.1	53.6
2014	28.9	37.2	49.2	55.4
2015	24.6	33.3	50.2	57.1
2016	20.5	29.5	51.2	58.8
2017	16.5	25.8	52.1	60.4
2018	12.6	22.1	53.0	61.9
2019	8.9	18.4	53.8	63.4
2020	5.2	14.8	54.6	64.9

Projection of Debt-to-GDP Ratio with Baseline Scenario



9.3 Impact of Change in Inflation Rate

Inflation is another important variable affecting the debt ratios. Higher inflation leads to lower real interest payments and higher nominal income; as a consequence, the Debt-to-GDP ratios are inversely related with the inflation. Like GDP, we have undertaken sensitivity analysis of debt in two scenarios: high inflation scenario and low inflation scenario. When we set the inflation rate at 7 percent (above the baseline), the public debt-to-GDP ratios work out to be at 68.8 percent in year 2006, 47.5 percent in year 2010, 24.6 percent in 2015 and 5.2 percent in year 2020. These ratios are lower than the baseline ratios and their rate of decline is also faster. On the other hand, when inflation rate is set at 5 percent (below the baseline), the public Debt-to-GDP ratios work out to be at 70.2 percent in year 2006, 53.4 percent in 2010, 33.6 percent in 2015 and 15.1 percent in the year 2020. These ratios are losing to the baseline scenario and their rate of decline is also slow.

Now turning toward the external debt, it is found that when inflation is set at 7 percent (above baseline), then external Debt-to-GDP ratios work out to be at 38.7 percent in year 2006, 44.4 percent in 2010, 50.1 percent in 2015 and 54.5 percent in the year 2020. These ratios are lower than baseline scenario and their rate of decrease is also slow. On the other hand, if inflation is set at 5 percent (below the baseline), then external debt-to GDP ratios work out to be at 39.4 percent in year 2006, 48 percent in 2010, 57.4 percent in 2015 and 65.3 percent in the year 2020. These ratios are not only higher than the baseline scenario but also have higher rate of increase.

Table 9.4 : Impact of Change in Inflation

Years	Public Debt to GDP		External Debt to GDP	
	7percent	5percent	7percent	5percent
2006	68.8	70.2	38.7	39.4
2007	63.2	65.9	40.2	41.7
2008	57.8	61.7	41.7	43.9
2009	52.6	57.5	43.1	46.0
2010	47.5	53.4	44.4	48.0
2011	42.6	49.3	45.7	50.0
2012	37.9	45.3	46.9	52.0
2013	33.3	41.3	48.0	53.8
2014	28.9	37.4	49.1	55.6
2015	24.6	33.6	50.1	57.4
2016	20.5	29.8	51.1	59.1
2017	16.5	26.0	52.0	60.7
2018	12.6	22.3	52.9	62.3
2019	8.9	18.7	53.7	63.8
2020	5.2	15.1	54.5	65.3

9.4 Impact of Change in Revenue/GDP ratio

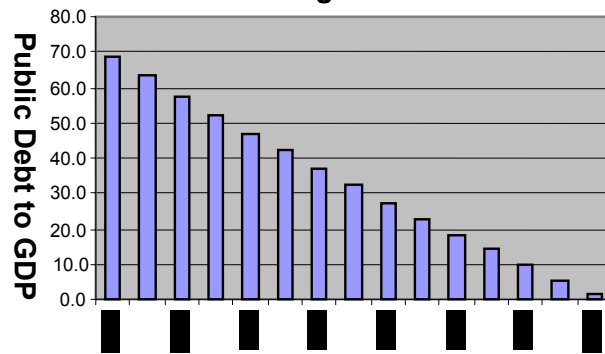
The tax rate is a most important tool of fiscal policy. High tax rate not only gives more revenue to the exchequer but also helps reducing debt burden through low borrowing requirements. We have undertaken to examine the sensitivity of Debt-to-GDP ratio to change in average tax rate (Tax-to- GDP). When Tax-to-GDP ratio is kept at 17 percent (above baseline) , the public debt-to-GDP ratio works out to be 68.8 percent in year 2006, 47.1 percent in 2010, 22.9 percent in 2015, and 1.5 percent in the year 2020. These ratios are below the baseline scenario, when tax-to-GDP is kept at 15 percent then public debt to GDP ratio work out to be 70.8 percent in year 2006, 56.6 percent in 2010, 40.8 percent in 2015 and 26.8 percent in the year 2020. These ratios are significantly higher than the baseline scenario. Thus the policy to reduce debt burden is, the government should increase its tax efforts to generate more tax revenue

