

# THE IMPACT OF EXTERNAL DEBT ON ECONOMIC GROWTH IN ETHIOPIA

Abinet Gebrekidan<sup>1</sup>

## *Abstract*

*A group of low-income countries classified as HIPCs have continued to experience difficulties in managing and servicing their huge stocks of external debt. Most of these countries including Ethiopia are in sub-Saharan Africa. The relatively high level of Ethiopia's external indebtedness and rising debt burden has serious implications on the country's development and debt sustainability initiatives. While the economic performance continue to deteriorate, there have been significant net outflow of resources to meet the debt obligations.*

*The study pin downs vital role of the emerging field of external debt and debt indicators in the Ethiopian economy with emphasis on empirical relationship of external debt and economic growth over the period 1963/64-2003/04. In doing so, this paper examines the magnitude and structure of the country's external debt, and its impact on economic growth across its three economic regimes. Using time series data for the same period, the empirical results indicated that past external debt accumulation has a negative impact on economic growth. Debt servicing also appears to affect economic growth adversely.*

*Several policy implications emerge from the study. The simultaneous attainment of sustainable levels of economic growth and external debt appear difficult at the moment and could remain elusive if aggressive measures are not undertaken. The results obtained from this study support the need for Ethiopia to be considered for comprehensive debt relief measures. In addition, creating credibility including political will to reforms is required to spur investor confidence for both local and foreign investments.*

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<sup>1</sup> Adama University  
E-mail: abinetgk@yahoo.com

## 1. Introduction

Perhaps one of the most important constraints on the resumption of growth in Ethiopia has been the external debt burden. Ethiopia is one of the developing countries classified as HIPCs. The external debt of the country which was 1344.7 million Birr in 1970 rose to 30212.7 million Birr in 1996. These were about 151.8 percent and 1139.8 percent of the export earnings of Ethiopia respectively for these years. External debt as a percentage of GDP was 10.5 percent and 80.2 percent for the years 1973 and 1996 respectively. In the year 2000, debt service due as percent of export was 56.3 while actual repayment was only 25.2 percent. During the same year, debt as percent of export was 556.9 while debt as percent of GDP was 92.3. In servicing its external debt, Ethiopia has been put in extremely distressed fiscal position; the result was severely compressed development budgets and a shrinking fiscal base for essential public services.

During the fiscal year 2003/04, a total of Birr 659.4 million was paid out to settle external loans of which 60 percent was for the payment of principal while interest payment accounted for the balance. As compared to the previous fiscal year, the amount of external debt service payments increased by about 22 percent. During the same fiscal year, Birr 677.9 million debt-relief (64.6 percent principal and 35.4 percent interest) was obtained from external creditors. As a result, the ratio of external debt services to export earnings declined from 13.1 percent in 2002/03 to 12.7 percent in 2003/04 (MoFED, 2004).

The country's external outstanding debt including arrears, at the end of fiscal year 2003/04, reached 7.2 billion USD (about 62.1 billion Birr), showed a 6.2 percent increase over the level of the preceding fiscal year. The increase was mainly attributed to the increase (by 9.5 percent) contracted from multilateral organizations. At the end of fiscal year 2003/04, from the total external debt stock, the amount owed to multilateral creditors stood at 65 percent while that of the Paris club, the Non-Paris club and commercial creditors stood at about 26 percent, 8 percent and 1 percent respectively (ibid).

The ratio of external debt stock to GDP at current market prices, however, declined to 89.7 percent in 2003/04 from 101.7 percent in 2002/03. Similarly, the ratio of external debt to exports, declined from 1377.9 to 1336.7 percent during the same period.

Thus, the country's external debt position was said to be still unsustainable since the government could not meet its external obligations in full without rescheduling its debt, seeking debt relief or accumulating arrears over the medium or long-term.

It would be extremely difficult to attain long-run sustainable growth, if not impossible, without addressing the debt overhang problem. The channels through which debt overhang translates into a drag on growth are multifaceted. First, the rising debt-service ratios in the face of rapidly growing debt stock reduce the availability of resources for initiating growth. Second, in the face of stagnating exports rising debt-service payments have entailed either payment defaults or a drain on scarce foreign exchange needed to import machinery and inputs of production.

The prime concern of this study is thus to focus on investigating the impact of Ethiopia's external debt on economic growth of the country. Specifically, the objectives are to:

1. Examine structure, type and composition of Ethiopia's external debt in three different regimes,
2. Identify the transmission mechanism of external debt influences on economic growth of the country, and
3. Draw policy implications based on the findings of the study for macro-economic management of external debt.

## 2. Macro-economic Performance of the Ethiopian Economy

### 2.1. Real GDP and its Sectoral Contribution

According to the World Development Indicators 2003, with gross national income per capita of USD 100 in year 2001, Ethiopia was ranked 206<sup>th</sup> exceeding Democratic Republic of Congo (one with gross national income per capita of USD of 80) (World Bank, 2003). Using the conventional measure of poverty (1 USD a day), about 44 percent of Ethiopia's population falls under the poverty line, which is close to the African average but very low by LDCs standards. By any standard, the country is one of the poorest nations in the world.

During the Imperial era, the economy had been growing at a linear growth rate of 4.1 percent per annum while population and per capita income was growing by 2.3 percent and 1.8 percent per annum, respectively. Even though agriculture had a great share to GDP (i.e. 60.8 percent), it accounted only 31.2 percent of the growth of GDP. In the same period, the values added in the agricultural sector were growing by 2.1 percent while the other sectors were growing by more than 6.8 percent per annum.

The performance of the Ethiopian economy during the *Derg*<sup>2</sup> period has been unsatisfactory on account of civil war, recurrent drought, high population growth and inappropriate economic policy and management. The average GDP growth for the Derg period was 1.9 percent per year compared with an average population growth of 2.8 percent per annum that leads to a decline in per capita income.

