IMPACT OF EXTERNAL DEBT SERVICE PAYMENT ON THE INVESTMENT

Impact Of External Debt Service Payment On The Investment Of PAKISTAN

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Abstract

This paper contains the review and impact analysis of external debt servicing on the aggregate investment (cmp\(^1\)) of Pakistan. The Gross Fixed Capital Formation (GFCF) is taken as a proxy of Investment. To analyze, we have used annual debt payments to Multilateral Financial Creditors (loans and credit from the World Bank, Development Banks and Intergovernmental Agencies), Bilateral Creditors, IBRD (non-concessional debt), IDA (concessional debt) and other creditors as variables to establish the relationship with Aggregate Investment (cmp). A simple and sophisticated technique of classical econometrics is used to determine the impact of each kind of debt service payment on our investment. This study determines that there is a substantial impact of loans on Aggregate investment along with the magnitude. Debt servicing practices to Multilateral Financial Creditors and other Private Creditors has a negative impact on our investment while the Bilateral Creditors, IBRD (non-concessional debt) and IDA have shown a positive contribution to the investment. This paper provides information to the Government should go to those External Creditors by which the country investment would save from the negative impacts.

Keywords: Debt Service Payment, GFCF, Multilateral Debts, Bilateral Debts.

\(^1\) cmp (Current Market Price)
1. Introduction

External debt is one of the common elements found in developing countries to finance their deficits. Pakistan is heavily indebted and the major portion of its national income is spent on debt servicing every year. External borrowing is done not only to finance deficits but also to put the economy on the pedals of growth cycle. If debt is utilized efficiently in a well-directed manner then not only the economy comes out of crises but it also grows. In the developing nations lack of basic infrastructure and capital, they need to have these resources necessarily in order to grow and these resources can be purchased by credit taken from developed nations.

Borrowing however has some bad aspects also. Sometimes this debt hampers growth and discourages investment and production. A great amount of foreign exchange reserves is spent on debt servicing accompanied by devaluation of currency that increases import bills. It is necessary to know the magnitude of relationship of growth with the debt service liabilities. Further, the variation in the sources of debt has varying impact on aggregate investment therefore if this impact is measured by a proper methodology and econometric technique it will be easier to determine the source of debt which is more suitable for a country. External finance availability must be consistent with a country’s policy framework that is required for its growth and sustainability of for instance (trade policies, exchange rate policy, interest rate policy, pricing policy, etc.).

The major sources of external credit to Pakistan are Multilateral, Bilateral and other Private creditors along with IBRD and IDA\(^2\) as the special plan purpose loan.

\(^2\) The explanation of all major sources are provided in section 3.2.
providers. Multilateral has until 1998-99 provided 37% of the total aid and about 47% aid on bilateral grounds by Paris club countries. (World Bank)

1.1 Regime Wise Analysis of Debt Servicing

Pakistan became the member of IMF on July 11, 1950. In the regime of 1958 Pakistan went for its very first loan of SDR25 million from IMF however standby loan\(^3\) got cancelled. During General Ayub Khan Regime in 1965 and 1968 two more standby arrangements were made of about SDR125 million. Zulfiqar Ali Bhutto Government took four such standby loans nearly SDR330 million. In the early 80’s IMF changed its policies and passed Extended Fund Facility (EFF)\(^4\) for Pakistan during Zia-ul-Haq regime for three years. This time the debt was as much as three times of all the previous loans amounting to SDR1.27 billion. At the end of 1981 another agreement was signed cancelling the former three year loan agreement. In 1988 IMF presented a new package of loans with conditionality named as Structural Adjustment Program (SAP). SAP asks about currency devaluation, lift trade restrictions, curtail Government expenditures, and dissolve subsidies and price controls as a condition to grant loan. This time more capitalistic economic reforms were introduced and the reason was this IMF’s Structural Adjustment Program (SAP) which was provided to overcome fiscal and external accounts deficit. Both Benazir Bhutto and Nawaz Sharif kept following the IMF designed Macro Economic Policies to run the economy. As per the agreement trade barriers were removed, more open economy was provided to enhance investments, exchange rates were left to market forces and the process of privatization was speeded up. All the above reforms as per

\(^3\) Stand-By Arrangements: The most common type of credit arrangement designed to provide short-term financial assistance. Purchases under Stand-By Arrangements are repayable in 8 quarterly installments 3¼ -