Table 9.5: Impact of Change in Rev/GDP

Years	Public Debt to GDP	
	17percent	15 percent
2006	68.8	70.8
2007	63.2	67.2
2008	57.7	63.6
2009	52.3	60.1
2010	47.1	56.6
2011	42.0	53.3
2012	37.1	50.1
2013	32.2	46.9
2014	27.5	43.8
2015	22.9	40.8
2016	18.4	37.8
2017	14.0	35.0
2018	9.7	32.2
2019	5.6	29.5
2020	1.5	26.8

Figure: 3

Projection of Debt-to-GDP Ratio with Change in Revenue



9.5 Impact of Change in Average Interest rate

High interest rate leads to more resources going to debt servicing, and consequently to more debt burden. One way to reduce debt burden is to reduce cost of borrowing by paying back expensive debt and borrowing new loans at cheaper rates. We have examined the sensitivity of public debt to the cost of borrowing. When cost of borrowing, i.e. average interest is increased by 1 percent, the Debt-to-GDP ratios increase such that it becomes 70.2 percent in year 2006, 53 percent in 2010, 32.9 percent in 2015 and 14.4 percent in year 2020. On the other hand when average interest rate is decreased by 1 percent then debt to GDP ratio reduces to 68.7 percent in year 2006, 47.1 percent in 2010, 24.1 percent in 2015 and 4.7 percent in the year 2020. Thus policy implication is very clear that government should seek for cheaper sources of funds.

Years	Public Debt to GDP	
	1% Increase	1% Decrease
2006	70.2	68.7
2007	65.8	63.0
2008	61.4	57.6
2009	57.2	52.3
2010	53.0	47.1
2011	48.8	42.2
2012	44.8	37.4
2013	40.8	32.8
2014	36.8	28.4
2015	32.9	24.1
2016	29.1	19.9
2017	25.3	15.9
2018	21.6	12.0
2019	18.0	8.3
2020	14.4	4.7

9.6 Impact of Change in Revenue Surplus

One of the important strategies of debt reduction is elimination of revenue deficit or preferably keeping revenue surplus. We have undertaken simulation analysis first by setting revenue deficit as zero and then by maintaining revenue surplus of one percent of GDP. When revenue Deficit is zero percent the public Debt-to-GDP ratios work out to be 69.2 percent in year 2006, 47 percent in 2010, 19.3 percent in 2015 and -1.5 percent in the year 2020. On the other hand when 1 percent revenue surplus was maintained, the debt-to-GDP ratio work out to be 69.3 percent in year 2006, 47.2 Percent in 2010, 21.2 percent in year 2015 and -1.7 percent in the year 2020. Thus this exercise is based on the targets set by the “*Fiscal Responsibility and Debt Limitation Act 2005*” for the revenue balances to make revenue deficit equal to zero till 2007 and maintain a revenue surplus a surplus afterwards.

Table 9.7: Impact of Change in Revenue Surplus

Years	Public Debt to GDP Ratio	
	0 percent	1percent
2006	69.2	69.3
2007	63.7	63.9
2008	58.2	58.4
2009	52.6	52.8
2010	47.0	47.2
2011	41.1	41.8
2012	35.5	36.4
2013	29.9	31.2
2014	24.5	26.2
2015	19.3	21.2
2016	14.2	16.4
2017	9.1	11.7
2018	4.3	7.1
2019	-0.5	2.6
2020	-5.1	-1.7

9.7 Impact of Change in External Average Interest Rate

Rate of interest on external debt has important bearing on the debt servicing and external debt burden. In order to examine the sensitivity of external debt to changes in interest rate, we have undertaken the simulation analysis, which suggests that when interest rate is increased by 100 basis point, the external debt-to GDP ratio increased to 39.9 percent in year 2006, 47.4 percent in 2010, 55.2 percent in 2015 and 61.6 percent in the year 2020. On the other hand, if interest rate is reduced by 100 basis points, the external Debt-to-GDP ratio declined to 39.8 percent in year 2006, 47 percent in 2010, 54.4 percent in 2015 and 60.5percent in the year 2020. In both the cases these ratio are close to the base line scenario results.