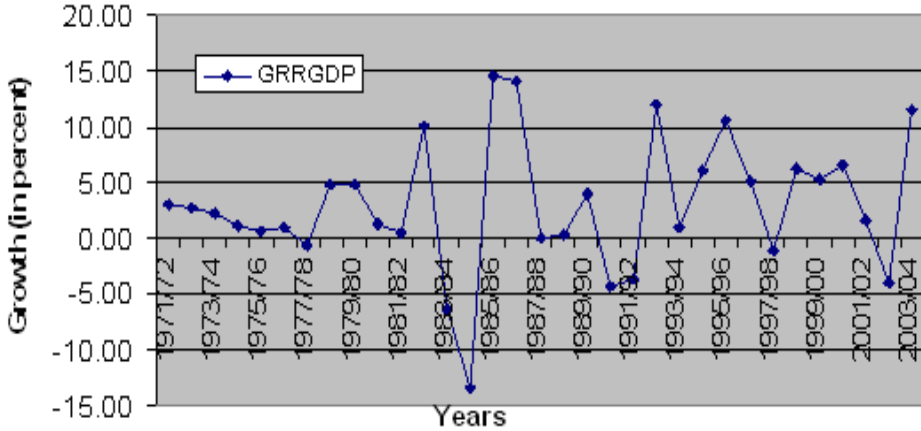
Post 1991, the new regime adopted typical structural adjustment policies with the support of the Bretton Wood institutions. Therefore, in terms of economic policy, this period witnessed a marked departure from the previous 'Socialist' system of command economy that represses private sector. As a result, during this period, relatively good economic performance is recorded though it experienced fluctuations. On the average, the economy and per capita income have been growing by about 5.04 and 2.06 percent per annum respectively during 1991/92-2000/01. If there had not been frequent droughts and the Eritrean aggression of May 1998, the growth rate of GDP would have been expected to be higher (Berhanu and Befekadu, 2000/01).

Ethiopia's real GDP growth rebounded strongly by 11.6 percent during 2003/04, as agricultural production recovered fully from the drought-affected levels of 2001/02–2002/03. Real GDP declined by 3.8 percent in 2002/03 following modest growth in 2001/02 (See figure 2.1). The drought in 2001/02-2002/03 was the most severe since 1984/85, with cereal production declining by 6 percent in 2001/02 and 26 percent in 2002/03. As a result of food shortages, inflation accelerated to 15 percent in 2002/03 from negative 7 percent in 2001/02, although core inflation remained stable at around 3 percent, consistent with core inflation projected at the decision point (NBE, 2002/03).

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<sup>2</sup> *Derg* is an Amharic word for military group. Throughout the paper, the terms *Derg*, socialist and military regimes are used interchangeably.

**Figure 2.1: Real GDP Growth Rate**



## 2.2. Public Sector

The Ethiopian government fiscal position has showed a significant change over the last four decades. The government budget, which was in surplus in the 1950s and 1960s, has adapted to continuous and growing deficit (MEDaC, 1999; Berhanu and Befekadu 1999/2000). Compared to other African countries like Kenya, Zimbabwe and Burundi, the overall deficit including grant as percentage of GDP is among the highest. Although domestic financing is equally important source of financing, the switch to foreign ones in fear of negative consequences like inflation, however, has resulted in growing debt burden, which was averaged to 96.9 percent of GDP over the period 2001/01 to 2002/03.

In Ethiopia it is quite clear that the government budget balance has never been in surplus since the 1970s. Moreover, the extent of the deficit has undergone significant changes over the different periods. During the period 1955-65 balanced budgets were maintained more or less while between 1965-74 deficits were kept small as the result of fiscal conservatism. Afterwards a large and persistently rising fiscal deficit was sustained. The budget deficit has also remained significant even after the introduction of various reform programs in 1992/93. In 1999/00 government expenditure was around 32 percent of GDP while total government revenue was 19.4 percent of GDP.

This clearly indicates that there is an excess of government expenditure over revenue, which leads to a huge budget deficit.

In 1998/99 and 1999/00 this fiscal deficit increased to 9.6 percent and 13.6 percent of GDP, respectively. This is due to the breakout of war with Eritrea in 1998 and the natural disaster in the same year. In 2000/01 this figure decreased to 8.2 percent of GDP. Based on updated estimates, in 2003/04 the fiscal deficit (including grants) is likely to be about 4.8 percent of GDP. In nominal terms, revenue surpassed the program target because of strong indirect tax receipts stemming from buoyant import growth and improved customs administration, which more than offset lower-than-projected direct taxes that reflected weak corporate profits following the drought of 2001/02. Moreover, donors provided more external grants and less project loans, given the vulnerable debt situation. The external current account deficit (including grants) is estimated to narrow to 4 percent in 2003/04. However, deficits had been financed from both external and domestic sources. External sources include external borrowing and grants while domestic sources include borrowing from banking system and non-banking sources.

### 2.3. External Debt

The poor performance of the Ethiopian economy has made external assistance a prominent feature of the country's economic structure. Since 1974, at which Ethiopia applied for loan from the IMF, the country has grown more and more dependent on external assistance and has reached a stage where it cannot function without it (Berhanu and Befekadu, 1999/2000).

Ethiopia's external debt has changed significantly in its magnitude, structure and composition over the last quarter of the 20<sup>th</sup> century. To put it in a historical context, the size of the debt and its composition has changed since the mid 1970s. During the Imperial regime the size of the debt was modest. The magnitude of the debt in 1975 when the Imperial regime fell was only USD 371 million. But by the end of 1991, it reached USD 8790 million. More than half (USD 4744 million or 54 percent) of the total debt was contracted for defence purposes. Consequently, the major share (74.6 percent) of the debt was owed for bilateral creditors in which the Former Soviet Union alone accounted for about 78 percent of the total bilateral debt. In contrast to the composition of the present debt, the share of Multilateral Institutions in the total debt was only 16.8 percent during the previous regime (Teklu, 2000).

According to IMF figures, Ethiopia's total debt stock at the end of fiscal year 2002/03 was about USD 6.8 billion (or USD 4.5 billion in net present value (NPV) terms). This debt is huge relative to the size of the economy and the performance of exports. It constitutes about 100 percent of GDP or about 246 percent of exports. Even after the scheduled debt relief under the initiative is applied, the IMF projects that Ethiopia's outstanding debt in NPV terms will be reduced to USD 3.9 billion or to about 90 percent of the current GDP in nominal terms (Haile, 2005).

