CHAPTER - V

IMPACT OF EXTERNAL DEBT ON ECONOMIC GROWTH

One of the most important objectives of the developing countries is to achieve higher and faster rate of economic development. By "underdeveloped", we mean an area or a region or a country which is not rightly industrialised, which is primarily rural, lacks scientific and mechanised agriculture. The term also implies a lack of development of natural resources, modern medical facilities for most of its population, followed by a high mortality rate, poverty and illiteracy. In brief it can be said that the term "underdeveloped" refers to a situation in which the resources of the economy remain unexploited, untapped and underutilized. Economic development implies an increase in real national income, that is, the total volume of goods and services produced in the economy must increase steadily. The per capita income also should increase simultaneously, so that development results in a higher standard of living to the people. It is often associated with certain sectoral changes in the economy and is more often associated with increase in the rate of capital formulation and the growth of per capita output. Thus, development may be viewed as a process with changing variable over long period.

The growth theories propounded by the eminent economists assign a key role to saving. But the less developed countries (LDCs) and the underdeveloped countries lack saving. In most of the developing economies, saving potential is not high enough to meet the growing investments. The demand for
investment-funds is always higher than the saving potential. This
deficit is often met by borrowing both internal and external. The
less developed countries are trying to catch up with the growth
standards of developed countries. These countries are highly
populated have weak infrastructure and the low capital base.
Economic growth is major component of economic development.
It may therefore, be beneficial to achieve economic growth for
economic development. To attain higher and faster rate of
economic growth, the rate of savings in the economy should be
increased to meet the growing investment demand. But as a result
of low per capita income, the level of saving in the economy
remains very low and so is the private capital. Under these
circumstances the under developed countries are compelled to
borrow from abroad.

In spite of the vital implications of external borrowings as
catalyst to growth thus such borrowings become inevitable for
the economic growth. The external debt is helpful in promoting
economic growth and development if the real transfers to the
borrowing country increases over time. It causes so many
hardships for the borrowing country if the trend of the real
transfers is biased to the lending country. Before establishing this
relationship, it is quite imperative to have a view of the
characteristics of the Indian economy as merging economy for
defining economic transition.

Characteristics of Indian Economy

As often the underdeveloped economies are marked by
existence of low per capita income. According to World Bank the
per capita income of India was $ 330 in 1991. It was less than
even one sixtieth of the USA's income. Indian economy is the second largest populated economy in the world after the Chinese. The population of India was 715 million in 1981 and 886 million in 1991. The population is growing at a faster rate. In 2001 the population of India was 1.06 billion which increased to 1.22 billion in 2011 and 1.27 billion in 2015. The rapid growth of population has resulted in a high dependency ratio. In India, percentage of population in the working age group (15-64) was 62.2 percent in 1991 and 65 percent in 2011. This demographic transition is also calls for a rapid economic growth.

There is great inequality in the distribution of income and a widespread poverty is still persisting in India. India presents a picture of contrast. On the one hand, we have people with all resources within their reach and enjoy a luxurious lifestyle, while on the other hand, we have a large section of society who are deprived of basic amenities of life. According to planning commission 29.9 per cent people are living below poverty line. But according the study conducted by Minhas, Jain and Tendulkar (1991) 45.85 per cent of the population was below poverty line. The situation is very alarming and grim in view of new data disclosure by the NITI Aayog.

In underdeveloped economies agriculture plays a dominant role. In India about seventy per cent of the population was dependent on agriculture for its subsistence in 1951. In 1991, 64.7 per cent of the working population was employed in agriculture. The share of agriculture in total GDP was 22.39 percent in 2001, while in 2011 it shifted to 13.94 percent in 2014. Even today, it is hovering around the same level. The most
striking symptom of under development in India is widespread unemployment. Unemployment and under-employment is rampant in every sector of the economy. From 1983 till 2011, Unemployment rates in India averaged 9 percent reaching an all time high of 9.4 percent in December 2010 and a record low of 3.8 Percent in December 2011. There is disguised unemployment in rural areas and white collar unemployment in urban areas. According to Planning Commission, those of the people who looked for full time new employment opportunities in 2014 were around 44.79 million.

Capital is a key factor for enhancing economic growth and development. But India lacks sound capital base. Since the inception of the planning, even, India's saving-investment growth rate have been inadequate. In 1991-92 the rate of domestic saving and domestic capital formation was estimated to be 15.6 and 17.1 per cent respectively. India has also poor quality of human capital. A huge section of the society suffers from deprivation of basic necessities and is illiterate. According to 2011 census of ,the total population 74.8 percent ,are able to read and write.In spite of substantial progress India still backward technology as compared to that of developed countries. The productivity is much low in India. Agriculture is characterized by highly backward techniques. Although in large scale industries and infrastructure sector modern production techniques have been introduced, there remains a gap between the sophisticated production techniques of developed countries and our technology.

In India standard of living is very low as compared to that of developed countries. The basic facilities relating to nutrition, health, housing, clothing etc. are much short and are of low
standard. Rural calorie consumption per day has fallen from 2,221 calories in 1983 to 2047 calories in 2004-05, a decline of 8 per cent. The urban calorie consumption fell by 3.3 per cent from 2,080 calories in 1983 to 2,020 calories in 2004-05. While the rural protein consumption registered a fall of 8 per cent, it remained unchanged in the urban areas. Medical facilities are of low standard and over 50 per cent of the households are living in houses made of mud or unburnt bricks. Another important feature of Indian economy which manifests its underdevelopment is the poor economic organisation. Certain crucial such institutions engaged in mobilising saving and financial markets have been well regulated.