**Table 9.8: Impact of Change in
Average Interest rate**

Years	External Debt to GDP Ratio	
	1%Increase	1% Decrease
2006	39.9	39.8
2007	41.9	41.7
2008	43.8	43.6
2009	45.6	45.3
2010	47.4	47.0
2011	49.0	48.6
2012	50.7	50.1
2013	52.2	51.6
2014	53.7	53.0
2015	55.2	54.4
2016	56.5	55.7
2017	57.9	57.0
2018	59.2	58.2
2019	60.4	59.3
2020	61.6	60.5

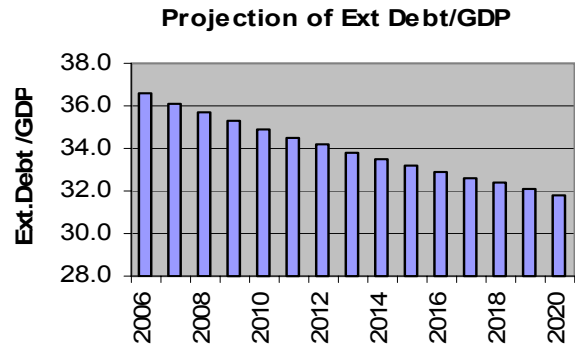
9.8 Impact of Change in Export/GDP ratio

Exports are the major source of foreign exchange receipts. Higher exports earning lead to less borrowing requirement and thus lower debt burden. In simulation analysis, we have examined the sensitivity of external debt-to-GDP ratio to change in Export/GDP ratio. When export/GDP ratio was kept at 16 percent (above than baseline), the external debt to GDP ratio increased to 38.6 percent in year 2006, 41.1 percent in 2010, 49.7 percent in 2015 and 54.3 percent in the year 2020. On the other hand when export-to-GDP ratio was kept at 18 percent (above the base line), the debt-to-GDP ratio declined 36.6 percent in 2006, 33.2 percent in 2015 and 31.8 percent in the 2020. It is clear from the above analysis that with increase in export to GDP ratio from 16 percent to 17 percent the Debt-to-GDP ratio increases gradually. Whereas with increasing Export-to-GDP ratio to 18 percent it leads to decrease in trade deficit and resultantly the external Debt-to-GDP decreases steadily. Thus the policy to reduce debt burden is that the government should increase its efforts to boost the exports and enhance the foreign exchange earnings.

Figure: 4

Table 9.9: Impact of Change in Export/GDP

Years	External Debt to GDP Ratio		
	16%Increase	17%Increase	18%Increase
2006	38.6	37.6	36.6
2007	40.0	38.1	36.1
2008	41.5	38.6	35.7
2009	42.8	39.1	35.3
2010	44.1	39.5	34.9
2011	45.3	39.9	34.5
2012	46.5	40.3	34.2
2013	47.6	40.7	33.8
2014	48.7	41.1	33.5
2015	49.7	41.5	33.2
2016	50.7	41.8	32.9
2017	51.7	42.2	32.6
2018	52.6	42.5	32.4
2019	53.5	42.8	32.1
2020	54.3	43.1	31.8