Ethiopia's debt grew at an average rate of 13.18 percent during 1970-74 (Imperial regime). The debt service grew at 3.11 percent during this regime. Infrastructure was given a major share in utilizing the long- term debt, which constituted 100 percent of the total debt. During the second regime (1974-91), imprudent economic policies led to inefficiencies in investments. As a consequence external debt increased by 13.21 percent and the debt service by 7.18 percent. Debt indicators have shown phenomenal increase during this period (Table 2.2), while debt servicing as a ratio of exports declined by 1991.

**Table 2.2: Summary of External Public Debt (in millions of birr)**

External debt*	1991/92	1993/94	1995/96	1997/98	1999/00	2000/01	2001/02	2002/03
disbursed	6551.4	25722.2	27088	27916.88	44647.5	46268.8	52809.7	58591.8
undisbursed	Na	na	na	na	na	na	na	na
Drawings(gross)	566.4	2378.8	1611.3	1094.5	1432.4	27488.6	4613	3889.6
Repayment (1)	-126.5	-400	-488.5	-695.967	-998.9	857.8	857.8	-650.41
Debt servicing(2)	837.4	1832.5	1714	1370.7	2227.7	1680.6	1680.6	1251.2
Principal	649.8	1417.8	1189.3	970.7	1748.2	1163.6	1163.6	781.9
Interest (3)	187.6	414.7	524.7	400	479.5	517	517	469.3
Debt service ratio	82.5	56.9	34.5	19.2	27.8	21.1	14.7	12.5
Ratio of external debt to GDP (%)	31.5	90.8	71.4	62	86.1	89	103.4	102.9

\*excludes state defense credits and ruble dominated debt

(1)-on cash basis; includes repayments of trust fund loans, and repurchase from IMF.

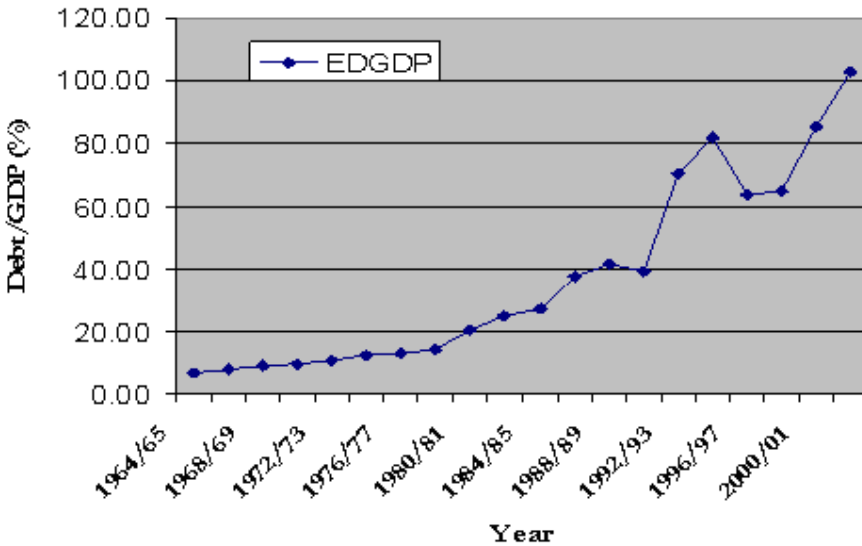
(2)-on accrual basis; includes repayments of trust fund loans, and repurchase from IMF.

(3)-includes IMF charge interest.

Source: National Bank of Ethiopia Annual Report 2002/03

During 1992 to 1998, the foreign debt of Ethiopia grew by 10.41 percent while the debt service dropped by 25.03 percent. Out of the total debt during this period, the long-term loan was 95.2 percent, the short-term debt was 4.23 percent and the IMF credit was 0.56 percent. According to World Bank (1998) Ethiopia's long term debt increased from 169 million USD in 1970 to 8843 million USD in 1991. This huge increase was due to increasing public finance deficit and current account deficit during the Derg regime. After the 1991 reform the external debt stock increased from 9003 million USD in 1992 to 9483 million USD in 1996.

**Figure 2.2 Trends in Total External Debt to GDP Ratio**



As noted above, Ethiopia is one of the severely indebted countries, even by the standards of HIPC of Sub-Saharan Africa (SSA). Although there is a slight reduction in recent years, owing to some cancellation and rescheduling, and mainly due to the granted debt relief amounting to USD 1.3 billion (in NPV terms) under the HIPC initiatives, the remaining balance is still high relative to GDP. The largest share of this debt is owed to the World Bank Group (IDA). Specifically, out of the total stock of debt outstanding, about 65 percent is owed to the IDA group of creditors.



### 3. External Debt and Economic Performance: Literature Review

#### 3.1. Theoretical Literature

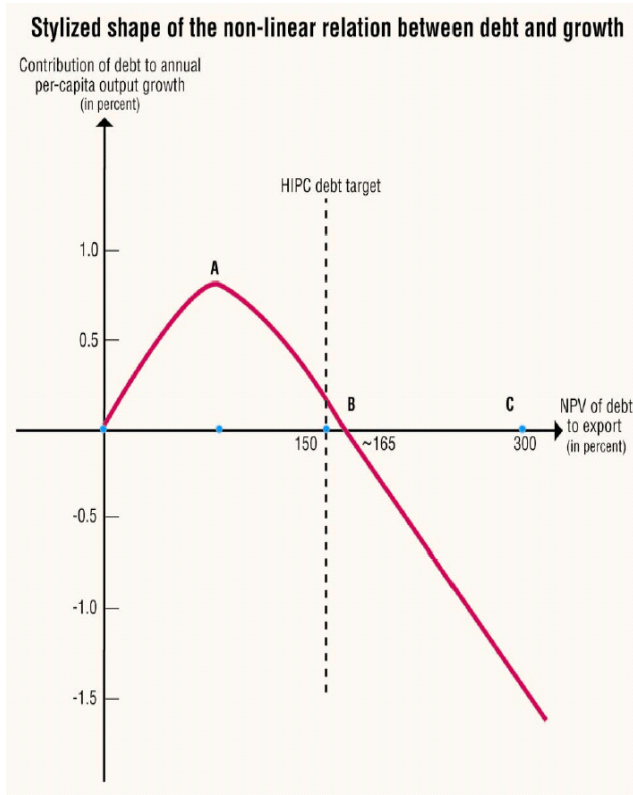
Economic theory suggests that reasonable levels of borrowing by a developing country are likely to enhance its economic growth. Countries at early stages of development have small stocks of capital and are likely to have investment opportunities with rates of return higher than those in advanced economies. As long as they use the borrowed funds for productive investment and do not suffer from macro-economic instability, policies that distort economic incentives, or sizeable adverse shocks, growth should increase and allow for timely debt repayments.

