RESEARCH PAPER

ON

THE FEASIBILITY OF PUBLIC AND PUBLICLY GUARANTEED DEBT RELATIVE TO GROSS DOMESTIC PRODUCT AS AN INDICATOR OF MACROECONOMIC CONVERGENCE IN THE SADC REGION

CCBG – MACROECONOMIC CONVERGENCE

RESEARCH PAPER

BY

THE RESERVE BANK OF ZIMBABWE

12 September 2008

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

This paper addresses questions on whether public debt should be a primary macroeconomic convergence indicator for the SADC region's integration initiative. The paper investigates the potential destabilizing effects of public debt on the economy. The possibility of public debt convergence in the SADC region is also investigated. The research applies both econometric and qualitative data analysis over the period 1990 to 2006. Results of the study show that public debt has had adverse effects on inflation and growth in the majority of the SADC countries. This suggests that the variable should be part of the primary macroeconomic convergence indicators for the region in its quest for the establishment of a monetary union. It has also been shown that public debt trends in most of the SADC countries have been declining over the sample period, henceforth, suggesting the possibility of debt convergence in the region by end of 2008, which is the target date for the first stage of the integration-the Free Trade Area.

BACKGROUND

In July 2001, the Southern African Development Community (SADC) through the Ministers of Finance and Investment endorsed a draft Memorandum of Understanding (MOU) on macroeconomic stability and convergence. The MOU set the scope for the harmonization of macroeconomic policies in the SADC sub-region as a necessary condition towards the formation of the SADC Customs Union in 2010.

The ultimate objective of the Macro-economic Convergence is to enable SADC member states to become a monetary union by 2016 and launch a regional currency for the Monetary Union by 2018. This will facilitate the free movement of goods, services, capital and labour across national frontiers and eventually lead to full regional monetary integration.

The SADC region set the following milestones in the period leading to its integration.
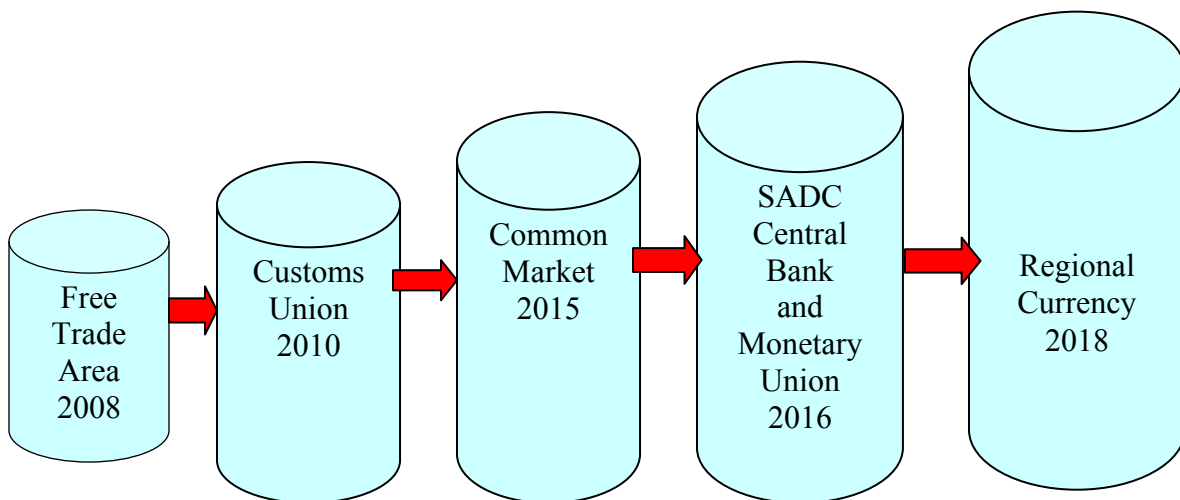
In a Free Trade Area, countries trade freely without payment of customs duty or charges of equivalent effect in goods produced amongst themselves. Usually tariffs are eliminated on selected goods. Under a Custom Union, the SADC

countries adopt a Common External Tariff (CET) against non member members. Countries also introduce a Common Valuation System and harmonization of Customs Legislation and Procedures.

A Common Market has features of a Customs Union plus free movement of the factors of production, namely labour and capital across boundaries of the individual countries. The distinction between local (national) and foreign businesspersons or investors of constituent members ceases in a Common Market.