9.9 Impact of Change in Exchange Rate

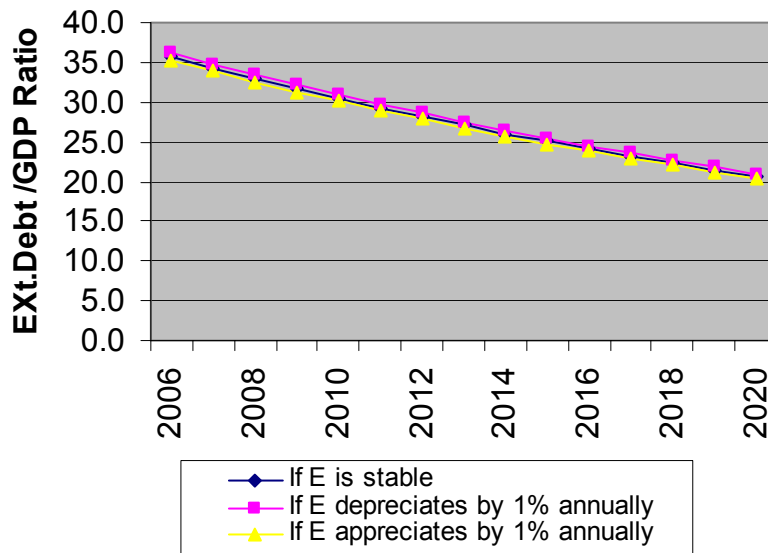
Changes in exchange rate also affect the extent of debt burden. Depreciation in exchange rate increases the value of the debt stock while appreciation decreases the value of debt stock in Rupee terms. The sensitivity analysis shows that if there is 1 percent depreciation in the exchange rate then external Debt-to-GDP ratio increase to 36.2 percent in 2006, 25.5 percent in 2015 and 21 percent in the year 2020. On the other hand, if there is 1 percent appreciation, then Debt-to-GDP ratio declined to 35.2 percent in 2006, 24.4 percent in 2015 and 20.4 percent in the year 2020.

Table 9.10: Impact of Change in Exchange rate

Years	External Debt to GDP ratio		
	1%Depreciate	Stable	1%Appreciate
2006	36.2	35.6	35.2
2007	34.8	34.2	33.9
2008	33.5	32.9	32.6
2009	32.2	31.6	31.3
2010	30.9	30.4	30.1
2011	29.8	29.3	29.0
2012	28.6	28.1	27.8
2013	27.5	27.1	26.8
2014	26.5	26.0	25.8
2015	25.5	25.0	24.8
2016	24.5	24.1	23.8
2017	23.5	23.2	22.9
2018	22.7	22.3	22.0
2019	21.8	21.4	21.2
2020	21.0	20.6	20.4

Figure: 5

Impact of Change in Exchange Rate



In conclusion, the exercise of simulation and sensitivity analysis for debt dynamics based on last five year averages of the key macroeconomic variable is carried out to work out the future path of the public and external debt for the period 2006-2020. We can comfortably say from the analysis that simulations worked out with GDP growth rate of 6%, zero revenue deficits and exports to GDP ratio of 18 percent are most likely along with base line scenario. As all these scenarios help in achieving the public debt-to-GDP ratio sustainable at a level set in the “*Fiscal Responsibility and Debt Limitation Act 2005*”.

Chapter 10

Conclusion and Policy Recommendations

10.1 Conclusion

The aim of the dissertation was to develop a theoretical framework for assessing debt sustainability and dynamics. Using a model, originally developed for the industrial countries, and modifying it according to the prevailing patterns of public finance in Pakistan to test the followings hypotheses:

- Assess the *sustainability of public and external debt* by testing the validity of the Government Inter-temporal Budget Constraint or the Non-Ponzi Game Condition (NPG);
- Analyze the issue of debt sustainability using the Traditional Debt Indicator Approach in order to make a meaningful comparison of pre- and post-2000 debt ratios. These findings will also be aimed at comparing and validating the results obtained through Accounting and Present Value Budget Constraint [PVBC] approaches;
- Test for *structural breaks* in fiscal policy. The break in fiscal policy may affect the test of debt sustainability that leads to biased inferences;
- Analyze the dynamics of public and external debt and to determine the contributions of the factors to change in debt to GDP ratio.
- Undertake **simulation and sensitivity analysis of debt dynamics** using different scenarios of key macroeconomic variables to workout the most likely scenario for debt sustainability in relation to the economy of Pakistan; and
- Beside the model-based analysis, a complete debt profile is presented that gives the historical evolution, composition of debt and its maturity structure.

The outcome of the **empirical analysis** confirmed that when the present value budget constraint approach was used, then both public and external debts were found to be unsustainable throughout the sample period 1971-2005. However, when the Accounting Approach for debt sustainability was used, even though it confirmed unsustainability for the period prior to 2000, the debt became sustainable in the post-2000 period.