Thus, some considerations suggest that, at reasonable levels of debt, further borrowing would be expected to have a positive effect on growth. Others stress that large accumulated debt stocks may be a hindrance to growth. Both these elements together imply that debt is likely to have nonlinear effects on growth. External debt has an inverted U-relationship with growth. The effect is initially positive, but as debt ratios increase beyond point A, debt eventually slows growth. When debt reaches point B, the overall contribution of debt turns negative (See figure 3.1 below).

Turning to the effects of large external debt on growth, there are both direct and indirect channels (Elbadawi et al, 1996). In the direct channel, debt accumulation expressed as a ratio of debt to GDP stimulates debt initially, while past debt accumulation (debt overhang) impacts negatively on growth. These two channels produce a debt-Laffer curve, which shows that there is a limit at which debt accumulation stimulates growth. When this limit is reached further debt accumulation impacts negatively on growth. The third channel works through a liquidity constraint where debt service payment obligations reduce export earnings available for expenditures and thus impacts negatively on growth.

There are also a few models that combine both these elements and imply that debt may have nonlinear effects on growth. Cohen and Sachs, 1986 and Cohen, 1993 present an endogenous growth style model where capital accumulation is the sole force driving growth.

Figure 3.1



Notes: HIPC denote highly indebted poor countries; NPV denotes net present value.  
Source: Iyoha, M. A. (1999)

Worldwide events in the 1970s and 1980s - particularly the oil price shocks, high interest rates and recessions in the developed countries, and the subsequent weak primary commodity prices – are usually referred to as the major contributors to debt explosion in the developing countries (IMF, 2000). The external debt crisis of SSA, like its Latin American counterpart, is not yet over. A significant number of countries in SSA have, in general, adopted a development strategy that lies heavily on foreign financing from both official and private sources. This, unfortunately, has meant that for many countries in the region the stock of external debt has built up over recent decades to a level that is widely viewed as unsustainable.

Relative to exports and economic activity (measured by the GNP), SSA's debt is the highest of any region in the world (Klien, 1987; Iyoha and Iyare, 1994). According to the ILO (1995:3),

*Africa's external debt is the highest in the world as a proportion of GDP; some countries in the region are spending more than half of their export earnings to service foreign debts. The debts of many African countries are so large in relation to their foreign exchange earnings potential that it would be impossible to pay them off even if growth resumed and was sustained at unrealistically high levels. Largely as a consequence of debt servicing, flow of capital from Africa is significantly more than flow of new capital to the region.*

The external indebtedness of African countries is becoming more acute for a number of reasons (Ajayi and Khan, 2000). First, the external debt is enormous relative to the size of the economy and has led, in many cases, to capital flight and the discouragement of investment, especially private investment. Second, debt servicing payments absorb a major proportion of export earnings and eat significantly into the funds that could be used to provide essential facilities to improve the welfare of a country's citizens. Third, debt burden threatens not only the execution but also the prospects of success of adjustment programs. Fourth, given the time spent on external debt negotiations and its management, debt has a negative impact on an economy's overall growth and growth prospects.

The growth of foreign debt in the 1970s and 1980s can be traced to a combination of internal and external factors. For example, in the 1970s, on the demand side there was a pressing need in oil-importing developing countries for foreign exchange in order to finance balance of payment deficits and public projects following the increase of oil price in the 1970s (Avery, 1990). Coupled with other domestic factors, such as, high trade and budget deficits, low savings rate, and poor project selection by donors exacerbated the dependence on external debt. On the supply side, the recessionary conditions in the developed countries forced the international banks to recycle their huge petro-dollar deposits in the developing countries (Bernal, 1987; Afxentiou and Serletis, 1996). This decision by the banks was also aided by the high interest rates in the developing countries.

However, a number of studies in the literature have summarized these factors to include, but not limited to, (1) exogenous factors, such as adverse terms of trade

shocks; (2) the absence of sustained adjustment policies, particularly when facing exogenous shocks, which gave rise to sizeable financing needs and failed to strengthen the capacity to service debt; this includes inadequate progress in most cases with structural reform that would promote sustainable growth of output and exports; (3) the lending and refinancing policies of creditors, particularly lending on commercial terms with short repayment periods by many creditors in the late 1970s and early 1980s and non-concessional rescheduling terms for most of the 1980s; (4) the lack of prudent debt management by debtor countries, driven in part by excessive optimism by creditors and debtors about the prospects for increasing export earnings and thereby building debt-servicing capacity; (5) lack of careful management of the currency composition of debt; and (6) political factors, such as civil war and conflict.

**a. Empirical Literature**

There have been several attempts to empirically assess the external debt-economic growth link—the debt overhang and crowding out effects—mainly by using OLS. Most of the empirical studies include a fairly standard set of domestic debt, policy and other exogenous explanatory variables. The majority find one or more debt variables to be significantly and negatively correlated with investment or growth (depending on the focus of the study). For instance, Borensztein (1990) found that debt overhang had an adverse effect on private investment in Philippines by estimating a standard neo-classical investment demand function and testing the significance of the addition of a term representing the extent of the foreign debt burden. The effect was strongest when private debt rather than total debt was used as a measure of the debt overhang. His results pointed out that the debt overhang did in fact contribute to the decline in gross (foreign plus domestic) investment relative to the GDP that occurred in the Philippines between 1982 and 1989.