\(^4\) Extended Arrangements: Provide credit for a longer period since these arrangements usually require fundamental reforms which may need more time to put in place and take effect.
the instruction of IMF made the economy vulnerable to shocks consequences of which are evident when the flood of 1992-93 hit the economy more badly. Financial crises in Asia during the same period affected Pakistan’s textile exporting industry. In 1993 Government of Moeen Qureshi took SDR265.4 million loan from IMF. Ms. Bhutto signed Enhanced Structural Adjustment Fund (ESAF) in her second Government. Nawaz Sharif in his second government took $495 million loan. In May 1998 new sanctions were imposed on Pakistan because of its nuclear tests and Pakistan now had to turn again towards the IMF’s enhanced structural adjustment facility and this funds facility extended in 1999 as a result re-scheduling of debts by the creditors of Paris Club and London Club was requested.

In perspective of last decade, General Musharaf signed Poverty Reduction and Growth fund amounting to US$1.3 billion from 2001 to 2004. He succeeded in fulfilling most of the IMF conditions.

1.2 Aftereffects of 9/11 on Debt Servicing Conditions

In the last decade Pakistan is moving towards more and more trade openness because of restrictions imposed by either unilateral creditors or by WTO, IMF and the World Bank. On the basis of demand for high expenditures for the fight against terrorism activities Pakistan has received substantial amount of loans and grants from international financial institutions (IMF, the World Bank, and the Asian Development Bank (ADB)) and other bilateral donors. In 2002, with the assistance of United Nations, Paris Club re scheduled the loan of Pakistan. In 2003, $1 billion bilateral debt of Pakistan was reduced by USA. In 2004, bilateral debt relief of about $500 million was granted. During the same year Pakistan issued $600 million of Islamic bonds which enhanced economic growth. On 8th October, 2005 Pakistan was hit by a
destructive earthquake, thousands of lives were lost and a million of people lost their shelters. It was a massive ruin the International agencies are called on humanitarian grounds for the help of Pakistan. However the GDP growth rate shown 6.6% in fiscal year 2005-06 despite of the earthquake (SBP)\(^5\). Pakistan’s debt sustaining capacity\(^6\) rose to 60% in 2008. Total liabilities increased to $80.7 billion\(^7\). Fiscal deficit became 5.4% of the GDP in 2008-09 mainly because of lower tax collection, high fuel subsidies and support to loss making public enterprises (FBR\(^8\)).

In 2008, Pakistan’s foreign exchange reserves had fallen substantially low and to cushion this effect Pakistan signed 23-month Stand-By Arrangement\(^9\) with the IMF. IMF loan of $11.3 billion was taken with an intention to restore investor’s confidence in economy along with the restoration of macroeconomic stability. Pakistan’s dependence on IMF and other international donors from time to time for economic support has affected the aggregate investment and development in different ways. Due to this economic support the Pakistan had to made 13.6% increase in electricity prices January 2010 that has worsened the productivity of all the manufacturing sectors on which our economy relies.

1.3 Research Hypothesis of Study

Hypothesis of this study is, \(H_0\): No significant relationship between Investment at current market prices (cmp) and external Debt service payment practices. Against the alternative hypothesis \(H_1\): Significant relationship between Investment at current market prices (cmp) and external Debt service payment practices.

\(^5\) Central Bank of Pakistan  
\(^6\) Calculated by the ratio of total debt and liabilities to GDP  
\(^7\) at Rs. 79.5 per dollar  
\(^8\) Federal Board of Revenue  
\(^9\) Purchases under Stand-By Arrangements are repayable in 8 quarterly installments 3 ¼ - 5 years after disbursement.
2. Review Literature

Many empirical studies have explored the effect of external debt services on an important growth component called investment. Findings of these studies were concluded with different results. Following literature review depicted a picture of work which has been done by different researcher on our above said topic.

Safia and Shabbir (2009) investigated the external debt effect on economic growth using a relatively small sample of 24 developing countries over a period of 28 years (1976-2003) and applied random effect and fixed effect estimation. She found that debt servicing to GDP does hamper economic growth and may leave less funds available to finance private investment in these countries leading to a crowding out effect. Author has taken different variables as a proxy to measure economic growth and external debt to GDP ratio as dependent variable.