To sum up we can say that India continues to exhibit the basic characteristics of an emerging economy in a new economic order. Economic growth and development can be achieved by increasing the rate of saving and investment. In India domestic resources falls short of meeting the financial requirement of the country we have to rely upon external resources in the form of capital and technical know how. Hence, External Debt is needed to supplement the domestic demand for capital.

**Economic Growth and External Debt**

As noticed, there exists a relationship between real transfers, domestic saving or development and balance of payment. A positive flow of real transfers can be defined as the net inflow of goods and services at current prices (excluding interest payments on foreign loans) from abroad. Underdeveloped economies are characterised by lack of capital. There savings are inadequate to finance the investment demand which is necessary for economic growth. Under-developed economies,
therefore, have to seek capital from abroad. The imports of capital goods brings modern technology accompanied with higher productivity. The imports of goods are conducive to economic growth. The imported consumption goods play an important role in development process in giving an incentive to the progressive upscaling of cultivators from subsistence to the cash economy and increasing specialisation and efficiency. These imports, in the case of insufficient savings, are financed by sourcing borrowings from outside the country. The higher imports may cause the balance of payments problem. Even, when the current account deficit continues to widen, net inflow of loans, and such the flow of real transfer from abroad may cease to grow, especially with a rising interest burden on foreign debt.

External debt to the extent at which the real transfers are positive is conducive to economic growth. It can supplement domestic saving available for capital consumption and accumulation. But when there is huge accumulation of debt and high debt servicing, the real transfers decline. In extreme cases, the real transfer may turn negative (the case of reverse transfer) with or without current account deficit. The argument runs as follows:

\[ RT_t = \text{CAD}_t - iD_t = M_t - X_t \]  

(1)

where
- \( RT_t \) = real transfer to debtor country during period \( t \)
- \( \text{CAD}_t \) = current account deficit during period \( t \)
- \( D_t \) = debt outstanding at the beginning of period \( t \)
- \( i \) = rate of interest on past loans
- \( M_t \) = Value of imports in period \( t \)
- \( X_t \) = Value of exports in period \( t \)
That is, a high interest service may cause real transfer to be negative.

According to Harrod-Domar model the economic growth is a function of marginal propensity to save (s) and incremental capital output ratio. But it can be shown, while keeping the marginal propensity to save and capital output ratio constant, that the rate of GDP in the debtor country is a function of real transfer as

\[ Y_t = C_t + I_t - (X_t - M_t) \]  \hspace{1cm} (2)

From equation (1) we have

\[ X_t - M_t = RT \]  \hspace{1cm} (3)

Putting (3) into (2)

\[ Y_t = C_t + I_t - RT \]

or

\[ Y_t - C_t = S_t = I_t - RT \]

Or

\[ \frac{s}{Y_t} = \frac{I_t - RT}{Y_t} \]

\[ S = Saving \]

\[ s = \text{marginal propensity to save} \]

\[ \frac{1}{Y_t} = \frac{S}{I_t - RT} \]  \hspace{1cm} (4)

Multiplying both sides of eqn. (4) by \( Y \)

\[ \frac{Y}{Y_t} = \frac{sY}{I_t - RT} \]  \hspace{1cm} (5)

Dividing the numerator and denominator of right hand side of
equation (5) by Y.

\[
\frac{Y}{Yt} = \frac{sy}{\frac{It}{Y} - \frac{RT}{Y}} \tag{6}
\]

\(Y\) - Change in GDP

\(k = \frac{It}{Y}\) - incremental capital output ratio

\(\frac{Y}{Y} = g\) - growth rate of GDP

Equation (6) clearly shows that a rise in real transfer (RT) would raise growth rate of GDP (g) provided that marginal propensity to save (sj and capital-output ratio(K) remain constant. Alternatively, decline in the real transfer causes a drop in growth (gj rate.

It is, therefore, necessary that the real transfer must be positive and increasing, if the rate of growth of GDP is to be increased. For maintaining the real transfer to be positive and increasing, it is required that debt service burden must be small.

\(RT = CAD - ID = D - (a+i) D\)

For \(RT > 0\), We need

\(D - (a+i)D > 0\)

or \(D/D > a + i\) where \(a =\) amortisation

or \(r > a + i\) \(\tag{7}\)

\(r =\) growth rate of gross inflow of capital

If the debt servicing is exceptionally heavy, it may pose serious implications for the debtor economy. The country may be caught in the 'debt trap- a situation where fresh (gross) borrowings, are no longer available for import financing.
Thus there is a relationship between the external debt and economic development. The external borrowings affect economic development of trade deficit economies both way. It may increase the growth rate of GDP. When contracted with utmost care and may hinder the economic development when the rate of foreign borrowing is high and debt service burden is intolerable.

**Dual Gap Model and External Borrowings**

In an open economy, when domestic savings prove to be inadequate and insufficient in relation to the targetted rate of growth, then these domestic savings can be supplemented by many kinds of external assistance. The 'Dual Gap Model basically explains the role of foreign borrowing in the development process.