Iyoha (1997) found similar results for SSA countries. He concluded that heavy debt burden acts to reduce investment through both the debt overhang and the 'crowding out' effect. However, Cohen's (1993) results on the correlation between LDCs debt and investment in the 1980s showed that the level of stock of debt does not appear to have much power to explain the slowdown of investment in developing countries during the 1980s. It is the actual flows of net transfers that matter. He found that the actual service of debt 'crowded out' investment.

According to Borensztein (1990), there are two channels through which the foreign debt may affect investment. The 'debt overhang' channel and the 'credit rationing' channel. According to the debt overhang when foreign debt obligations cannot be fully met with existing resources and some negotiation process between the debtor country and its creditors determines actual debt payments. Thus, Borensztein argued that the debt overhang had an adverse effect on private investment, which was strongest when private debt, rather than total debt, was used as a measure of debt overhang.

In two recent papers, Elbadawi *et al.* (1996) generated a "Laffer curve" of debt establishing a critical threshold beyond which debt impacts negatively on growth and investment. On the basis of their results, debt in excess of 97 percent of GDP is likely to have a negative impact on investment and growth. With respect to the private sector investment, they posit that a debt to GDP ratio greater than 33.5 percent would generate a depressive effect by reducing investment.

Elbadawi, *et al.* (1996) also confirmed a debt overhang effect on economic growth using cross-section regression for 99 developing countries spanning SSA, Latin America, Asia and the Middle East. They identified three direct channels in which indebtedness in SSA works against growth: current debt inflows as a ratio of GDP (which should stimulate growth), past debt accumulation (capturing debt overhang) and debt service ratio. The indirect channel works through the impacts of the above channels on public sector expenditures. They found that debt accumulation deters growth while debt stock spurs growth.<sup>3</sup> Their results also showed that the debt burden has led to fiscal distress as manifested by severely compressed budgets. Other studies that have found a negative effect of external debt on growth include Befekadu (1992). Some studies simply use the simulation analysis to show the impact of the debt burden indicators on economic growth under different scenarios (e.g. Ajayi, 1991 and Osei, 1995).

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<sup>3</sup> Total external debt stocks consist of public and publicly guaranteed long-term debt plus private non-guaranteed long-term debt plus the use of IMF credit plus estimated short-term debt. This is to be distinguished from debt outstanding and disbursed (DOD), which is defined as the total debt outstanding and disbursed of long-term official concessional, official non-concessional and private loans. On the other hand, external debt accumulation is the amount, at any given time, of disbursed and outstanding contractual liabilities of residents of a country to non residents to repay principal, with or without interest, or to pay interest, with or without principal (Klein, 1994; P. 56).

**b. The Ethiopian Case**

A number of studies have been undertaken to investigate the origin of Ethiopia's external debt crisis. Most of the findings indicate that the general causes are the same as the rest of the African countries. It is a combination of multiple domestic policies orientation and external shocks. Regarding the literature on Ethiopia's debt sustainability, there are different views. According to Ghani and Zang (1995), Ethiopia's debt was unsustainable prior to the launch of the reform programme. But after the launch of the reform program in 1992, Ethiopia began to make transition from unsustainable to sustainable debt path.

On the other hand, Abdulhamid (1999), based on his descriptive analysis concluded that Ethiopia's debt is unsustainable and the economic reform effort is threatened by unsustainability of debt rather than assist the country to reduce to sustainable level. The debt sustainability analysis is also prepared by the World Bank, the IMF, and the African Development Bank jointly with Ethiopian authorities who evaluate Ethiopian prospect for attaining external debt sustainability through an examination of Ethiopia's debt level in the context of 20 years macro-economics and balance of payment framework.

Research attempting to link external assistance to growth, savings and government's fiscal position remains controversial. Two papers have attempted to evaluate the impact (Befekadu, 1992; Alemayehu and Befekadu, 1999). Befekadu (1992) showed that there was a positive correlation between external resource inflows and economic growth between 1960 and 1974, but a negative correlation between 1975 and 1988. The different outcome was explained by the different policy regimes pursued by the two governments, that is, external capital contributed positively to growth in Ethiopia during the Imperial era and negatively during the Derg regime. He emphasized that the negative contribution of external capital during the Derg era was a result of the policies pursued. The policies in the Derg regime were diverted resources away from agriculture to other sectors. As a result coffee which is the most important export commodity has its share of export earning declined 61 percent. Alemayehu and Befekadu (1999) used an error correction model (ECM), the results of which showed a positive long-run relationship between aid and growth, although the correlation was negative in the short-run.

## 4. Econometric Analysis and Estimation Results

### 4.1. Model Specification

Recent literature has provided a significant body of evidence about the most relevant indicators and predictors of external debt crises. The key macro-economic indicators are output growth; terms of trade; monetary indicators; interest rates; external debt ratio to GDP, external debt service ratio to GDP, external debt service ratio to exports, and, ratios of short term debt to total debt, and debt service due to total debt.

To capture all relevant debt burden indicators, the model adopted is based on Elbadawi *et al'* (1996) model specification. As in similar studies, the debt burden indicators enter the production function directly. Therefore, the regression equation is specified as:

$$RGDP_t = f(EDGDP, DSR, PINV, TOT, INFL) \quad (4.1)$$

Where  $RGDP_t$  = Real GDP at time t

EDGDP = Stock of external debt to GDP ratio (-)

DSR = The debt service as a ratio of export earnings (reflect the 'crowding out' effect) (-)

PINV = Current real private investment as a ratio of GDP (+)

TOT = Terms of trade (captures external shocks) (- or +)

INFL = Rate of inflation (reflects macro- economic stability) (- or +)

Using equation (4.1) and expressing the variables in natural logarithmic form, an attempt has been made to look at the relative contributions (elasticities) of each variable to the growth process. Therefore, the model to be estimated is specified as

$$LRGDP_t = \beta_0 + \beta_1 LEDGDP + \beta_2 LDSR + \beta_3 LPINV + \beta_4 LTOT + \beta_5 LINFL + \varepsilon_t \quad (4.2)$$

In equation (4.2) above,

$\beta_1$ ,  $\beta_2$ ,  $\beta_3$ ,  $\beta_4$  and  $\beta_5$  are coefficients of elasticities, and  $\varepsilon_t$  is the random disturbance term.

