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Impact of External Debt on Economic Growth: A Case Study of Tanzania

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Abstract

This study investigated the impact of external debt on economic growth of Tanzania for the period of 1990-2010. The study used time series data on external debt and economic performance. It is assumed that external debt helps developing countries to meet developing needs. While debt servicing seeks development by restoring credibility to existing and new creditors. The study collected data from Bank of Tanzania (BoT), Zanzibar branch, President's Office Finance, Economy and Development Planning in Zanzibar and Ministry of Finance (MoF), Tanzania. In addition, data were collected from the World Bank (WB) and International Monetary Fund (IMF) publications. The study revealed that there is significant impact of the external debt and debt service on GDP growth. The total external debt stock has a positive effect of about 0.36939 and debt service payment has a negative effect of about 28.517. Long run relationship the co-integration test shows that there is no long run relationship of the external debt and GDP. Conclusively, there is a need for further research to identify the impact of external debt on foreign direct investments and the impact of external debt on domestic revenues.

JEL classification numbers: C32, C53, E51, F31
Keywords: External debt, debt sustainability, co-integration test.

1 Introduction

The basic reason of external debt in developing countries is to fulfil lack of "saving-investment" gap (Chenery 1996). The developing countries facing with a current account deficit were encouraged to borrow from developed countries as well as an international

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community to boost their economic growth. Gohar et al. (2012) recommended that countries take debt from the external sources for many reasons that are their income is low, with budget deficit or they are having low investments. In addition, Soludo (2003) asserted that countries borrow for two broad categories; macroeconomic reasons or to finance the transitory balance of payments deficits aimed at boosting economic growth and reduce poverty.

If borrowing is necessary to economic growth. Our study provides evidence that countries have persistently borrowed from one another in different forms. The study, therefore looks at the historical background and rationale of the debt in view of its contribution in economic growth.

1.1 Background to the Research Problem

External debt problem is one of the main challenges faced by the developing countries like Tanzania. Gohar et al. (2012) mentioned that the repayment or "debt service" creates problems for many countries especially for developing countries because a debt has to be serviced are more than the actual amount it was taken for. Therefore, large debt service payments impose a number of constraints on a country's growth scenario. Either, it drains out limited resources and restricts financial resources for domestic need of development of these countries.

Benedict et al. (2003) suggested that foreign borrowing has a positive impact on investment and growth of a country up to a threshold level but external debt service can potentially affect the growth as most of the funds will go in the repayment of the debt rather at the investments. Furthermore, Fosu (2009) found out that debt servicing shifts spending away from the social sector, health and education. This is shown that the aim of taking debt is behind to seek development than being depressed by debt service payments because it cuts up most of the resources rather than development. As a result creates a great hindrance in the economic growth of a country due to high interest payments on the external debt, heavy public expenditures and foreign exchange to repay that debt.

According to World Development Indicators (WDI-2011) developing countries suffered a foreign debt burden and debt servicing rather than developed and the Organization for Economic Co-operation and Development (OECD) countries. For instance over the period of 1990-2010 the countries like the United State of America (USA), United Kingdom (UK), and Japan paid nothing for debt service. The table 1.0 shows debt and debt service of selected countries for 2010.

Table 1: Total debt and debt service for 2010 (US$ million)

Country	External debt position	External debt service
China	548,551	62,611
Brazil	346,978	45,806
Burundi	537	3
Kenya	8,400	399
Japan	0	0
Nigeria	7,883	349
Pakistan	56,773	4,338
Rwanda	795	15
UK	0	0
USA	0	0
Tanzania	8,664	199

Source: World Development Indicators Report (2011)

Tanzania as one among the developing countries has taken significant measures to liberalise it is economy. Muganda (2004) explained that in order to solve the persistent severe economic crisis which confronted the country since the late 1970s; Tanzania signed an agreement with the World Bank (WB) and the International Monetary Fund (IMF) in 1986 to adopt Structural Adjustment Programmes (SAPs). The reforms of Tanzania classified into three broad phases; liberalization (1986-1995), derailed reforms (1992-1995), and successful reforms (1996-2004). The programmes included Economic Recovery Programme (ERP), Economic and Social Action Plan (ESAP) and the Priority Social Action Plan (PSAP).

These reforms implied that GDP growth could be sufficient to allow increases in income per capita, including in rural areas. Overall the long-term poverty trend has been declining. However the decline in poverty has been more pronounced in urban areas, while poverty in rural areas remains considerably higher (Muganda 2004). Either, in April 2000, Tanzania has been classified by the IMF and WB as a heavily indebted country and is eligible for enhanced Highly Indebted Poor Countries (HIPC) debt relief assistance (Mc Groarty et al. 2009). The HIPC debt reduction, which was followed by additional donor inflows, allowed the government to increase expenditure allocations to public service delivery.

On the other hand, External debt of Tanzania reached US$ 8.7 billion in 2010 from US$ 6.5 billion in 1990. While in case of the percentage of GDP, it decreased from 130.1% in 1990 to 41.6% in 2010. The annual debt service of Tanzania slightly declined from US$ 0.21 billion in 1990 to US$ 0.20 billion in 2010 (WDI 2011). The sustainability of debt burden indicators shows declining trend, so far the external debt of Tanzania is sustainable (MOF 2012). Either the macroeconomic performance of Tanzania has been well performing. The growth rate increased by 7% and the revenue collection also increased by 16.4 % of GDP (BOT 2012). As a result donor funding and expansion in public spending increased.

Notwithstanding, Tanzania received assistances of debt relief and foreign aids, and major SAPs of its economy still remains a slow movement to it is economic growth and stability, a heavy external debt burden and heavily dependent on donor support. Mc Groarty et al. (2009) reported that "Tanzania has long been one of Sub-Saharan Africa's top recipients of international aid with Official Development Assistance (ODA). Tanzania's budget remains heavily dependent on aid". The report also mentioned that the reduction in debt by approximately US$ 3.6 billion between 2005 and 2006 was partly caused by the receipt of financing through the Multilateral Debt Relief Initiative (MDRI) following implementation of the Paris Club (PC) 7 Agreement.

Many previous studies on the relationship between external debt and economic growth show that some researchers found positive relation, some negative and some no significant relationship between external debt and economic growth for different economic condition. Some of the studies like Were (2001); Wijeweera et al. (2005); Seetanah et al. (2007); Sharif et al. (2009); and Malik et al. (2010) concluded that there is negative relationship between external debt and economic growth. Thus, the objective of this paper was to examine the impact of external debt on the economic growth performance of Tanzania for the period of 1990-2010.