The outcome of **Indicative Debt Burden Thresholds (IDBT)** also confirmed that the levels of public debt ratios remained unsustainable for the period under consideration and the situation did not improve even in 2000s. For the external debt ratios, on the other hand, sustainability levels were attained in late 2000s, more specifically in 2004 and 2005. The present value of Debt to foreign Exchange earning were also quite above the critical level and did not support the assumption of having attained sustainability levels as implied by recent external debt ratios. Thus, the study found a consistent result on the basis of both, empirical analysis and the use of indicator approach.

Then test for **structural break** in fiscal policy, the exact timing of the break on the basis of the highest test value was found for the years 1993 and 1998. The effect of these two breaks on Pakistan public debt was then investigated. The finding is that accounting for the structural break in the analysis has made no change in the results reported. It implies that despite these fiscal breaks, Pakistan public debt remained unsustainable during the period under consideration.

To workout the future path of the public and external debt for the period 2006-2020 **simulations and sensitivity analysis** based on the results of last five-year averages of key macroeconomic variables was undertaken. The simulations worked out with GDP growth rate of 6 percent, revenue deficit of zero percent, and exports-to-GDP ratio of 18 percent were found to be the most likely baseline scenario. All these scenarios help in achieving sustainable public Debt-to-GDP ratio at the level set in *“Fiscal Responsibility and Debt Limitation Act 2005”*.

The results of **public debt dynamics** confirmed that the primary balances were the main contributors to the rise in debt ratios up to FY 2000. Thereafter the primary balances turned positive that helped in improving the position. The exchange rate factor was responsible for worsening of the debt ratios throughout the period barring some improvement during the period after 2000. On the other hand, the interest rate factor was not ‘generally’ responsible for any positive contribution towards the change in debt ratios, except for the period of 2000s. The explosive growth of public debt in 1990s

coupled with low growth in the revenues, especially in second half of the decade, increased the debt burden tremendously.

On the **external debt dynamic**, primary current balances played a significant role in contributing to the rise in external debt ratios for the investigation period except for more recent years; but the interest rate factor was marginally responsible for contributing towards the rise in debt to GDP ratio in 1990s and 2000s. The high interest rate costs also contributed mildly up to 1990 but significantly in 1990s and 2000s. Compared to this, the fluctuations in foreign exchange reserve were rather insignificant in affecting the debt ratios.

The importance of present comprehensive study could be gauged from the fact that no work on the subject has been conducted so far except for some preliminary studies undertaken by Bilquees (2003), Pasha and Ghaus that have examined the evolution of public debt and the factors contributing towards its growth in Pakistan. Their findings that the rise in the debt was the result of cumulative effects of successive large primary budget deficit along with the non-interest current account deficit that contributed to rise in the external Debt/GDP ratio have been substantiated by the results reported in this thesis. Similar results were found by Luporini (2000) for the Brazilian economy.

The preceding results have following caveats: The findings of the study are sensitive to certain risk factors both internal and external uncertainties that have not been taken into account due to measurement issues. Secondly, the data used for the external debt takes into account only the outstanding debt that does not incorporate the impact of foreign exchange liabilities in our analysis. Thirdly, revisions in credit ratings of a country by specialized agencies generally impact the debt sustainability efforts. The impact of changes in sovereign credit ratings on the access of developing countries to capital markets is significant. While improved ratings result in better terms of borrowing, any adverse revision in these ratings could have devastating effects on these terms, with adverse consequences on output and the sustainability of debt. Pakistan's economy is particularly risky in this area.

10.2 Policy Recommendations

The debt analysis of Pakistan in the preceding chapters has established that both Public Debt and External Debt are not at the sustainable levels. It is imperative to resolve this issue for long-term debt sustainability. The incremental addition to the stock of debt is to be avoided and debt-servicing costs are to be reduced. At the same time the repayment capacity has to be enhanced by increasing exports & revenues and by bringing fiscal discipline necessary to achieve efficient use of resources. From the analysis carried out the following policy recommendations emerge;

10.2.1 Prudent Debt Management:

To manage the current debt situation, the debt management committee made the following recommendations:

- The incremental addition to the stock of debt is suggested to be avoided by not allowing short-term private external loans, and by lowering the fiscal deficit to 2-3 % of the GDP level.
- Elimination of borrowing for non-developmental spending is to be ensured.
- Efforts should be made to mobilize external financing on concessional terms or at least on terms that are consistent with the medium term debt servicing capacity of the economy. Risks related to maturity structure and unfavorable terms of new debt are to be avoided.
- Utilizing of 90% of the privatization proceeds for repayment of loan should strictly be adhered to.