In the advanced stage of economic integration, the region will transform into an Economic Union. This stage incorporates all the features of the Common Market plus common monetary and fiscal policies and the adoption of a single currency issued by a common monetary authority.

The formation of the SADC Regional Integration Arrangement (RIA) emanates from the benefits that the African countries can derive from such an arrangement. In a report presented to the SADC Committee of Central Bank Governors (CCBG) in January 2002, McCarthy noted that integration will enable SADC countries to benefit from increased market size, enhanced intra-regional trade, investment and growth.

In this paper, it is further argued that the SADC Monetary Union will be a stronger economic and trade lobbying block in the global economy than individual countries of the region can be.

The harmonization of macroeconomic policies is geared at building a more favourable climate for trade and economic integration in the sub-region by creating a more stable and conducive macroeconomic environment, which is

promotive of increased trade and investment flows, while reducing distortions that can retard growth of the region. This process is not only essential to the deepening of integration in SADC, but also directly underpins national objectives of promoting greater economic stability.

In order to achieve the SADC macro-economic convergence goals, a harmonization framework was set up, which defined a set of macroeconomic convergence criteria or targets that must be obtained by member states within stipulated time frames.

The pre-set macroeconomic convergence targets are as follows: (i) inflation to be reduced to single digit levels by 2008, to 5% by 2012, and to 3% by 2018, (ii) the ratio of the budget deficit to GDP should not exceeding 5% by 2008 and 3% as an anchor within a band of 1% by 2012 and be maintained at the 2012 level up to 2018; (iii) the nominal value of public and publicly guaranteed debt should be less than 60% of Gross Domestic Product by 2008; and this should be maintained through out the plan period (2018); and (iv) the current account deficit should be less than 9% of GDP by 2008.

Several other RIAs such as the EMU, ECOWAS, CMU, COMESA, EAC, WAEMU and SACU have adopted formal frameworks to guide the integration process and to promote the harmonization and progressive convergence of national economic structures and macroeconomic policies.

Recent Macroeconomic Developments in SADC

Growth in the SADC region is estimated to have slowed down to 4.9% in 2007 from 5.8% in 2006 against the backdrop of continued pressure on the global economic outlook emanating from a marked deterioration in global financial stability and escalating prices of food and oil.

Individual SADC economies, however, remain structurally diverse and at varying stages of development. South Africa, the region's most advanced economy, has an average annual GDP of US$278 billion. South Africa had a growth rate of 5.4% and 5.1% in 2006 and 2007, respectively.

In 2006, Malawi, Lesotho, Mauritius, Zambia, Swaziland, Namibia and Madagascar had accelerated growth mainly as result of good agriculture sector performance and improved macroeconomic management. Mauritius and Madagascar maintained high growth rates of 5.4% and 6.2%, in 2007, respectively. Lesotho, Malawi, Mozambique, Namibia,, South Africa and Zambia had decelerated growth in 2007 compared to 2006. The Zimbabwean economy continued to go through successive contractions, with real GDP falling by a cumulative of more than 33% percent between 2000 and 2007.

Inflation rate for the SADC region[1] averaged 8.4% in 2007, compared to 9.5% in 2006. South Africa, Botswana and Tanzania had the lowest annual inflation rates of about 7% in 2007, while Zimbabwe had the highest rate of 66 212%.

Countries with more than single digit inflation rates in 2007 were Madagascar, Zambia and Zimbabwe. Botswana, the DRC, Madagascar, Malawi, Mozambique and Tanzania had decelerating inflation in 2007. Prospects of achieving single digit inflation in 2008 are high in most of the region's countries. There is urgent need, however, to institute deflationary measures and policies in Zimbabwe where inflation has persistently remained high.

There was marked decline in the public debt-to-GDP ratio among the SADC countries since 2000 as the ratio continues to systematically trend downwards in the majority of the SADC countries. This is reflective of debt relief and improved fiscal management in most of the countries.

---

[1] Figures exclude Zimbabwe. With Zimbabwe included, the average goes up to 100.5% in 2006.

The ratio of the public and publicly guaranteed debt to Gross Domestic Product averaged 44.9% for the region in 2007, compared to 31.8% in 2006. High debt ratios, however, continue to prevail in DRC and Zimbabwe.

Improvement in fiscal management among the SADC countries is reflected by either falling budget deficits or widening budget surpluses in Mauritius, South Africa, Tanzania, Zambia and Zimbabwe in 2007. Worsening budget positions were obtained in the rest of the countries, which, however, remained within the convergence target threshold.