The foreign debts are important to determinants of economic performance of a country. Developing countries take the foreign debts for many purposes as mentioned by Chenery (1996) are to fulfil lack of "saving-investment" gap. Another reason is to fill the gap of

budget or balance of payment deficit due to low investment (Gohar et al. 2012 and Soludo 2003).
Since independence, Tanzania has been received several foreign debts in order to spur economic growth. But the heavy external debt burden as resulted in creating a great hindrance in the economic growth of a country due to high interest payments on the external debt and heavy public expenditures. According to WDI (2011), Tanzania in year 2010 had an external debt of US$ 8.6 billion from US$ 6.4 billion in 1990 and servicing the debt of US$ 0.2 billion was only 2.3% of the external debt. The main interest of this study is to investigate the impact of external debt on economic growth of Tanzania.

1.2 Objectives of the Study

The aimed at achieving the following specific objectives:
1. To establish the relationship between external debt and economic growth of Tanzania.
2. To find out the impact of debt servicing and external debt on the Tanzanian economic growth.
3. To investigate long-term correlation between external debt and economic growth in Tanzania.

1.3 Significance of the Study

The study is premised on the understanding that Tanzania, like other developing countries suffering on debt burden problem. According to WDI (2011) in year 1990 external debt of Tanzania was US$ 6,448 million and rose to US$ 8,664 while GDP grew by 6.5%. Many developing countries claimed about the debt burden problem and the International Development Agencies (IDA) agreed to cancel the debt through HIPC programme and Tanzania was among countries that received the debt relief (Mc Groarty et al, 2009). This study constructs a framework for rationalisation of the impact of external debt on economic growth and it useful for further researches.
The main objectives of this study are: to investigate the relationship between external debt and economic growth of Tanzania. Additionally, the study aimed to examine the impact of external debt on economic growth of Tanzania.
Particularly, the question of interest was whether "there is any impact of external debt and debt servicing on economic growth of Tanzania". It was interesting to find out at what level of external debt has a negative or positive impact on the economic performance and to what extent of the effect. The study used econometric models to determine the relationship of debt on growth within the standard growth model. The study adopted a model developed by Malik et al. This study based on the analysis of Time series data of Tanzania over the period of 1990 to 2010.

2 Literature Review

This paper reviews both theoretical and the empirical literatutre on impact of the external debt on economic growth. This section underscores literature on external debt burden, debt servicing capacity and debt sustainability.

2.1 External Debt Burden and Debt Service Capacity

External debt burden is the reflection of the difficulties and strains arising from the servicing of external debt. This may result from inability to generate enough resources to meet commitments in debt servicing. The burden is measured in terms of the proportion of current resources (income) devoted to financing past consumption (Ogunlana, 2005). Therefore, when a disproportionately large share of current resources is deployed to serve external debt the burden increases. The reverse is the case when external debts can be serviced without compromising the requirements of domestic economic development.

Salop and Spitaller (1980) observed two key issues on debt capacity. The first addresses what the optimal level of debt should be in order not to run into debt service difficulty. The second relates to the sustainability of debt situations and policies. The optimizing framework dominated much of theoretical literature. This concerns analysis of marginal cost and benefits of borrowing which should be equal at the optimal level of debt. This approach does not provide a simple formula that would make it possible to ascertain in more operational detail the debt capacity stance of individual country (Hjertholm, 1999).

The non-optimizing model examines the sustainability of particular debt situations and policies in the light of the expected growth path of the economy. In this case, the emphasis has largely been on foreign borrowing for investment purposes in order to fill the gap between domestic savings and investment (King, 1968, Solomon, 1977). Though simple and readily understandable, the model suffers from a number of conceptual problems and the rigidity of its basic assumptions. While it focuses on investment gap, less consideration was given to whether the investment will generate foreign exchange to service debt at maturity (Mc Donald, 1982).

The borrowing country's external solvency condition was addressed in the "debt dynamic" model. Hence the consideration of the value of exports which gives a more accurate impression of income in foreign currency that can be used to service debt (World Bank, 1985, Hernandez, 1988). However, because of the assumption of a time-variant growth path for exports and the rate of interest, the use of the debt dynamics model also has limitations in assessing the sustainability of a borrower's debt. In spite of the obvious weakness of the growth-cum-debt and the debt dynamic models, they still provide insight for determining external debt capacity.

2.2 Debt Burden and its Sustainability

The analyses of external debt sustainability are inherently forward looking. A number of factors come into play to establish if a country will be able to service its debt. These factors include the existing debt stock and associated debt service, the prospective path of its deficits, the financing mix of the debt and the evolution of its repayment capacity in terms of foreign currency value of GDP, exports and government revenues (Abrego et al 2001). Projections of the debt dynamics provide a link between debt sustainability and macroeconomic policy. The integrity of such projections determines the extent of their usefulness in establishing debt sustainability.

In measuring debt burden literature expounds good number of indicators as provided here under: Ogunlana (2005) mentioned several indicators which have been used over the years to measure debt burden and its sustainability. The indicators are usually reported in percentages (ratios). These include: Debt Stock/Export, Debt Service/GDP, Debt Service/Export, Debt Stock/GDP, Reserves/Import and Reserves/Debt Stock. Each of

these indicators has its merits and its limitations, suggesting that they should be used in combination and with caution.

The strength of any economy depends on its output and export potentials. Its debt stock with regard to its export should be well balanced and sustainable. In the same way, external debt stock/GDP is a scaled measure of debt stock position. They will measure foreign presence in an economy in the form of past reliance on contractual foreign capital inflow with the potential of attracting capital outflow in the future. Whether these will create debt burden in the future or not depends on the terms of the loan regarding its maturity structure, interest rate and usage.

The Debt Service/Export and Debt Service/ GDP indicate the proportion of exports and national output that are committed to service of debt incurred in the past. In particular, debt service/export is a liquidity measure. The debtor's ability to meet debt servicing obligation declines as the ratio increases. This directly shows that the debt is likely to be unsustainable. This situation can be costly as it can require greater adjustment to compensate for adverse balance of payments developments. For the debt service/GDP, it measures the magnitude of current domestic output used in meeting debt service commitments entered in the previous period.

The Reserves/Debt Stock ratio, though not a common measure of debt sustainability, assumes that if the total debt stock of the borrower is to be paid off with the reserves, how far would it go. The greater the ratio the more comfortable the debtor appears to be in terms of its capacity to meet its external commitments. Similarly, the Reserves/Import ratio measures the capacity of the country to pay for its imports.

The debt burden indicators suffer the limitations endemic to ordinal measurement. For instance, a country with a low ratio of debt stock/GDP may record unsustainable external debt if the value of exportable constitutes a very small proportion of its GDP. Foreign exchange resources may not be available to meet its debt service payments. Furthermore, the debt/GDP can also be influenced by exchange rate since local currency depreciation can raise the ratio while physical output and debt stock in foreign currency remain unchanged.

In addition, many debt ratios such as debt stock/GDP and debt stock/exports do not convey the terms and conditions and mix of concessionality and non- concessionality in the debt. These conditions have different impacts on the magnitude of the subsequent debt service payments (Omoruyi, 2005). The greater the level of concessionality in a stock of debt, which allows for long grace and maturity periods and low interest, the better, compared with debt with short maturity and high interest rate. This is because the debt service difficulty will be minimised.