In national income accounting

\[
\text{Income} = \text{Consumption} + \text{Import} + \text{Saving}
\]

\[
Y = C + M + S
\]

Output = Consumption + Export + investment

\[
Y = C + X + I
\]

Since income = output

Then

\[
C + M + S = C + X + I
\]

\[
M + S = X + I
\]

\[
I - S = M - X
\]

Investment - Saving = Imports - Exports

That is an excess of investment over domestic saving is equivalent to a surplus of imports over exports. An import surplus financed by foreign borrowing supplement domestic saving directly or indirectly by providing foreign exchange to buy imports which could be capital goods substitutes for
domestically produced consumer goods.

Notice that in accounting term the amount of foreign borrowing required to supplement domestic savings is the same whether the need is just for more resources for capital formation or for imports as well. The identity between the two gaps \((I-S)\) and \((X-M)\) follows from the nature of the accounting procedures. It is a matter of arithmetic that if a country invests more than it saves, a balance of payments deficit will result or to put it differently, excess of imports over exports necessarily implies an excess of resources used by an economy over resources supplied by it or an excess of investment over saving. There is no reason in principle, however, why the two gaps should be equal ex ante (in a planned sense) i.e. that plans to invest in excess of planned saving should exactly equal plans to import in excess of plans to export. This is the starting point of dual gap analysis.

To understand the mechanism of the dual gap analysis, start with a particular target rate of growth and to achieve this target growth rate, the savings and import of investment goods are required. The Harrod-Domar growth model explains the relation between growth, and savings expressed in terms of incremental capital-output ratio \((R)\) which is the reciprocal of the productivity of capital.

\[
g = \frac{S}{C}
\]

or

\[
g = SP
\]

where

\[
g = \text{growth rate of income} \\
S = \text{saving ratio} \\
P = 1/C
\]

Similarly, the relation between growth and investment
goods, inputs is expressed in terms of incremental capital import ratio (m') i.e. \( g = i \cdot m' \)

where \( i = \text{import ratio} \), given \( P \) and \( m' \). An increase in \( g \) requires an increase in \( S \) and \( i \) of target ratio of growth, then the required saving ratio \((S^*)\) to achieve that target growth is

\[
S^* = \frac{r}{P}
\]

and the required import ratio \((i^*)\) is

\[
i^* = \frac{i}{m'}
\]

If domestic saving is calculated to be less than the level necessary to achieve the target growth rate, there is said to exist a saving investment gap equal to \( S^*-S \). Similarly, if minimum import requirements to achieve the target growth are calculated to be greater than the maximum feasible level of exports, there is said to exist an export-import or foreign exchange gap equal to \( i - i^* \). In the absence of foreign borrowing growth will proceed at the highest rate permitted by the most limiting factor. If the biggest gap is the \( S-I \) gap, then growth is limited by the availability of domestic savings and is said to be investment limited.

If the biggest gap is the foreign exchange gap then the growth is limited by availability of foreign exchange and is said to be trade limited. Traditionally, the role of foreign borrowing was to supplement deficient domestic savings. But the distinctive contribution that has been made by dual gap model to the development theory is that, if foreign exchange is the dominant constraint, it points to the additional role of foreign borrowing in supplementing foreign exchange, without which a fraction of domestic savings might go unutilised, because actual growth would be constrained by the inability to import necessary imports. To put it more precisely, if foreign exchange gap is the
larger, so that, \((i^* - i)m' (S^* - S)P\), growth cannot proceed at the rate \(SP\), must proceed at a lower rate \(im^1\).

If \(P\) is given, a fraction of \(S\) go unused. It may be further stressed since growth is limited by the larger of two gaps, foreign borrowing is only required to meet the larger of the two gaps. If the \((X-M)\) gap is the larger, then foreign borrowing to fill it will also fill the \((S-I)\) gap since investment goods can come either from home or abroad. If the \((s-g)\) gap is the larger, the foreign borrowing to fill it will obviously cover the smaller exchange gap.

**Implications of Foreign Borrowings**

Although external debt plays an important role in economic growth provided that contracted in reasonable limits. It places several challenges before the developing countries but there is no precise criteria for determining this limit. The foreign borrowings generate the problem of debt servicing, balance of payment crisis, deficiency of foreign exchange etc.

The problems created by the foreign borrowings can be recognised by relating the foreign borrowings and debt servicing to macro economic magnitudes such as GNP, Exports of Goods and services, foreign exchange holdings, domestic saving, investment and the like. Foreign Borrowings will exert positive impact on domestic saving if the rate of interest on foreign borrowings is less than the productivity of capital. Income will increase because of high productivity, therefore, saving being a function of income will also increase.

In the development of a country exports play a key role. They earn foreign exchange which can be utilised to imports that
are conducive to economic growth. The external borrowing and debt servicing affect the magnitude of foreign exchange. If the larger part of the exports absorbed by debt servicing, less foreign exchange will be available for necessary imports and even for servicing the debt for future. The debt servicing capacity of nation is important for contracting future loans. The lenders take serious review of debt service capacity while extending the loans. The debt of a country is 'sustainable if the proportion of debt to exports continue to decline and vice versa.

The large magnitude of debt in proportion to gross national product have also very serious implication in the economy of the debtor country. The country may even fell into debt trap. Whether debt as a proportion of national income is rising or falling depends not only on interest rate but also on the relation between the average and marginal saving ratios. Consider two extreme - one if the saving are equal to investment and the rate of interest is greater than the rate of growth of income, then debt as a proportion of income will rise. Second, if savings exceeds investment by just enough to meet interest payments on past loans, there will be no increase in the net indebtedness.

