Impact of Debt Relief on Fiscal Allocation to Social Priority Sectors and Response of Social Indicators in the HIPCs: A Case Study of Tanzania

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List of Abbreviations

ADF	-	Africa Development Fund
AfDB	-	Africa Development Bank Group
AIDS	-	Acquired Immune Deficiency Syndrome
BoT	-	Bank of Tanzania
CGE	-	Computable General Equilibrium
DC	-	Developed Countries
DCP	-	Debt Conversion Programme
DRF	-	Debt Relief Facility
DSA	-	Debt Sustainability Analysis
GDP	-	Gross Domestic Product
GNP	-	Gross National Product
GoT	-	Government of Tanzania
HIPC	-	Heavily Indebted Poor Countries
HIV	-	Human Immunodeficiency Virus
IDA	-	International Development Association
IFS	-	International Financial Statistics
ILO	-	International Labour Organization
IMF	-	International Monetary Fund
LDC	-	Less Developed Countries
MDF	-	Multilateral Debt Fund
MDGs	-	Millennium Development Goals
MDRI	-	Multilateral Debt Relief Initiative
MTEF	-	Medium Term Expenditure Framework
NPV	-	Net Present Value
OECD	-	Organization of Economic Cooperation and Development
OPEC	-	Organization of Petroleum Exporting Countries
PAF	-	(Uganda) Poverty Action Fund
PC	-	Paris Club
PRSP	-	Poverty Reduction Strategy Paper
SSA	-	Sub-Saharan Africa
TZS	-	Tanzanian Shillings
UGX	-	Uganda Shillings
UPE	-	Universal Primary Education
UNU	-	United Nations University
US$	-	United States of America Dollar
UCT	-	University of Cape Town
VAR	-	Vector Autoregression
VECM	-	Vector Error Correction Model
WIDER	-	World Institute for Development Economic Research.

Dedication

This dissertation is dedicated to my wife Herica and sons; Baraka and Leseriani

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First and foremost, I would like to give thanks to Almighty God for sustaining and leading me throughout the entire period of this study. Whenever I felt distracted I revised the biblical verse "**I can do everything through Him who gives me strength**" (*Phil. 3:13*). It is God's incomparable **LOVE** and **MERCY** that enabled me successfully complete this study.

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Abstract

External debt burden has been viewed as one of the key impediments to economic growth and a cause of widespread poverty in the Heavily Indebted Poor Countries (HIPCs). To join efforts of the HIPCs in fighting poverty, the international donor community granted substantial debt relief through different initiatives including among others; unilateral bilateral agreements, the Paris Club Agreements, debt buyback schemes, the HIPC Initiative and its successor, the Multilateral Debt Relief Initiative (MDRI). All these initiatives were expected to increase public spending in social priority sectors and ultimately reduce poverty incidence in the HIPCs.

This study assesses, firstly whether the debt relief has helped to increase Government spending on education and health sectors in Tanzania and, secondly, whether increased fiscal spending on the sectors has translated into improvement in the primary and secondary school enrollments and life expectancy. A system of structural equations is estimated within a Vector Autoregressive (VAR) framework.

The findings suggest increases in Government expenditure on education and health through debt relief. Primary and secondary school enrolments improve with increased Government spending on education and health. Institutional quality is found to be significant in determining education spending and educational indicators. However, life expectancy was not found to respond to public spending, possibly due to the inherent gestation period in health related indicators and quality of data used. Nevertheless, the findings, though based on short-run series, give an insight that in the long-run, the cumulative effects of debt relief can contribute towards successes in the fight against poverty and ultimately attainment of the Millennium Development Goals (MDGs).

1.0 Introduction

Over the last three decades, poor countries have accumulated external debts built up through; cold war-motivated lending, cheap availability of petrol dollars[1] in the mid 1970s, natural disasters, unfavourble terms of trade, and poor domestic policies. The accumulated debt became a serious impediment to economic development and poverty reduction in the poorest countries. Until the mid 1980s and early 1990s many countries had accumulated external debts to unsustainable levels and witnessed increased arrears. On average, poor countries spent between 30-40 per cent of their annual budgets repaying debts. This was much more than the countries spent on health and education combined (Jubilee, 2000). Many countries in Sub-Saharan Africa (SSA) experienced difficulties with debt repayments (Fosu, 2007). In Latin America for instance, Mexico declared debt moratorium in August1982[2]. This situation raised concern for borrowers, creditors and international community at large. The fear of the international community was that the debt crisis would trigger a global financial crisis, suppress economic growth and eventually lead to world economic recession. There was, therefore the desire to implement policies which would reduce debt repayments to sustainable levels.

Starting in the mid 1980s, bilateral and commercial debt relief initiatives under different platforms were considered[3]. The bilateral initiatives, however, made little impact as most of the indebted countries' debt obligations were with multilateral institutions. To deal with unsustainable debt comprehensively, multilateral debt relief initiatives were launched mid 1990s spearheaded by the International Monetary Fund (IMF) and the World Bank. While reducing debt burden to sustainable levels remained the intermediate objective of the debt relief initiatives, the receiving governments were bound to a key condition to use the debt relief savings estimated

[1] It is estimated that due to the rise in oil prices, western commercial banks' holding of the OPEC surpluses grew from US$7 billion in 1973 to US$ 115 billion in 1980.

[2] Before debt moratorium the Mexican primary fiscal deficit was 7.1 per cent of GDP which turned within three years into a surplus of 5 per cent of GDP and increased further to 8 per cent during 1988 to 1990 despite the decline in oil revenue by more than 7 per cent of GDP (Wijnbergen, 1991).

[3] Paris Club for public and publicly guaranteed debts, and London Club for commercial non-guaranteed debts.

at US$1.0 billion annually for poverty reduction (Jubilee, 2000). The ultimate goal was for debt relief to speed up the attainment of the Millennium Development Goals (MDGs) through sizeable fiscal allocation to social priority sectors. This was in response to the conviction that external debt burden has been one of the main causes of low levels of fiscal allocations to pro-poverty sectors and a cause of wide spread poverty in most of the HIPCs. The questions that remain to be answered are; first, whether debt relief savings increase social services spending and second whether social indicators respond to budget allocation towards the achievement of the MDGs.

In answering the questions, an empirical investigation remain vital as to whether; the past debt relief translated into higher social services spending and how the social indicators responded. The rationale for empirical investigation follows the fact that, we may not objectively conclude the increase in Government Expenditure on priority social sectors in most of the HIPCs including Tanzania since early 2000 being attributable to debt relief savings alone. During the period, there were several factors that might have contributed to the general rise in fiscal allocation including; favourable relations with donor community that led to increased budget support disbursements in the form of grants and program loans, fiscal policy reforms in areas of expenditure discipline and Tax reforms supported by high economic growth and stable domestic prices, and improvements in governance, transparency and public accountability.

Investigation follows the fact, Chauvin and Kraay (2005) estimated that between 1989 and 2003, debt relief worth US$100 billion was granted to low-income countries. Dessy and Vencatachellum (2007) estimated further that about US$60 billion was granted to Africa between 1990 and 2004. The relief was meant to create fiscal space for higher poverty related spending as outlined in the receiving countries' Medium Term Expenditure Frameworks (MTEF), Poverty Reduction Strategy Papers (PRSPs) and Millennium Development Goals (MDG). Failure to streamline the debt relief savings into these sectors jeopardizes chances of achieving the set goals, and as a consequence, the countries may get trapped back into unsustainable debt positions in future through new financing borrowings followed by higher debt service payments and subsequently the deterioration of social indicators.

Empirical literature based on recent studies shows that debt relief under the Heavily Indebted Poor Countries (HIPC) Initiative had positive impacts on Government expenditure on social services and simulation studies revealed improvement in social indicators. Apart from the initial surveys by the World Bank that showed that the recipient countries were using the relief on poverty reduction and expenditure on these sectors increased by nearly twice the amount realized as debt relief, studies by Mullinge (2003), Osei et al. (2005), Chauvin and Kraay (2005), Dessy and Vencatachellum (2007), Cassimon and Campenhout (2007, 2008) among others, found debt relief to increase fiscal allocation to social priority sectors.

Dessy and Vencatachellum (2007) work is among recent studies that investigated the extent to which past debt relief granted to African countries during the periods 1989–93 and 1994–98 translated into voluntary higher social services expenditure in the following five-year periods. Within the priority social services, the study focused on health and education sectors which are believed to generate the highest social returns. In their estimation, the dependent variables were; the share of public education expenditure in Gross National Income (GNI) and public health expenditure as a share of Gross Domestic Product (GDP). The independent variables were; debt relief, official development assistance and institutional change. The equations were estimated using Seemingly Unrelated Regression (SUR).

The SUR technique has consistent and asymptotically efficient estimators as long as the right hand side (RHS) variables are truly exogenous. However, theory shows that most of the budget variables are correlated which makes them endogenous, thus disqualifying the estimators of SUR. Worse still, the debt relief data used that ended 1998, excluded data for debt relief initiatives under the HIPC and MDRI, whose implementation in most HIPCs started in 2000 and after 2006, respectively. Thus, drawing conclusion from the bilateral debt relief only, may not explain the debt relief impact comprehensively because bilateral debt has not been serviced fully in many countries including Tanzania. In addition, bilateral debt stock was relatively small in magnitude for most countries of the HIPCs as compared to that of multilateral institutions that

was not supposed to accumulate arrears. Nonetheless, their findings show increases in public spending in education and health alongside debt relief, with quality institutions as a prerequisite.

This dissertation, therefore, diverges from Dessy and Vencatachellum (2007) study by; including the omitted variables in the estimation, using VAR estimation technique instead of SUR, and using debt relief data up to 2007 and so capturing all forms of debt relief initiatives. Among the omitted variables included in this dissertation are debt stock, domestic revenue and external debt service. A recent study by Lora and Olivera (2006) found that higher debt ratios reduce Government social expenditures even after controlling other variables. Similarly, domestic revenue has a direct impact on the magnitude of resource allocation to individual sectors as identified by Cassimon and Campenhout (2007). External debt service has been viewed in literature as one of key constraints to HIPCs fiscal allocations.

Other variables are primary and secondary education enrollments and life expectancy to capture improvements in education and health sectors, respectively. The focus is on Tanzania as a case study of HIPCs that received debt relief since mid 1980s. The main sources of data are the United Nations Statistics Division website, World Bank and IMF databases augmented with country publications and other specified sources. With an exception of institutional quality, primary and secondary education enrollments, and life expectancy, all other variables are normalized as ratios of GDP. Data for budget variables are annual and based on fiscal years whereas, the rest are based on calendar years. The study covered a period of 38 years (1970 – 2007), which is reasonably long enough for time series analysis.

Since debt relief is a necessary but insufficient condition for poverty alleviation in the recipient countries, this dissertation broaches the question of whether debt relief had any impact on government expenditure patterns in Tanzania. That is, it determines whether budget allocation on poverty reduction has changed over time and whether social indicators have responded accordingly. The converse would mean that countries had neither plans nor intentions to honour their debt obligations and low budgetary allocation to social priority sectors altogether are not attributable to external debt burden. As a consequence, debt relief in such situations would not

deliver the recipient countries out of poverty. In summary, the findings attempt to answer the following questions pertaining to the objectives of the dissertation; (i) has fiscal expenditure on education and health sectors changed with debt relief since mid 1980s? (ii) are the improvements in the primary and secondary school enrollments and life expectancy attributable to budget spending on education and health respectively?

Thus, in answering the questions, empirical investigation is conducted in two stages. In the first stage, the impact of external debt relief received by Tanzania on the fiscal allocations to education and health is examined empirically. The second stage extends the investigation by estimating the effects of education and health expenditure on the primary and secondary school enrolments and life expectancy, respectively. The findings suggest that debt relief is significant in increasing Government expenditure on both education and health. Institutional quality plays a positive role in determining fiscal allocation to education and health though not significant with latter.

The results echo the findings by Dessy and Vencatachellum (2007) and Fosu (2007) that, debt relief had a positive impact on the share of Government resources allocated either to education or health in countries which have improved their institutions. However, the findings diverge from previous studies in the essence that interaction of institutional quality and debt relief lowers fiscal allocation to the sectors. The findings on the impact of fiscal spending on social indicators suggest that both primary and secondary school enrolments increase with Government expenditure on education and health.

The results however do not support the notion that heath expenditure improves life expectancy. This is probably due to long gestation period inherent with the latter. In short, the findings shed light on how the Tanzanian government spent the debt relief savings and the extent to which social priority sectors in general responded in the short-run. In addition, the findings form a basis for proposing policy measures to maximize the benefits of debt relief savings through changes in government expenditure patterns.

The rest of the dissertation is organized into five chapters: Chapter Two presents Tanzania's background information and reviews both theoretical and empirical literature on the link between debt relief and public spending on health and education. Chapter Three provides data and methodology. Chapter Four estimates the impact of debt relief on education and health spending, whereas, estimation in Chapter Five assesses the impact of fiscal spending on social indicators. The last chapter concludes, with a summary of findings, draws policy recommendations, indicates limitations and identifies areas for further research.

2.0 Background Information and Literature Review

2.1 Tanzania's Background Information

This section reviews; the Tanzanian debt problem, the debt relief initiatives, public expenditure on education and health, and highlights the development of the key indicators of education and health sectors.

2.1.1 The Debt Problem in Tanzania

Tanzania has been a Heavily Indebted Poor Country (HIPC) with an unsustainable debt situation even after full application of traditional debt relief mechanisms. Prior to HIPC initiative, about 40 per cent of Government monthly revenue was utilized to service external debts with meager allocation to the social priority sectors. This culminated into low economic growth and widespread poverty. Thus, due to debt service costs, coupled with low domestic revenue, about 40 per cent of the government's total budget or more than 100 per cent of development expenditure have been financed by donors in the form of loans and grants.

The accumulation of external debt has been attributable to; poor domestic policies, external shocks and natural calamities. The nationalization of major means of production followng the Arusha Declaration of 1967, establishment of Government parastatal companies and the formal rural community settlements (Vijiji vya Ujamaa) in the early and mid 1970s serve as representatives among the domestic policies that plummeted fiscal expenditure largely financed through borrowing. External factors, most of them not unique to Tanzania included; shocks of oil prices of 1973 and 1979, the world economic recession of the early 1980s, collapse of the East Africa Community in 1977, unfavourable terms of trade, sharp increases in international interest (lending) rates in 1982, and the imprudent lending to the developing countries by the international commercial banks which had accumulated excess liquidity from oil price hikes "petrol dollars" of November 1973 and late 1970s (Iyoha, 1999). Natural calamities including the 1974 and 1983 droughts caused serious food shortages and low revenue from the exports of agricultural products. Consequently, the imports of food were done on credit.

All these factors coupled with poor economic performance of the late 1970s and early 1980s forced the country to borrow both internally and externally. Consequently, the external debt increased from US$ 212 million in 1970 to US$2,450 million in 1980 and US$7,931 million in 1997. Similarly, debt-to-GDP ratio increased from 122 per cent in 1988 to a peak of 179 per cent in 1994. Government expenditure on social services were the victims of the unsustainable debt burden and poor economic performance. Public spending on education and health as ratios of GDP, decreased from 3.2 and 1.8 per cents in 1975/76 to 0.9 and 0.7 per cents in 1989/90, respectively. As a consequence, social indicators deteriorated including gross primary school enrolment ratio that fell from 94 per cent recorded in 1981 to 62 per cent in 1998.

2.1.2 Debt Relief Initiatives

Tanzania has benefited from debt relief initiatives in different forms since mid 1980s. The type and mechanism of the debt relief initiative varied depending on the nature and source of the debt under consideration.

Bilateral Debt Cancellations

Between 1986 and 2001, Tanzania attended the Paris Club (PC) meetings seven times to negotiate for debt relief[4] with the last and exit being in 2001 organized under the framework of the enhanced HIPC initiative. As at end of June 2007, Tanzania had debts worth US$3.3 billion cancelled by PC bilateral creditors. On the other hand, the bilateral non-PC creditors cancelled and rescheduled debts worth US$184.6 million and US$171.2 million respectively. Table 2.1 summarizes debt relief granted to Tanzania by bilateral creditors.

[4] The eligible debts for treatment under PC were the official bilateral and publicly guaranteed commercial debts contracted before 30th June 1986.