Another important dimension to measuring the burden or sustainability of external debt is the use of the net present value (NPV) of such debt in terms of the discounted value of future debt service payments. However, the problem with this is that it compares future debt service obligations with existing repayment capacity without considering the country's ability to grow. This is particularly relevant when the debt maturity period is long. Moreover, while NPV indicators may signal debt servicing difficulties sometime in the future, they do not provide information on when these problems may become pressing. Similarly, the discount rate may vary with market conditions. The NPV approach has to its advantage the capacity to make an effective comparison of debt burden among the countries on the same level of development.

The choice of relevant denominators in establishing debt ratios is another important issue. In general, this depends on the constraints that are most binding in an individual country. The use of GDP captures overall resource constraints, export relates to foreign exchange constraints while revenue indicates government's ability to generate fiscal resources. For external debt, it is useful to monitor and assess debt sustainability in relation to GDP and export earnings while public debt in general could be related to GDP and fiscal revenues (IMF, 2000).

It is important to observe a review of a country's external debt sustainability with total neglect of the level and constraint associated with domestic debt servicing will be underestimating the seriousness of indebtedness and the stress of debt servicing. This is because the impact of debt servicing on the budget is independent of whether payments are due to external or domestic debt obligations. Indeed they both have the effect of reducing allocation on other expenditure heads which may be important for sustainable growth.

Some general thresholds have been considered in the empirical literature for each of these ratios under the enhanced HIPC Initiative beyond which a country's debt might be considered unsustainable. These include NPV Debt-to -Export ≥ 150 per cent, Export-to-GDP ≥ 30 per cent, and Government Revenue-to-GDP ≥15, NPV Debt – to- Government Revenue ≥ 250 per cent, Debt Service-to-Export ≥ 15 per cent and Debt Service-to-Revenue ≥ 25 per cent.

Under the Country Policy and Institutional Assessment (CPIA) in which institutional strength and quality of policies play important determining factors, classification of countries to poor, medium and strong, determines what ratio should apply for Debt Service to export as well as Debt Service to Revenue. Countries classified as strong are to observe the ratios of 25 and 35 percent for debt service-export and debt service-government revenue, respectively.

The HIPC initiative was not intended to address the debt problems of all debtor countries. Hence its thresholds may not be applicable to all. However, the critical issue is that its eligibility criteria even for the HIPC are neither based on a comprehensive measure of poverty nor on a comprehensive measure of indebtedness. For example, the classification of Tanzania, which is poor and highly indebted by all standard, as a "blend" country rather than "IDA Only" has shown some discrimination which can partly be explained by political factors.

Some critics have argued that the use of the indicators such as debt and debt service to exports should be complemented with NPV debt-to-GDP which in itself is a good overall indicator of a country's indebtedness. This is not only because it puts all countries at par in considering the heaviness of debt, but also it is less volatile than NPV debt-to- exports indicator and more easily available than the NPV debt-to- government revenue indicator (Sachs, 2000)

Kappagoda and Alexandra (2004) developed five indicators that together allow for sustainability conclusions to be drawn: The first indicator is the Present value of Debt to GDP ratio: The GDP figure used is the average of the current year and two preceding years. Comparisons of GDP demonstrate the size of debt in comparison to the size of the economy. The second indicator is the present value of debt to Export ratio: The exports figure used is the average of the current and the two preceding years. Comparisons to exports demonstrate the ability to pay for the debt, however the availability of funds to pay for the debt depends on the openness of the economy and arrangements made for attracting foreign direct investment.

The third indicator is Present value of debt to Government revenues ration: The Government revenues figure used is the average of the current year and two preceding years. Domestic revenues are the best way out of debt problems; so reducing the ratio between the debt and government revenues must be a policy target. The fourth indicator is Debt service to exports ratio: The exports figure used is the average of the current and the two preceding years. Comparisons to exports demonstrate the ability to pay for the debt, however the availability of funds to pay for the debt depends on the openness of the economy and arrangements made for attracting foreign direct investment. And the firth indicator is Debt service to Government revenue ratio: The Government revenues figure used is the average of the current year and two preceding years. Domestic revenues are the best way out of debt problems; so reducing the ratio between the debt and government revenues must be a policy target.

Due to the fact that the country does default to service their debts, IMF (2000), Kappagoda and Alexander (2004) established debt threshold. The debt threshold aims at providing strength and quality of debt servicing policies. Table 2.2.3 below highlights such threshold.

Table 2: Kappagoda and Alexander debt distress thresholds

Details	**Institutional Strength and Quality of policies**		
	Strong	**Medium**	**Poor**
PV Debt: GDP	60%	45%	30%
PV Debt: Exports	300%	200%	100%
PV Debt : Government Revenue	250%	200%	150%
Debt Service: Exports	35%	25%	15%
Debt Service: Government Revenue	40%	30%	20%

Source: Kappagoda and Alexander (2004)

2.3 An Overview of Economic growth and External debt of Tanzania

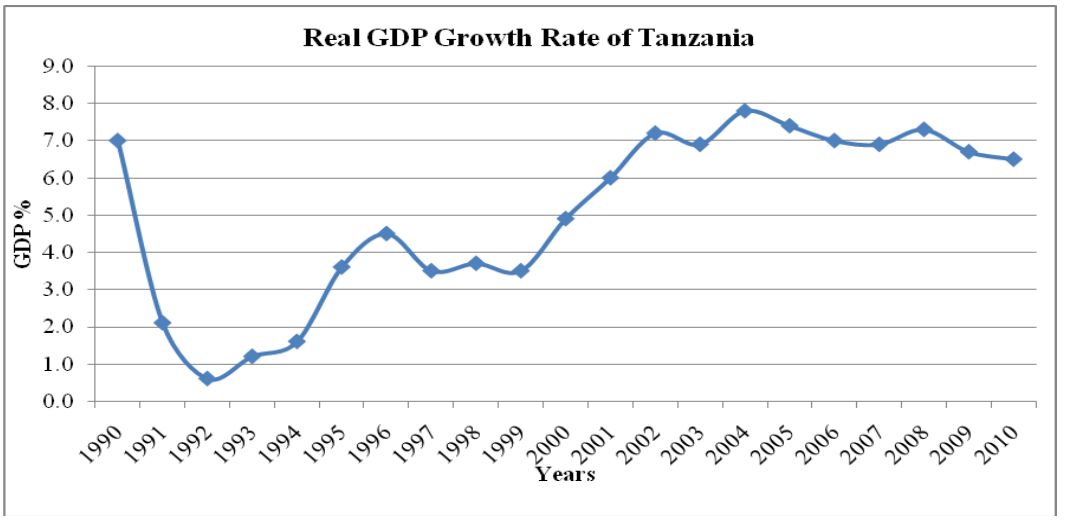
The macroeconomic performance of Tanzania for the period of 1990 to 2010 has been well performing. The growth rate increased and the revenue collection also increased. Tanzania's macroeconomic performance over the last decade has been strong. Growth averaged 7 percent per year during 2002-09 which, together with a sharp increase in revenue collection and increased donor funding, provided room for a substantial expansion in public spending (Lewis et al. 2011).