Between these two extremes, given the size of the debt in relative to national income and a marginal saving ratio greater than investment ratio, the external debt and national income will increase at some critical rate of interest. Assuming no debt at the beginning of the period this critical rate of interest can be expressed as a function of initial and marginal saving ratios, the capital output ratio and the desired growth rate by the formula:

\[ i = \frac{i(So - S')}{So - Cr} \]
where

\[ r = \text{desired growth rate} \]
\[ S_Q = \text{initial saving ratio} \]
\[ C = \text{capital output ratio} \]
\[ S' = \text{Marginal saving ratio} \]

If this critical rate of interest is exceeded, the debt could well become unmanageable in the sense of being unserviceable by further borrowing (debt trap).

There is no doubt that the investment and imports are conducive to economic growth. In the wake of the insufficient savings at home, heavy external borrowings take place. These imports and heavy debt arise the problem of balance of payments which further enhance the indebtedness of the country. The growing current account deficit must be financed. The indebtedness of the country will grow as current account deficit increases. Thus it may safely be inferred that despite its crucial role in the development process external debt is not without tear. It require some reservations to be taken into account, while contracting the foreign loans.

India after independence opted for a path of economic development based on centralized planning with a leading role assigned to the external debt on the consideration that it shall be used for planned investment to achieve rapid economic growth. Given the current drive towards incurring external debt, it is important to ask how external debt may influence economic growth. What evidence exists on the direct relationship between external debt and economic growth is conflicting at best and lacks for the most. The same may be said for the theoretical
development and empirical evidence on the relationship between external debt and investment and the indirect effect of external debt on economic growth through investment. If public debt negatively influences economic growth directly or indirectly then policymakers need to be aware of these relationships when formulating and implementing macroeconomic policy. On the other hand, if debt enhances economic growth, or at a minimum does not present obstacles to capital formation and hence growth, the case for public debt is strengthened and policymakers need to focus their attention on the potential influences of public debt. However, it is important for overall macroeconomic policy to manage the debt and it needs to be coordinated closely with fiscal, monetary and other macroeconomic policies. An attempt has been made to correlate the relationship between external debt and economic growth which is a much debated issue. There is no agreement among economists either on analytical grounds or on the basis of empirical results whether financing government expenditure by incurring debt is good, bad or neutral in terms of its real effects, particularly on investment and growth. Among the mainstream analytical perspectives, the classicists viewed external debt as burden on the society; the neoclassical economists viewed external debt detrimental to investment and growth and the Ricardian view consider government debt equivalent to future taxes (Barro 1974) which implies neutrality of debt to growth; but in the Keynesian paradigm, it constitutes a key policy prescriptive. While the neoclassical and Ricardian schools focus on the long-run, the Keynesian view emphasizes the short-run effects.

In light of the above theoretical backdrop, this chapter
makes an attempt to analyze whether external debt has direct impact on capital formation (investment) and on economic growth? Finally, whether the external debt has a potential indirect influence on economic growth through its impact on investment, i.e. to examine the proposition that the static efficiency of external debt have a corresponding dynamic effect in the arena of economic growth?

External Debt, Investment and Growth in India

An understanding of the behavior of external debt is important for considering its impact on investment and hence on growth. In this section, we look at the trends over the period between (1981-2011), which span both the pre and post reform period, helps us understand the relationship between debt and growth in India economy.

Table-5.1 shows nominal value of Gross Domestic Product (GDP), total external debt, public debt and investment for the period from 1981 to 2014. The table shows that the value of total liabilities of Government of India has increased more than 63 times between 1980-81 and 2013-14 and the growth rate of total debt averages about 16.3 percent per annum during the same period.
Table-5.1: Relationship between External debt and the Economic Growth