Gross international reserves improved in the majority of the SADC countries in 2007. The regional average import cover for the reserves increased from 4.8 months in 2006 to 6.9 months in 2007. Zimbabwe's reserve cover, however, remained low at 0.4 months in 2006, slightly above the 0.3 months of cover in 2005.

Botswana had the highest reserve cover of 26 months in 2006. Mauritius and South Africa also had significant amount of reserves in 2007. Nine of the SADC countries had gross reserve cover of at least 3 months in 2007.

Table 1   Macroeconomic Convergence in SADC

Country	Public Debt/ GDP Ratio		GDP growth		Inflation rate		Budget deficit/ surplus (% GDP)	
	2006	2007	2006	2007	2006	2007	2006	2007
Angola	19.2[1]	n.a	18.6	n.a	12.2	n.a	-3.41	n.a
Botswana	5.2[1]	n.a	0.5	6.1	11.6	7.1	15.4	n.a
DRC	134.9	116.1	5.6	6.34	18.2	9.9	-0.7	-1.0
Lesotho	51.2[1]	47.12	7.2	5.1	6.0	7.9	12.41	10.3
Madagascar	32.2	30.3	5.0	6.2	10.8	10.3	37.4	-2.8
Malawi	26.3	24.6	8.2	7.9	13.9	8.0	-0.51	-2.8
Mauritius	63.0[1]	59.12	5.0	5.4	6.1	9.8	-4.31	-3.82
Mozambique	52.0	45.0	8.5	7.3	13.3	8.2	-1.7	-2.9
Namibia	28.0[1]	22.1	4.1	3.8	5.1	6.7	4..81	1.1
South Africa	34.9[1]	31.82	5.4	5.1	4.7	7.1	-1.5[1]	0.6
Swaziland	17.2	17.4	2.8	2.8	5.3	8.1	10.11	-0.52
Tanzania	40.6[1]	42.42	6.7	7.1	7.3	7.0	-5.01	-3.62
Zambia	40.3[1]	36.22	6.2	5.7	9.1	10.7	-2.91	-0.22
Zimbabwe	78.31[1]	67.5	-2.0	-6.2	1281.1	66,212	-4.31	1.8
Average, excl Zim	44.5	45	5.8	4.8	9.5[5]	8.4[5]	3.9	-0.3

Source: SADC Recent Economic developments (2007)

Notes: n.a not available; [1] Fiscal 2006/2007; [2] 2007/2008; [3] December 2006; [4] Estimate; [5]Excludes Zimbabwe

IMPORTANCE OF MEC IN MONETARY UNIONS

The convergence targets for the SADC regional integration arrangement were set in view of the fact that macroeconomic stability should precede the formation of a Monetary Union in order to guide and integrate key aspects of future economic and financial policy among the member SADC countries.

Such policy co-ordination will protect the credibility of the SADC Regional Central Bank. In addition, it will also ensure that the region is stable and less vulnerable to external and internal shocks that will adversely affect the international credit worthiness and capital flows to the region.

Pursuance of uncoordinated country fiscal and monetary policies in members of the Monetary Union will encourage free-rider attitudes among member countries that, through direct or contagion effects, will implicitly tax other countries of the region exercising prudent economic policies.

Maruping (2005) posits that the attainment of macroeconomic stability through sustainable fiscal deficits and public indebtedness, external current account deficit, as well as low and stable inflation, before a member country of a region becomes a member of an economic grouping is key to the achievement of strong and sustainable economic growth.

While it is obvious that macroeconomic stability in individual countries is a necessary condition for accelerated growth and development in the region, debate remains on the issue of whether all the convergence indicators often set for integration initiatives such as the SADC Monetary Union are equally relevant and feasible. Further questions are on whether members of a bloc should religiously wait to attain the pre-set targets before they join an economic union or can be part of the union before satisfying all convergence criteria.

Practically, there are indicators that are key and primary such as rate of inflation, budget deficit and public debt and external current balance. Others are more secondary, as they are derivatives of the fundamental key indicators. These include public expenditure, interest rates, the level of central bank lending to government and level of foreign reserves. This paper contributes to the discussion on the harmonization of macroeconomic policies in the context of the SADC sub-region.

In the context of broader regional integration, the feasibility of public and publicly guaranteed debt as a MEC indicator has coveted controversy the world over. This study, therefore, examines the feasibility of public and publicly guaranteed debt as an indicator of macroeconomic convergence.