Alfredo and Francisco (2005) empirically tested the linear or non-linear relationship of external debt and economic growth for 20 Latin American and Caribbean economies over each of the seven 5-year periods between 1970 and 2002. The paper used a dynamic system Generalize Method of Moments (GMM) panel estimator. The result show that lower total external debt levels are associated with higher growth rates and there is an insignificant association between debt service ratios and growth rate of the economy. Also, they found no evidence of non-linear effect on them.

Safdari and Mehrizi (2011) found the influence of five variables Gross Domestic Product, private investment, public investment, external debt and imports on each other in Iran for the period of 1974 to 2007. These effects were analyzed using the Vector Autoregressive Model (VAR). The results showed that external debt and
imports have a negative effect on economic growth. Also, variable of private investment and public investment had a positive effect on economic growth.

Adesola (2009) explored the effect of external debt service payment practices on sustainable economic growth and development with particular emphasis on Nigeria. Data pertaining to 1981 through 2004 were used with the ordinary least square multiple regression model. He examined the impact of external debt with Nigeria’s Gross Domestic Product and Gross Fixed Capital Formation. The empirical results indicated a significant impact of debt services on GDP and GFCF.

Ogunmuyiwa (2011) examined whether external debt actually promotes economic growth in developing countries using Nigeria as a case study. Time series data from 1970-2007 were used with various econometric techniques such as Augmented Dickey Fuller(ADF) test, Granger Causality Test, Johansen Co-integration test and vector error correction method(VECM). According to this study, external debt only helps to exploit the potentials of a country, it does not enhance it. Empirical results have shown clearly that causation between external debt and growth could not be established in the Nigerian context and external debt could thus not be used to forecast improvement or slowdown in economic growth of Nigeria.

Hassan and Butt (2008) tested the relationship between economic growth, trade, external debt, labor force and education in long run and short run for Pakistan over a period of 1975-2005, using Autoregressive Distributed Lag Approach (ARDL) to Co-integration. Evidence presented suggests that total debt is not an important determinant of economic growth either in short run or in the long run. This result indicates that the external debt has not been used productively and efficiently in Pakistan which may be one of the reasons behind the slow economic growth.
Malik et al (2010) tried to measure the impact of external debt on economic performance of Pakistan among 1972 to 2005 by using time series econometric techniques. Results showed that external debt is negatively and significantly related with economic growth it means increase in external debt will lead to decline in economic growth. Debt servicing has also negative impact on GDP growth.

Iyoha (1996) estimated a simulation approach to investigate the impact of external debt on economic growth of Sub-Saharan African countries for the period 1970-1994. An important finding of this study was that rising external debt depresses investment through both a disincentive effect and a crowding out effect. It was found that debt stock reduction would have significantly increased investment and economic growth. He also stressed that debt forgiveness could provide a much needed stimulus to investment recovery and economic growth in Sub-Saharan African countries.

All the above studies have taken debt servicing on aggregate level except Adesola (2009) who has conducted his studies for Nigeria by measuring the impact of debt servicing on GDP and GFCF to Paris club, non-Paris club, multilateral institutions and other promissory notes.

The impact of debt servicing (by different loaning agencies) in the disaggregated form on the Pakistan aggregate investment has not been analyzed yet. In the perspective of Pakistan this paper might provide important guide line for hottest issue so called Debt Services Payment. External credit becomes necessary to meet current, financial and capital account deficits but different creditors have different policies of granting loans. Some loans are bind to be invested on special projects while others provide it, without bothering about where the loan is being allocated and ask for high
rate of return on short term basis. Some agencies provide credit on easy terms with tight macroeconomic policies of their own to be implemented.

In the current study our objective is to test the relationship between the aggregate Pakistan’s investment and external debt service payment, if the relationship exists the second objective would be identify those factors which disturbed the component of investment.

3. Research Methodology

3.1 Data

Appropriate Collection of data is the crucial component of research and the current study belongs to the construction of model estimation of investment in Pakistan which is affected by various types of external debt service payment practices. For this purpose lump sum external debt service payment and principal repayment has been bifurcated into five main variables. In this time series study data range is from 1978 to 2009 and the data for all variables in model has been taken from World Bank, Global Development Finance.