10.2.2 Improvement in Debt Servicing Capacity:

The debt carrying capacity can be improved through growth in revenue, exports, remittances and other foreign receipts.

Diversification of Exports: A great focus on diversification of exports is needed, as it would be most critical driver for attaining debt sustainability. The Pakistani Export lack value added items and are dependent on cotton-based products. The exports are vulnerable to shifts in the world demand, domestic shocks and changes in terms of trade. Fostering growth of exports and developing the domestic production of diversified

tradable items is essential to bring external debt sustainability and to reduce its vulnerability to shocks in the agricultural sector. Moreover the share of the manufactured exports especially in textile and engineering sectors needs to be increased as Pakistan's share in the total manufactured exports of the world is negligible i.e. 1% only.

Input Costs need to be reduced to make our exports more competitive in the international markets and for enhancing the productivity of the tradable. Taxes on electricity and gas are to be eliminated; the inefficiencies and corruption of concerned departments, in form of line losses and thefts, are to be overcome and electricity dues from FATA/ Balochistan are to be recovered. These measures, along with construction of more reservoirs for more power generation, would help in bringing the cost of electricity down.

Non-Conventional and Informal Sectors should be focused for increase in exports e.g. vegetables, fruit and flowers, livestock products (meats), information technology, handicrafts.

Reduction in Imports: Import bill is a major drain on foreign exchange earnings. Consumption of oil should be reduced through gas consumption, establishing good public transport system and by spending more on oil and gas exploration for finding more reserves. Gas pipeline project with Turkmenistan, Qatar and Iran should be finalized on priority bases. Tea plantation should be encouraged; People should be encouraged to think economically and should avoid using imported articles, Be Pakistani and Be Simple.

Foreign Direct Investment should be encouraged as it brings non-debt creating capital inflows. The growing interest of Middle Eastern companies and entrepreneurs in investing in our country, as a result of privatization process, has to be sustained. Large dozes of capital from this source have already been brought in the FDI and Portfolio investment is on the rise since 2000 onwards. Investors concerns regarding political stability need to be effectively and credibly addressed through some institutional arrangements that are legal as well as sustainable.

Streamlining Flow of Remittances: Financial resources are flowing to Pakistan as reflected in the change in the composition of remittances. The Pakistani community might have started looking for alternative sources of income outside U.S.A and E.U.

countries after 9/11. The strict regulatory controls imposed by U.S.A on flow of funds to other countries may have given impetus to the process of investment making in homeland. Their serious interest is reflected by their huge investments in hospitals and clinics building. *This should be an important part of public policy to sustain the interest of expatriates to facilitate them.*

Resource Mobilization

The resources are to be mobilized because the existing policy of containment of public expenditures for sake of improving primary balances is not sustainable for long, given that the public spending on Education, Health, and physical infrastructure are already at sub optimal level. Increased revenues must therefore be a policy priority, as it will ensure the surplus primary balance along with essential expenditures on the level needed to support high medium term growth. It is therefore suggested:

- The tax system should be modernized and all the sectors of economy be brought in to the tax net. All exemption and privilege allowed in income tax ordinance 2001 should be withdrawn except for the widows and for pensioners. Black economy may also be brought into tax net.
- Tax machinery should be improved with emphasis on efficiency, commitment and curbing tax evasion.
- At present a good amount of tax revenues is from Presumptive tax or At Sources deduction. The share of direct taxes is to be increased if Tax/GDP ratio [which is around 12% level since long] is to be brought at the level of developed countries [where it is 25 - 40% of GDP] or at least comparable to developing countries like Srilanka [where it is 16% of GDP].

Without expanding the tax base and without increasing the proportion of direct taxes the Tax/GDP ratio cannot be improved and the dream of achieving fiscal surpluses could not come true.