<table>
<thead>
<tr>
<th>Year</th>
<th>GDPmp GDP Growth Rate</th>
<th>Total External Debt</th>
<th>External Debt Growth Rate</th>
<th>Public Debt</th>
<th>Public Debt Growth Rate</th>
<th>Investment</th>
<th>Investment Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981-82</td>
<td>178505 17.51</td>
<td>68186 14.1</td>
<td>47981 13.8</td>
<td>33303</td>
<td>18.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982-83</td>
<td>196644 10.16</td>
<td>84872 24.5</td>
<td>60621 26.3</td>
<td>37522</td>
<td>19.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1983-84</td>
<td>229021 16.46</td>
<td>95261 12.2</td>
<td>65383 7.9</td>
<td>41756</td>
<td>18.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1984-85</td>
<td>256611 12.05</td>
<td>113441 19.1</td>
<td>75174 15.0</td>
<td>49078</td>
<td>19.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985-86</td>
<td>289524 12.83</td>
<td>137484 21.2</td>
<td>89192 18.6</td>
<td>59648</td>
<td>20.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1986-87</td>
<td>323949 11.89</td>
<td>166546 21.1</td>
<td>106611 19.5</td>
<td>65048</td>
<td>20.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1987-88</td>
<td>368211 13.66</td>
<td>195561 17.4</td>
<td>121869 14.3</td>
<td>80532</td>
<td>21.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1988-89</td>
<td>436893 18.65</td>
<td>229771 17.5</td>
<td>140244 15.1</td>
<td>99796</td>
<td>22.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1989-90</td>
<td>501928 14.89</td>
<td>268192 16.7</td>
<td>161536 15.2</td>
<td>119009</td>
<td>23.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990-91</td>
<td>586212 16.79</td>
<td>314558 17.3</td>
<td>185529 14.9</td>
<td>152604</td>
<td>26.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1991-92</td>
<td>673875 14.95</td>
<td>354662 12.7</td>
<td>209698 13.0</td>
<td>146907</td>
<td>21.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992-93</td>
<td>774545 14.94</td>
<td>401924 13.3</td>
<td>241369 15.1</td>
<td>178437</td>
<td>23.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1993-94</td>
<td>891355 15.08</td>
<td>477968 18.9</td>
<td>293057 21.4</td>
<td>197785</td>
<td>22.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1994-95</td>
<td>1045590 17.30</td>
<td>538611 12.7</td>
<td>317396 8.3</td>
<td>258561</td>
<td>24.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995-96</td>
<td>1226725 17.32</td>
<td>606232 12.6</td>
<td>359118 13.1</td>
<td>310045</td>
<td>25.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1996-97</td>
<td>1419277 15.70</td>
<td>675676 11.5</td>
<td>398715 11.0</td>
<td>336125</td>
<td>23.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997-98</td>
<td>1572394 10.79</td>
<td>778294 15.2</td>
<td>444330 11.4</td>
<td>402092</td>
<td>25.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998-99</td>
<td>1803378 14.69</td>
<td>891806 14.6</td>
<td>516950 16.3</td>
<td>436521</td>
<td>24.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999-00</td>
<td>2012198 11.58</td>
<td>1021029 14.5</td>
<td>772691 19.5</td>
<td>538834</td>
<td>26.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-01</td>
<td>2168652 7.78</td>
<td>1168541 14.4</td>
<td>869643 12.5</td>
<td>528299</td>
<td>24.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001-02</td>
<td>2348330 8.29</td>
<td>1366408 16.9</td>
<td>984607 13.2</td>
<td>571146</td>
<td>24.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002-03</td>
<td>2530663 7.76</td>
<td>1559201 14.1</td>
<td>1080301 9.7</td>
<td>627743</td>
<td>24.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003-04</td>
<td>2837900 12.14</td>
<td>1736678 11.4</td>
<td>1187830 10.0</td>
<td>762416</td>
<td>26.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004-05</td>
<td>3242209 14.25</td>
<td>1994421 14.8</td>
<td>1336849 12.5</td>
<td>1064041</td>
<td>32.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005-06</td>
<td>3693369 13.73</td>
<td>2260145 13.3</td>
<td>1484001 11.0</td>
<td>1279754</td>
<td>34.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006-07</td>
<td>4294706 16.28</td>
<td>2538596 12.3</td>
<td>1647691 11.0</td>
<td>1531433</td>
<td>35.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007-08</td>
<td>4987090 16.12</td>
<td>2837425 11.8</td>
<td>1920390 16.6</td>
<td>1900762</td>
<td>38.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008-09</td>
<td>5630063 12.89</td>
<td>3159178 11.3</td>
<td>2151595 12.0</td>
<td>1931380</td>
<td>34.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009-10</td>
<td>6457352 14.69</td>
<td>3517845 11.4</td>
<td>2477263 15.4</td>
<td>2363670</td>
<td>36.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010-11</td>
<td>7674148 18.84</td>
<td>3931105 11.7</td>
<td>2898799 15.2</td>
<td>2692031</td>
<td>35.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011-12</td>
<td>8912178 16.13</td>
<td>4352689 10.7</td>
<td>3281465 14.7</td>
<td>2700754</td>
<td>32.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012-13</td>
<td>9809722 10.9</td>
<td>4706232 12.7</td>
<td>4625874 14.9</td>
<td>2711434</td>
<td>39.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013-14</td>
<td>10885073 10.8</td>
<td>5577824 13.6</td>
<td>4460472 13.6</td>
<td>3887761</td>
<td>43.38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Data for 2013-14 are Revised Estimates and data for 2013-14 are Budget Estimates.

**Source:** Computed from the data available in Indian Public Finance Statistics, 2013-14 and Economic Survey 2013-14
It is important to know the relationship of external debt with that of investment and growth. Figure-5.1 gives an overview of trends in growth rates of total debt, GDP and investment for the period 1981 to 2014. It can be seen that the debt position of the government has somehow impacted the total investment of the economy in India. As a proportion of GDP, investment rate stood at 43.38 percent during the period 2013-14. This had reached an average of 26.22 percent during the entire period of under study i.e 1981-2013-14. In the long run there would be a limit to growth of investment and as debt amount rises. The relative growths of government debt and GDP during the years 1981-82 to 2013-14 were about 16.3 and 15.6 percent per annum respectively.

Figure-5.1 GDP Growth, Total External Debt Growth ,Public Debt Growth and Investment Growth-1980-2014
Note-Figure draw on the basis of data source –World Bank and Budget Estimates

The Model and its Empirics

In this section, we extended a theoretical model to examine
the influence of external debt on investment and hence on economic growth. Accordingly our objectives are first to account for the direct relationship between public debt and economic growth, and second, to incorporate the potential influence of external debt on investment into the aggregate production function; and therefore examine the indirect influence of external debt on economic growth through its impact on investment.