A traditional indicator for creditworthiness, debt-service ratio relates debt service requirements to export income. The higher the ratio of debt service to exports of goods and services, the greater will be the likelihood that in the event of a severe decline in export earnings the country will no longer be able to meet debt-service obligations. The probability that a country will seek a rescheduling rises as its debt-service ratio rises.

Private investment is included in the model to capture the accelerator principle. The model also incorporates other policy, fundamental and shock variables. The macro-economic policy variables are captured by inflation rate. The shock variable is captured by terms of trade. These variables show the extent of vulnerability of the economy to external factors and consequently to reliance on foreign resource financing. They also show the extent of credibility of policies and their effect on economic growth.

Inflation may also act as a proxy variable for the quality of economic management. A high rate of inflation is a sign of internal economic tension and of the inability or unwillingness of the government and the central bank to balance the budget and to restrict money supply. The higher the inflation rate, the more risky the government is perceived to be. Furthermore, inflation can influence the demand for foreign funds through its adverse impact on the trade accounts. That is, inflation would tend to cause export demand to fall and import demand to rise, and the growing trade deficit, in turn, would increase trade-financing requirements.

#### 4.2. Data Type, Sources and Description

As the success of any econometric analysis ultimately depends on availability of appropriate data, it is, therefore, essential to discuss about the source and nature of the data. The study is conducted based on secondary data from domestic and foreign sources. For the domestic sources from documents of the former Ministry of Economic Development and Cooperation (MEDaC) the now Ministry of Finance and Economic Development (MoFED) and the National Bank of Ethiopia (NBE) while for external sources from World Debt Tables, Global Development Finance, different World Bank Reports and IMF publications are utilized.



Different publications showed different figures for the same variable in the same period. Debt figures obtained from MoFED are not the same as that of NBE. Similarly, data obtained from World Bank, World Debt Tables is not consistent with the publications of International Financial Statistics (IFS) year book. Besides, some important variables were missing i.e. difficult to get all the acquired variables either from domestic or international sources. As a result, both sources are used jointly.

However, most of the data are employed from national sources to its advantage by giving consistent figures when the sectoral distribution and debt burden implication are considered. But this source doesn't provide the military-related debt which is very important not only because of its magnitude but also it does not leave behind productive projects which could provide export earnings to service it (Befekadu, 1992).

To estimate the model and examine the statistical significance of the explanatory variables on RGDP, econometric analysis will be employed using time-series data. The sample period for this study is from 1963/64 to 2003/04.

The data series on gross capital formation (at current market price) was computed by subtracting aggregate consumption expenditure (public and private consumption) from the gross domestic expenditure series. Government capital expenditure is used as a proxy for public investment. Hence, private investment is calculated as the difference between gross capital formation and public investment. Gross domestic product at constant 1980/81 factor cost was used for real output. Inflation rates were derived as percentage changes in the consumer price index in each period.

## 4.3. Empirical Analysis and Results

### 4.3.1. Results for Unit Root Tests

Before estimating the above equation, a test for simultaneity was carried out to ascertain whether simultaneous equation-bias exists. The test showed that only weak simultaneity exists. This was handled by normalizing the variables through the error correction process. Therefore, the equation is estimated incorporating an error correction term.

The first step was to test for stationarity of the variables. The conventional Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) tests were used to test for

stationarity of the series. The results of the test for the variables in levels are presented in Table 4.1. In addition to the ADF test, the paper attempts to observe the trend of the variables graphically. The graphical representation of the variables showed the same characteristic of the variables as the ADF test.

**Table 4.1: Unit Root Tests of the Variables**

Variables	Augmented Dickey-Fuller With drift and trend	
	Lag 1	Lag 2
LRGDP	-2.2744	-0.88263
LEDGDP	-3.6316*	-2.9815
LDSR	-0.78818	-0.98091
LTOT	-1.4695	-1.8926
LINFL	-4.3606**	-2.8475
LPINV	-1.8133	-1.7062
DLRGDP	-7.3234**	-3.7971*
DLEDGDP	-5.8710*	-4.5596**
DLDSR	-3.7020*	-2.4720
DLTOT	-3.8541*	-3.2620
DLINFL	-7.7994**	-4.6072**
DLPINV	-5.8093**	-5.2694**
Critical	1%	-4.224
Values	5%	-3.535

\* Denote rejection of the null at 5% significance level

\*\* Denote rejection of the null at 1% significance

The tests show that the variables LINFL and LPINV are stationary (integrated of order zero) at 1% level of significance while LEDGDP is stationary at 5% level of significance. The rest of the variables were found to be stationary after differencing them once. The variables are, therefore, integrated of order one ( $I \sim I(1)$ ).

Returning to our analysis, it is necessary to determine whether there exists at least a single linear combination of these variables that is  $I(0)$ . The Johansen maximum likelihood test enables us to check the possibility of having more than one cointegrating vector, which is the apparent procedure in the presence of more than two variables. Estimating the model, the following test results on the number of cointegrating vectors are obtained from the PcFiml 9.0 output.

**Table 4.2: Tests for number of Cointegrating Vectors**

Ho: rank = p	T log (1-λr <sub>+1</sub> )	λ max 95%	Tsumlog (1-λi)	λ trace 95%
P=0	37.88**	25.5	58.53**	42.4
P<=1	12.54	19.0	20.65	25.3
P<=2	8.112	12.3	8.112	12.3

\* Denote rejection of the null at 5% significance level

\*\* Denote rejection of the null at 1% significance

As presented in Table 4.2, the null of no cointegration is rejected at 1% level of significance while the alternative hypothesis that at least one cointegrating vector is not rejected by both λ max and λ trace statistics. For the null hypothesis (no cointegrating vectors), the value of λ max = 37.88 and λ trace = 58.53 are greater than their respective critical values of 25.5 and 42.4 at 1% level of significance, respectively.

The conclusion drawn here is that there exists precisely one cointegrating vector in the estimated model. This suggests that there exists a linear combination of I(1) variable that cointegrates them in a stable long-run relationship.