Table 2-1: Debt Relief from Bilateral Creditors as at end of June 2007

ARRANGEMENT	TERMS	AMOUNT CANCELLED (Millions of USD)
PC I (Sept. 1986)	Huston	2.72
PC II (Dec. 1988)	Toronto	19.62
PC III (Mar. 1990)	Enhanced Toronto	12.18
PC IV (Jan.1992)	London	182.82
PC V (Jan. 1997)	Naples Flows	861.48
PC VI (Apr. 2000)	Cologne flows	867.6
PC VII (Nov. 2001)	Cologne Stock (HIPC)	1,390.90
Sub Total Bilateral PC		**3,337.32**
Bilateral Non-PC		**184.6**
Grand Total		**3,521.92**

Source: Compiled from several Quarterly Bulletins published by BoT

Commercial debts and Export Credits

The non-guaranteed commercial and exports credits were treated under Debt Conversion Programme (DCP) and the Debt Buyback Scheme. Between 1990 and 1993 Tanzania's external debts worth US$182 million were converted and the proceeds were invested in 82 selected economically viable projects under DCP. Debts worth US$199.5 million comprising both principal and interest were cleared under the Debt Buyback Scheme at a price of 12 cents on a dollar of principal tendered using Debt Reduction Facility (for IDA only countries) funded by IDA and the governments of Germany and Switzerland.

Multilateral Debt Treatments

Tanzania has benefited from three forms of multilateral debt treatments. The first was in April 1998, when the Government established a Multilateral Debt Relief Fund (MDF) by requesting the donors to grant a support to cover debt service payments to the major multilateral institutions. Between 1998 and 2002 a total of US$212.6 million was disbursed to the fund by different donors and utilized accordingly. The second treatment was under the enhanced Heavily Indebted Poor Countries (HIPC) Initiative, aimed at cancelling external debt in flow terms to sustainable levels. Under the initiative, Tanzania reached Decision Point in April 2000 followed by a

floating completion period reached in November 2001. As at end of December 2006, a total of US$452.8 million was already realized from multilateral institutions under the initiative. The third treatment was under the G8 Multilateral Debt Relief Initiative (MDRI) that involved the three major multilateral creditors; the IMF, the International Development Association (IDA) and Africa Development Fund (ADF). Under the initiative, the three institutions utilized generous financing commitments from the G8 members to cancel their outstanding debts to Tanzania upfront to the tune of US$3.7 billion.

2.1.3 Government Expenditure on Social Services and Indicators

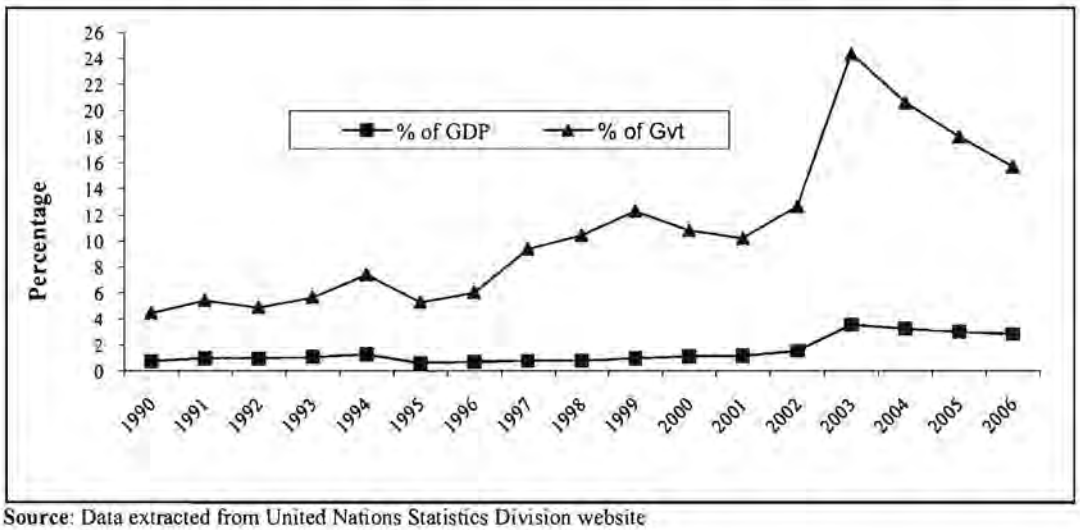
Health Sector Spending and health indicators

Since political independence in 1961, the Tanzanian Government has remained committed to financing the provision of basic social services including health services. Emphasis has been on strengthening of primary health care services as it was believed to be most cost effective. The commitments and efforts to increase fiscal allocation to the sector in the framework of the Poverty Reduction Strategy implementation were, however, derailed by inadequate resources. This was mainly because the health care needs have been increasing with population and escalating costs. To circumvent the financing difficulties while improving provision of health services, the Government, through the Ministry of Health, embarked on extensive health financing reforms that included among others: strengthening budget formulation, expenditure monitoring framework; mobilization of financial resources from domestic sources and development partners; establishment of National Health Insurance Fund and the Drug Revolving Fund; and Capitalization of Hospital Pharmacies.

To make the financing efforts effective, Health Sector Public Expenditure Reviews (PERs) and National Health Accounts (NHA) studies have been undertaken since 1998 and 2000 respectively. The PER has since become a tool of government planning and budgeting process, specifically to ensure that the expenditure patterns of the government match the policy priorities

as stipulated in the Poverty Reduction Strategy and recently the MKUKUTA[5]. The NHA supplements the annual PER with information on the private sector and out-of pocket expenditure by households on health care. In combination, the two studies give a comprehensive picture on health expenditure in the country. The PERs and NHA have facilitated the Ministry of Health's preparations of the rolling three years Medium Term Expenditure Framework (MTEF) starting in 2000/01 and based on clearly defined performance indicators within a strategic plan. In the aftermath of MTEF implementation, progress has been recorded in increasing budgetary allocation to the health sector from TZS100.7 billion in 1999 to TZS290.4 billion in 2004. Government spending on health as a share of total government consumption and GDP increased from 4.5 and 0.7 per cents in 1990 to 20.6 and 3.3 per cents in 2004 before declining slightly to 15.7 and 2.9 per cents in 2006, respectively (**Figure 2-1**).

Figure 2-1 Public Health Spending as per cent of Government Consumption and GDP



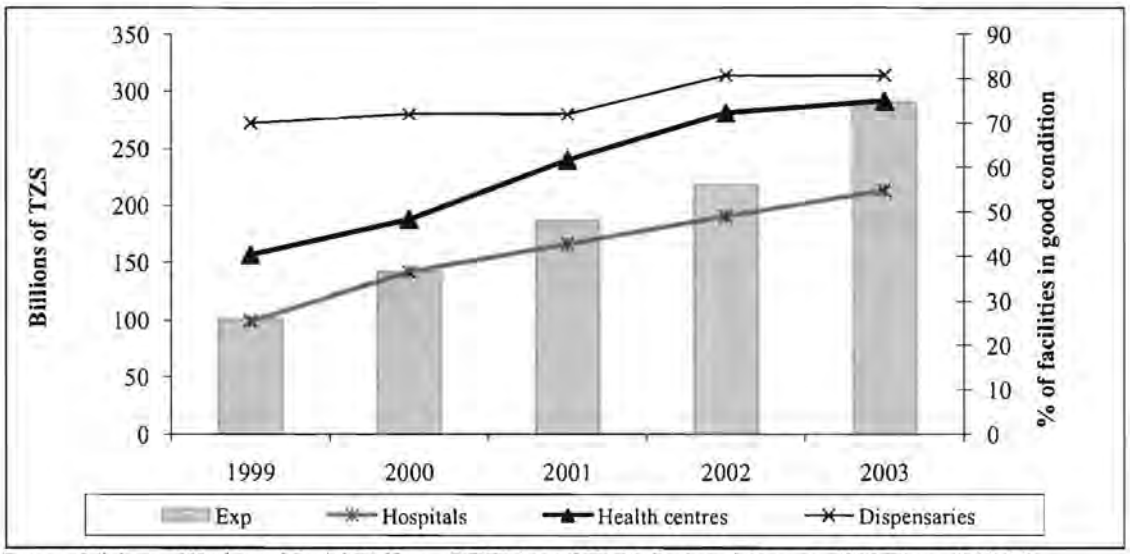
Source: Data extracted from United Nations Statistics Division website

The increase in Government health spending has translated into health services delivery especially in terms of increased accessibility and provision of preventive and promotive health care to the rural poor. As chart 2-2 illustrates, the proportion of hospitals, health facilities and dispensaries

[5] Mkakati wa Kukuza Uchumi na Kuondoa Umaskini Tanzania (MKUKUTA) or the National Strategy for Growth and Reduction of Poverty

in good state increased from 25.5, 40.3 and 70 per cents of total in 1999 to 54.8, 75.0 and 80.8 per cents in 2003, respectively. High levels of child immunization have been maintained which have culminated into the decline, by almost half, of infant mortality from 241 (per 1000 of children under five years) in 1970 to 122 in 2005. Life expectancy recorded an increasing trend from 43.5 years in 1970 to 54.5 years in 1990 before declining again to 47 years in 2005. The overall progress in health indicators have been undermined by several setbacks such as prevalence of HIV; poor infrastructure especially in the rural areas where the majority live; mismatch between health care needs and available resources and escalating costs of health facilities and medicines.

Figure 2-2 Facilities in Good State and Government Expenditure on Health



Source: Ministry of Health and Social Welfare – (URT) Annual Health Statistical Abstract, 2006 (Figure 1.12, 14)

Education Sector Spending and Educational Indicators

One of the key objectives of the 1967 Arusha Declaration was to ensure that basic social services were available equitably to all Tanzanians. In the education sector, the goal was translated into the 1974 Universal Primary Education (UPE), whose objective was to make primary education universally accessible, compulsory, and provided free of cost to ensure that it reached the poorest. Large-scale increases in the numbers of primary schools and teachers were realized. For

instance, by the beginning of the 1980s, each village in Tanzania had a primary school and gross primary school enrollment reached nearly 100 per cent as compared to around 30 per cent in the late 1960s (Terme, 2002).

The deterioration of terms of trade, high oil prices, high debt service costs in the 1980s among others translated to poor economic performance and consequently low domestic revenues culminating into inadequate provision of social services including the education sector. Moreover, a 3 per cent annual growth rate of population during the 1980s led to increased demand for education which placed an additional strain on the sector. Trying to mitigate the problem, the Government, with pressure from IMF and the World Bank through the Structural Adjustment Programmes (SAPs), introduced cost sharing policies including the primary school enrollment fees and other contributions that increased progressively through mid 1990s. The policy worsened the situation as gross enrollments in primary education declined to just above 60 per cent in mid 1990s from high scores of early 1980s while illiteracy increased from 10 per cent in 1986 to 16 per cent in 1992.

The transformation of the IMF and World Bank tailor-made SAPs to country specific Poverty Reduction and Growth Facilities (PRGF) placing poverty reduction at the centre, benefited the education sector among others. Linked to the PRGF is the condition attached to the HIPC initiative and MDRI that the debt relief recipient countries prepare a Poverty Reduction Strategy Paper (PRSP) outlining explicitly the measures it undertakes to fight poverty. As in most HIPCs education is in the centre of poverty reduction in Tanzania. User fees for primary education were eliminated in the year 2000 and also included as a prior action for the HIPC completion point in 2001. The policy received donor support including a US$150 million World Bank project loan and a number of bilateral commitments, all coordinated under the umbrella of Primary Education Development Programme (PEDP). According to Sita[6] (2007), the PEDP was strategically designed to achieve the MDGs and to address the critical challenges facing primary education. The latter had four key components: enrolment expansion, quality improvement, capacity-

[6] The Minister for Education and Vocational Training during the period.

building and strengthening of institutional arrangements. The implementation of PEDP has led to a number of successes that suggest universal primary education is likely to be achieved within the Vision 2015 target. Sitta (2007) summarized the achievements as follows:

(i) Enrolment in pre-primary education increased from 554,835 children in 2004 to 795,011 children in 2007, an increase of 43.3 per cent;
(ii) The number of primary schools and children enrollment increased from 11,873 and 4.4 million in 2001 to 15,624 and 8.3 million in 2007, respectively while net enrolment rate has improved from 58.8 per cent in 2000 to 97.3 per cent in 2007;
(iii) The book to student ratio improved from 1:20 in 2000 to 1:3 in 2007 following the introduction of capitation grants in primary schools. Eventually, the Primary School Leaving Examinations' pass rate improved from 22 per cent in 2000 to 70.5 per cent in 2006, with the transition rate to secondary schools rising from 20.3 per cent in 2000 to 67.3 per cent in 2007;
(iv) Recruitment of new 45,796 teachers while a total of 50,813 previously under-qualified primary school teachers have been trained, upgrading their skills to the minimum qualification requirements;
(v) Teaching and learning environments have improved through the construction of 36,641 new classrooms and 12,588 good quality houses for teachers.

Despite these achievements, there are still challenges that are likely to affect the sustenance and attainment of the MDGs. These include among others: the necessary infrastructure to meet the rising demand for primary education, professional teaching skills, mismanagement of the disbursed grants at primary school level, and provision of care and support to teachers and pupils affected by HIV/AIDS.

2.2 Literature Review

There are various perspectives to consider when reviewing the literature on the impact of debt relief on fiscal spending patterns, particularly on social priority sectors and the response of social indicators. Theoretical and empirical literature is either based or ends up on these perspectives. The first perspective relates to sustainability of budget constraints in which a debtor country is unable to allocate adequate resources to social services due to domestic resource gap. Under this scenario, domestic savings gap requires external financing that can either be in form of budget grants or loans as identified in the three-gap models. The second relate to a situation where a debtor's capacity to finance social services is constrained by sizeable debt service costs. Tangible evidence of such perspective occurs when payment arrears accumulate and debt is rescheduled or forgiven. A third perspective relates to political economy, which deals with regimes prioritization in terms of fiscal allocations among social services, defense and prestige. The Government may accumulate external debt arrears without necessarily spending in social services and not because of budget constraints. The political regime perspective is linked to institutional quality as a function of good governance and transparency hence by implication debt relief would not help. Another perspective relates to a situation where a country's foreign debt burden is too large to adversely affect economic development regardless of whether it is serviced in full, partially or not at all. This perspective is significantly related to the debt vicious circle or simply debt sustainability and it is a typical of HIPCs.

Since most of these perspectives cannot be observed and/or measured objectively, the debt burden has been blamed for meager fiscal allocation to social priority sectors and the widespread of poverty. Thus, taking on board the highlighted perspectives, debt relief may not be considered equitable and efficient as; first, it intrinsically target countries with poor economic management and penalizes those that managed their economies prudently (Dessy and Vencatachellum, 2007). Second, debt relief may encourage moral hazards as the beneficiaries may resort back to reckless borrowing after debt cancellation. Third, debt relief may overestimate feed up resources if the beneficiaries used to service only a fraction of debt obligations prior to the debt relief which is very common in the HIPCs whereas arrears are accumulated on commercial and bilateral debts

(Bird and Milne, 2003). Fourth and more important, public expenditure is fungible and may not mean that additional resources from debt relief savings translate into increased services delivery.

The subsequent sections of this chapter present both theoretical and empirical literature that links debt relief with fiscal allocation to social priority sectors, the response of social indicators and literature evaluation to identify the gap that this study seeks to fill.

2.2.1 Theoretical Link between Debt Relief and Social Sector Development

The earliest theoretical literature on the debt capacity of developing countries dates back to the late 1950s and early 1960s. Some of the studies include those by Avramovic (1958), Avramovic and Gulhati (1960), Alter (1961), Avramovic *et* al. (1964) and Gulhati (1967). The context from which these studies grew was the rapid growth in public international indebtedness and a growing concern with the repayment flows in the post-war period. Since then, and especially after the emergence of the debt crisis in early 1980s, literature on debt capacity has expanded considerably, though the concept of debt capacity has been very difficult to pin down with any degree of precision or consensus. Moreover, theoretical literature on debt relief initiatives is still underdeveloped due to its newness.

To a large extent, the theoretical models link debt burden to economic growth and magnitude of public expenditure but do not extend explicitly to changes in fiscal expenditure patterns save for debt relief initiatives. Nevertheless, using the models, implications are drawn that link debt relief to increased social services spending directly and indirectly. Directly, debt cancelation increases the budget breathing space to accommodate more expenditure on social priority areas, and indirectly debt relief saves investible resources to boost economic growth which translates into higher domestic revenue that increases available resources for allocation to social priority sectors. Social indicators are expected to respond accordingly irrespective of whether the effect is direct or indirect. Moreover, the effectiveness of debt relief depends on whether or not the

initiatives are based on sound diagnostic and deep understanding of the causes of debt crises in the recipient countries.

Despite the presence of various theoretical models that link debt with social services delivery, the emphasis in this dissertation is on the Debt Traps and the Debt Overhang model. This model is widely named after author Jeffrey D. Sachs (2002) and is contented as one of the latest models that links debt crisis, debt relief and economic growth. The background of the model is based on the perspective that poor countries are vulnerable to a poverty trap attributable to excessive external debt burden.