10.2.3 Efficient Use of Resources

The efficient uses of resources contribute significantly in the economic growth, which in turn improve the debt carrying capacity. A significant percentage of the government borrowing has been used to finance non-development spending. The quality of public

spending deteriorated because of corruption and weakness in the institutions like limitations in the capacities for appropriate channeling for and utilization of funds. The public investments were made on non-productive projects with insignificant economic returns. It is suggested that the institutional reforms should be undertaken for building up their capacities for channeling & utilizing funds efficiently. It is absolutely essential to have transparency in execution of projects; mechanisms are to be developed for preventing the leakages and embezzlements of public sector funds through rampant corruption of the government machinery. Hard choices are to be made for making investment in productive projects and not in politically motivated / maneuvered schemes like laying soling and small drains in the villages. Purchase of new vehicles, renovation of offices, high project fees being received by official working on projects is no service to the nation; it is plundering of the resources borrowed by the government and has to be done away with.

10.2.4 Expenditure Curtailment

Curtailment of non-development current expenditures is the need of the day. It is suggested that all austerity measures should be taken for maximizing the returns on capital invested, especially borrowed funds. The curtailment should not affect pro-poor expenditures and social sector spending for ensuring equitable growth. The aim should be to eliminate wastages i.e. unfair fuel expenses, unjustified allowances, and privileges. Every Rupee of the nation should be spent with a purpose and aim of nation building.

10.2.5 The Restructuring of Private-Public Sectors Relationship

The building of strategic relationship is of vital importance to maximize benefit of private sector savings and for enhancing the effectiveness of public sector saving. It is therefore suggested that;

- The private sectors entrepreneur's should be motivated and encouraged to have joint ventures with public sector. This exercise is already in progress in shape of Sundar Industrial Estate in Lahore, Construction of Faisalabad – Lahore highway projects on BOT basis. This partnership should be further extended, strengthened

and institutionalized. The private-public sector cooperation would help in eliminating bureaucratic hurdles in implementation of development and investment programs.

- The privatization process has resulted in palpable increase in the private sectors role in the economy and the public sector has shrunk considerably. Resultantly the management control of big public sector enterprises stands transferred to the private sector along with some of its ownership e.g. PTCL, and KESC. This transfer of control would be helpful in minimizing PSEs losses.
- Participation of the people in the development project in shape of formation of Citizen Community boards should be encouraged as it promotes community saving and ensures their participation in execution of the projects. It would help in reducing embezzlement of resources and more efficient execution of the projects.

At present the economy is moving with dominant role and active participation of the private sector but the restraints in the form of Legal and Regulatory system, for fair and effective use of economic power, are non-existent. It may result in income disparities, slow poverty alleviation and economic exploitation of the common man. Such injustices may result in resentment, which may get vented through political agitation and crimes in the absence of political process and Legal and Regulatory system. This scenario of poor law and order may prove detrimental for investors from abroad and entrepreneurs. *Thus the provision of proper Legal & Regulatory system for handling private sector is suggested to be in place at the earliest. It is further suggested that an institutional mechanism for ensuring continuity of economic policies and dispelling political uncertainties should be placed in; the sooner it is the better it would be.*

10.2.6 Capital Markets Development:

At present capital markets need to be strengthened by developing long term debt instruments for raising public debt. The launching of long term government bonds in 2000 has solved the situation to some extent. However, the secondary market for these bonds remains to be a source of concern. These PIBs are primarily meant for the non-banking sector and increased appetite by the banking sector is not a healthy development. It is suggested to promote more integrated and deep markets for domestic currency debt instruments in general and for government debt instruments in particular.

10.2.7 Attitudes and Character:

The urgent attention to the national character building, evolving attitudes and modifying orientations should be the top most priority. Nationalism and patriotism have to be inculcated; people should be selfless, should have spirit to sacrifice, committed to the country and should visualize their interests subordinate to the greater national interest. People should be persuaded to lead simple life and develop SAVING HABITS, which will result in enhanced national saving rate that would be good for the economy. Finally, the deteriorating image of the economy is hurting the national interest very badly. It has to be improved on priority to make a difference.

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