The external debt of Tanzania reached US$ 8.7 billion in 2010 from US$ 6.5 billion in 1990. While in case of the percentage of GDP, it decreased from 130.1% in 1990 to 41.6% in 2010. The annual debt service of Tanzania slightly declined from US$ 0.21billion in 1990 to US$ 0.20 billion in 2010 (WDI, 2011). The sustainability of debt is assessed through different macroeconomic indicators like external debt to GDP ratio and Debt service percentage of Export of goods, Service and Income. Most of the debt burden indicators show a declining trend. Thus, so far the external debt of Tanzania is sustainable (MOF, 2011).

On GDP growth rate, World Economic Outlook (WEO) 2012 the real GDP growth rate of Tanzania in 1990 there is an upward trend due to the achievement of the economic reforms. Muganda (2004) mentioned that "… subsequent to the temporary setback in macroeconomic policy during the first half of the 1990s, the government achieved

macroeconomic stability in the late 1990s". Nonetheless, the growth rate of Tanzania was shocked and downward from 7.0% to 2.1% in 1990 and 1991 respectively. The trend continues to decline and slightly increased in 1995. The main reason donor support fell in the early 1990s when the reform effort temporarily collapsed, it rose again when reforms resumed under the Mkapa regime in 1995 (Muganda, 2004).

Another reason that implied to decline the growth rate of Tanzania was the many conditions from the donors to get the foreign aid. Muganda (2004) mentioned "… conditioning aid on policy measures was a contentious source of tension: it was perceived to undermine sovereignty and government's ownership of economic management. It created tension between the government and its donors and prompted donors to evaluate their approaches in aid relations". Furthermore, at the period between 1995 and 2000 the growth rate of Tanzania was fluctuated and significantly increased to 6.0% in 2001. Fortunately, after 2001 the trend shown that there is slightly increased of growth despite the fact that the movement was swung from 2002 to 2010 as shown in figure 1.

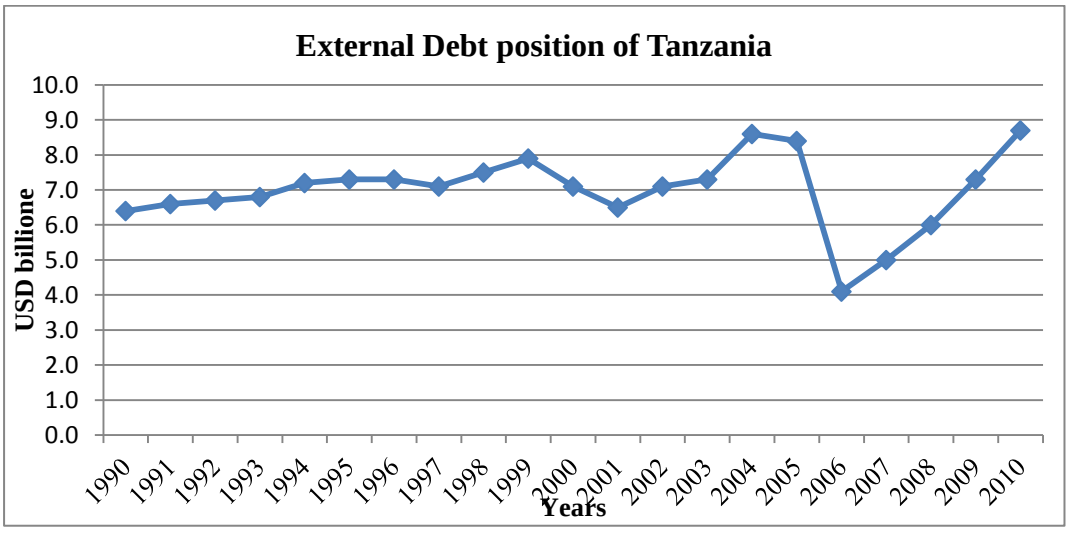


Source: World Economic Outlook (2012)

Figure 1: Real GDP Growth Rate of Tanzania

According to WDI, BoT and MOF (2011) the external debt position of Tanzania reached US$ 8.7 billion in 2010 from US$ 6.5 billion in 1990. While in case of the percentage of GDP, it decreased from 130.1% in 1990 to 41.6% in 2010. The annual debt service of Tanzania slightly declined from US$ 0.21billion in 1990 to US$ 0.20 billion in 2010. The sustainability of debt is assessed through different macroeconomic indicators like external debt to GDP ratio and Debt service percentage of Export of goods, Service and Income. Most of the debt burden indicators show a declining trend. Thus, so far the external debt of Tanzania is sustainable.

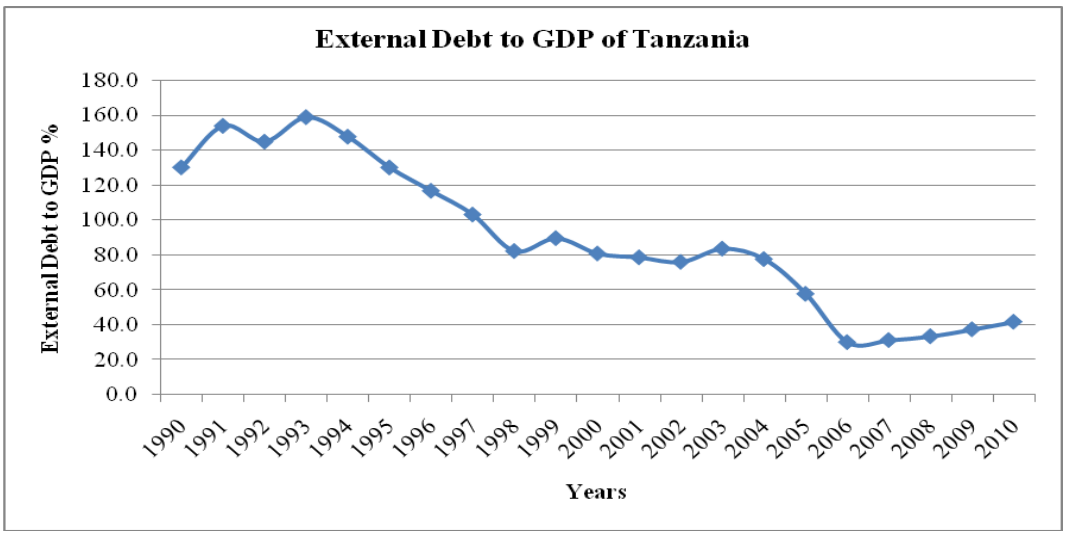
The trend of debt position shown that between 1990 and 2005 the external debt of Tanzania was fluctuated while in 2006 there is a sharp decline of external debt due to the fact that Tanzania has upfront cancellation of about US$ 3 billion debts in the framework of MDRI as mentioned by MOF (2011). Moreover, Steven et al. (2009) reported that "... it is estimated the reduction in debt by approximately US$ 3.6 billion between 2005 and 2006 ..." However, after 2006 the trend shown that there is continuous increased of external debt as shown in the figure 2.