In equation (2.1), savings s equal zero when income y is less than a minimum real level of consumption m to meet basic needs. When income y exceeds the minimum level of consumption m, the household will save a fraction σ of excess income $(y-m)$.

$$\left\{\begin{array}{ll} s=0 & \text{if } y<m \\ s=\sigma(y-m) & \text{if } y\geq m \end{array}\right\} \quad \ldots\ldots(2.1)$$

Equation (2.2) equates income y level to output q plus foreign aid inflow f minus the external debt service payments d.

$$y=q+f-d \quad \ldots\ldots(2.2)$$

Output q is assumed to be a linear function of reproducible capital k as given in equation (2.3) with A representing the standard notation for technology.

$$y=Ak \quad \ldots\ldots(2.3)$$

Capital accumulation is assumed to follow the standard accumulation pattern as given in equation (2.4), where n is population growth rate and δ is the depreciation rate of reproducible capital.

$$dk/dt = s - (n+\delta)k \quad \text{.....(2.4)}$$

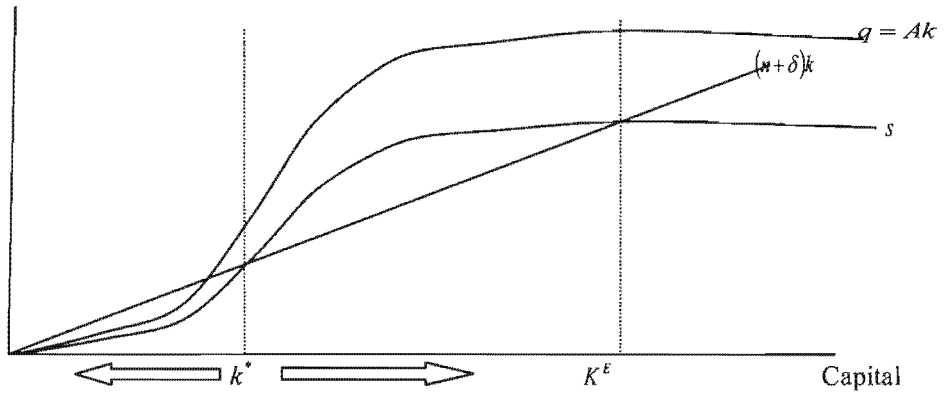
The model is built on two strict assumptions that; (i) foreign aid net of external debt service does not fully cover basic needs, that is, $f - d < m$, and (ii) the economy maintains a positive growth when income level exceeds the threshold level, that is, $A\sigma - \delta - n > 0$.

The fundamental idea behind the model is that the economy grows or shrinks depending on the level of the capital stock k. Hence by implications, (equation: 2.5) a threshold between growth and decline of output occurs when;

$$k^* = \sigma(m + d - f)/(A\sigma - \delta - n) \quad \text{.....(2.5)}$$

Where k^* as shown in figure (2.3) is the level of capital stock where savings equals capital widening, that is, $s = (n+\delta)k$. At this point there is no growth as savings can only meet the capital gap.

Figure 2-3 Growth Model with Minimum Capital Stock Threshold



From figure (2.1), negative growth occurs when the stock of per capita capital is below k^* where the amount of per capita savings needed to hold the capital to labour ratio constant in relation to

population growth and depreciation is not sufficient, that is, $s<(n+\delta)$. Depending on how much below the actual level of capital k is from k^* three scenarios exist:-

(i) When the initial level of capital is not sufficient to cover basic needs, savings per capita will equal zero and the economy will experience negative growth at the rate of $-(n+\delta)$. That is when;

$k<(m+d-f)/A<k^*$; then $s=0$ and $dk/dt=-(n+\delta)k$ .....(2.6)

(ii) When the initial level of capital is below the infliction point k^*, but still enough to cover basic consumption needs m, output will decline till the point where savings s equal zero and the same outcome of negative growth will occur similarly to the path demonstrated in the first scenario

$(m+d-f)/A<k<k^*,7)\ \ dk/dt=\sigma(Ak+f-d-m)-(n+\delta)k<0$.....(2.7)

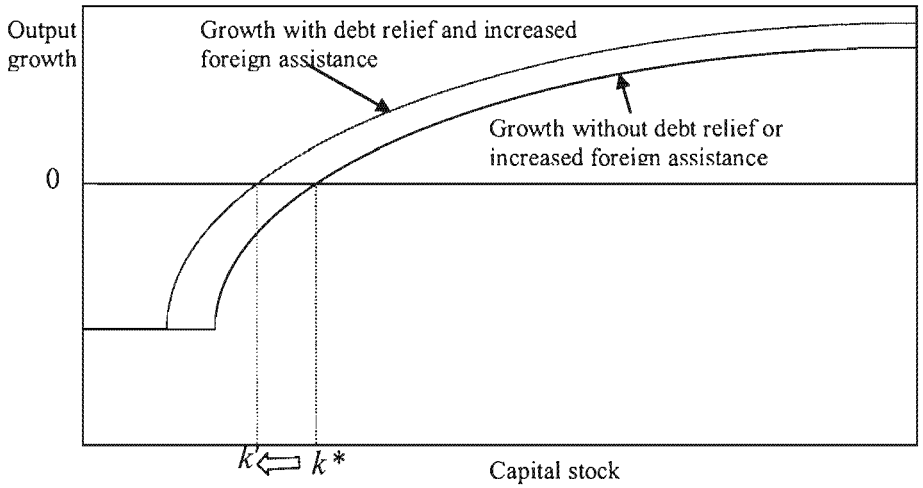
(iii) Finally, given that $k>k^*$ the economy will grow at a rising rate towards the steady state K^E at a positive rate that asymptotically approaches $A\sigma-\delta-n$.

The model implies that, when the economy's actual capital stock k is below k^*, the economy is caught in a poverty trap, that is, growth is undermined by; debt payments, basic consumption needs in the face of population growth and depreciation of the capital stock. To get out of the poverty trap, Sachs advocates for a debt relief to HIPCs in form of foreign transfers f or a decrease in external debt service payments d. If the outcome of debt relief is sufficient enough to move initial level of capital stock k above the infliction level of capital k^* the economy will start to grow.

Figure (2.4) graphs the capital stock against growth of output, for given external debt service payments and foreign assistance. The economy; grows when $k>k^*$, shrinks when $k<k^*$ and stagnates when $k=k^*$. Rise in foreign aid or reduction in external debt service of size Δ reduce

the threshold level of capital by $dk = -\sigma\Delta/(A\sigma - \delta - n)$ to a new threshold level k'. It is hence assumed that Δ is sufficient to reduce the threshold level to a point where actual stock of capital k is above k^*. Consequently, the outcome of debt relief will shift the output growth curve upward by the amount $\Delta/\sigma k$. The implication of the model with respect to the impact of debt relief is that, the economy that was shrinking because of debt burden will start growing as long as k^* shifts below k as a result of debt cancelation.

Figure 2-4 Effects of Debt Relief on Economic Growth



Source: Jeffrey D. Sachs (Figure 1: Pp 7)

However, the Sachs model is not immune to criticisms. The strict assumption that debt relief will increase savings in the HIPCs, may not be justifiable given the moral hazard problems and lack of proper functioning institution that could ensure good governance and accountability. There is no guarantee that debt relief will increase savings to be channeled into productive investments, which calls for necessity of conditionalities. The model also implies that the debtor country has been servicing debt accordingly while in practice most of the HIPCs have been accumulating arrears especially with bilateral and commercial credits.

2.2.2 Empirical Studies on impact of Debt Relief on Social Sectors Development

There are relatively few empirical studies that have assessed the effects of debt service payments on the composition of public spending, save for their mixed findings. Precisely, there is little in depth analytical literature of the link between the recent comprehensive debt relief initiatives and public social services spending, albeit the fact that, the recent studies came up with short-term based findings. The recent debt relief initiatives involving to a large extent the concessional multilateral debts have not been dealt with adequately in literature as the cancellation effects of these debts may not be felt immediately on fiscal allocation patterns and on the improvements in social indicators. Even so, by investigating the extent to which fiscal allocations towards pro-poverty have changed with debt relief savings and improvements in social indicators in the short-run give a promising insight of the long-run effects.

Debt Relief and Government Expenditure on Social Services

Empirical work on the impact of debt relief on government expenditure on social services spending can be categorized into two major categories - one relating to cross countries studies and the second relating to country specific studies. Cross countries studies include work by Gupta *et* al. (2002), Kraay (2005), Lora and Olivera (2006), Dessy and Vencatachellum (2007), Jubilee USA Network (2007), and Cassimon and Campenhout (2007). Country specific studies include those by Nannyonjo (2001), Kimalu (2002), Bigsten *et* al. (2002) and Osei *et* al. (2005).

Initial surveys by the World Bank show that, on average, spending on poverty reduction as a share of total government spending in the HIPCs rose from 41 per cent in 1998 to 54 per cent in 2004 as a result of debt relief. The findings were supported by Jubilee USA Network[7] (2007) who found that debt relief has already brought significant changes in the recipient countries. For instance; Tanzania used savings from debt relief, averaging US$80 million a year to import vital food supplies for those affected by drought and has increased education spending and so making possible elimination of primary school fees. The Ugandan Government used the debt relief savings to fund UPE, fight HIV, and to provide clean water. Mozambique used debt relief

[7] The successor organization to the U.S. Chapter of Jubilee 2000

savings of around US$70 million annually to vaccinate children against tetanus, whooping cough and diphtheria, and to build and supply electricity to schools, while Cameroon's US$140 million per year savings were used to launch a national HIV/AIDS plan for prevention, education, testing, and mother-to-child transmission abatement. The Ghanaian Government improved the country's basic infrastructure, including rural feeder roads, and to increase expenditure on education and health care. Both Burundi and Honduras allocated the debt relief savings to eliminating school fees. For Burundi it was possible to allow an additional 300,000 children to enroll into primary schools in 2005.

In assessing the extent to which the US$100 billion worth of debt relief granted to low-income countries between 1989 and 2003 have induced government expenditure on social spending in 62 low income countries, Chauvin and Kraay (2005) found mixed results. In the first estimation that included 35 countries all from Africa, there was no statistical relationship between debt relief granted during the period 1989 - 1993 and the share of government expenditure on education and health for the period 1994 - 1998. However, in the second estimation, with a majority of the countries involved being non-African, there was a strong relationship between the debt relief granted during the period 1994 - 1998 with government expenditure in the sectors for the period 1999 - 2003[8]. The authors attributed poor quality of data as the reason for the mixed findings. It is worth noting that, the difference in difference technique used by Chauvin and Kraay (2005) may not be appropriate in investigating the fiscal responses as savings from debt relief in one year are expected to be used in the same year and not in the next five years especially in most of HIPCs with low domestic revenue relative to expenditure needs. The method could instead be appropriate in investigating the responses of social indicators due to the inherent time lag. More notably, debt relief data used in the estimations ended up in 1999 and included only the bilateral and commercial debt relief initiatives leaving aside the multilateral debt initiatives which would had significant impact given the fact that, high proportions of the HIPCs debts were to the multilateral institutions and were serviced accordingly.

[8] Kraay identified Mozambique and Yemen to have influenced the results in the sample where majority of the candidate countries are from Latin America.

Another study by Lora and Olivera (2006) covering the period 1985 and 2003 on whether public debt crowds out social services used a sample of 50 countries and found that, even after controlling for other variables, higher debt ratios reduce government's social expenditures. The authors argue that, the effect comes mostly from the debt stock and not from debt service payments, citing the former to reduce room for further indebtedness through loss of credibility. The findings if hold, imply that the beneficiaries of debt relief whose debts have been cancelled under HIPC and MDRI should have their expenditure in social services increased. This implication, however, may induce more reckless borrowing and a subsequent re-accumulation of new debt in the case of irresponsible Governments. The findings coincide with the Gupta *et* al. (2002) conclusion that, the initiatives will generate substantial savings for public spending on health and education provided if the allocated resources are tracked to the targeted activities. Tracking would form bridging mechanisms to broach the identification and reporting of spending on poverty-reducing programmes alongside improving all aspects of public expenditure management through strengthening budget formulation, execution, and reporting systems.

On country specific, Nannyonjo (2001) showed that between 1998/99 and 2000/01, debt relief savings in Uganda estimated at UGX 268 billion were used to increase expenditure on priority poverty reduction programs through the Ugandan Poverty Action Fund (PAF). Budget expenditure on education increased from 12 per cent of total national budget in 1995/96 to 19 per cent in 1998/99 and eventually led to the launch of the UPE meant to provide free education to four children per family. Likewise primary health expenditure increased from 2.9 per cent 1998/99 to 13 per cent in 2000/01 and is reflected in the Government's fight against HIV/AIDS. The findings are supported by Kuteesa and Nabbumba (2004) studies on HIPC debt relief and poverty reduction strategies in Uganda who showed that the resources saved allowed Uganda to increase the budget for the most critical areas such as rural roads, safe water supply and sanitation, and agriculture altogether in addition to primary education and primary health care.

A study by Nafula (2002) on how can debt relief achieve sustainable Universal Primary Education in Kenya showed that introduction of cost sharing had adverse effects on primary education with low enrolment rates and high dropout rates being the consequences. In that line,

the study proposed using savings from the debt relief initiatives to replace and to away with cost sharing at primary school level, and to grant other subsidies such as free meals during the day and increase the number of trained teachers. The findings are in line with the earlier study on the determinants of primary school enrolment in Kenya by Bedi *et* al, (2004) that revealed primary school fees as one of the key obstacles. Based on these empirical findings, it was concluded that reducing primary school fees in Kenya to zero may translate into a 10-12 per cent increase in enrolment which could raise gross enrolments to more than 100 per cent.

Empirical Studies on the Tanzania's context

Literature on the impact of debt relief on fiscal allocation and ultimately improvements in social indicators in Tanzania is very limited despite early studies that identified unsustainable debt levels as one of the critical constraints to government's budget allocation and a cause of the widespread poverty[9]. Investigating the relationship between budget performance and accumulation of foreign indebtedness in Tanzania, Kilindo (1993) used a multiple regression equation that included both domestic and external factors in the debt crisis. The study showed that deficit in budgets had significant effects on debt accumulation which in turn, through servicing, widens the fiscal gap in the subsequent period, thus translating into a debt viscous circle, with spending on social sectors acting as shock absorbers in the process. The findings if hold, imply that a fall in debt service payments as a result of debt relief reduces budget deficit, thus breaking the debt vicious circle and consequently increasing social services spending.

Bigsten *et* al. (2002) used a Computable General Equilibrium Model (CGEM) in their study on the impact of debt relief offered under the HIPC initiative on economic growth in Tanzania and Zambia. The assessment was on the impact of debt relief on increased government spending in either consumption or investments. They found the effect of increased public spending as rather modest regardless of whether it is public consumption or investments that is increased. Therefore, considering HIPC initiative savings as additional resources to stimulate demand would not generate any substantial gains. The study also carried out simulations using a period of

[9] For more studies on the effects of unsustainable debt in Tanzania *see* among others; Lyakurwa (1990), Mjema (1994), Njau (1995), Lipumba and Noni (1997) and Mbelle (2002).

four years, which is rather too short to assess the impact of public investment especially in human capital on economic growth. Moreover, the estimations excluded savings from the traditional debt relief initiatives as well the latest comprehensive MDRI which could have altered if not changed the findings.

On whether debt relief can reduce poverty in Tanzania, Danielson (2001) argues that, while in theory debt reduction may affect the economy favorably, practically that is only justifiable under sound non-reversal macroeconomic policies. He concludes that, debt relief initiatives should not be thought to cause rapid economic growth on their own, but rather as complementary to the implementation of sound macroeconomic policies in order for Tanzania to attain the MDGs.

The Debt Relief, Conditionalities and the Role of Institutional Quality

The use of funds saved from debt relief initiatives are guided by each country's poverty-reduction strategy as outlined in PRSPs formulated and updated in collaboration with IMF and the World Bank, civil society and development partners. The strategies in the PRSPs are results-oriented in order to encourage countries to adopt policies that will lead to tangible and measurable improvements in the well-being of the poor. Empirical studies on effectiveness of debt relief in the recipient countries have found institutional quality to play a significant role. Precisely, the debt relief initiatives would not achieve their objectives unless countries adopt policies of good governance.