Since the existence of only a unique cointegrating vector is statistically supported in the above tests, the first column of α matrix and the first row of the β matrix in Table 4.3 happen to be the relevant entries. This, in turn, makes the relevant equation one in which LRGDP is written as a function of the other five explanatory variables. However, the explanatory variables are required to be weakly exogenous in order to fulfil the classical linear regression assumptions. Weak exogeneity is required for the analysis as a single acquisition to be efficient.

**Table 4.3: Results of Johansen's Cointegration Analysis (PC Fiml output)**

Standardized \beta' eigenvectors			
LRGDP	LDSR	LToT	Trend
1.0000	0.10633	0.098042	-9.5960e-005
22.548	1.0000	-9.0650	0.019606
-11.771	3.5233	1.0000	0.020211
Standardized \alpha coefficients			
LRGDP	LDSR	LToT	Trend
-0.90232	-3.2173	-0.0099407	0.016907
-0.0024077	-0.11553	-0.0024077	-0.11553
0.062639	0.062639	0.062639	0.057199

Number of lags used in the analysis: 2

Variables entered unrestricted: Constant

Variables entered restricted: Trend

This test is conducted by imposing a zero restriction on the speed of adjustment parameters ( $\alpha$ -coefficients) in the reduced single equation, using the log likely ratio (LR test). The results of the tests for weak exogeneity are summarized in Table 4.4.

**Table 4.4: Tests for Zero- restrictions on  $\alpha$  –coefficients (Test for weak exogeneity of variables)**

Variables	LRGDP	LDSR	LToT
$\alpha$ –coefficients	-0.90232	-3.2173	-2.3249
LR test, Chi <sup>2</sup> (1)	13.163	8.724	5.6025
P-value	[0.0003] **	[0.0632]	[0.0779]

\*\* Denote rejection of the null at 1% significance  
 \* Denote rejection of the null at 5% significance level

When testing for weak exogeneity, both explanatory variables, LRGDP and LDSR, happened to be weakly exogenous, while LRGDP was found to be endogenous. In fact, this is a requirement for the dependent variable to be endogenous. Hence, there was no need to conduct the two stage least squares (2SLS) simultaneous equation estimator. The validity of a single equation estimation of the unique cointegrating vector is already confirmed by the weak exogeneity condition established for all the explanatory variables in the model.

The columns of  $\beta$  have important economic interpretations as co-integrating vectors. Hence, they may be interpreted as long-run parameters. Thus, the single equation model with estimates of the long-run coefficients (elasticities) is given by:

$$LRGDP = - 0.10633LDSR - 0.098042LTOT \tag{4.6}$$

In order to test the significance of the long-run coefficients, a zero restrictions are imposed on each  $\beta$  coefficient and the results of the long-run statistics are presented in Table 4.5.

**Table 4.5: Tests for zero restriction on  $\beta$ - coefficients**

Variables	LDSR	LTOT
$\beta$ –coefficients	0.10633	0.098042
LRtest, Chi <sup>2</sup> (1)	10.029	3.9588
P-value	[0.0015] **	[0.0466] *

\* Denote rejection of the null at 5% significance level  
 \*\* Denote rejection of the null at 1% significance

As it is explained from the table, the long-run results depict that all explanatory variables for LRGDP were found to be significantly different from zero. Moreover, the variables are with the hypothesized sign. The result rejects the null hypothesis that the  $\beta$  coefficients are jointly statistically insignificant at 1% and 5% level of significance implying the explanatory variables jointly explain variations in the dependant variable significantly.

The information provided by the long-run test can now be used to generate a set of error correction models that capture both the short and long-run behaviours of the relationship. The changes in the relevant variables represent short-run changes, while the coefficient of an error correction term represents a speed of adjustment back to the long-run relationship among the variables.

### **The Short-Run Model**

So far we have determined the long-run relationship between the variables of interest. Having already obtained the long-run model (see equation 4.6) and estimated the coefficients, the next step will be estimation of coefficients of the short-run dynamics that have important policy implications. Hence, an error correction model (VECM) will be estimated that incorporates the short-term interactions and the speed of adjustment towards long-run equilibrium. In the error correction model, the short-run disequilibria are approximated by the first lag of the estimated long-run linear combination.

The procedure adopted for estimation is the Hendry's approach of general to specific modelling. In this approach a large model is estimated first which includes as many explanatory variables and their lags as possible. Then all insignificant explanatory variables are continuously dropped until a parsimonious model with few explanatory variables but acceptable in terms of significance, economic interpretation and diagnostic validity is obtained. After step-by-step dropping of the insignificant variables from the estimate, one will have a specific parsimonious vector error correction model (PECM) as reported in Table 4.6.

The results of the various diagnostic tests are reported and the tests did not detect any problem of heteroscedasticity (ARCH-Autoregressive conditional heteroscedasticity test), non-normality (Normality  $\chi^2(2)$  test). None of these tests suggests that the

model was mis-specified. The tests covered, respectively, the Breusch-Golfrey LM test for serial autocorrelation up to the second lag, an ARCH test for conditional heteroscedasticity, Jarque-Bera Normality  $X^2$  (.) tests, and the Ramsey RESET general test for misspecification. We also observe from Table 4.6 that there is no evidence of serial correlation by AR test.

**Table 4.6: Results of the Specific Parsimonious Error-Correction Model (PECM)**

Variables	Coefficients	Std. Error	t-value	t-prob
Constant	0.023104	0.011272	2.050	0.0499
DLRGDP_1	1.0645	0.35677	2.984	0.0058
DLRGDP_2	-0.68212	0.11851	-5.756	0.0000
DLDSR	-0.043440	0.019776	-2.197	0.0365
DLINFL_1	0.029257	0.0097872	2.989	0.0058
DLPINV_2	0.043054	0.0093902	4.585	0.0001
DLEDGDP_1	-0.14530	0.039344	-3.693	0.0010
DLEDGDP_2	0.080759	0.032266	2.503	0.0184
ECM1_1 <sup>a</sup>	-0.73460	0.36388	-2.019	0.0532
<b>Diagnostic Tests</b>				
R <sup>2</sup> = 0.749448				
DW = 2.12				
AR 1- 2 F( 2, 26) = 0.31508 [0.7325]				
ARCH 1 F( 1, 26) = 0.12255 [0.7291]				
Normality Chi <sup>2</sup> (2)= 8.7456 [0.7213]				
Xi <sup>2</sup> F(16, 11) = 0.28385 [0.9887]				
RESET F(1, 27) = 0.042943 [0.8374]				

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<sup>a</sup> denotes an error correction term

Most of the variables considered in the determination of economic growth in Table 4.6 have their hypothesized expectations. The coefficient of past debt accumulation (debt lagged once) is negative as expected. These results confirm the existence of debt overhang problem as postulated earlier. The results tally with the findings of similar studies (e.g. Elbadawi, *et al.*, 1996). However, the magnitude of the coefficients is quite small. The negative effect of current debt service ratio on economic growth was as expected. Moreover, this is a short-run effect. A rise in private investment as a ratio of GDP (both current and lagged) has a positive effect on growth as would be expected. According to the accelerator principle, growth in investment facilitates faster economic growth.