Source: World Development Indicators (2011)

Figure 2: External Debt Position of Tanzania

The relationship between external debt and GDP could be highlighted in figure 2.4.6 below. The external debt to GDP of Tanzania between 1990 and 1993 was reached to 130% and 147% respectively. Fortunately, the trend declined from 82.1% in 1998 to 57.6 % in 2005. There is a sharp decline of external debt to GDP in 2006 and arrived to 29.9% due to the fact that Tanzania has debt cancellation of about US$ 3billion. The performance of external debt to GDP slightly increased in the period from 2007 to 2010 as shown in the figure 3.

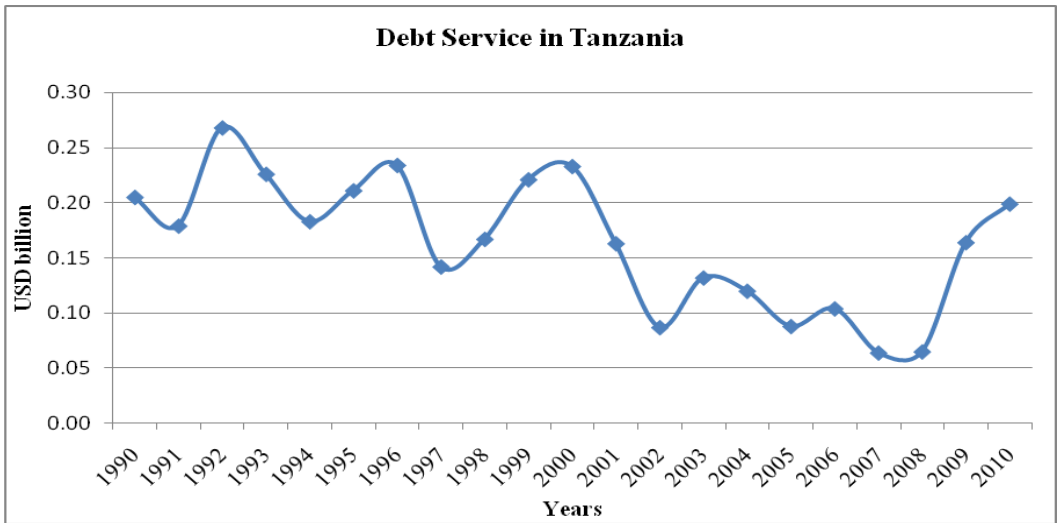


Source: World Development Indicators and Bank of Tanzania (2011)

Figure 3: External Debt to GDP of Tanzania

High debt generally leads to high debt service liability. However, the severity of the debt service liability of a country depends on the relationship of its GDP and on the level of debt in relation to its debt service obligation (Malik et al. 2010). Tanzania like other developing countries suffered on debt servicing.

The trend of debt servicing of Tanzania was fluctuated. The figure shows an increasing trend in debt servicing from 1990 till 2000, then there was a sharp decline in debt servicing on 2002. After that there are slight fluctuations of trend in debt servicing between 2003 and 2008. However, the trend increased and reached US$ 0.2 billion on 2010. All in all the debt servicing of Tanzania nearly remain the same amount in 1990 and 2010 as shown in figure 4.



Source: World Development Indicators (2012)

Figure 4: Debt Service in Tanzania

3 Methods of Analysis

The main source of data used in this study is secondary data. The used of secondary data was valid for this study for the purpose of gathering background information and of comparing the past experience with the current. The data obtained from BoT, MOFEA and MOF Reports; and WB and IMF publications, books, papers, journals articles and related literature on external debt and economic growth. Key data collected include annual, quarterly and monthly reports and corresponding of the interview from the employees of the Debt Management Office both BoT and MOF.

The sample size of the study covered 21 years from 1990 to 2010, where annual data employed were easily available as compared to quarterly or monthly data of which annual GDP, external debt stock and debt servicing. Systematic sampling techniques were used due to draw a solid conclusion with reference to a specific period of time, it was also adopted this technique as the study could be used for further investigation with reference to time.

3.1 Models and Estimation

In order to observe the overall impact of external debt on economic growth of Tanzania the equation estimated growth model as suggested by the Malik et al. (2010).
In the light of above, the following specifications were used in order to evaluate the effects of external debt on economic growth; and mathematical models were constructed for analysis:

$$GDP = f(ED, DS) \quad (1)$$

The econometric equations are as follows:

$$GDP = \alpha + \beta ED + \varepsilon \quad (2)$$

$$GDP = \alpha + \beta DS + \varepsilon \quad (3)$$

$$GDP = \alpha + \beta_1 ED + \beta_2 DS + \varepsilon \quad (4)$$

Where: α = Constant term; β = Responsiveness coefficient of the independent variable to the dependent variable; GDP = Gross Domestic Product; ED = External Debt; DS = Debt Servicing; ε = Random error term.
The formula to find the correlation coefficient of the variables indicated below:

$$r_{gdp,ed} = \frac{Cov_{gdp,ed}}{\delta_{gdp} \, x \, \delta_{ed}} \quad (5)$$

Where: $r_{gdp,ed}$ = Correlation coefficient of economic growth and external debt; $Cov_{gdp,ed}$ = Covariance of economic growth and external debt; δ_{gdp} = Standard deviation of economic growth; δ_{ed} = Standard deviation of external debt
Furthermore, the study applied Ordinary Least Square (OLS) technique to estimate the impact of external debt on economic growth. The study also applied descriptive techniques such as graphs, charts and tables to uncover the extent of the impact of external debt on the economy of Tanzania.

3.2 Unit Root Test

Given the fact that the study used time series data, it was worthwhile to test for stationarity and covariance between the two time periods depends only on the distance or gap and not the actual time then the series is said to be stationary. Stationarity tested by using Augmented Dickey-Fuller (ADF) unit root tests. The ADF test consists of estimating the following regression (Gujarati, 2009):

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \Sigma \alpha_i \Delta Y_{t-I} + \varepsilon_t \quad (6)$$

Where: ε_t = is a residual time; Y_t = is the relevant time series.

4 Data Analysis and Discussion

The study presented and analysed the findings quantitatively to fulfilment research objectives. Ordinary least Squares (OLS) techniques was applied to establish relationship between external debt and economic growth.