Findings by Arslanalp and Henry (2004) identified lack of good institutions as one of the main problem faced by countries receiving debt relief in translating the benefits into more social services spending. In the same line, Nafula (2002) warned that without conditionalities, there are greater possibilities of diverting debt relief savings to increased military and/or prestige spending, resorting to new borrowings and reverting back to unsustainable debt levels. Dessy and Vencatachellum (2007) supported the role of quality institutions in their study indicating that debt relief and official development assistance were not statistically significant in explaining the share of public allocation to health and education expenditure in GDP unless interacted with changes in the political institution. They concluded that conditioning debt relief to institutional

reforms through increased accountability is required for countries to allocate proportionately more resources to social services. Their conclusion is in line with Cooper and Sachs (1985) who argue that without conditionalities, a government with a high discount factor will rather consume than invest in infrastructure and human capital once debt relief is obtained.

Debt Relief and Improvements of Social Indicators

It is evident from the foregoing empirical findings that debt relief increases public spending in social sectors including education and health - *ceteris paribus*. However, allocation of additional spending to these sectors is not the end at itself but leads to the need to bring about the desired reduction in poverty. In order to determine reduction in poverty, there should be assessments of whether or not the poverty related social indicators of the financed sectors are responding accordingly. It would, therefore, be of value to monitor the benefit incidence by conducting periodic surveys as outlined in the Poverty Reduction Strategy Papers of the HIPCs benefiting from the HIPC Initiative and MDRI.

Empirical findings further show that increases in budgetary allocation to priority sectors have significant positive impacts on social indicators. Kuteesa and Nabbumba (2004) have found that higher budget allocation had significant improvement in social service delivery and noticeably decline on poverty in Uganda. In particular, the 9 per cent annual increase in government expenditure on education between 1999 and 2002, in line with Uganda's UPE policy, has contributed to the increase in the gross primary enrolment from 2.6 million pupils in 1999 to 7.3 million in 2002 with the gender gap closing. Other achievements included; (i) the fall in HIV/AIDS prevalence rates from 14 per cent in the mid-1990s to 6.5 per cent during 2001-2002, (ii) increase in the share of the rural road network being maintained from 20 per cent in 1997-98 to 60 per cent in 2000, and (iii) improvements in access to safe water from 40 per cent nationally in 1997 to 52 per cent in 2001. In totality, it was estimated that poverty incidence had fallen from 56 per cent in 1992 to 35 per cent in 2000. The achievement is in line with the attainment of the Poverty Eradication Action Plan and MDGs targets for Uganda.

In simulating how debt relief could improve education, Kremer *et* al. (1997) and Glewwe *et* al. (1998, 1999) experimented with two groups of schools in Kenya, one getting additional funding and the other not. It was established that provision of financial assistance to buy text books and uniforms reduced drop-out rates relative to a control group of students in schools that did not get additional funding. The study also showed that class sizes increased considerably as parents decided to enroll their children at the schools that received the additional funds. The findings imply that Governments could raise enrolments and reduce dropout rates by using the debt relief savings to fund schools.

Studies by Bommier and Lambert (2000) and Ainsworth *et* al. (2002) found that enrollment rate for secondary education in Tanzania was among the lowest in the world. They also established that enrollments in primary schools were below the average for Africa, with the first year of enrolment being between 1 and 3 years beyond the mandatory enrollment age of seven years. The findings showed that the children whose enrolment was most affected at the primary level were maternal orphans and children in poor households suffering an adult death, and other costs of schooling that include school fees, uniforms and other schooling inputs. The availability of schools also affected parents' decisions to enroll their children. The implication of the findings is that the use of debt relief savings to eliminate school fees and provide teaching materials increases education enrollment rates. This is in inconformity with UNICEF and Oxfam (1999) estimates that, achieving good quality universal primary education in sub-Saharan Africa would cost between US$2 and US$3.6 billion a year for ten years, an amount equivalent to between 17 per cent and 33 per cent of annual debt service payments.

2.2.3 Evaluation of the Literature

There are limitations to validity of theoretical literature and in particular its practicability with respect to debt relief. Nevertheless, available literature provides a base for the empirical evidence on how debt relief can be used to resolve constraints to fiscal allocation caused by debt stock and debt service payments.

In summary both cross countries and country specific empirical studies have revealed that budgetary spending on health and education, among other priority social sectors, have increased following the implementation of debt relief initiatives. Particularly, substantial empirical evidence suggests that debt relief savings could raise primary and secondary school enrolments, reduce drop-out rates and increase completion rates. Regarding health services improvements, there is limited empirical evidence (probably due to the short-time since inception of the comprehensive debt relief initiatives) against aspects of health indicators that are long-run in nature, that is, long lags between increase in fiscal expenditure and indicators' responses.

Nevertheless, the identified progress in addressing poverty in the early cases under the debt relief initiatives has been uneven across countries. It is not all countries that have developed comprehensive poverty reduction strategies in the PRSPs. Even where these are in place, they have typically not incorporated specific measurable targeted improvements in key social indicators. This makes difficult assessment of changes in poverty incidence as a result of debt relief savings. Worse still, even in the countries with specific and measurable targets on key social indicators, there are no tracking mechanisms on debt relief released resources to ensure they reach the intended clientele.

Basing on the above, most studies have ended up in investigating how fiscal expenditures respond to debt relief, most of them using traditional debt relief initiatives that were partial and inadequate as they covered only bilateral debt treatments. Some other studies concentrated on simulations on how debt relief could help in raising social indicators but not incorporating debt relief data explicitly in their models. There are no studies, as yet, that have empirically examined explicitly the impact of debt relief on fiscal allocation to health and education sectors in Tanzania, leave alone on how budgetary allocation to these sectors translate into improvements in social services. This dissertation intends to address that gap by using all forms of debt relief initiatives granted to Tanzania as a case study of HIPCs.

3.0 Data and Methodology

This chapter discusses the methodology for this study, highlighting the sources of data, choice and justification of variables, the research model, stationarity and cointegration tests, and the vector error correction estimations.

3.1 Data Sources and Variables Justification

Analysis of government spending on social priority sectors requires consideration of an array of factors that influence budgetary allocation. Available literature (*see* Sturm, 2001 and Fielding, 1997) shows that political pressure, donors' influence, government revenue, GDP, inflation, exchange rates, availability of new borrowings, cost of existing and new debts, legal and institutional frameworks, and social-economic policies are among the many factors that influence government expenditure patterns. Most of these factors are qualitative in nature and may not be easily measurable as they require costly raw data collection and perceptions of individuals that are likely to be subjective and biased. Given time and financial constraints, this study is limited to secondary data of the variables identified in recent studies to have influence on fiscal allocation[10]. In the first instance, two measures of expenditure on social services are considered: (1) the ratio of government expenditure on education to GDP (EDUC), and (2) government expenditure on health as a share of GDP (HEAL). Data for the period 1998 – 2007 was collected from the Economic Survey, whereas data for the period 1970-1997 was obtained from United Nations Statistics Division website (http://data.un.org/). In the second case, three measures of improvements in social services are considered focusing on; primary (PREN) and secondary (SCEN) school enrolment for education; and life expectancy (LFXP) for health. Data for these output social indicator variables were obtained from Xuereb *et* al. (2005). The input variables in the estimation are; external debt relief (EXDR), international official transfers (INOT), institutional quality (INST), external debt stock (EXDB), external debt service (EXDS) and domestic revenue (DREV).

[10] *See* for instance studies by; McGillivray and Feeny (2002), McGillivray and Ouattara (2003), Remma (2004), Chauvin and Kraay (2005) and Cassimon and Campenhout (2008),

3.1.1 Input Variables

Debt Relief

External Debt Relief (EXDR) is a key variable in the estimation, thus, its impacts on government expenditure on education and health is investigated. To estimate the magnitude of debt relief granted to Tanzania, the debt relief data in NPV constructed by Chauvin and Kraay's (2005)[11] is adopted for the period 1988 – 2003. Data for the last three years (i.e. 2004 – 2007) is extracted from various Annual, Quarterly and Monthly economic reports of the Bank of Tanzania. The NPV of debt relief is favoured against nominal values, as the former captures all forms of debt treatments, that is, cancellations and rescheduling while the latter captures the cancellation effects only. Nominal data in fact understates the magnitude of debt relief. For normalization, the debt relief was used as a share of GDP. A positive correlation is expected between debt relief and government expenditure on the chosen sectors.

International Official Transfers (INOT)

All forms of debt relief do not involve injection of external funds into the economy as the two-gap model would suggest. That is, it does not augment domestic savings but rather alters intratemporal and/or intertemporal reallocation of domestic resources. For the debt relief to contribute to the attainment of the MDGs as intended, it should be complemented by International Official Transfers (INOT) that provides fresh funds. Dessy and Vencatachellum (2007) identified Tanzania and Mozambique as the major recipients of INOT in Sub Saharan Africa (SSA) having been granted US$17.2 billion and US$16.9 billion, respectively between 1990 and 2004. The INOT is included in the model to deduce viability of the assertion that increases in budget allocation to social spending in developing countries may be attributable to increased budget support inflows and not the debt relief savings. Increased foreign aid in the form of budget support would be expected to increase government expenditure on public investment as was established by Clements *et* al. (2005) and Remmer (2004). Data for the INOT

[11]Courtesy to Kraay for providing the debt relief dataset in Net Present Value (NPV) terms for the period 1970 - 2004. Data for the last three years are in nominal terms as obtained from the BoT publications and comprised debt relief under HIPC and MDRI that involved no rescheduling but cancellation, thus, it would not make a significant difference using in nominal terms.

were obtained from the United Nations Statistics Division website[12], after which they were normalized as share of GDP.

Institutional Quality

One of the strong conditions attached to debt relief and other recent official transfers is for the recipient countries to reform their institutions and adopt good governance principles[13]. In estimating the institutional quality in Tanzania, this study uses the Marshall and Jaggers (2007) Polity IV database. The institutional quality (INST) is computed as an average of three concept variables: (1) executive recruitment that combines regulation of chief executive recruitment, competitiveness of executive recruitment and openness of executive recruitment, (2) executive constraints, and (3) political participation competitiveness. The Polity IV score ranges from -10 (high autocracy or poor governance) to +10 (high democracy or quality governance). Basing on this measure, the institutional quality for Tanzania improved since mid 1980s consistent with political and economic reforms from a score of 2.3 points in 1970 to 5.3 points in 2007. The quality of a country's institutions is expected to impact the allocation and efficiency of freed-up resources from debt relief initiatives as was found by Kimenyi (2006). The trickle down effects of the Government allocated resources to intended improvement in the social services depend very much on the quality of governance.

Debt stock

The recent study by Lora and Olivera (2006) covering the period 1985 and 2003 using a sample of 50 countries established that, even after controlling for other variables, higher debt ratios reduce government's social expenditures. The effect comes mostly from the debt stock that reduces room for further indebtedness as the country's credibility is eroded. Hence by implications, the beneficiaries of debt relief whose debts have been cancelled under HIPC and MDRI, should have their expenditure in social services increased through new borrowings. To

[12] McGillivray and Morrissey (2001) noted that these data are a donor measure of gross aid mostly reflecting commitments and may not always correspond to the actual flows of funds into the recipient country's fiscal budget.

[13] Maizels and Nissanke (1984), however, found that during the cold war, specifically the United States, British, French, German and Japanese bilateral aid allocations were made solely to foster donors' perceived foreign economic, political and security interests, that is, less attention was given to good governance.

that effect, external debt balance (EXDB) is included in the estimation and is expected to undermine public expenditure in social services. The EXDB data was obtained from the United Nations Statistics Division website and where necessary augmented with data from BoT publications. As with other variables, debt stock is normalized as a ratio of GDP.

Domestic Revenue

Domestic revenue (DREV) has a direct impact on the magnitude and direction of all other budget variables. A study by Cassimon and Campenhout (2007) on the effectiveness of aid, debt relief and public finance response, using a panel of HIPCs showed that, increase in government revenue is followed by an increase in government expenditure. The expenditure on social services is, therefore, expected to increase with DREV. Data for domestic revenue is obtained from government annual budget estimates and annual economic surveys. The domestic revenue data used in the study consists of both tax and non-tax revenue and where available inclusion of proceeds from privatization and dividends from Government agencies and corporations.

Interaction of Variables

The findings by Burnside and Dollar (2000) study on Aid, Policies and Growth, suggest the need to investigate the extent to which the marginal benefits from EXDR interact with a country's institutional quality (INST) in order to bring about the desired impact. Studies by Osei *et* al. (2005), Chauvin and Kraay (2005) and Dessy and Vencatachellum (2007), for instance, suggest that debt relief could have potential impact when linked with policy and institutional reforms in the recipient countries. In our estimation, such potential effects on government expenditure in education and health are deduced by interacting EXDR with INST to form a variable DRINST. The hypothesis is that EXDR and INST are strategic complements and expected to have a positive relationship with expenditure on social services.

3.1.2 Output Variables

Primary Enrolment

Several poverty studies suggest that education is a key element in eradicating poverty. Hence linking debt relief to education is one way in which the poor will benefit from the HIPC Initiative[14]. UPE is one of the key MDGs justifying its inclusion as one of the potential subsectors to be financed using debt relief savings in most HIPCs. Though education is in different levels, that is, primary, secondary and tertiary, empirical studies, for instance by Nandwa and Asiedu (2007) have shown that primary education has a higher impact relative to other levels in the developing countries, Tanzania included. A more breathing space in the government budget created by debt relief leads to higher expenditure on education and is expected to translate into higher primary school enrollments.

Secondary School Enrolment

Secondary school education is identified as a second to primary school in contributing to economic growth in developing countries and particularly in building human capital. Tanzania has recently witnessed increasing expansion of secondary education through private, community and Government initiatives to meet increasing demand for further education from the fast growing number of primary school leavers. In this context, secondary school enrolment has been included in the estimation. It is expected that increase in government expenditure using debt relief savings would facilitate expansion of secondary school facilities as well as wider avenues for higher education.

Life expectancy

Although there are several indicators of health, such as, child mortality rate, access to primary health facilities, doctors/nurses per patient, HIV/AIDS cases, and the like, the need is clear to translate these into positive factors altering life expectancy. Better health facilities lengthen life expectancy. It is in that context, this study opted for life expectancy (LFXP) as one of the best

[14] For more literature see for instance, work by Mwabu *et* al. (1999, 2000), Alemaheyu *et* al. (2001) and, Oyugi and Mwabu (2001).

proxies for health sector performance. This move is made despite the fact that LFXP is a long-run response measure of both systematic short and long-run formulation and implementation of fiscal and health policies. Since data on life expectancy is published in five-year intervals, a moving average technique was used to generate annual data in between the intervals.

3.2 The Model

Traditionally, fiscal response models are estimated in the structural form using a nonlinear 3-Stage Least Square (3SLS) method. The technique, however, has a problem of being extremely sensitive to the starting values (Cassimon and Campenhout, 2007). This study follows the Osei *et* al. (2005), and estimates the model in a Vector Autoregressive (VAR) modeling framework[15]. The VAR technique is favoured due to the fact that, macroeconomic and fiscal aggregates, in particular, are highly interlinked creating the possibility of endogeneity as suggested by Engle and Granger (1987) and Fagernas and Roberts (2004). Moreover, the technique enables graphing impulse response functions, which is a convenient method in evaluating the effects between two variables of interest. This study therefore employs the VAR model of the form;

$$X_t = \phi_1 X_{t-1} + \phi_2 X_{t-2} + ... + \phi_p X_{t-p} + \varphi Y_t + \varepsilon_t \quad (3.1)$$

Where; p is the lag length, X_t is a $(m \times 1)$ vector of jointly determined $I(1)$variables, Y_t is a $(q \times 1)$ vector of deterministic variables and each $\phi_i (i = 1,2,..., p)$ and φ are $(m \times m)$ and $(m \times q)$ matrices of coefficients to be estimated using a $(t = 1,2,..., T)$ sample of data. ε_t is a $(m \times 1)$ vector of normally and identically distributed disturbances with zero mean and non-diagonal covariance matrix, Σ.

[15] Since our interest is not investigation of fiscal response per se as with case for Osei *et* al.(2005), the variables in the Model are different.

Since all the variables in our model are treated as endogenous due to theoretical linkages among the fiscal variables, equation (3.1) is transformed for estimation by omitting the deterministic variables to become;

$$X_t = \phi_1 X_{t-1} + \phi_2 X_{t-2} + ... + \phi_p X_{t-p} + \varepsilon_t \quad \text{.....(3.2)}$$

The estimation of model presented in equation (3.2) is in two stages; first stage estimates the impact of debt relief on fiscal allocation to social priory sectors and second investigates to what extent the fiscal expenditure has translated to improvement in the sectors.