**External debt, Investment and Growth Model:**

Following Mankiw, Romer, and Weil (1992), an attempt has been made in this study to develop an augmented Solow (1956) neoclassical model of economic growth, which includes, among other variables, the accumulation of physical capital and human capital to examine the influence of external debt and this model has also been extended the model by assuming that the technological progress can be disaggregated into exogenous technical progress, the direct effect of external debt on economic growth, and the effect of external debt on investment. By augmenting the model, it examine how external debt may indirectly influence economic growth through investment channel. We note that the disaggregation of the exogenous technical progress term is consistent with the literature and adheres to the conditional convergence hypothesis.

It has assumed a Cobb-Douglas production function for the entire economy and so that the production at time $t$ is given by

$$Y_t = V_t K_t^a H_t^\beta L_t^{1-a-\beta} \quad (1)$$

Where, $a, \beta > 0$ and $a + \beta < 1$. $Y_t$ is output, $V_t$ the technological progress and other institutional factors, $L_t$ is the labor, and $K_t$ and $H_t$ are the stocks of physical and human capital.
at time \( t \), respectively.

Again it defines \( V_t \) as the product of the level of technology (exogenous) and other institutional factors at time \( t \) or

\[
V_t = A_t D_t I_t \; \ldots \ldots \ldots \ldots \ldots \ldots \ldots (2)
\]

Where \( A_t \) is the level of technology (exogenous), \( D_t \) is the level of external debt, and \( I_t \) measures investment and the level of capital formation. Note that \( D_t \) is synonymous with the direct effect of external debt on output. If external debt indirectly influences output through its impact on capital formation, then it will indirectly influence economic output through it. While the primary focuses is the indirect influence of external debt on economic growth through its impact on investment.

It further assumed that \( L_t \) and \( A_t \) grow exogenously at rates \( n \) and respectively, and that the investment \( (I_t) \) is a function of, among other things, public debt or

\[
l_t = f(D_t Z_t) \; \ldots \ldots \ldots \ldots \ldots \ldots (3)
\]

Where, \( Z_t \) is a set of control variables including economical, institutional and social variables. At this time, for theoretical simplicity, it assume that \( D_t \) is uncorrelated with \( Z_t \).

Let \( s_k \) be the fraction of income invested in physical capital and \( s_h \) be the fraction of income invested in human capital. Thus the evolution of the economy can be determined by

\[
K_t = s_k y_t - (n + \rho + \delta) k_t \; \ldots \ldots (4)
\]

\[
h_t = s_h y_t - (n + \rho + \delta) h_t \; \ldots \ldots (5)
\]

Where \( y = Y/L \), \( k = K/L \) and \( h = H/L \) are quantities per effective
unit of labor. These are under the assumption that same production function and same rate of depreciation applies to physical and human capital. In addition, each one is subject to decreasing returns to scale that no combination of capital inputs exhibits constant returns. This implies that the economy, over the long-run, will tend to remain productive at constant physical capital-labor and human capital-labor ratios. Thus once steady state output is achieved, additional increases in output can only be achieved through increases in capital productivity and thus increases in the level of external debt (assuming that the overall effect of external debt on economic growth is positive). From this perspective public debt may affect output through two channels, a potential direct effect on output in defined channel, and a series of potential indirect effects, one of which is investment channel.

Now to determine the influence of external debt on economic growth, an attempt has been made we must first determine the steady state levels of the physical inputs specified in the production function. Equations (6) and (7) imply that the economy converges to a steady state defined by

$$k^* = \left( \frac{s_k^{1-\beta} - s_q^\beta}{n + \rho + \delta} \right)^{\frac{1}{1-\alpha}} \ldots (6)$$

$$h^* = \left( \frac{s_k^\alpha s_q^{1-\alpha}}{n + \rho + \delta} \right)^{\frac{1}{1-\alpha}} \ldots (7)$$

Expanding $V_t$ and substituting (6) and (7) into the production function (equation 1) and taking the natural logarithm gives an equation for output per capita as
\[
\ln y_t = \ln A_t + \ln D_t + \ln I_t + \frac{a}{1-a-\beta} \ln s_k + \frac{\beta}{1-a-\beta} \ln s_h - \frac{a+\beta}{1-a-\beta} \ln (n + \rho + \delta). (8)
\]

Thus, this equation shows how steady state per capita output depends on the accumulation of reproductive capital, the technology, the direct effect of external debt on output, and the indirect effect of external debt on economic growth through the investment channel.

**Specification of Econometric Model for Empirical Estimation**

In other perspective, the task of determining whether the empirical support exists for the hypothesis of the possible indirect effects of External debt on economic growth. Towards this end, it employed a time series data set for the period 1981-2014 from Indian Public Finance Statistics and Economic Survey published by Ministry of Finance, Government of India as the data source.

In order to perform an in-depth analysis of the debt-investment-growth relationship, it is better to disentangle the debt-growth nexus in a two-step relationship, in which the first is the direct link between debt and investment, and the second is the usual growth equation. We first study an investment model, as done, among others, by Cohen (1993) and Clements et al. (2003).