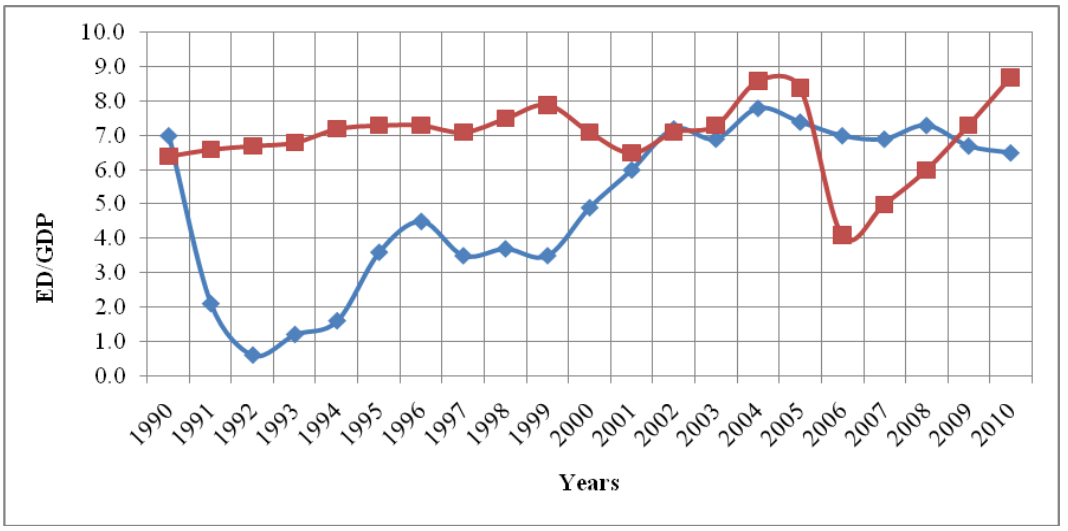
4.1 The Relationship between External Debt and Economic Growth

The first objective of this study was established the relationship between external debt and economic growth in Tanzania for the period of 1990 to 2010. To overcome with this objective three methods are used. The methods are graphically presented in figure 5 and in the following simple equations (7) and (8) below:

$$GDP = \alpha \pm \beta ED + \varepsilon \quad (7)$$

$$GDP = \alpha \pm \beta DS + \varepsilon \quad (8)$$

Where: GDP is percentage of economic growth; α is a constant term; β is the Responsiveness coefficient of the independent variable to dependent variable; ED is external debt and DS is debt servicing and ε is a random error term.



Source: Research Study (2012)

Figure 5: The Relationship Between External Debt and GDP

The figure 5 shows the relationship between external debt and economic growth whereby the GDP and External debts (ED) are on the vertical axis and years are in horizontal axis. The figure provided are GDP is percentage and ED is US$ billion.

The trend shows that in 1990 the GDP was an upward trend due to the achievement of the economic performance of Tanzania. Muganda (2004) mentioned that "… in macroeconomic policy during the first half of the 1990s, the government achieved macroeconomic stability in the late 1990s". However, in 1992 the growth rate of Tanzania was shocked and downward from 7.0% to 2.1% in 1990 and 1991 respectively. The trend increased and slightly improved in 1995 and reached 4.5%. In 2002 the trend reached 7.2% even though there is a declined between 1997 and 1998. Furthermore, the trend shows good performance from 2003 to 2010 despite the movement was swung.

On the other hand, the external debt position shown fluctuated trend from 1990 to 1999 where the debt ranged between US$ 6.4 billion and US$ 7.9 billion respectively. The trend dropped in 2001 and reached US$ 6.5 billion. In 2006 there was a sharp declined of US$ 4.1 billion due to a debt relief from IDA and PC. However, from 2007 to 2010 the

trend shows the debt position slightly increased hence the position reached US$ 6.5 billion in 2010.
Furthermore, the study analysed the relationship between external debt and economic growth by using the regression analysis and found that there is negative relationship for both External Debt (ED) and Debt Servicing (DS) on economic growth of Tanzaniaas explained below.

4.1.1 External debt and economic growth

External debt (or foreign debt) is that part of the total debt in a country that is owed to creditors outside the country. Economic growth is the increase in the capacity of an economy to produce goods and services, compared from one period of time to another as indicated in Table 2 below.

Table 2: Estimation Results Dependent Variable GDP

Dependent variables	**Constant**	**ED**
Coefficient	5.6684767	-0.0894
Standard error	3.485197	0.49269
(t)	1.63	-0.18
Correlation coefficient		-0.0416

Source: Research Study (2012)

The coefficient of the dependent variable that is GDP at zero level of the explanatory independent variable of external debt is 5.6684767 and standard error is 3.485197 whereas the t- statistic is 1.63. This indicates that there is a positive relationship between the constant parameter and economic growth even though the constant has no significant meaning in the model rather than reflecting the value of economic growth when a variable is holding a constant.
The coefficient of external debt (ED) shows there is a negative relationship of 0.08894 with economic growth. This means that when GDP increased by 1% leading to decrease of ED by 9%. Additionally, the correlation coefficient has been used to establish the relationship between external debt and economic growth. This result a negative relationship of 0.0416 between external debt and economic growth. Thus the strength of linear between ED and GDP is -4.16%.

4.1.2 Debt service and economic growth

Debt service refers to all payments made against a loan: amortisation, interest and commission payments. The estimation results of economic growth on debt servicing are summarized in Table 3.

Table 3: Estimation Results Dependent Variable GDP

Dependent variables	**Constant**	**DS**
Coefficient	9.412714	-26.599
Standard error	6.421948	1.119968
(t)	8.40	-4.14
Correlation coefficient		-0.6888

Source: Research Study (2012)