It has been said that inflation may stimulate growth at low and containable levels but can impact negatively on growth at high levels. The results show that current inflation rate (INFL) deters economic growth while past inflation rate (INFLt-1) stimulates economic growth.

The lagged error correction term (ECTt-1) included in the model to capture the long-run dynamics between the cointegrating series is correctly signed (negative) and statistically significant. The coefficient indicates a speed of adjustment of 73.46% from actual growth in the previous year to equilibrium rate of economic growth. This is a high speed of adjustment implying that all errors/deviations are corrected within one year. A further discussion of what ECT entails is worthwhile as it reveals long-run relationships of the non-stationary variables. It has a negative sign implying that any shock in the system in the short-run will return back to its long-run path.

The goodness of fit, also called the overall significance of the model, as measured by  $R^2$ , shows that about 74.94 percent of the variations in the dependent variable (LRGDP) is explained by the explanatory variables. This overall significance test of the model indicated that explanatory variables jointly are statistically significant at 1% level of significance.

## 5. Conclusion and Policy Implications

### 5.1. Conclusion

In a country like Ethiopia, where material and financial resources are lacking to carry out development programs, the need for external borrowing is something one cannot afford to ignore. However, financing the deficit through external borrowing resulted in increasing external debt stock. The debt burden of a country is of great concern because it imposes a number of constraints on its economic growth. Hence, the study examined the effect of debt on economic growth in Ethiopia using a model developed by Elbadawi *et al.* (1996).

The study pin downs vital role of the emerging field of external debt and debt indicators in the Ethiopian economy with emphasis on empirical relationship of external debt and economic growth over the period 1963/64-2003/04. In doing so, this paper examines the magnitude and structure of the country's external debt, and its

impact on economic growth across its three economic regimes. Using time series data for the same period, the empirical results indicated that past external debt accumulation has a negative impact on economic growth. Debt servicing also appears to affect economic growth adversely.

## 5.2. Policy Implications

The simultaneous attainment of sustainable economic growth and external debts appear difficult at the moment and could remain elusive if aggressive measures are not undertaken. The government could play an important role in stimulating the economy if the resources obtained from the debt relief initiatives are targeted at productive public investments with the resultant crowding-in effects on private investment, and social spending for the poor.

Being the key source of indebtedness, the challenge to the government remains that of ensuring efficiency in delivery of services and increased productivity of public investments. Efforts are already being directed towards this direction through privatization of parastatals and downsizing of the civil service, but more has to be done to revamp the economy to a higher sustainable growth path. In the long-run, foreign savings should supplement but not replace domestic savings.

Proper macro-economic management of the economy as a whole is important since it also determines the volume and servicing of external debt, as well as the credit rating. Availability of external finance should be consistent with a policy framework that is credibly maintained (fiscal stance, exchange rate policy, interest rate policy, pricing policy, etc.). It is important to create credibility including political will in order to spur investor confidence for both local and foreign investments. Commitment to rebuilding credibility is a key challenge for Ethiopia.

Development activities could also be financed through increased export earnings spearheaded by an export-led growth strategy. As part of a broader strategy to assist the HIPC's out of the debt crisis, the international community should provide a conducive environment for exports from the low-income countries including Ethiopia. Ethiopia still has a chance of overcoming its external debt problems by cultivating the right policies, but will need considerable support through debt relief/reduction initiatives.



Given the scope of the paper, the followings are some of the plausible policy implications with respect to the effort to deal with high levels of external debt and its consequences on the economic growth of the country and for the various parties involved in debt issues:

**For debtor country (Ethiopia):**

Because external loans must be paid in foreign exchange, external borrowing decisions must be linked to a general economic policy framework that will guarantee profitability of the invested borrowed funds and the generation of sufficient foreign exchange for external debt service. Therefore, the need for good policies and sound economic management cannot be overemphasized.

Public and private borrowing needs to be subject to strict scrutiny in terms of its use, within the context of growth-oriented debt sustainability exercises, with comprehensive debt monitoring and follow-up procedures, including private sector debt. The IMF and other international financial institutions should continue to provide technical assistance in these areas.

Ethiopia needs to set up contingent financing in preparation for short-term crises, in order to preclude unnecessarily tough policy adjustments. IMF needs to play a major role in this regard.

Structural problems inherent to the Ethiopian economy could be considered as one of the relevant factors contributing to the debt problem in the country. In general, diversifying its export sector is one of the solutions to reduce the debt problem.

Since debt servicing erodes resources which otherwise would have been used to improve the welfare of the citizens, the issues of debt reduction, debt forgiveness and debt rescheduling must get due considerations. Hence, debt forgiveness is the most complete and effective strategy for debtor countries to recover from debt-induced depression and resume sustainable growth. Not only is the principal extinguished but also the steady accumulation of debt that comes from repeated rescheduling and the resulting capitalization of interest and arrears are eliminated.

External capital should be used to promote high and stable rates of economic growth that are consistent with the achievement of sustainable balance of payment position. Thus, the country must establish criteria for making effective use of resources that will be at its disposal in the future.

The country should introduce effective debt management as a major policy concern to achieve the benefits of external finance without creating difficult problems of macro-economic and balance of payment stability.

To sum up, the external debt problem is a real constraint and should not be ignored. Therefore, the country must assume primary responsibility for its own fate by sustaining economic reforms and adjustment process.

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