It would, however, not be possible to focus sorely on public debt and publicly guaranteed debt without touching on other related economic variables such as the budget deficit, inflation and GDP growth.

DEFINITIONAL ISSUES ON PUBLIC DEBT

The World Bank defines public debt as the sum of public and publicly guaranteed debt. Public debt is, therefore, the sum of all domestic and external obligations of public debtors. These include the Central Government and its agencies; states, provinces or similar political subdivisions including their agencies; and autonomous public bodies such as state enterprises and subsidiaries in which they have joint ownership with the private sector and a major shareholding. The obligations of public bodies outside the Central Government include borrowings that are both guaranteed and not guaranteed by the Government.

Publicly guaranteed debt is the sum of all domestic and external obligations of the private sector that is guaranteed for repayment by a public entity.

The International Monetary Fund and World Bank classify the debt of a country as external and domestic debt on the basis of residence of the lender. Accordingly, both foreign and domestic currency debt held by non-residents is classified as external debt and those held by residents is classified as domestic debt. This would not have any implications for total public sector debt though the breakdown into foreign and domestic debt would have to take this into account if this definition is used.

The level of contingent liabilities has become a concern for Governments after the Asian crisis. These are liabilities that could arise due to predefined events or circumstances such as defaults on guarantees. Further, obligations of the public sector as a whole become those of the Government and included borrowings guaranteed by it, both explicitly or implicitly. Borrowings by the private sector that are the result of Government policies which encouraged them add another dimension to the level of contingent liabilities.

With the removal of capital controls, the public and private sectors can opt to raise financial resources from either the domestic or international capital markets provided that the domestic markets are adequately developed and have a range of borrowing instruments. These changes eliminated the distinction between domestic and external sovereign liabilities to a large extent and made the management of the total domestic and external debt of the public sector a priority.

The evolution of public debt in most developing countries involves to a large extend, the thrust by the countries, to undertake development and reconstruction programs and investment in health and education, roads and other infrastructure

networks, designed to enhance the livelihood of disadvantaged indigenous communities.

Reflecting the nascent economic growth and developing country conditions, domestic financial resources in the developing countries are usually insufficient for the multi-layered investment programs needed in these countries. This has necessitated the need to borrow from external sources.

The flow of international goodwill for the developing world enhanced the countries' access to international capital markets, hence increasing the countries' external borrowings to finance their diverse developmental projects.

It has also been argued that most developing countries rely on primary exports in the form of minerals, agriculture commodities and semi-processed manufactures, to sustain their current account requirements. As prices of these commodities fall in the international markets, the developing world experience deteriorating terms of trade, which compel them to borrow externally to bridge their widening foreign resource gaps.

Balance of Payments imbalances necessitated request for support from the IMF under Structural Adjustment Programmes. This has increased the external debt stock of most developing countries.

DEBT MEASUREMENT PROBLEMS

The challenges that SADC countries face with regard to using public and publicly guaranteed debt as one of the macroeconomic convergence indicators range from measurement problems to data paucity. The use of public and publicly guaranteed

debt as a convergence indicator will require measurement synchronization across the SADC countries.

Any measurement differences will make comparison of the debt ratios across countries difficult. Banco de Mozambique (2005:16) noted that most SADC member states lack aggregated data on internal and external debt, hence making it difficult to ascertain the extent of government debt guarantees in the countries.

One challenge is with regard to the debt sustainability indicator or criterion to be used. The commonly used and most comprehensive indicator of debt sustainability is the debt-to-GNP ratio. There are other equally useful debt sustainability indicators, such as the external debt and debt service-to-exports ratio. Similarly, total public debt and debt service-to-government revenue is a useful indicator for fiscal debt sustainability analyses.

For practical purposes, three debt sustainability indicators are commonly used. These distinguish between (i) nominal stock-of-debt indicators, (ii) net-present-value-of-debt indicators, and (iii) debt service indicators (UNCTAD, 2004). These are usually normalized by either income, or exports, or government revenue. Each of the three measures has different information, which may be equally critical as an indicator of debt sustainability.

The Asian financial crisis revealed that the extent of Government obligations go beyond its direct borrowings and guarantees issued to include unguaranteed borrowings of the public sector and a range of implicit guarantees. Consequently, there is need for a more comprehensive coverage of public sector debt, at least for the purpose of collecting full and complete data on these obligations.