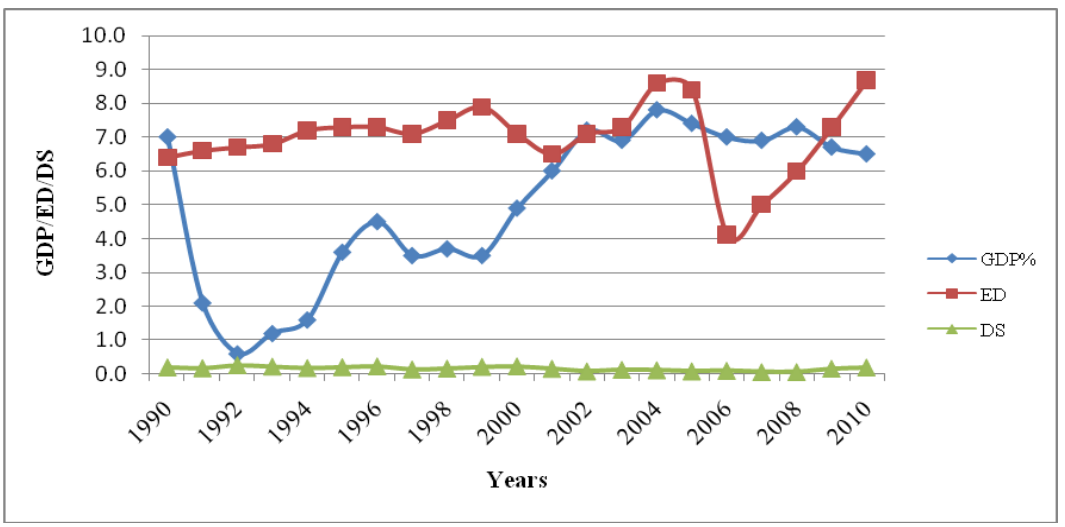
The coefficient of the dependent variable GDP at zero level of the explanatory independent variable of debt service is 9.412714 and standard error is 6.421948 whereas the t statistic is 8.40. This indicates a positive relationship between the constant parameter and economic growth even though the constant has no significant meaning in the model than reflecting the value of economic growth when a variable is holding a constant.
The coefficient of debt servicing (DS) shows there is a negative relationship of 26.599 with economic growth. This means that when GDP increased by 1% the DS imply to decrease the GDP by 2669.9%. Additionally, the correlation coefficient has been used to establish the relationship between debt servicing and economic growth. The result of the study shows there is negative relationship of 0.6888 between debt servicing and economic growth. Thus the degree of linear between DS and GDP is -68.88%

4.2 Impact of ED and DS on Tanzanian Economic Growth

The second objective of this study was uncovered the impact of ED and DS on Tanzanian economic growth in the period of 1990 to 2010. In order to overcome with this objective two methods are used, graphical as presented in Figure 6 and in the equation (9).

$$GDP = \alpha + \beta_1 ED + \beta_2 DS + \varepsilon \quad (9)$$

Where: GDP is percentage of economic growth; α is a constant term; β is the Responsiveness coefficient of the independent variable to dependent variable; ED is external debt and DS is debt servicing and ε is a random error term.
The figure 6 shows the impact of external debt and debt servicing on economic growth for the period of 1990 to 2010. The GDP, Debt service (ED) and External debts (ED) are on the vertical axis and years are in horizontal axis. The figure provided are GDP is the percentage whereas DS and ED are US$ billion.



Source: Research Study (2012)

Figure 6: The Impact of ED and DS on Economic Growth of Tanzania

The trend of GDP and ED were explained in section 4.1. In case of debt servicing the trend shows that there is a fluctuation trend from 1990 to 2010. In general, the debt servicing was fluctuating between US$ 0.27 billion and US$ 0.18 billion in the period from 1990 to 2000. Moreover, on the period of 2001 to 2006 the debt service was ranged between US$ 0.16 billion and US$ 0.10 billion, then there was a sharp decline in debt servicing on 2007 and 2008 which reached US$ 0.06 billion and US$ 0.07 billion respectively. After that there was increased of debt servicing and reached US$ 0.16 billion and US$ 0.20 billion in 2009 and 2010 respectively. Thus, this proves or indicates the debt servicing of Tanzania nearly remained the same during the 1990 to 2010.

Furthermore, the study analysed the impact of external debt and debt service on economic growth by using the regression analysis in Ordinary Least Square (OLS) methodology and the results of estimations are reported in Table 4 below the regression result shows that there is significant impact of the external debt service and external debt on economic growth. The debt service payment has a negative effect and external debt has a positive effect. The evidence suggests that increase in external debt will lead to increase in economic growth and as the debt servicing increase, there is fewer opportunities for economic growth.

Table 4: Estimation Results Dependent Variable: GDP

Variable	**Coefficient**	**Std error**	**t statistic**	**Probability**
Constant	7.143841	2.553902	2.8	0.012
DS	-28.51727	6.712276	-4.25	0.000
ED	0.3693937	0.3736322	0.99	0.336
Prob > F = 0.0019;				
R-squared = 0.5016				
Adj R-squared = 0.4462				
Root MSE = 1.7232				
Durbin- Watson stat =1 .78199				

Source: Research Study (2012)

From the figure 4 above the effect of external debt on Tanzanian economy the coefficient of the dependent variable GDP at zero level of the explanatory of all independent variable are 7.143841. This indicates a positive relationship between the constant parameter and economic growth despite the constant has no significant meaning in the model than reflecting the value of GDP when other explanatory variables are held constant.

The coefficient of external debt (ED) shows that there is a positive relationship of 0.36939 with economic growth. This means that when ED goes up by a thousand dollars, on average, the GDP also goes up by about 369.39 per thousand other things remain constant. However, the coefficient of debt servicing (DS) shows that there is negative relationship of 28.517 with economic growth. This means that when DS goes up by a thousand dollars, on average, the GDP goes down by 28,517 per thousand other things remain constant.

The coefficient of multiple determinations (R^2) is 0.5016 equivalents to 50.2%. This indicates that about 50.2% of the total systematic variations in the economic growth is jointly explained by the variation in all the explanatory variables of ED and DS and the

remaining 49.8% could be attributed to the stochastic error term not included in the model.

4.3 The Long-term Relationship Between ED and Economic Growth

The third objective was to find the long-term relationship between external debt and economic growth in Tanzania. In order to overcome this objective the analysis used the different tests such as Augmented Dickey-Fuller unit root test, the Johansen co-integration test and Durbin Watson.

4.3.1 Unit root test

Augmented Dickey-Fuller test has performed to test the unit root hypothesis to all variables. The results are reported in Table 5. According to the results, all variables are not integrated of the same order. All the data are stationary at their first difference. With estimates the value without trend and intercept that is a random walk model GDP also shows stationary in first difference but not in the level. All the data are not trend stationary in level but difference stationary at first difference. From the point of view of all the test first difference is accepted for all the variables. Al all the variables are integrated of I (1), so the residuals from the regression is expected to I (0). Forecasting from this regression of stationary time series data will not produce spurious regression result.

Table 5: Augmented Dickey-Fuller Test

Variables	**Level**	**1st Difference**	**Conclusion**
GDP	-1.428	-5.665	I (1)
ED	-2.624	-3.835	I (1)
DS	-2.007	-3.835	I (1)

Source: Research Study (2012)

4.3.2 Johansen co-integration test

Augmented-Dickey-Fuller (ADF) test is used to find out the order of integration of variables and found that the variables are I (1). To check the long run relationship between variables, the Johansen co-integration method Johansen (1988); and Johansen and Juselius (1990) are used. The Johansen co-integration approach tests in a multivariate framework provides a clear picture than other tests like Engle-Granger (1987) co-integration method in some aspects. Beside this Johansen technique launch the hypothesis tests of parameters to estimate and rank restrictions using likelihood ratio tests Johansen and Juselius (1992), Strauss (1996).

According to Johansen's test for co-integration, when the maximum rank is zero, there is no co-integrating relationship. If the rank is one there is one, if it is two there are two and so on. As the result from the Table 6 present the zero maximum rank, this indicates that no co-integration relationship so cannot reject the null of having no rank (rank=0) as there is no co-integration. This means that there is no long run relationship of the variables.