In estimating the impact of debt relief on government expenditure on education and health, the vector variables in (3.2) will be defined as;

$$X_t \equiv (EDUC_t, HEAL_t, EXDB_t, EXDR_t, EXDS_t, INOT_t, INST_t, DREV_t, DRINST_t) \quad \text{.....(3.3)}$$

In estimating the improvements in primary and secondary school enrolments and life expectancy attributable to fiscal allocation on education and health, the vector variables in (3.2) will be defined as;

$$X_t \equiv (PREN_t, SCEN_t, LFXP_t, EDUC_t, HEAL_t, LINST_t) \quad \text{.....(3.4)}$$

The first and second stage estimations and interpretations of the results are presented in chapter four and five, respectively.

3.3 Estimation Technique

As procedures of estimations based on times series require, we first test for stationarity to avoid spurious regressions. In case of non-stationary time series, we test for cointegration relationships to establish long-run equilibrium solutions among the variables in accordance to the economic theories.

3.3.1 Stationarity Tests

This study employs, both Augmented Dickey-Fuller (ADF) and Phillip Perron (PP) tests to examine the stationarity of each of the series. Conventionally, statistical estimations are based on the assumption that data series are stationary, though there is substantial evidence in literature to suggest that many macroeconomic time series may possess unit roots. The stationarity criterion ensures constancy of the mean, variances, and autocovariances through time (Judge, 1988), that is, to ensure that the moments of the stochastic processes do not depend on time[16]. The consequences of estimations based on non-stationary series involve detection of strong and statistically robust relations but spurious and thus invalidate estimators and forecasts made based on the established relationships.

Formally, the ADF test uses the regression of the first differences (ΔX_t) of the series against the lagged once series, (X_{t-1}) and lagged difference terms (ΔX_{t-1}), that is, it takes into account the autoregressive process $(AR(p))$. The variables are tested with a constant α without a linear trend term. The ADF takes the form;

$$\Delta X_t = \alpha + \beta X_{t-1} + \sum_{i=1}^{m} \gamma_i \Delta X_{t-i} + \varepsilon_t ; \quad \varepsilon_t \sim IID(0, \sigma^2) \qquad (3.5)$$

The ADF is used to test the null hypothesis of $H_0 : \beta = 0$ (non-stationary) against the alternative $H_0 : \beta < 0$ (stationary). Given the $AR(p)$ process, whereas p denotes a number of lags, an inadequate number of lags tends to reject the null hypothesis of non-stationarity whereas, too many lags reduces the power of ADF, hence an appropriate number of lags will be determined using Akaike Information Criteria (AIC)[17] and Schwarz Criteria (SIC). However, the economic series may have to be differenced before stationarity can be assumed to hold (Engle and Granger,

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[16] Given non-stationary series the variance of $Var(y_t) = \sum_{j=1}^{t} \sigma^2 = t\sigma^2$, that is, $Var(y_1) = \sigma^2$ while $Var(y_2) = 2\sigma^2$. The variance of the series diverges to infinity with t.

[17] The latest version of Eviews for instance, Eview5 determines the number of lags automatically

1987). The Phillips and Perron (PP) test will also be employed given its ability to correct the autocorrelations in the series by using nonparametric techniques [18](Kiymaz et al. 2006).

3.3.2 Cointegration Tests

If variables are non-stationary in levels, a cointegration test is run to establish the long-run relationship among them, as some of the macroeconomic variables may be non-stationary individually but tend to become stationary in linear combination.

Despite the existence of several cointegration tests, for instance; the ordinary least square (Engle and Granger, 1987), non linear least square (Stock, 1987), principal components (Stock and Watson, 1988) and canonical correlations (Bossaerts, 1988), the maximum likelihood method of Johansen's has a number of desirable properties, including treatment of all test variables as endogenous variables which is suitable for multivariate models[19]. In static models, the Engle and Granger method suffers omission of the short-run elements of the dynamic model and in estimating the long-run parameter β, the method pushes more complicated dynamic terms into the residual, leading to severe autocorrelation in the residual (Harris, 1995) especially in case of more than one cointegrating relationships. Likewise, the Watson test is only relevant when testing for the residual ε_t in the absence of higher-order autocorrelation, a situation that is very common in time series.

Given the multivariate model employed in this study, the Johansen procedure that uses the Maximum Likelihood (ML) procedure, relying on the relationship between rank of a matrix and its characteristic roots (Eigen values) to estimate long-run relationships between non-stationary variables is ideal. The null hypothesis $r = 0$ (there is, no cointegration vectors) is tested. If accepted, the procedure stops since the variables are non-cointegrated, but if $r = 0$ is rejected, it

[18] The PP takes the form $X_t = \beta_0 + \beta_1 X_{t-1} + \beta_2\left(t - T/2\right) + \mu_t$ where T is the number of observations and the error μ_t is such that $E(\mu_t) = 0$

[19] The Johansen technique suffers as well some weakness as pointed out by Harris (1995).

is then possible to test the hypothesis that there is at most one cointegration vector. The test provides the maximal Eigenvalues as well as the Trace test statistics, which aid in determining the number of cointegration vectors. The basic question the test intends to answer is whether there is a long-run equilibrium relationship between the variables included in the model.

For multivariate models, if variables are non-stationary but cointegrated (at most $r \leq (n-1)$ cointegration equations), a Vector Error Correction Model (VECM) is estimated to explore the nature and determinants of the long–run equilibrium relationships.

3.3.3 The Vector Error Correction Model

The Vector Error Correction (VEC) Model is employed due to its ability to difference the data to achieve stationarity and use error correction term to re-introduce the long-run information lost through differencing (Fanchon and Wendel, 1992). The VEC model include error correction term (that is, the residual series of the cointegration equation) to represent departures from the long-run equilibrium relationship between the cointegrated variables.

The estimated VECM is a restricted VAR that has cointegration restrictions built into specification, and is designed for use with non-stationary series that are known to be cointegrated. Specification of the VECM restricts the long-run behaviour of the variables to converge to their cointegrating relationships while allowing a wide range of short-run dynamics. The cointegration term (that is, the error correction term) corrects gradually deviations from the long-run equilibrium through a series of partial short-run adjustments. The VECM to be estimated is of the form;

$$\Delta X_t = \alpha\beta' X_{t-p} + \sum_{i=1}^{p-1} \Gamma_i \Delta X_{t-i} + \varepsilon_t \quad \text{.....(3.6)}$$

Where β is $(n \times r)$ matrix of cointegrating vectors that qualify the long-run relationship between the variables in the system, and α is $(n \times r)$ matrix of equilibrium correction coefficients, the

elements of which load deviations from the equilibrium $\beta' X_{t-k}$ into ΔX_t for correction. The Γ_i coefficients estimate the short-run effect of shocks on ΔX_t.

3.3.4 Impulse Response Functions

The fiscal response of different variables using Impulse Response Functions (IRFs) is investigated following the Osei *et* al. (2005) approach. The IRFs graphs are used to show the response of budgetary allocation on priority social sectors and social indicators over-time to a one-time shock in input variables. In particular, we use the orthogonalized IRFs that allow analysis of how a change in debt relief, holding everything else constant, affects government expenditure after some period. A Cholesky decomposition approach proposed by Sims (1980) will be employed to calculate the IRFs. The impulse response analysis uses the moving average representation integrated of order one $\{I(1)\}$, that is;

$$Y_t = \varepsilon_t + \Lambda_1 \varepsilon_{t-1} + \Lambda_2 \varepsilon_{t-2} + ... + \sum_{i=0}^{\infty} \Lambda_i \varphi X_{t-i} \quad \text{.....(3.7)}$$

Where the $(m \times m)$ coefficient matrices Λ_i can be obtained according to

$$\Lambda_i = \phi_1 \Lambda_{i-1} + \phi_2 \Lambda_{i-2} + ... + \phi_p \Lambda_{i-p} \quad \text{.....(3.8)}$$

With $\Lambda_0 = I_m$ and $\Lambda_i = 0$ for $i < 0$

Analysis of Impulse Response attempts to describe the dynamic properties of the model following certain shocks. Essentially it traces out the moving average representation of the system and describes how variables of interest (endogenous) respond over time to a one-time shock to one of the innovations. Sims (1980a) noted that, examining the IRFs might be the most effective way of checking for Granger non-causality in multivariate frameworks.

In the first place; debt relief, international official transfers, domestic revenue and institutional quality are shocked to assess the responses on the government expenditure on education and health. It is expected that social services spending would respond positively over time to the shocks. In a second simulation, an assessment is done on how both primary and secondary

school enrolments and life expectancy respond over time to a one time shock on government expenditure on education, health and institutional quality. The shocking is expected to generate positive impulses over time on both primary and secondary school enrolments and life expectancy.

4.0 The Impact of Debt Relief on Education and Health Spending

This chapter estimates and interprets empirical results to show how debt relief impacts public expenditure on education and health using the model presented in the previous chapter. As a procedure for time series based estimations, tests are done on the stationarity and cointegration followed by estimation of Vector Error Correction Model (VECM), Impulse Response (IR) functions, correlations and covariance analysis and robustness check. Policy implications are drawn based on the findings.

4.1 Stationarity Tests

The stationarity test results revealed (see Table 4.1) that, all variables were non-stationary at levels ($\sim I(0)$), hence we reject the null hypothesis (i.e. $H_0 : \beta = 0$). After first differencing ($\sim I(1)$), the series became stationary even at 99 per cent confidence interval and since there was no trend detected in the data, only a constant is included in the tests. Graphical illustrations of the variables at levels and after first differencing are included in Appendices I and II, respectively. Thus, due to the presence of unit root, we proceeded to test for the long-run equilibrium relationship among the variables using the Johansen cointegration method.

In theory, interaction of collinear variables may lead to type I error and consequently spurious results. However, studies by Yoav Ganzach (1998), Busemeyer and Jones (1983), Lubinski and Humphreys (1990) and Cortina 1993) suggested that, impact of collinearity is severe when a linear model estimated in the presence of both multicollinearity between independent variables and curvilinear, particularly quadratic, relationship between independent variables and dependent variable. Shepperd (1991) further stated that when theory predicts interaction, but no quadratic relationships, quadratic terms should not be included in the estimation. Since there is no theoretical base for quadratic relationship between the variables in this study, the quadratic terms were not included and the impact of the collinearity between the variables was not expected affect significantly the results.

Table 4-1: Stationarity Tests of Fiscal Spending Variables

Variable Name	Variable Description	ADF		PP	
		$\sim I(0)$	$\sim I(1)$	$\sim I(0)$	$\sim I(1)$
LDREV	Log of domestic revenue	-0.29	-5.29***	-0.31	-5.39***
LEDUC	Log of education expenditure	-0.10	-2.40*	-0.07	-6.10***
LEXDB	Log of external debt stock	-1.12	-8.33***	-2.96	-7.54***
LEXDR	Log of external debt relief	-0.58	-7.27***	-1.09	-9.89***
LEXDS	Log of external debt service	-2.11	-3.89***	-2.20	-3.95***
LHEAL	Log of health expenditure	0.08	-5.93***	0.08	-5.93***
LINOT	Log of international official transfers	-1.41	-14.42***	-1.35	-12.86***
LINST	Log of institutional quality	-0.07	-6.24***	0.03	-6.25***
LDRINST	Log of (EXDR*INST)	-0.47	-8.62***	-1.48	-11.49***

Note: ***, **, * denotes rejection of the null hypothesis of non-stationarity at 1%, 5% and 10% significance level, respectively.

4.2 Cointegration Test Results

The cointegration test (*see* Table 4.2) of the variables in log form revealed presence of up to 5 and 3 cointegration equations based on Trace Test and Maximum-Eigenvalues, respectively. The null hypothesis of non-cointegration is therefore rejected. Consistent with theoretical expectations, three cointegrating equations are considered in for estimation[20].

Table 4-2: Cointegration Results for Government Expenditure Variables

Hypotheses		Trace Test		Max-Eigenvalue Test	
H_0	H_A	Statistic	5% C. V.	Statistic	5% C. V.
$r = 0$	$r = 1$	351.50*	197.37	109.88*	58.43
$r \leq 1$	$r = 2$	241.62*	159.53	69.34*	52.36
$r \leq 2$	$r = 3$	172.28*	125.62	57.94*	46.23
$r \leq 3$	$r = 4$	114.34*	95.75	39.52	40.08
$r \leq 4$	$r = 5$	74.82*	69.82	31.52	33.88

Note: Trace and Max-Eigenvalue tests indicate 5 and 3 cointegrating equations (*) respectively at 5% level.

[20] For more literature on contradicting results between Trace and Max-Eigenvalues statistics, *see* Johansen (1995), and Fedderke and Romm (2004).

4.3 Analysis of the Long-run Relationship

The long-run equations in Table 4.3 suggest positive elasticity of Government expenditure on education (LEDUC) with respect to health spending (LHEAL), international official transfers (LINOT) and interaction between debt relief and institutional quality (LDRINIST) while negative with external debt balance (LEXDB), the relationships that are consistent to theoretical and empirical literature. Contrary to expectations, government spending on education seems to decrease with domestic revenue (LDREV) and debt relief (LEXDR) and increases with external debt service (LEXDS). However, government expenditure on health (LHEAL) increases with domestic revenue but decreases with debt relief, external debt balance, international official transfers and institutional quality (LINST). Moreover, LDREV is found to increase with all variables except the interaction of debt relief and institutional quality. Institutional quality is not significant in explaining LEDUC in the long-run. The divergence of the findings from expected theoretical long-run relationships are likely to be attributable to poor quality of data and relatively shortness of the series used, particularly debt relief in the estimation.

Table 4-3: The Cointegration Equations on Government Spending

Variables	Case 1	Case 2		Case 3		
	Eq1(LEDUC)	Eq1(LEDUC)	Eq2(LHEAL)	Eq1(LEDUC)	Eq2(LHEAL)	Eq3 (LDREV)
LEDUC	1.0000	1.0000	0.0000	1.0000	0.0000	0.0000
LHEAL	0.7174*	0.0000	1.0000	0.0000	1.0000	0.0000
LDREV	-0.3218*	6.4577*	9.4505*	0.0000	0.0000	1.0000
LEXDR	-0.6339*	-1.6899*	-1.4721*	-1.0931*	-0.5988*	0.0924
LEXDB	-0.3783*	-3.0259*	-3.6907*	-0.8426*	-0.4955*	0.3381*
LINOT	0.4005*	-1.8746*	-3.1715*	1.0244*	1.0710*	0.4489*
LEXDS	0.3752*			0.4470*		
LINST		-9.7476*	-13.5719*			1.3997*
LDRINST	0.5237*	2.6965*	3.0289*	1.0291*	0.5886*	-0.2582*

Note: * denotes 5% significance level

Thus, due to the presence of the cointegration vectors among the variables, a Vector Error Correction Model (VECM) is estimated instead of the unrestricted Vector Autoregression (VAR) model to establish the short-run relationships.

4.4 VECM Estimation and Analysis of Short-run Relationship

Interpretation of VECM results need caution as coefficient estimates and their standard errors are of little relevance for two main reasons; firstly, a highly parameterized model and/or with limited data set erodes the degree of freedom which makes the coefficient estimates uninformative, and secondly, near collinearity of the regressors arising from a highly parameterized model may lead to very imprecise estimates of the short-run relationship (Canova 1995). It is therefore, the signs of coefficient estimates that deserve close attention in the analysis. Caution is also taken to avoid loss of degree of freedom due to over-parameterized[21] model while maintaining optimal use of relevant information. Thus, on the basis of diagnostic tests based on the number of observations, a VEC model of one lag is chosen for estimation in this study. All variables are transformed into log form to smooth out breaks and sharp fluctuations.

The VEC model is estimated using the identified cointegration relations arriving at the results presented in Table 4.4 (Annex III shows full version of results). The table-heading column indicates the dependent variables in each of the model equations, while the row headings indicate the conditioning variables. Since our interest is on the impact of debt relief on fiscal allocation to education and health expenditure, concentration is on the second and third columns (EDUC and HEAL) against the rows for debt relief (EXDR), institutional quality and the variable representing interaction of the two (DRINST).

As expected, government spending in education and health increases with debt relief, the results that echo the findings by Cassimon and Campenhout (2007). The institutional quality revealed to contribute positively to expenditure on education and health though not significant with the later. This may be justified by time lag between improvement in institutions and increase in government spending, especially in a one lag VECM specification. The findings, further suggest for a significant autoregressive effect in education, that is, there is likeliness that spending in one

[21] Moderately sized models become highly over-parameterized relative to the number of observations, leading to insignificant or inefficient estimates of short-run parameters while too short lags also produce statistical models, where only a subset of relevant information is used to characterize the data and leaves serial correlation in error terms, which may induce spurious significance and inefficient estimates.

year lead to higher spending in the subsequent years. The findings, however, do not hold on health spending.