Payments that could arise due to unfunded pension liabilities, health care and other benefits of the public sector, insurance and reinsurance programs of the

Government, indemnities, comfort letters and other forms of assurances that are not legally binding could be a potential burden in times of crisis. These liabilities need to be identified, recorded and quantified and the magnitudes monitored for sound macroeconomic management.

Other measurement challenges that may arise in using the debt ratio in the SADC region relate to the conversion of foreign and domestic debt to similar currency denominations for comparison purposes.

The official nominal exchange rate is usually commonly used in converting the foreign and local debt components to the same currency before the debt ratios are computed. Some of the SADC countries have managed exchange rate systems, which inevitably result in overvalued exchange rates that are not reflective of the economic fundamentals prevailing in the countries.

The tendency in countries that control their exchange rates is, therefore, to create an overvalued nominal exchange rate that systematically raise domestic currency denominated debt components when converted to foreign currency. Using the overvalued exchange rate to convert foreign debt components to the local currency equivalence will equally depress the local currency equivalence of the external debt. Among the SADC countries, Zimbabwe is likely to face such conversion challenges.

The debt ratios by themselves also conceal information that can be of paramount importance with regard to the stability of the region. Two countries that have the same debt ratios are not equally stable or unstable if their debt maturity profiles are different or the composition of the debt between foreign and domestic debts is different. Long-term debt maturities tend to have less de-stabilizing effects than short-term debt. Equally, more of foreign debt compared to domestic debt is generally riskier than otherwise.

EXPERIENCES OF OTHER INTEGRATION ARRANGEMENTS

The European Monetary Union (EMU)

The European Monetary Union required macroeconomic convergence in five areas-namely inflation, budget deficits, interest rates, national debt and exchange rates as encompassed in the Maastricht Treaty. The Maastricht criteria for the EMU specify five conditions by which a country is admitted to the European Union.

These are:

- Inflation rate not more than 1.5% above the average of the three countries with the lowest inflation.
- Nominal long-term interest rates not exceeding 2% for the three countries with lowest inflation rates.
- No exchange rate realignment for at least two years.
- Government budget deficit of at most 3% of GDP in each of the countries.
- Gross debt to GDP ratio of at most 60% in individual countries.

The first three are meant to ensure monetary stability by supporting a fixed exchange rate regime among member countries, while the last two conditions are meant to reinforce the stability of the euro by checking on inflationary pressures that may result from unsustainable fiscal policies.

It is worth noting that the EMU convergence conditions were only set as a requirement for admission into the union at the stage of the introduction of a common currency in 1992. The integration initiative had started way back in 1957

when the European Coal and Steel Community was transformed into the European Economic Community (EEC).

In 1979, the EEC was transformed to the European Monetary System (EMS), which was later followed by the Single European Market in 1992, which provided for free movement of goods, persons, services and capital among member countries. The European Union introduced the euro as the region's common currency in 2002.

Afxentiou and Serletis (2000), in examining the convergence performances of fifteen EU member countries with regard to each criterion, observed that all the countries had a satisfactory debt ratio convergence. The study also found strong evidence of general progress in the Maastricht criteria.

The Economic Community of West African States (ECOWAS)

In 1987, the Economic Community of West African States (ECOWAS adopted the ECOWAS Monetary Cooperation Programme (EMCP) with a set of macroeconomic convergence criteria for member countries.

By 1999, the establishment of the single monetary zone had not materialized. The major obstacles to successful implementation of the programme included lack of political will and commitment and non uniform adoption of required macroeconomic framework and lack of policy coordination and harmonization among the countries.

By 2002, no country had satisfied all the pre-set macroeconomic convergence criteria. All countries satisfied the limit on central bank financing, while only Nigeria met the fiscal deficit/GDP ratio. Three countries, The Gambia, Guinea and Sierra Leone satisfied the target on single digit rate of inflation, while two

countries, Nigeria and the Gambia met the floor on foreign exchange reserves of 3 months of imports. In the first half of 2002, three countries met the inflation criterion, the budget deficit requirement, and the stipulation on central bank

The Eastern African Community (EAC)

The convergence criteria under the EAC included reduction of current account deficit to GDP to a sustainable level; reduction of budget deficit to GDP ratio to less than 5 percent; and maintenance of stable competitively determined exchange rates, reduction of inflation to low levels among other things.

The EAC member states have been progressing towards convergence of the key macroeconomic convergence indicators. Moving towards sustainable fiscal deficits that exclude external grant financing has been more difficult to achieve in countries that heavily depend on donor funding such as Uganda and Tanzania.