**External Debt and Investment**

Hence, the investment model is represented by equation (6) in which the dependent variable \((I_t)\) is the investment ratio. Following Cohen (1993) and Clements (2003), it has hypothesized that the investment rate is determined by the rate of
economic growth, the growth of the money supply, and, among things we included level of public debt as:

\[ I_t = \beta_0 + \beta_1 D_t + \beta_2 M_t + \beta_3 Y_t + \beta_4 T_t + \beta_5 R_t + U_t, \ldots \ldots \ldots \ldots \] \[6\]

Where \( I \) is the investment ratio, \( D \) is the level of external debt, \( M \) is the measure of \( M_3 \) as a percentage of GDP, \( Y \) is GDP; \( T \) and \( R \) are additional control variables: openness to international trade (as proxied by export and import entities are expressed in log neutral perspective as percent of GDP) and the real interest rate respectively. It also noted that the presence of serial correlation in the error terms when the base equation is estimated in levels. After stationarity (if they are non-stationary) of the observation, OLS method of estimation for the relationship between debt and investment was used in this perspective. The rationale of this specification lies in the expected positive effect that the degree of openness, level of debt and the level of GDP have on the investment decisions. The interest rate is expected to have a negative impact [Barro and Sala-i-Martin (2004) and Cohen (1993)].

**Debt, Investment and Growth**

The question of effect of the external debt on economic growth. The theoretical model suggested that a direct relationship between external debt and economic growth is possible, yet the question remains whether the relationship can be empirically substantiated in a fully specified model that controls, among other things, for the indirect effect of external debt on economic growth. Thus, the base equation for growth is specified as:

\[ Y_t = \beta_0 + \beta_1 D_t + \beta_2 I_t + \beta_3 H_t + \beta_4 T_t + \beta_5 P_L t + U_t, \ldots \ldots \ldots \ldots \] \[7\]

Where \( Y \), \( D \) and \( I \) are as previously discussed; and \( H \) is
human capital as proxied by gross enrolment ratio; T and PL are additional control variables: openness to international trade (as proxied by ratio of export & import to GDP) and growth of population.

Unit root tests

Both the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests are applied for all the variables by taking null hypothesis as 'presence of unit root' (i.e. presence of non-stationarity) against the alternative hypothesis 'series is stationary'. If the absolute computed value exceeds the absolute critical value, then it rejects the null hypothesis and conclude that series is stationary and vice-versa. The ADF and PP tests results are carried out using without trend and with trend and depicted in Table 5.3 and 5.4.

The result in the table 5.4 shows that all the variables were not stationary in levels. This can be seen by comparing the observed values (in absolute terms) of both the ADF and PP test statistics with the critical values (also in absolute terms) of the test statistics at the 1% and 5% level of significance. Result from the table provides strong evidence of non stationarity. Therefore, the null hypothesis is accepted and it is concluded that there is a presence of unit root in the variables at levels, following from the above result, all the variables were differentiated. These results are reported in table 5.4
Table-5.2: Result of Unit Root Tests at 0.05 or 0.01 Levels

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>INTERCEPT ALONE</th>
<th>INTERCEPT+TREND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ADF PP</td>
<td>ADF PP</td>
</tr>
<tr>
<td>D</td>
<td>4.879 -5.591</td>
<td>-1.791 -2.2221</td>
</tr>
<tr>
<td></td>
<td>(3.598) (3.944)</td>
<td>(4.285) (4.312)</td>
</tr>
<tr>
<td>Y</td>
<td>-0.905 -0.494</td>
<td>-1.940 -1.470</td>
</tr>
<tr>
<td></td>
<td>(3.699) (3.689)</td>
<td>(4.339) (4.323)</td>
</tr>
<tr>
<td>I</td>
<td>-0.009 -0.123</td>
<td>-3.252 -2.534</td>
</tr>
<tr>
<td></td>
<td>(3.689) (3.689)</td>
<td>(4.415) (4.323)</td>
</tr>
<tr>
<td>M</td>
<td>-0.153 -0.669</td>
<td>-3.010 -1.730</td>
</tr>
<tr>
<td></td>
<td>(3.699) (3.689)</td>
<td>(4.339) (4.323)</td>
</tr>
<tr>
<td>T</td>
<td>0.918 0.744</td>
<td>-2.511 -2.623</td>
</tr>
<tr>
<td></td>
<td>(3.689) (3.689)</td>
<td>(4.323) (4.323)</td>
</tr>
<tr>
<td>R</td>
<td>-2.235 -1.673</td>
<td>-2.688 -1.948</td>
</tr>
<tr>
<td></td>
<td>(3.689) (3.689)</td>
<td>(3.580) (3.580)</td>
</tr>
<tr>
<td>PL</td>
<td>-5.519 -7.0005</td>
<td>1.191 2.691</td>
</tr>
<tr>
<td></td>
<td>(3.4333) (3.680)</td>
<td>(4.115) (4.290)</td>
</tr>
</tbody>
</table>

* Significant at 1 per cent level of significance
** Significant at 5 per cent level of significance.
Table-5.3: Result of Unit Root Tests at Differences

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>INTERCEPT ALONE</th>
<th>INTERCEPT+TREND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ADF</td>
<td>PP</td>
</tr>
<tr>
<td>D</td>
<td>-4.002</td>
<td>-4.200</td>
</tr>
<tr>
<td></td>
<td>(3.512)*</td>
<td>(3.519)*</td>
</tr>
<tr>
<td></td>
<td>(3.699)*</td>
<td>(3.699)*</td>
</tr>
<tr>
<td>I</td>
<td>-4.060</td>
<td>-5.922</td>
</tr>
<tr>
<td></td>
<td>(3.788)*</td>
<td>(3.699)*</td>
</tr>
<tr>
<td>M</td>
<td>-3.142</td>
<td>-3.204</td>
</tr>
<tr>
<td></td>
<td>(3.699)*</td>
<td>(2.976)***</td>
</tr>
<tr>
<td>T</td>
<td>-3.509</td>
<td>-3.455</td>
</tr>
<tr>
<td></td>
<td>(3.699)*</td>
<td>(3.699)*</td>
</tr>
<tr>
<td>K</td>
<td>-3.369</td>
<td>-2.600</td>
</tr>
<tr>
<td></td>
<td>(2.986)***</td>
<td>(2.629)***</td>
</tr>
<tr>
<td></td>
<td>(3.699)*</td>
<td>(3.699)*</td>
</tr>
<tr>
<td>PL</td>
<td>-0.307</td>
<td>-2.432</td>
</tr>
<tr>
<td></td>
<td>(3.699)*</td>
<td>(3.676)*</td>
</tr>
</tbody>
</table>