Contrary to theoretical expectations, government spending on education has a significant negative elasticity with respect to domestic revenue. On the other hand, fiscal spending on health has a positive elasticity coefficient though insignificant with respect to domestic revenue. The findings suggest that education and health spending are determined by factors other than domestic revenue which may be justified by a 40 per cent on average of annual budget being externally financed. International official transfers (INOT) and external debt balance (EXDB) were not significant in determining government spending on the two sectors, with possible explanation being the quality of data used, particularly the INOT that were based on donor commitments and not actual disbursements. In the same line, the findings by McGillivray and Ouattara (2003) established that the bulk of aid is allocated to debt servicing and that aid is associated with increases in the level of public debt. The DRINST was not found to influence EDUC and HEAL which diverges from the findings by Dessy and Vencatachellum (2007) as well as from theoretical expectations.

Table 4-4: VECM for Impact of EXDR on EDUC and HEAL

Error Correction	D(LEDUC)	D(LHEAL)	D(LEXDR)	D(LEXDS)	D(LINST)	D(LDRINST)
D(LEDUC(-1))	0.7288	0.0324	2.5741	-0.1464	0.1066	3.3630
	[2.3112]	*[0.1333]*	*[2.8320]*	*[-0.5243]*	*[0.7588]*	*[2.6763]*
D(LHEAL(-1))	-0.4865	-0.1219	-2.0623	0.1685	0.0664	-2.7695
	[-1.2929]	*[-0.4207]*	*[-1.9012]*	*[0.5054]*	*[0.3958]*	*[-1.8469]*
D(LEXDR(-1))	0.4786	0.4451	-0.6875	-0.0326	-0.1162	-1.0645
	[2.0193]	*[2.4401]*	*[-1.0063]*	*[-0.1552]*	*[-1.1006]*	*[-1.1271]*
D(LEXDS(-1))	-0.2846	0.6555	1.7697	0.1466	-0.0810	2.4977
	[-1.1839]	*[3.5425]*	*[2.5535]*	*[0.6883]*	[-0.7562]	*[2.6070]*
D(LINST(-1))	1.9801	0.2268	-6.8841	0.0841	0.0098	-10.3302
	[2.6894]	*[0.4001]*	*[-3.2437]*	*[0.1289]*	[0.0298]	*[-3.5209]*
D(LDRINST(-1))	-0.4543	-0.3235	0.7045	-0.0838	0.0735	1.1240
	[-2.7149]	*[-2.5119]*	*[1.4604]*	*[-0.5655]*	*[0.9853]*	*[1.6855]*

t-statistic in brackets

The elasticity of debt relief with respect to external debt balance and external debt service has insignificant negative signs in line with priori expectations. Despite the elasticity of domestic revenue with respect to debt relief taking the expected positive sign, the coefficient is not significant suggesting a weak relationship. The results further suggest negative elasticity between debt relief (EXDR) and international official transfers (INOT) which is contrary to the expected complementarity relationship. This, however, may be justified by the assertion that some donors committed debt relief as a substitute to general or budget support. Moreover, Maizels and Nissanke (1984) found that, end of cold war had witnessed a dramatic decline in the official bilateral assistance mostly due to the less importance of politically motivated transfers, the period that coincided with the launch of various debt relief initiatives.

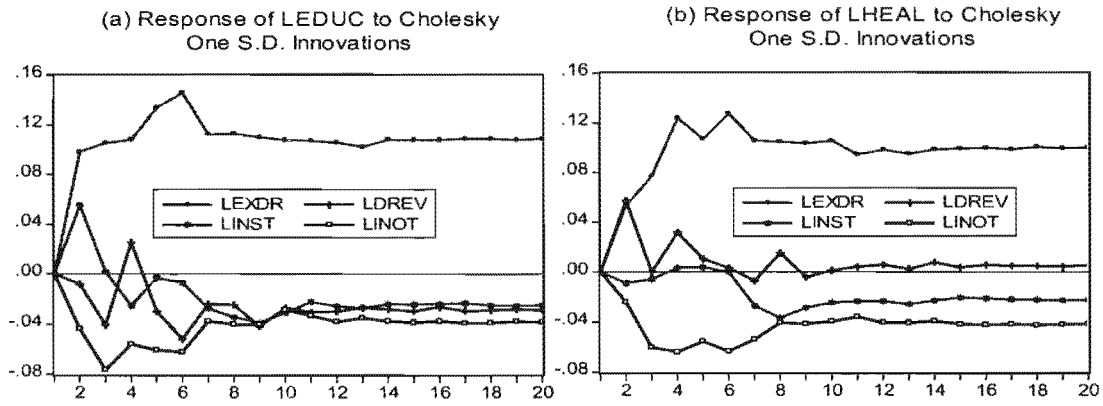
4.5 Impulse Response of Government Expenditure on Social Services

In investigating the response of government expenditure on education and health, innovations are generated on the variables; *EXDR*, *INOT*, *INST* and *DREV*. The Impulse Response Functions (IRFs) of each of the shocks is computed using the Choleski decomposition (with adjusted degree of freedom) on the estimates from the VEC model. The IRF of government expenditure on education and health are illustrated in Figure 4-1.

Panel (a) shows the IRFs associated with government expenditure on education. Illustration is on the evolution over time of education spending due to a one standard deviation shock on the debt relief, domestic revenue, international official transfers and institutional quality. As the figure shows, a shock on EXDR increases EDUC continuously to a maximum of 14.6 per cent in the sixth year before declining to about 10 per cent in the tenth year, the level that remain constant throughout. A shock on DREV generates negative effects that fluctuate in the first six years with a positive impact of 2.5 per cent in the fourth year only. The shock stabilizes around negative 3 per cent starting in the seventh year. Government expenditure on education declines sharply with a shock on INOT to a minimum of negative 7.6 per cent in the third year after which stabilizes at around negative 3 per cent. A shock on INST seems to raise EDUC by 5.5 per cent in the first year before declining and remaining constant below negative 3 per cent.

Panel (b) shows that a shock in EXDR increases HEAL to a maximum of 12.8 per cent in the sixth year, thereafter decline slightly and remain constant at around 10 per cent. A shock in DREV increases health spending to about 5.8 per cent in the first year then declines and oscillates at around zero throughout. Government spending on health seems to decline with a shock on INOT and INST.

Figure 4-1 Impulse Response for Government Spending in Social Services



4.6 Correlation and Covariance matrix

Despite the findings in the previous section, the point estimates of the VECM may be of little significance due to the over-parameterization related problems, so the covariance of the reduced form residuals deserves attention. As Table 4-5 presents, the covariance matrix of the reduced form residuals is on the upper triangular (highlighted) and on the lower triangular are the correlations. Some patterns of correlation are worth emphasizing though with a caution as they reflect partial correlations only.

The correlation matrix shows that, debt relief is positively correlated with the government expenditure on education and health, which is in accordance to priori expectations. In line with fiscal theories, government expenditure on education and health was found to improve with domestic revenue. With an exception of life expectancy and domestic borrowing, all variables

were found to be positively correlated with institutional quality. However, external debt service is positively correlated to all other variables which is contrary to theoretical expectations. The interacted variables behaved according to prior expectations.

Table 4-5 Government Expenditure Covariance and Correlation Matrix

	LEDUC	LHEAL	LEXDR	LINST	LDREV	LEXDB	LINOT	LDRINST	LEXDS
LEDUC	5.51	4.70	3.91	0.69	4.24	4.40	4.61	4.69	4.43
LHEAL	0.99	4.97	4.14	0.70	4.50	4.70	4.93	4.91	4.73
LEXDR	0.90	0.90	4.24	0.60	3.84	4.08	4.30	5.01	4.19
LINST	0.92	0.89	0.82	0.12	0.62	0.61	0.65	0.76	0.59
LDREV	0.97	0.98	0.91	0.86	4.21	4.48	4.60	4.47	4.61
LEXDB	0.93	0.94	0.89	0.77	0.98	5.00	5.00	4.63	5.22
LINOT	0.94	0.96	0.91	0.80	0.98	0.97	5.28	4.94	5.14
LDRINST	0.89	0.89	0.98	0.87	0.88	0.83	0.86	6.16	4.66
LEXDS	0.88	0.90	0.86	0.70	0.95	0.99	0.99	0.79	5.61

4.7 Robustness of the Estimation

To check for the robustness of the results, estimation is done using debt relief data in nominal terms obtained from Bank of Tanzania publications instead of NPV terms used in the previous section. The use of NPV was meant to capture impact debt cancellation ignoring intertemporal effects of rescheduling. The series was normalized as a ratio of GDP and the variable became stationary after first differencing. The results (attached as Appendix IV) indicated debt relief had the expected positive sign though not significant on influencing government expenditure on education and health. The insignificance might be attributable to the fact that, nominal debt relief figures do not capture the effects of debt rescheduling, and as such understate the impact of debt relief initiatives. Interaction of nominal debt relief with institutional quality had a negative effect on government spending on education and health as was with the NPV figures.

4.8 Policy Implications

It is evident from the findings that the past debt relief granted to Tanzania increased government expenditure on social priority sectors, particularly education and health. Moreover, the findings suggest institutional quality to play an important role in increasing public expenditure to education and health sectors. Contrary to expectations, debt relief is found to substitute international official transfers. The findings, if hold, had policy implications in the sense that; the increased budget allocation to the priority social sectors need to be sustained through fiscal policy formulation and implementation alongside continuing with institutional reforms to enhance the benefits of debt relief. Moreover, since debt relief seems to replace other international official transfers, the debt relief receiving countries need to formulate fiscal policies that enhance domestic revenue sources by taking into account the fact that both HIPC and MDRI involved no external inflow of fresh resources.

5.0 The Impact of Fiscal Spending on Social Indicators

In this chapter we estimate and interpret results of the impact of education and health public spending on primary and secondary school enrolments as well as on life expectancy. The stationarity and cointegration tests are conducted, followed by estimation of VEC Model, IRFs, correlations and covariance matrices, and robustness check. Eventually, policy recommendations are drawn based on the findings.

5.1 Stationarity Tests

The stationarity test results presented in Table 5-1 revealed that all variables were not stationary at levels. However, after differencing ($\sim I(1)$), the rest of the series became stationary at 99 per cent confidence interval, except life expectancy (LFXP) that was significant at 90 per cent. Graphical illustrations of the variables at levels and after first differencing are included in Appendices I and II, respectively.

Table 5-1: Stationarity Test of the Social Indicators Variables

Variable Name	Variable Description	ADF		PP	
		$\sim I(0)$	$\sim I(1)$	$\sim I(0)$	$\sim I(1)$
LEDUC	Log of education expenditure	-0.10	-2.40*	-0.07	-6.10***
LHEAL	Log of health expenditure	0.08	-5.93***	0.08	-5.93***
LINST	Log of institutional quality	-0.07	-6.24***	0.03	-6.25***
LLFXP	Log of life expectancy	-1.58	-2.87*	0.03	-2.72*
LPREN/1	Log of primary school enrolment	-1.57	-2.40***	-2.07	-2.40***
LSCEN	Log of secondary school enrolment	-1.02	-5.45***	0.94	-5.52***

Note: ***, ** and * denotes rejection of the null hypothesis of non-stationarity at 1%, 5% and 10% levels, respectively. /1 LPREN is tested in levels and first difference without constant.

5.2 Cointegration Test Results

Table 5-2(a) presents the cointegration results on the variables incorporated in estimating the impact of fiscal allocation on education improvement as proxied by primary and secondary school enrolments, and on health improvements using life expectancy as an indicator. The

incorporated variables in log form; PREN, SCEN, LFXP, HEAL, EDUC, and INST showed presence of at most 2 cointegrating equations based on both Trace test and Maximum-Eigen values at 5 per cent level. In all the cointegration tests, the t-statistic from the Trace test and Maximal-Eigen values statistics support the rejection of the null hypothesis that $r = 0$ at 95 per cent confidence interval.

Table 5-2 Cointegration Results for Social Indicators Variables

Hypotheses		Trace Test		Max-Eigenvalue Test	
H_0	H_A	**Statistic**	**5% C. V.**	**Statistic**	**5% C. V.**
$r = 0$	$r = 1$	133.3183	95.75366	51.83873	40.07757
$r \leq 1$	$r = 2$	81.47954	69.81889	43.96754	33.87687

Note: Both Trace and Max-eigenvalue tests indicate 2 cointegrating equations at 5% level.

5.3 Analysis of the Long-Run Relationship

As presented in Table 5-3, PREN increases with SCEN in the long-run due to greater possibility of primary school leavers getting opportunities to proceed to school education. As expected, improvements in LFXP by one unit increases PREN and SCEN by 29 units and 6 units respectively, the relationship is likely to emanate from the fall in child mortality rates. Likewise, the elasticity of PREN with respect to HEAL and education is positive, suggesting that in the long-run social indicators improve with more resources allocations. Moreover, INST is significant in determining PREN. The long-run relationships, however, suggest that the elasticity of secondary school enrolment with respect to EDUC and INST are negative, which is contrary to theoretical expectations.

Table 5-3 Long-Run Equations on Social Indicators

Variables	Case 1(LPREN)	Case 2	
		Eqn 1 (LPREN)	Eqn 2 (LSCEN)
LPREN	1.0000	1.0000	0.0000
LSCEN	4.8774*	0.0000	1.0000
LLFXP	29.3904*	0.3557*	6.2846*
LHEAL	2.0396*		0.4911*
LEDUC	0.2507*		-0.0573*
LINST	5.1280*	-2.0962*	-1.4812*

Note: * denotes significance at 5% level

5.4 VECM Estimation and Analysis of Short-run Relationships

Though theory would suggest longer lags for the social indicators to respond to fiscal spending in education and health, a model of two lags is optimal for our analysis due to the small number of observations, particularly debt relief that started mid 1980s. The 2 lags used in the estimation are supported by diagnostic AIC, SIC and LR criteria.

The findings as presented in Table 5-4[22] suggest significant increase in both primary and secondary school enrollment with the increase in EDUC in the first year. The results support findings by Jubilee USA Network (2007) that, on average, Tanzania spends US$80 million a year to increase education spending since realization of the HIPC debt relief. As a results, school fees at primary level were eliminated and consequently registration of about 1.6 million children into primary schools.

Improvement in the institutional quality was found to contribute significantly to primary and secondary school enrollments starting in the first year. The results further suggest an increase in primary school enrolment in response to government expenditure in health in the first year, which could be attributable to prevention and treatment of common diseases and eventually fall in child mortality. All these results are in line with theoretical expectations.

However, government expenditure in health was not significant and worse negatively related to life expectancy. Institutional quality was also not significant in explaining life expectancy. The insignificance can partly be attributable to relatively short lags of the model and other factors that shorten life expectancy including HIV/AIDS and its related diseases.

[22] Full set of results is presented in Appendix V.