The West African Economic and Monetary Union (WAEMU/UEMOA)

The West African Economic and Monetary Union (WAEMU) embarked on a programme of harmonization and co-ordination of their macroeconomic policies through a set of convergence criteria in 1994. The macroeconomic convergence criteria adopted included a ceiling on civil service wage bill of 40% of the tax revenue, a ceiling on public investment financed by primary basic surplus of not less than 15% of tax revenue and a declining or unchanged level of domestic and external arrears.

Member countries demonstrated strong commitment to comply with the criteria. Lack of sanctions for non-compliance and poorly designed indicators, however, undermined progress towards the initiative.

In 1999, more stringent indicators under the Convergences, Stability, Growth and Solidarity Pact were adopted. The Pact required member countries of the WAEMU to aim at achieving a fiscal balance, an inflation rate of 3% at most, Domestic debt to GDP and External debt to GDP ratios of below 70%. The Pact also prescribed sanctions for non-compliance.

The Sub-region took a decision to integrate with non-WAEMU countries to establish a fast track monetary integration through the formation of a second monetary zone, the West African Monetary Zone (WAMZ). The WAMZ countries adopted a set of convergence criteria, as pre-conditions for adoption of a single currency and a common central bank. The convergence targets were missed despite time extensions on two occasions.

THE IMPACT OF PUBLIC DEBT ON ECONOMIC GROWTH

There is no consensus in the literature with regard to the debt-economic growth relationship. In neoclassical growth models perfect capital mobility which increases external borrowing improves economic growth. Whereas, in the recent endogenous growth models, rising cost of foreign capital inflow reduces external borrowing causing a decline in long run economic growth.

Recent studies dealing with the issue of external resource inflow and economic growth also argue that a more realistic assumption is that countries may not be able to borrow freely because of the risk of repudiation or moral hazard. Cohen (1993) included repudiation risk in his analysis of debt-growth relationship and found that low levels of debt are associated with higher growth whereas large levels of accumulated debt stocks lead to lower economic growth.

The debt-economic growth relationship has been highly investigated since the 1980s. During the 1980s the question of how to achieve higher economic growth in less developed countries (LDCs) became more difficult because of heavy debt burdens in these countries. Several countries have been investigated and the studies confirm that the relationship between public debt and economic growth is still a controversial one.

Some studies found that there is a negative relationship between public debt and economic growth. Deshpande (1992) and Cunningham (1993) showed that a strong negative relationship exists. Sawada (1994) and Bauerfreund (1985) indicated that external debt leads to reduced investment and economic growth.

Smyth and Hising (1995) investigated USA federal debt in the early 1980s and 1990s and calculated an optimal debt ratio (DEBT/ GDP) of 38.4 percent. In the early 1980 debt ratios in the USA were below 38.4% and debt-financing stimulated economic growth. On the other hand, during 1986-1993, debt ratios had risen to 50.9 percent resulting in low average economic growth rate.

Afxentiou (1993) revealed that indebtedness affected economic growth negatively. Cohen (1993) showed that external debt has not affected GDP growth rate. Similar model developed by Cohen and Sachs (1986) seems to fit well with the experiences of most of the developing countries. The model shows that there would be two stages of economic growth. In the first stage the growth rate of external capital inflow and output growth rate are high. In the second phase, the resource inflow and growth will both slow down.

Using data for 93 developing countries for the period 1968–98, Pattillo, et al., (2002) find a nonlinear impact of debt on economic growth. The results of the study suggest that average impact of debt on economic growth becomes negative when debt is at about 160–170 percent of export-earnings or 35– 40 percent of

gross domestic product. The marginal impact of debt on growth becomes negative at about half of these values. Similarly Chawdhury (2001) finds that debt servicing as a percentage of either export earnings or GDP affect growth rate of GDP per capita adversely. This effect is equally important and statistically significant for HIPCs and other developing countries facing heavy debt burden.

Savvides (1992) asserts that if a debtor country fails to pay its external debt, debt payments become linked to the country's economic performance. This implies that debt only has de-stabilizing effects when it has become unsustainable.

THE IMPACT OF PUBLIC DEBT ON INFLATION

Joseph Thullah (2006), in a study on the impact of public debt on inflation in Sierra Leone showed that 60-78 percent of the variations in inflation were explained by the changes in money supply, the level of government deficit and public debt. While changes in money supply and total deficit financing proved to be positively related to variations in inflation, public debt was positively correlated with inflation.