3.2 Model Specification

The study research model for the Investment with five regressors which are mentioned below can be formulate as,

\[ INV_t = f(MDS_t, BDS_t, IDA_t, OTH_{PC_t}, IBRD_t) \] (3.2.1)

Appearing variables in the model (3.2.1) are defined as follows:

MDS = Multilateral Debt Service.

BDS = Bilateral Debt Service.
IDA = International Development Association.

OTH_PC = Other Private Creditors.

IBRD = International Bank of Reconstruction and Development.

INV = Gross Fixed Capital Formation (GFCF) at Current Market Price.

3.3 Multilateral Debt Service

Multilateral loans and credits guaranteed by World Bank and IMF and debt service payments are the sum of principal repayments and interest payments actually made in the year specified. Data set is in terms of current dollars (U.S).

3.4 Bilateral Debt Service

Bilateral lateral loans and credits guaranteed by governments and their agencies (including central banks) and direct loans from official export credit agencies, e.g. loans taken by Paris club member countries. Data set is in terms of current dollars (U.S).

i) International Development Association

This variable includes Debt service payment on the loans and credits guaranteed by the International Development Association (IDA). Data set is in terms of current dollars (U.S).

ii) Other Private Creditors

This variable includes debt service payment on the loans and credits guaranteed by other private creditors Data set is in terms of current dollars (U.S).

iii) International Bank of Reconstruction and Development
This variable includes debt service payment on the loans and credits guaranteed by the International Bank for Reconstruction and Development (IBRD). Data set is in terms of current dollars (U.S).

**(iv) Investment**

Aggregate investment of Pakistan is measured by Gross Fixed Capital Formation (GFCF) at current market prices (cmp) in US Dollars; it includes public as well as private capital investment. The pattern of Response variable (investment) in Pakistan from 1978 to 2008 is shown below.

![Pakistan Aggregate Investment](image)

**Fig: 1 Aggregate Investment in Pakistan from 1978 to 2009**

(Source: World Bank & IMF)

### 3.5 Breusch-Godfrey Test for Autocorrelation

To avoid the limitations of Durbin Watson (DW) statistic for detection of autocorrelation the Breusch-Godfrey (BG) or Lagrange Multiplier (LM) (Lagrange Multiplier) test is used. This test allows following assumptions:
i) Non-stochastic regressors such as lagged value of dependent variable.

ii) Higher order autoregressive scheme such as AR (1), AR (2), …

iii) Simple higher order moving averages of white noise error terms.

The BG test follows the following procedure; we may consider a multiple linear regression with n regressors. Where the residuals $v$ might follow an AR ($p$) autoregressive scheme, as follows:

$$v_t = \rho_1 v_{t-1} + \rho_2 v_{t-2} + \cdots + \rho_p v_{t-p} + \epsilon_t$$  \hspace{1cm} (3.3.1)

The simple regression model is first fitted by ordinary least squares to obtain a set of sample residuals $\hat{\epsilon}_t$. Then the following auxiliary regression model is fitted

$$\hat{\epsilon}_t = \theta_0 + \theta_1 X_1 + \theta_2 X_2 + \cdots + \theta_n X_n + \rho_1 \hat{\epsilon}_{t-1} + \rho_2 \hat{\epsilon}_{t-2} + \cdots + \rho_p \hat{\epsilon}_{t-p} + \epsilon_t$$  \hspace{1cm} (3.3.2)

And if the usual $R^2$ statistic is calculated for the above model, then the following asymptotic approximation can be used for the Chi-square distribution of the test statistic

$$nR^2 \sim X^2_p$$  \hspace{1cm} (3.3.3)

When the null hypothesis $H_0: (\rho_i = 0 \text{ for all } i)$ holds (that is, there is no autocorrelation of any order up to $p$). Here $n$ is sample size available for the second regression that is for $\hat{\epsilon}_t$.

3.6 White General Hetroscedasticity Test

The White General Hetroscedasticity test encounters the all explanatory variables which present in the model and another advantage of this test it is easy to implement.
As an illustration of the basic idea, consider the four steps. In the first step obtain the residuals from the original model. In step 2 run the auxiliary regression of square of residuals on regressor. In step 3 we obtain R-square from the auxiliary regression and multiplied it by sample size (n). In the fourth and last step the null hypothesis ($H_0$: No Heteroscedasticity) is examined by Chi-Square distribution.