Table 5-4 VECM Results for Social Services Indicators

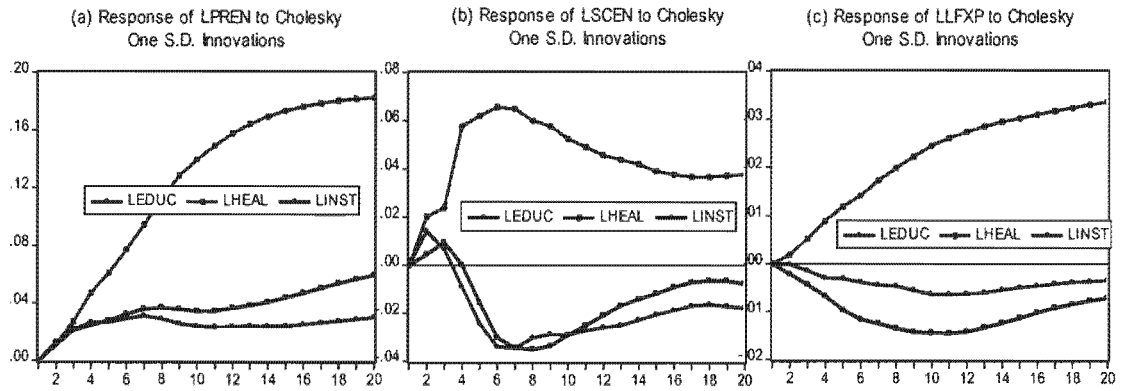
Error Correction	D(LPREN)	D(LSCEN)	D(LLFXP)	D(LEDUC)	D(LHEAL)	D(LINST)
D(LPREN(-1))	0.4634	-0.5178	0.03497	8.0817	0.4900	0.2276
	[2.3555]	*[-1.9796]*	*[0.6094]*	*[1.3215]*	*[0.4922]*	*[0.4211]*
D(LPREN(-1))	0.1758	-0.0957	-0.0298	-8.2518	0.2403	-0.3208
	[0.9344]	*[-0.3825]*	*[-0.5437]*	*[-1.4113]*	*[0.2525]*	*[-0.6208]*
D(LSCEN(-1))	0.5705	1.1254	0.0409	-10.936	-1.3754	-0.2675
	[2.6365]	*[3.9124]*	*[0.6478]*	[-1.6261]	*[-1.2563]*	*[-0.4500]*
D(LSCEN(-2))	0.4924	1.0374	0.0261	7.6252	0.3047	-0.7089
	[2.8421]	*[4.5039]*	*[0.5163]*	*[1.4158]*	*[0.3476]*	*[-1.4895]*
D(LLFXP (-1))	2.1639	3.2277	0.0458	-7.6623	-3.5422	0.5452
	[2.1503]	*[2.4127]*	*[0.1560]*	*[-0.249]*	*[-0.6956]*	*[0.1972]*
D(LLFXP (-2))	0.3109	-0.9247	-0.0222	117.8966	0.1027	-1.4430
	[0.3594]	*[-0.8039]*	*[-0.0880]*	*[4.3834]*	*[0.0235]*	*[-0.6071]*
D(LEDUC (-1))	0.0232	0.0360	0.0010	0.3871	0.0278	-0.0041
	[3.2972]	*[3.8537]*	*[0.4821]*	*[1.7705]*	*[0.7802]*	*[-0.2146]*
D(LEDUC (-2))	-0.0080	-0.0075	-2.09E-06	-0.1139	0.0043	-0.0256
	[-1.4211]	*[-1.0057]*	*[-0.0013]*	*[-0.6552]*	*[0.1477]*	*[-1.6674]*
D(LHEAL (-1))	0.0468	-0.0538	-0.0183	-0.7741	-0.4139	0.2474
	[0.989]	*[-0.8559]*	*[-1.3264]*	*[-0.5267]*	*[-1.7300]*	*[1.9049]*
D(LHEAL (-2))	0.0913	-0.0015	-0.0106	2.4233	-0.1264	0.1110
	[2.0850]	*[-0.0252]*	*[-0.8295]*	*[1.7803]*	*[-0.5703]*	*[0.9229]*
D(LINST(-1))	0.5682	0.7793	0.0283	-12.9600	-1.7280	0.1430
	[3.2739]	*[3.3780]*	*[0.5597]*	*[-2.4024]*	*[-1.9678]*	*[0.2999]*
D(LINST(-2))	0.3855	0.8449	0.0132	-4.0681	-0.8493	-0.1901
	[2.6831]	*[4.4231]*	*[0.3152]*	*[-0.9108]*	*[-1.1681]*	*[-0.4817]*

t- statistics in brackets

5.5 Impulse Response of Social Indictors

The impulse response of social indicators with respect to innovations on government expenditure and institutional quality are depicted in Figure 5-1. Panel (a) shows that a shock on government expenditure on education increases moderately primary school enrolment to a maximum of 3 per cent in the seventh year after which declines and remain constant above 2 per cent. The response functions further suggest that a shock on institutional quality increases primary school enrollment moderately over time whereas, a shock on public health spending seems to increase significantly primary school enrolment with time.

Figure 5-1: Impulse Response Functions for Social Services Indicators



Panel (b) shows innovation on HEAL increases SCEN sharply in the fourth year recording a maximum of 6.6 per cent in the sixth year, after which dissipates moderately to below 4 per cent in the twentieth year. Shocks on INST and EDUC increases initially SCEN closer to 1 per cent after which worsens starting in the fourth year onwards with a worst being in the seventh year.

The response of life expectancy as presented in panel (c) depicts that a shock in health spending lengthens life expectancy throughout the considered twenty years. Shocks on education spending and institutional quality seems to shorten life expectancy recording minima in the tenth year though converge to zero in the out years.

5.6 Correlation and Covariance matrix

The correlation results presented in Table 5.5 with the covariance matrix of the reduced form residuals on the upper triangular (highlighted) and correlations on the lower triangular suggests that, government expenditure on education on its own and when interacted with institutional quality is positively correlated with primary and secondary school enrolment. Life expectancy improves with fiscal expenditure on health, though when interacted with institutional quality life expectancy deteriorates, the findings that support those of the previous section. With an exception of life expectancy, all other variables are found to be positively correlated with institutional quality.

Table 5-5 Social Indicators Covariance and Correlation Matrix

	LEDUC	LHEAL	LPREN	LSCEN	LLFXP	LINST	LDCINST	LHEINST
LEDUC	4.5069	4.6961	0.1589	0.6508	0.0102	0.6905	5.7079	5.5243
LHEAL	0.9919	4.9731	0.1695	0.6960	0.0164	0.7020	5.9029	5.8211
LEXDR	0.3263	0.3313	0.0526	0.0148	0.0084	0.0092	0.1666	0.1734
LINST	0.9394	0.9565	0.1970	0.1065	0.0026	0.0973	0.8062	0.8016
LDREV	0.0756	0.1151	0.5769	0.1265	0.0041	-0.0052	-0.0144	-0.0080
LEXDB	0.9202	0.8907	0.1135	0.8436	-0.2292	0.1249	0.9206	0.8662
LINOT	0.9850	0.9697	0.2661	0.9051	-0.0826	0.9541	7.4515	7.1627
LDRINST	0.9807	0.9837	0.2848	0.9258	-0.0470	0.9235	0.9889	7.0412

5.7 Robustness of the Estimation

Checking for robustness of the findings presented in the previous sections, we use infant mortality rate[23] (INFM) estimated by UNICEF as health improvement indicator instead of life expectancy and of primary-to-secondary education transition (PTRN) and transition in secondary education[24] (STRN) in position of gross enrolments rates. The series became stationary after first differencing and two cointegrating equations were established. The results (Appendix VI) showed that government expenditure on education had the expected signs and significant in improving primary-to-secondary in first year but not significant in the second year. Likewise, education spending improves transition within secondary education though not significant. Expenditure on health improves insignificantly primary-to-secondary transition, but deteriorates infant mortality rates, the results that echo those of the previous sections. The abnormality of the findings may be attributable to the quality of data. Institutional quality improves transition in both primary-to-secondary and within secondary education. Thus, from the robustness check, it is clear that, budgetary allocation to education improves educational indicators irrespective of the measure used.

[23] Infant mortality rate (INFM) used in this estimation refers to number of deaths out of 1000 for children under five years of age.

[24] Secondary education transition (STRN) refers to the proportion of pupils selected to join Form Five after completing successfully Form Four.

5.8 Policy Implications

The results if hold, implies that, attainment of MDGs requires sizeable public expenditure on social priority sectors. Since gross primary and secondary education enrollment rates responded positively to the education expenditure, the desire to achieve long-term targets of 100 per cent enrollments as envisaged in the Vision 2015, are foreseeable as long the Government maintains the financing pattern to education. The findings also suggest school enrollments to improve with expenditure on health, hence by implication poor health worsens primary and secondary school enrollments, *ceteris paribus*. The Government can as well address school enrollment rates through sizeable allocation to the health sector. Nevertheless, institutional reforms remain vital in the course of attaining the MDGs.

6.0 Conclusion and Policy Recommendations

6.1 Summary and conclusion of the study

The purpose of this study was to investigate the impact of debt relief on fiscal allocation and the response of the social indicators in the HIPCs using Tanzania as a case study. Specifically, the study investigated how debt relief impacted fiscal allocation on education and health sectors. Extension was done to examine how increased funding in education and health translated into primary and secondary school enrolments as well as into life expectancy.

Based on the estimations and the consequent analysis of the findings on how debt relief alters fiscal allocation to education and health and ultimately the response of primary and secondary school enrolment, and life expectancy to public spending on education and health, respectively, the following conclusions emerge:

(i) Debt relief is one of the effective ways of increasing government expenditure on social priority sectors.

(ii) Increases in fiscal allocation to education and health improve both primary and secondary school enrolments.

(iii) Institutional quality plays a significant role in determining fiscal allocation to education and to primary and secondary school enrollments, though not with respect to health or life expectancy.

(iv) The results, however, do not support the expectation that increase in heath improves life expectancy probably due to longer gestation period inherent with the latter.

As indicated in the objectives of the study, the findings give a promising insight that debt relief savings increase social spending in the HIPCs as findings suggested in the case of Tanzanian. Likewise, there is a greater possibility that increased public spending on social services improves social indicators. If the results hold, a conclusion can be drawn that, with quality institutions, the use of debt relief savings contribute towards faster attainment of MDGs in the HIPCs.

6.2 Policy recommendations

At the outset, debt is not a sin as long as the borrowed funds are used in socially and economically productive projects and programs that ends up reducing poverty. In the second place, debt should be sustainable in such as a way that, current consumption does not deprive future generations. An important implication of the study is that, debt relief is not an end in itself. Though debt relief is advocated for increased spending in social priority sectors and ultimately contributes to poverty reduction efforts, the effectiveness of the relief depends very much on the Government's commitment to channel the debt savings and ensure that the resources reach the identified poverty related sectors with a focus on education and health.

The channeling and tracking of the debt savings to achieve the desired goals requires improvements in institutional quality specifically good governance, accountability and transparency. Both theoretical and empirical literature shows the importance of institutional quality and improvement of the necessary infrastructure for the debt relief to contribute effectively in economic development and ultimately attainment of MDGs. The achievement of the desired goals using debt relief savings depends very much on the recipient countries' abilities to track all poverty-reducing expenditure in accordance with each country's poverty reduction strategy mostly bound to be country specific (Gupta *et* al., 2002).

Moreover, debt relief benefits are long-run in nature as long as there are no policy reversals. Sustenance of the macroeconomic policies that facilitated reaching decision and completion points under HIPC initiative and ultimately realization of MDRI remain vital. In as much, debt relief should be viewed as a complement to prudent domestic macroeconomic policies necessary in the fight against poverty. Debt is one among many causes of wide spread poverty in HIPCs. The Government should not use the breathing space provided by debt relief initiatives to contract more new debts. Otherwise, the Governments will be practicing a moral hazard identified in both theoretical and empirical literature to undermine the effects of debt relief. The consequence of the moral hazard is reverting back to unsustainable debt and hence continuation of the debt poverty-trap.

6.3 Limitations of the study and areas for further research

Although the greater part of the findings conforms to theoretical expectations, the observed divergences and suggestions that can be drawn from the findings need to be taken with care due to the limitations inherent in the estimations made. The study considered only education and health using secondary data while poverty related sectors identified in the PRSP are diverse, of which including all of them in the model, could have changed the findings. Likewise, gross primary and secondary school enrollments were considered to represent improvements in the education sector, whilst factors like quality of services were not covered. Enrollments may not necessarily signify improvements in the education, given the fact some of the new opened primary and secondary schools lack (qualified) teachers and basic teaching facilities such as desks and books.

Secondly, debt relief initiatives especially under the frameworks of HIPC and MDRI are new and their impacts on social indicators are long-run. The insignificance of debt relief on the estimation of health spending and life expectancy can be attributed to the relatively short length of the series used in the model used. Thirdly, the data used in the study were drawn from different sources that would likely compromise the quality of data and the findings. For instance, the insignificance of international official transfers in determining government spending on education and health can be attributable to the use of donor data which reflect commitment rather than actual disbursements.

Research in this area can therefore be stretched to include the omitted variables linked to poverty reduction as identified and included in the PRSP. In assessing the response of social indicators, collection of quality primary data through household surveys could improve the findings. Furthermore, debt relief under HIPC and MDRI is new and treats debts that were supposed to be serviced for up to fifty years, and for which cancellations may not be felt immediately in fiscal allocations. Social indicators on the other hand respond to fiscal allocation with time lag and the length of the lags depends on the infrastructure in place, governance and institutional quality. For sound conclusion, the impact of debt relief can be investigated thoroughly using long series.

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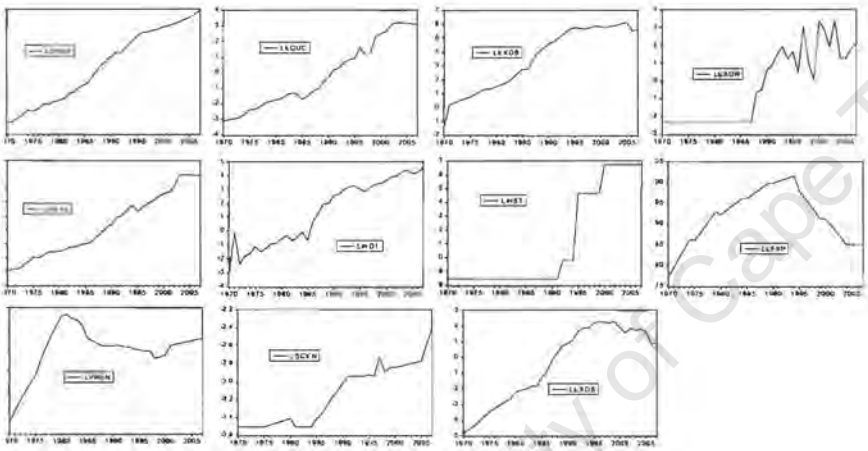
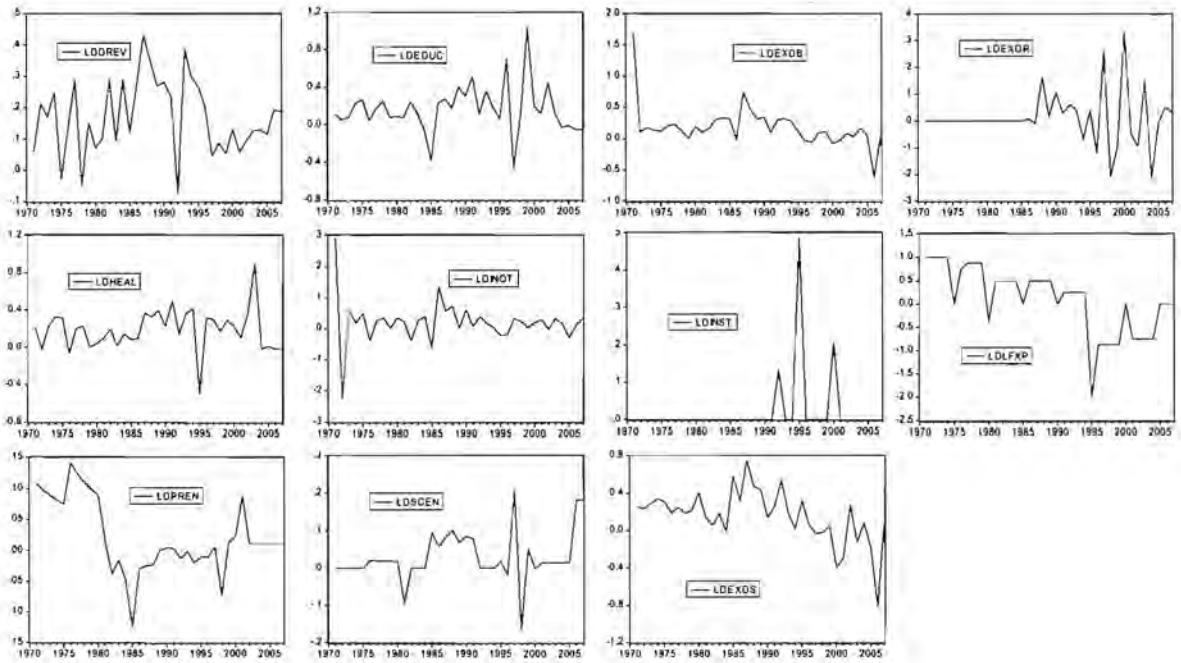
Appendices