Sargent and Wallace's (1981) in their predictions, indicate that an increase in public debt is typically inflationary in countries with large public debt. Similar views are supported by Goohoon, McFarlane, Robinson (2006), in their paper on role of public debt in determining inflation and inflation expectations, which showed that the relationship holds strongly in indebted developing countries, weakly in other developing countries, but generally not in developed economies. The paper posits that increased government debt adds to household wealth and, hence, to demand for goods and services, leading to price pressures. Results from the study by Goohoon (2006), et al. suggest that the risk of a debt-inflation trap is significant in highly indebted countries.

In analyzing the effects of public debt on the economy, Fischer and Easterly (2002) argued that the consequences of public debt depend on the sources of financing such debt. They identified four sources of finance, which are: the use of international reserves, the use of domestic borrowing, the use of international borrowings and the use of seignorage revenue.

Each of these has its incumbent effects on the economy. Use of international reserves to finance the public debt will put pressure on a country's exchange rate. This will also reduce the import cover of the international reserves to risky levels. Such a move will reduce capital inflows for the region. Further, Ferrucci and Penalver (2003) noted that the high country risk will degenerate into debt and financial crises.

The use of domestic borrowing to retire public debt also has adverse effects on the macroeconomic stability of a country and the region at large. It directly crowds out private investment through the attendant pressures on interest rates and credit availability to the private sector. High public debts are, therefore, potentially adverse to private demand and investment.

Use of seignorage to retire public debt implicitly taxes households and firms in a country through the resultant inflation. The created inflation worsens the country's macro economic instability.

From the above literature, it can be argued that higher public and publicly guaranteed debt may hamper growth and worsen inflation through its macroeconomic de-stabilizing effects. To the contrary, it can also be argued that what matters is the composition of the debt and the structure of government spending. External debt may, for example, accelerate growth in the short term through its complementary effects on private investment. Borrowing by

governments to finance infrastructure development may also boost private investment and growth.

It has, however, generally been noted that unsustainable public debt retards growth and development through the deployment of significant resources to debt servicing. Compelling countries to converge their debt towards a sustainable benchmark such as 60% of GDP before admission into the SADC integration will prevent fiscal laxity on the part of individual SADC countries.

Countries that have different and divergent public and publicly guaranteed debt will make it difficult to co-ordinate monetary and fiscal policies in the integration arrangement. Unified public debt management in the SADC region will make it easier for the Regional Central Bank to co-ordinate monetary and fiscal policies in the region. Uncoordinated fiscal policies will make it difficult to sterilize asymmetric economic shocks that will threaten regional macroeconomic stability.

It can also be argued that having a centralized monetary policy system that co-exists with uncontrolled and decentralized fiscal policies in individual countries will create serious moral hazard tendencies as countries engage in expansionary fiscal policies which will implicitly tax other countries through higher inflation.

The regional central bank will be forced to inject liquidity into the region to bail out insolvent countries. The regional central bank will be pushed to take this stance as a way of protecting its credibility as well as restoring stability of the whole region, hence inflicting bad policy externalities on other countries. Ferrucci and Penalver (2003) observed that once countries have become members of a regional integration, allowing them to have, unmonitored debts will lead to post contractual opportunism that will involve too much borrowing and laxity by the countries. A collectively monitored public and publicly guaranteed debt for the region will avoid such tendencies.

PUBLIC DEBT AND ECONOMIC STABILITY IN THE SADC REGION

It has been noted that as a macroeconomic convergence indicator, public and publicly guaranteed debt has a bearing on inflation, growth and sustainable development. This paper empirically investigates how public debt has related to inflation and economic growth over the period 1990 to 2006 in the SADC region. Inflation and economic growth have been chosen as proxies for macroeconomic stability. High and unstable inflation and retarded economic growth are reflective of an unstable economic environment.

Countries were classified into two categories - namely high debt countries and low debt countries. High debt countries have been categorized as those with an average debt to GDP ratio of over 60%. Low debt countries are those lying below this threshold. The sample period 1990 to 2006 has been split into two sub-samples, with 2000 being the cut-off year to match the MOU for macroeconomic stability and convergence for SADC countries which was signed in July 2001.