When the problem of Heteroscedasticity is identified from above procedure a process of *White’s Heteroscedasticity consistent variance and standard errors* is applied for the removal of this drastic problem.

4. Results And Discussions

The impact of debt service payment practices on Investment taking GFCF as a proxy is analyzed by the given regression model

$$INV_t = \delta_0 + \delta_1 MDS_t + \delta_2 BDS_t + \delta_3 IDA_t + \delta_4 OTH\_PC_t + \delta_5 IBRD_t + \varepsilon_t$$ (4.1)

All the analysis is carried out by the Econometrical software; Envies. In which first we examine our model through the classical econometrical technique in which the autocorrelation is tested by the LM test. The results are reported in table 4.1.

Breusch-Godfrey Serial Correlation LM Test:

<table>
<thead>
<tr>
<th></th>
<th>F-statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obs*R-squared</td>
<td>0.081200</td>
<td>0.778025</td>
</tr>
<tr>
<td></td>
<td>0.103599</td>
<td>0.747553</td>
</tr>
</tbody>
</table>

Table: 4.1 BG or LM test for autocorrelation.
This clearly shows there is no autocorrelation because the p-value is in the acceptance region. After the autocorrelation the Heteroscedasticity is checked by the White general test with cross terms.

White Heteroscedasticity Test:

<table>
<thead>
<tr>
<th>F-statistic</th>
<th>21.19208</th>
<th>P-value</th>
<th>0.000004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obs*R-squared</td>
<td>31.19051</td>
<td>P-value</td>
<td>0.052725</td>
</tr>
</tbody>
</table>

Table: 4.2 White Heteroscedasticity test for Heteroscedasticity with cross terms.

According to the table: 4.2 the p-value lies in the rejection region that is why the present model has the problem of Heteroscedasticity that was removed by the method *White’s Heteroscedasticity consistent variance and standard errors.*

After removal of the problem Heteroscedasticity the final estimated model of Investment is present below:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3720000000</td>
<td>0.0000</td>
</tr>
<tr>
<td>MDS</td>
<td>-5.09</td>
<td>0.0246**</td>
</tr>
<tr>
<td>BDS</td>
<td>7.94</td>
<td>0.0001**</td>
</tr>
<tr>
<td>IDA</td>
<td>168.15</td>
<td>0.0000**</td>
</tr>
<tr>
<td>OTH_PC</td>
<td>-23.65</td>
<td>0.0075**</td>
</tr>
<tr>
<td>IBRD</td>
<td>5.74</td>
<td>0.6934</td>
</tr>
</tbody>
</table>
The equation showing Investment is negatively related to MDS & OTH_PC and positively related to BDS, IDA & IBRD. $R^2$ Reflecting high explanatory power of the independent variables that is 92% of the variation in dependent variable is brought about by independent variables taken in this model. Remaining 8% may be due to other factors that are not included in this model. F-stat is 100% significant showing the overall significance of the model. All the variables are significant at 5% except IBRD. DW statistic is showing no autocorrelation.

5. Conclusion And Policy Implications

This study shows that investment does get affected by debt service payment practices however the affect differs in nature depending on the crediting institute. It is evident from the results that debt services to Multilateral Creditors and other Private Creditors have a negative impact on Pakistan’s Gross Private Capital Investment. Debt from Bilateral Creditors, IDA and IBRD contributes positively for aggregate investment however as per our calculated results the role of IBRD is not significant.

1. Government of Pakistan can enhance aggregate investment by focusing on capital investment which will generate employment opportunities.

2. Debt is considered bad for the economy and more than forty percent of the national income goes in debt servicing as a result the investment opportunities for sustainable economic growth does not attain on satisfactory level.
3. Government is therefore required to think about while taking debt to avoid those factors that further hampers the economic growth via investment.

4. Government should ensure that any dealing with Multilateral and other Private Creditors must be dealt with caution as they cast negative impact on our investment.

5. If credit is taken from multilateral and other private creditors then it shall preferably be accompanied by other tools that might be used to sustain capital investment.

6. Bilateral loans are not bind by macroeconomic policies imposed by the donor countries/agencies but they require high interest rates on short term bases. Our study shows that despite of debt service pressure of such credits Pakistan is facing a positive contribution in Investment through this cannel.
6. References