Appendix I: Stationarity Graphs of the Variables at Levels



Appendix II: Stationarity Graphs of the Differenced Variables



Appendix III: The VECM for Impact of EXDR on EDUC and HEAL

Error Correction	D(LEDUC)	D(LHEAL)	D(LEXDR)	D(LEXDB)	D(LEXDS)	D(LINOT)	D(LINST)	D(LDREV)	D(LDRINST)
Coint Eqn 1	-0.7968	0.5223	1.0136	-0.2806	-0.1415	-0.4159	-0.0787	-0.1704	2.0323
	[-3.3355]	*[2.8411]*	*[1.4720]*	*[-1.6175]*	*[-0.6688]*	*[-2.0348]*	*[-0.7397]*	*[-1.2085]*	*[2.1350]*
Coint Eqn2	0.5940	-0.6587	-0.2812	0.0455	-0.2592	0.5373	0.1167	0.2221	-0.7793
	[2.3509]	*[-3.3874]*	*[-0.3861]*	*[0.2476]*	*[-1.1582]*	*[2.4852]*	*[1.0369]*	*[1.4892]*	*[-0.7740]*
Coint Eqn3	-0.5851	0.1155	0.9869	-0.3158	-0.3418	-0.2901	-0.0114	-0.05112	1.8964
	[-4.0600]	*[1.0413]*	*[2.3757]*	*[-3.0172]*	*[-2.6774]*	*[-2.3524]*	*[-0.1775]*	*[-0.6009]*	*[3.3022]*
D(LEDUC(-1))	0.7288	0.0324	2.5741	0.3110	-0.1464	1.2288	0.1066	0.1337	3.3630
	[2.3112]	*[0.1333]*	*[2.8320]*	*[1.3579]*	*[-0.5243]*	*[4.5545]*	*[0.7588]*	*[0.7185]*	*[2.6763]*
D(LHEAL(-1))	-0.4865	-0.1219	-2.0623	-0.1813	0.1685	-1.7818	0.0664	-0.3038	-2.7695
	[-1.2929]	*[-0.4207]*	*[-1.9012]*	*[-0.6634]*	*[0.5054]*	*[-5.5342]*	*[0.3958]*	*[-1.3679]*	*[-1.8469]*
D(LEXDR(-1))	0.4786	0.4451	-0.6875	-0.0412	-0.0326	-0.5363	-0.1162	0.0288	-1.0645
	[2.0193]	*[2.4401]*	*[-1.0063]*	*[-0.2395]*	*[-0.1552]*	*[-2.6449]*	*[-1.1006]*	*[0.2059]*	*[-1.1271]*
D(LEXDB(-1))	0.4064	-0.1767	0.1661	-0.1411	-0.3857	-0.1348	0.0794	0.1032	-0.1875
	[1.6006]	*[-0.9044]*	*[0.2270]*	*[-0.7655]*	*[-1.7152]*	[-0.6208]	*[0.7019]*	*[0.6888]*	*[-0.1854]*
D(LEXDS(-1))	-0.2846	0.6555	1.7697	0.1512	0.1466	1.7355	-0.0810	0.0771	2.4977
	[-1.1839]	*[3.5425]*	*[2.5535]*	*[0.8660]*	*[0.6883]*	*[8.4366]*	*[-0.7562]*	*[0.5434]*	*[2.6070]*
D(LINOT(-1))	-0.0457	0.0997	0.2158	0.04633	0.0145	0.0002	-0.0158	0.0293	0.3424
	[-0.5693]	*[1.6137]*	*[0.9322]*	*[0.7945]*	*[0.2033]*	*[0.0031]*	*[-0.4422]*	*[0.6182]*	*[1.0701]*
D(LINST(-1))	1.9801	0.2268	-6.8841	-0.3383	0.0841	-3.9962	0.0098	-0.2604	-10.3302
	[2.6894]	*[0.4001]*	*[-3.2437]*	*[-0.6328]*	*[0.1289]*	*[-6.3436]*	*[0.0298]*	*[-0.5992]*	*[-3.5209]*
D(LDREV(-1))	-0.8938	0.0367	1.0974	0.2299	0.6144	-0.1959	0.0707	0.0113	1.9498
	[-2.2855]	*[0.1219]*	*[0.9735]*	*[0.8096]*	*[1.7736]*	*[-0.5854]*	*[0.4058]*	*[0.0488]*	*[1.2511]*
D(LDRINST(-1))	-0.4543	-0.3235	0.7045	-0.0251	-0.0838	0.4303	0.0735	0.0025	1.1240
	[-2.7149]	*[-2.5119]*	*[1.4604]*	*[-0.2070]*	*[-0.5655]*	*[3.0058]*	*[0.9853]*	*[0.0252]*	*[1.6855]*
C	0.2270	0.0987	-0.3283	0.1020	0.1057	0.1413	-0.0171	0.1715	-0.4512
	[2.8791]	*[1.6266]*	*[-1.4448]*	*[1.7819]*	*[1.5143]*	*[2.0948]*	*[-0.4860]*	*[3.6865]*	*[-1.4362]*

Determinant Resid Covariance (dof Adj)	0.0000
Determinant Resid Covariance	0.0000
Likelihood	246.5128
Akaike Information Criteria	-5.6952
Schwarz Criteria	0.6389

t-statistic in brackets

Appendix IV: Robustness Check on the Public Expenditure on Social Sectors

Error Correction	D(LEDUC)	D(LHEAL)	D(LEXDR)	D(LEXDB)	D(LEXDS)	D(LINOT)	D(LINST)	D(LDREV)	D(LDRINST)
Coint Eqn 1	-0.3431	0.0976	-1.1811	0.0189	0.0199	0.0861	-0.0274	-0.0602	-1.4560
	[-1.8904]	*[0.5587]*	*[-2.0474]*	*[0.1450]*	*[0.2639]*	*[0.5007]*	*[-0.4042]*	*[-0.2605]*	*[-2.5326]*
D(LEDUC(-1))	0.3444	0.2435	1.0678	-0.0108	0.0390	-0.2990	0.1012	-0.1446	1.2759
	[1.6438	*[1.2078]*	*[1.6035]*	*[-0.0715]*	*[0.4473]*	*[-1.5070]*	*[1.2911]*	*[-0.5417]*	*[1.9226]*
D(LHEAL(-1))	0.0384	-0.0874	-0.7634	-0.0150	-0.0949	-0.0825	0.0447	0.3339	-1.0510
	[0.1536]	*[-0.3631]*	*[-0.9602]*	*[-0.0836]*	*[-0.9121]*	*[-0.3482]*	*[0.4775]*	*[1.0480]*	*[-1.3264]*
D(LEXDR(-1))	0.2436	0.0266	1.4438	0.1256	-0.0490	0.3536	0.0973	-0.1128	1.60773
	[1.1163]	*[0.1269]*	*[2.0820]*	*[0.8006]*	*[-0.5401]*	*[1.7112]*	*[1.1923]*	*[-0.4059]*	*[2.3262]*
D(LEXDB(-1))	0.2097	-0.3087	0.7952	0.2521	0.0616	-0.3340	0.0843	-1.1556	0.8466
	[0.8385]	*[-1.2831]*	*[1.0005]*	*[1.4022]*	*[0.5919]*	*[-1.4102]*	*[0.9015]*	*[-3.6276]*	*[1.0687]*
D(LEXDS(-1))	-0.6411	0.0521	3.0804	0.1959	-0.3582	0.8390	-0.1208	0.5823	3.0932
	[-1.3426]	*[0.1134]*	*[2.0298]*	*[0.5709]*	*[-1.8033]*	*[1.8553]*	*[-0.6765]*	*[0.9573]*	*[2.0453]*
D(LINOT(-1))	-0.1532	0.2585	-0.9594	0.1982	-0.1200	0.3617	-0.1191	0.8862	-0.8425
	[-0.6792]	*[1.1909]*	*[-1.3382]*	*[1.2224]*	*[-1.2790]*	*[1.6931]*	*[-1.4121]*	*[3.0841]*	*[-1.1791]*
D(LINST(-1))	0.1653	0.2988	-2.8489	-0.5799	0.0507	-1.0133	-0.1915	-0.4288	-2.034551
	[0.2457]	*[0.4618]*	*[-1.3326]*	*[-1.1994]*	*[0.1813]*	*[-1.5908]*	*[-0.7612]*	*[-0.5005]*	*[-0.95496]*
D(LDREV(-1))	0.0118	0.0521	0.0646	0.1143	0.0052	0.1500	-0.0325	-0.2104	0.1068
	[0.1447]	*[0.6625]*	*[0.2489]*	*[1.9475]*	*[0.1520]*	*[1.9390]*	*[-1.0645]*	*[-2.0226]*	*[0.4128]*
D(LDRINST(-1))	-0.2834	-0.0081	-1.3574	-0.1215	0.0120	-0.2627	-0.0867	0.1282	-1.5213
	[-1.3906]	*[-0.0412]*	*[-2.0959]*	*[-0.8294]*	*[0.1418]*	*[-1.3616]*	*[-1.1379]*	*[0.4939]*	*[-2.35706]*
C	-0.0094	0.0254	0.0804	-0.0004	0.0098	0.0115	0.0220	0.0112	0.0584
	[-0.2015]	*[0.5655]*	*[0.5423]*	*[-0.0115]*	*[0.5040]*	*[0.2605]*	*[1.2639]*	*[0.1889]*	*[0.3953]*
Determinant Resid Covariance (dof Adj)			0.0000						
Determinant Resid Covariance			0.0000						
Likelihood			169.8453						
Akaike Information Criteria			-3.4359						
Schwarz Criteria			1.3147						

t-statistic in brackets

Appendix V: VECM Results for Social Services Indicators

Error Correction	D(LPREN)	D(LSCEN)	D(LLFXP)	D(LEDUC)	D(LHEAL)	D(LINST)
Coint Eqn 1	0.1471	0.2189	0.0009	1.5525	-0.6296	-0.0172
	[3.0508]	*[3.4150]*	*[0.0650]*	*[1.0356]*	*[-2.5800]*	*[-0.1298]*
Coint Eqn2	-0.4283	-0.6998	-0.0245	0.4745	1.8126	0.0707
	[-3.2292]	*[-3.9689]*	*[-0.6325]*	*[0.1151]*	*[2.7008]*	*[0.1940]*
D(LPREN(-1))	0.4634	-0.5178	0.03497	8.0817	0.4900	0.2276
	[2.3555]	*[-1.9796]*	*[0.6094]*	*[1.3215]*	*[0.4922]*	*[0.4211]*
D(LPREN(-1))	0.1758	-0.0957	-0.0298	-8.2518	0.2403	-0.3208
	[0.9344]	*[-0.3825]*	*[-0.5437]*	*[-1.4113]*	*[0.2525]*	*[-0.6208]*
D(LSCEN(-1))	0.5705	1.1254	0.0409	-10.936	-1.3754	-0.2675
	[2.6365]	*[3.9124]*	*[0.6478]*	[-1.6261]	*[-1.2563]*	*[-0.4500]*
D(LSCEN(-2))	0.4924	1.0374	0.0261	7.6252	0.3047	-0.7089
	[2.8421]	*[4.5039]*	*[0.5163]*	*[1.4158]*	*[0.3476]*	*[-1.4895]*
D(LLFXP (-1))	2.1639	3.2277	0.0458	-7.6623	-3.5422	0.5452
	[2.1503]	*[2.4127]*	*[0.1560]*	*[-0.249]*	*[-0.6956]*	*[0.1972]*
D(LLFXP (-2))	0.3109	-0.9247	-0.0222	117.8966	0.1027	-1.4430
	[0.3594]	*[-0.8039]*	*[-0.0880]*	*[4.3834]*	*[0.0235]*	*[-0.6071]*
D(LEDUC (-1))	0.0232	0.0360	0.0010	0.3871	0.0278	-0.0041
	[3.2972]	*[3.8537]*	*[0.4821]*	*[1.7705]*	*[0.7802]*	*[-0.2146]*
D(LEDUC (-2))	-0.0080	-0.0075	-2.09E-06	-0.1139	0.0043	-0.0256
	[-1.4211]	*[-1.0057]*	*[-0.0013]*	*[-0.6552]*	*[0.1477]*	*[-1.6674]*
D(LHEAL (-1))	0.0468	-0.0538	-0.0183	-0.7741	-0.4139	0.2474
	[0.989]	*[-0.8559]*	*[-1.3264]*	*[-0.5267]*	*[-1.7300]*	*[1.9049]*
D(LHEAL (-2))	0.0913	-0.0015	-0.0106	2.4233	-0.1264	0.1110
	[2.0850]	*[-0.0252]*	*[-0.8295]*	*[1.7803]*	*[-0.5703]*	*[0.9229]*
D(LINST(-1))	0.5682	0.7793	0.0283	-12.9600	-1.7280	0.1430
	[3.2739]	*[3.3780]*	*[0.5597]*	*[-2.4024]*	*[-1.9678]*	*[0.2999]*
D(LINST(-2))	0.3855	0.8449	0.0132	-4.0681	-0.8493	-0.1901
	[2.6831]	*[4.4231]*	*[0.3152]*	*[-0.9108]*	*[-1.1681]*	*[-0.4817]*
C	-0.0849	-0.0569	0.0033	0.4265	0.3584	0.0022
	[-3.2806]	*[-1.6539]*	*[0.4359]*	*[0.5302]*	*[2.7367]*	*[0.0303]*

Determinant Resid Covariance (dof Adj)	0.0000
Determinant Resid Covariance	0.0000
Likelihood	334.3629
Akaike Information Criteria	-13.2779
Schwarz Criteria	-8.7451

t-statistic in brackets

Appendix VI: Robustness Check on the Response of Social Indicators

Error Correction	D(LPTRN)	D(LSTRN)	D(LINFM)	D(LEDUC)	D(LHEAL)	D(LINST)
CointEq1	0.18217	0.0743	0.0345	0.0203	0.0221	0.0014
	[2.503]	*[1.645]*	*[1.475]*	*[3.564]*	*[2.719]*	*[0.399]*
CointEq2	-0.4933	-0.2038	0.0482	0.0312	0.0139	-0.0059
	[-4.875]	*[-3.247]*	*[1.482]*	*[3.938]*	*[1.230]*	*[-1.165]*
D(LPTRN(-1))	0.1337	0.2195	-0.0423	0.0412	0.0655	-0.0109
	[0.590]	*[1.5620]*	*[-0.581]*	*[2.324]*	*[2.593]*	*[-0.965]*
D(LPTRN(-2))	0.0988	0.14028	-0.0825	0.0488	0.0224	-0.0056
	[0.391]	*[0.895]*	*[-1.016]*	*[2.473]*	*[0.795]*	*[-0.448]*
D(LSTRN(-1))	0.0644	0.1422	-0.1263	0.0106	0.0436	0.0124
	[0.165]	*[0.588]*	*[-1.007]*	*[0.348]*	*[1.003]*	*[0.638]*
D(LSTRN(-2))	0.5772	0.1479	-0.1057	0.0582	0.0525	0.0151
	[1.954]	*[0.807]*	*[-1.113]*	*[2.517]*	*[1.594]*	*[1.025]*
D(LINFM(-1))	0.7959	0.5980	0.6548	0.0566	-0.0973	0.0200
	[1.179]	*[1.428]*	*[3.018]*	*[1.072]*	*[-1.292]*	*[0.593]*
D(LINFM(-2))	0.4373	0.3608	0.1989	0.0986	0.0039	0.0193
	[0.596]	*[0.793]*	*[0.844]*	*[1.716]*	*[0.048]*	*[0.529]*
D(LEDUC(-1))	4.6362	1.1974	0.0258	0.2631	0.0559	0.1539
	[2.514]	*[1.047]*	*[0.044]*	*[1.8222]*	*[0.272]*	*[1.675]*
D(LEDUC(-2))	2.9007	0.6274	0.4310	0.6608	0.2918	0.0882
	[1.400]	*[0.488]*	*[0.647]*	*[4.073]*	*[1.262]*	*[0.854]*
D(LHEAL(-1))	12.3073	1.6952	0.5780	0.3110	0.0800	-0.1256
	[3.451]	*[0.766]*	*[0.504]*	*[1.113]*	*[0.201]*	*[-0.707]*
D(LHEAL(-2))	6.5793	-3.6160	-0.4410	0.4485	0.2394	-0.0255
	[2.420]	*[-2.144]*	*[-0.505]*	*[2.107]*	*[0.790]*	*[-0.188]*
D(LINST(-1))	28.7830	4.9199	4.8905	2.4465	1.2231	-0.6687
	[3.593]	*[0.990]*	*[1.899]*	*[3.9009]*	*[1.369]*	*[-1.675]*
D(LINST(-2))	24.9983	7.1455	0.8753	0.4906	0.4166	-0.4781
	[3.873]	*[1.784]*	*[0.422]*	*[0.971]*	*[0.579]*	*[-1.487]*
C	6.8886	3.9855	0.0566	-0.3589	-0.0828	0.1650
	[4.138]	*[3.859]*	*[0.106]*	*[-2.753]*	*[-0.446]*	*[1.989]*
Determinant Resid Covariance (dof Adj)			0.0000			
Determinant Resid Covariance			0.0000			
Likelihood			22.2409			
Akaike Information Criteria			4.5577			
Schwarz Criteria			9.0904			

t-statistic in brackets