Table 6: Result Co-integration Test

Max Rank	**Eignen value**	**Trace Statistics**	**5% Critical Value**
0	-	29.2549*	29.68
1	0.66798	7.2035	15.41
2	0.24647	1.5439	3.76
3	0.07429		

Source: Research Study (2012)

5 Discussion of the Results

The relationship of external debt and economic growth in Tanzania (1990 to 2010) in the graphical analysis shown there was some relationship between external debt and economic growth typically, when the country acquired the debt relief. During the debt relief the GDP trend was upward compare to ED trend while when Tanzania increased the ED the GDP trend went down. The trend shows that Tanzania likes any other developing countries suffered from debt burden and servicing.

On the other hands the regression analysis indicated that there was a negative relationship between ED and GDP by 9%. This means that when ED increased by 1% there was a decrease the GDP by 9%. This shows that the impact of ED and economic growth are some related while DS shown there was no impact. This is because when refer from the literature review on portfolio of external debt of Tanzania specified that the accumulation of external debt mainly consisted of multilateral and bilateral loans, which have long maturity of 20 to 40 years. Thus, over the period of 1990 to 2010 the debt services of Tanzania mainly considered the interest payments, besides the debt relief is considerable.

In regression analysis the results shown that there were significant impact of the external debt service and external debt on economic growth. The debt service payment has a negative effect and positive effect for external debt. Hence, coefficient of external debt (ED) shows a positive relationship that accounts around 40% with economic growth which means that when ED increased by 1% the GDP also increase by 40%. There is negative relationship between DS and ED of about 28.517. This shows that the increases of 1% in DS the decreases of GDP 2851.7% of GDP. The analysis shows that increase in external debt it implies to increase in economic growth and as the debt servicing increase result the decline of economic growth.

The long-term relationship between the external debt and economic growth the Augmented Dickey-Fuller unit root test shows that all variables are not integrated of the same order. All data are stationary at their first difference. With estimates the value without trend and intercept that is a random walk model GDP also shows stationary in first difference but not in the level. All the data are not trend stationary in level but difference stationary at first differed so all the test first difference was accepted for all the variables. Moreover, co-integration test show that there is no co-integrating relationship and the result of Durbin Watson the statistic is non autocorrelation.

The result of those tests is reasonable as capital formulation need long period of time to affect productive activity. Debt service payment affects instantly the economy since there is a lack of financial solvency or liquidity.

6 Summary of the Research Findings

The analysis results show that there is significant impact of the external debt and debt service on economic growth of Tanzania. The debt service payment has a negative effect and external debt has a positive effect. This seems to support the empirical assertion by Ruby (2012) on a study of the impact of external debt on economic of Bangladesh.

Tanzania has spent about 26% of its external debt for BOP support and the rest spent in other activities whereby infrastructure only accumulated 36%. This means that remain sectors spent about 38% only on external debt. This show that the impact of external debt on economic growth of Tanzania has a positive relationship because the uses of funds mainly support to development sectors.

Besides, the portfolio of external debt of Tanzania is mainly accumulated multilateral and bilateral loans which are about 95% of total external debt. This position influenced the greater level of concessional in a debt stock of Tanzania as a result allows for long grace and maturity periods and low interest, compared with commercial and export loans which are short maturity and high interest rate.

Alternatively, the debt servicing affects the economic growth of Tanzania because the returns from infrastructure sector take a long time to implement hence the payment of debt service should derive from other sectors. Thus, the debt relief from IDA and PC in Tanzania most likely implied to boost the economic growth in other way around. However, on the period of 1990 to 2010 the debt servicing of Tanzania was very low, and this is because the most loans are mature in long period hence the payment for the whole period is interest payments and a few of other loans.

The regression analysis result has shown that there is significant impact of the external debt and external debt service on GDP growth. The total external debt stock has a positive effect of 0.36939 and debt service payment has a negative effect of 28.517. This means that when the country increase to take external debt it might lead to increase in economic growth while when the country decide to service the external debt might lead to disturb the economic growth of the country. Either, in a long run relationship the unit root test shows that there is no long run relationship of the external debt and GDP.

6.1 Recommendations of the Study

External debt is a very important area in any country for boosting the economic activities. It is a contradiction whether external debt stimulates economic growth or hinders growth. Some researchers found positive relation, some negative and some no significant relation between external debt and economic growth for different economic condition.

Deficit financing takes place either from internal sources or external source. Any government borrows either for revenue or development expenditure. Higher indebtedness can affect growth rate through different channels. High current stock of external debt may act as future increasing obligations to serve a debt. This represents all things that debt financed fiscal policy affect economic growth for the lack of availability of investment resources.

Hence, in this study it is recommended that in future plans should ensure to take an external debt which productive used and the rate of return of debt is higher than the service payment rate. It should be a serious concern for what the purpose of external debt is undertaken and to provide the efficiency of domestic resource uses (that is, it will be advisable for the government to create other optional strategies to improve their income

using their natural and cultural endowment so that they can an increase their economy rather than depending to the extrenat debt) and to reducing unnecessary cost of government to spend the budget in the right way in order to avoid the bulky deficit.

6.2 Policy Implications and Limitations of the study

In order to find some policy implications for this study it the government should provide the following: The government should pay more attention to the debt management profile and particularly for its items of expenditure. It should try to the best in implementing the borrowing funds to proper and productive programmes for the betterment of the whole nation. Importantly, the government should establish, maintain and manage a credible database. The database should provide timely, accurate and comprehensive data to requisite stakeholders for the purpose of disclosure and DSA.

Moreover the government should establish a transparency of loan cycle that covers the activities for project identification, appraisal and approval, loan negotiations and contracting, loan disbursements, project implementation monitoring and evaluation as well as loan repayment. Finally, the government should provide a policy framework that is credibly creating an environment that will encourage investors' confidence for both local and foreign to invest in the country.

The study based on a case study at Ministry of Finance (MOF), Tanzania and Bank of Tanzania (BoT) Zanzibar branch. The research explored the impact of external debt on economic growth of Tanzania and used the data from 1990 to 2010. During this period there was a debt cancellation that contributed in the economic performance of Tanzania. However, due to the difficulty of the availability of data of debt cancellation distributed to government sectors such as education, health, agriculture and infrastructures it is difficult to measure the contribution of debt relief on the economic growth of Tanzania.

Another limitation was a lack of time availability and availability of funds to perform the study at a very significant depth. Also most of the top managements are scared to provide the data, taking to granted that these data are very confidential and it is for the government purposes only.

6.3 Suggestions for Further Research

External debt is a very interesting study, it involves many areas thus on further research it is better to consider some of the following areas: The impact of private external debt on economic growth, the impact of external debt on foreign direct investments and the impact of external debt on domestic revenues.

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