* Significant at 1 per cent level of significance

** Significant at 5 per cent level of significance.
The table reveals that all the variables were stationary at first difference, on the basis of this, the null hypothesis of non-stationarity is rejected and it is safe to conclude that the variables are stationary. This implies that the variables are integrated of order one, i.e. I(1).

Regression Results

Finally, the regression result of equation-[6] and equation-[7] is reported below in Table 5.4 and 5.5 respectively.

Table 5.4:
Econometric Estimates: Relationship between External Debt and Domestic Investment

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>t-statistics</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.164141</td>
<td>1.616787</td>
<td>0.1202</td>
</tr>
<tr>
<td>External Debt</td>
<td>0.82979**</td>
<td>2.120376</td>
<td>0.1853</td>
</tr>
<tr>
<td>GDP</td>
<td>1.782963*</td>
<td>2.828439*</td>
<td>0.0101</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>-0.276502**</td>
<td>2.421436</td>
<td>0.0242</td>
</tr>
<tr>
<td>M3 (% of GDP)</td>
<td>-0.11392</td>
<td>0.115107</td>
<td>0.9095</td>
</tr>
<tr>
<td>Openness to International Trade</td>
<td>0.113379</td>
<td>0.458886</td>
<td>0.6510</td>
</tr>
<tr>
<td>R- squared (Adjusted-R²)</td>
<td></td>
<td>0.3798 (0.2678)</td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td></td>
<td>2.3111</td>
<td></td>
</tr>
</tbody>
</table>

Source: Results are based on Table 5.1

* Significant at 2 per cent level of significance
** Significant at 5 per cent level of significance.

The table shows the estimates when external debt is associated with investment. To this objective, the most important result of the econometric estimates is the positive and statistically significant (at 2% level) relationship between external debt and the rate of investment. The estimated coefficient for external debt also appears to be robust to the
inclusion of other regressors; M, Y and other additional control variables such as T and R. Thus it appears that while the external debt does not affect investment harm fully.

The other controlling variables such as GDP and interest rate have shown the expected positive significant and negative significant relationship with the investment respectively. However, the openness to international trade supported the expected outcomes while the coefficients remain insignificant and thus no defining relationship is noticed between the External debt and the GDP growth numbers and the interest rates in the home country. And these specifications explain almost 38 percent of the variation in the rate of investment during the sample period.

**Table 5.5**

*Econometric Estimates: Relationship between the External Debt and the Economic Growth.*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>t-statistics</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.046372</td>
<td>-0.913243</td>
<td>0.3710</td>
</tr>
<tr>
<td>External Debt</td>
<td>0.072966*</td>
<td>2.343111</td>
<td>0.1213</td>
</tr>
<tr>
<td>Investment</td>
<td>0.110090**</td>
<td>2.044130</td>
<td>0.0531</td>
</tr>
<tr>
<td>Gross Enrolment Ratio</td>
<td>0.554489**</td>
<td>2.206547</td>
<td>0.0381</td>
</tr>
<tr>
<td>Openness to International Trade</td>
<td>0.131302*</td>
<td>2.438039</td>
<td>0.0233</td>
</tr>
<tr>
<td>Population</td>
<td>2.226659</td>
<td>1.731784</td>
<td>0.0973</td>
</tr>
<tr>
<td>R- squared (Adjusted-R )</td>
<td></td>
<td>0.4333 (0.2747)</td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td></td>
<td>2.0459</td>
<td></td>
</tr>
</tbody>
</table>

Source: As for Table 5.5

* Significant at 2 per cent level of significance
** Significant at 5 per cent level of significance.
The table shows the estimates when external debt is associated with the economic growth. The most important result of the econometric estimates is positive and statistically significant between the external debt and the economic growth. The estimated coefficient for external debt also appears to be robust to the inclusion of additional control regressors: T and PL. The other controlling variables such as investment, gross enrolment ratio, openness to international trade and growth of population have shown the expected positive and significant relationship with the GDP growth. And these specifications explain 47 percent of the variation in growth in the sample period.

CONCLUSION

The foregoing analysis in the boundary of external debt and economic growth points that, external debt appears to have enhanced the rate of investment, and econometric estimates also verify that a positive relationship exists between investment and economic growth. Thus, an increase in the level of external debt, when other variables remain equally disposed would induce the rate of investment over time and, in turn, indirectly enhance economic growth. It is based on the premise that this first evidence on the indirect influence of external debt on economic growth is intriguing as it supports the contention that external debt has also an indirect effect on the economic growth through its beneficial impact on the investment. Thus, it has magnified the rate of growth in GDP numbers in the Post – liberalised era.