Table 2: Debt classification by country

LOW DEBT COUNTRIES		HIGH DEBT COUNTRIES	
Before 2000	**After 2000**	**Before 2000**	**After 2000**
South Africa	South Africa	Lesotho	Lesotho
Namibia	Namibia	Madagascar	Madagascar
Swaziland	Swaziland	Malawi	Malawi
Tanzania	-	Mauritius	Mauritius
Zimbabwe	-	Mozambique	Mozambique
Botswana	Botswana	Zambia	Zimbabwe
-	-	-	Tanzania
-	-	-	Zambia
		DRC	DRC

During the sub-sample 1990-2000, low debt countries had a collective average debt-to-DGP ratio of 136.6% while the low debt countries had an average of 23%. Average inflation in the high debt countries was higher at 20% compared to 15% in the low debt countries. After 2000, the average debt ratio for the high debt countries had fallen to 116.4%. For the low debt countries the debt ratio had increased to 25% of GDP. Average inflation in the two country categories had slowed down to 9.6% and 7.6% for the high and low debt countries, respectively.

This analysis suggests that high debt was inflationary among in the SADC region over the entire sample period as evidenced by the disparity between the average inflation rates of the two country categories. To the extent that most of the SADC countries have thin tax bases, there is inclination towards financing government expenditure and debt repayment through inflationary money printing. The scatter graph below confirms the positive correlation between public debt and inflation among the SADC countries.

PUBLIC DEBT AND INFLATION IN SADC COUNTRIES (2000-2006)
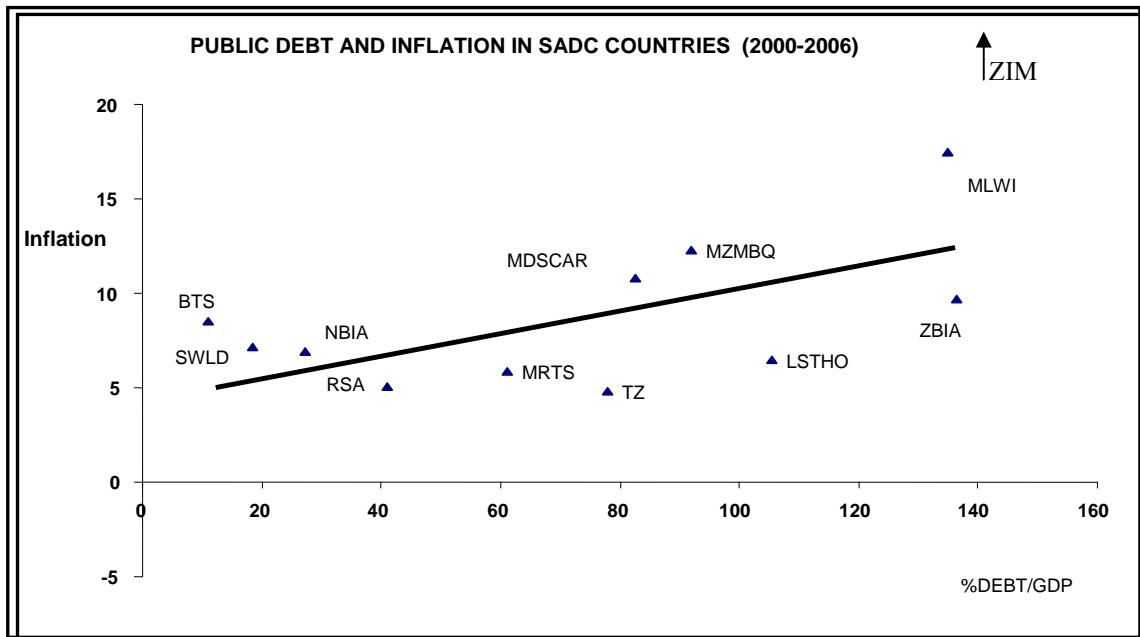
Goohoon, et al (2006), drawing on extensive panel data set, found that the relationship between public debt and inflation holds strongly in highly indebted developing countries, weakly in other developing countries but generally not in developed countries.

The relationship between public debt and economic growth is not easily predictable. High public debt may be reflective of high government expenditure, which may propel or retard growth depending on current levels of the expenditure and debt. For the SADC region, during the first sub-sample 1990-2000, economic growth was higher in the high debt countries at 4.1% per annum compared to 3.4% in the low debt countries. Between 2000 and 2006, economic growth remained at 4.1% in the high debt countries, while there was an improvement to 4.4% per annum in the low debt countries.

There was, however, a mild negative relationship between public debt and growth in the SADC region over the period 2000 to 2006.

PUBLIC DEBT AND ECONOMIC GROWTH IN SADC COUNTRIES (2000-2006)
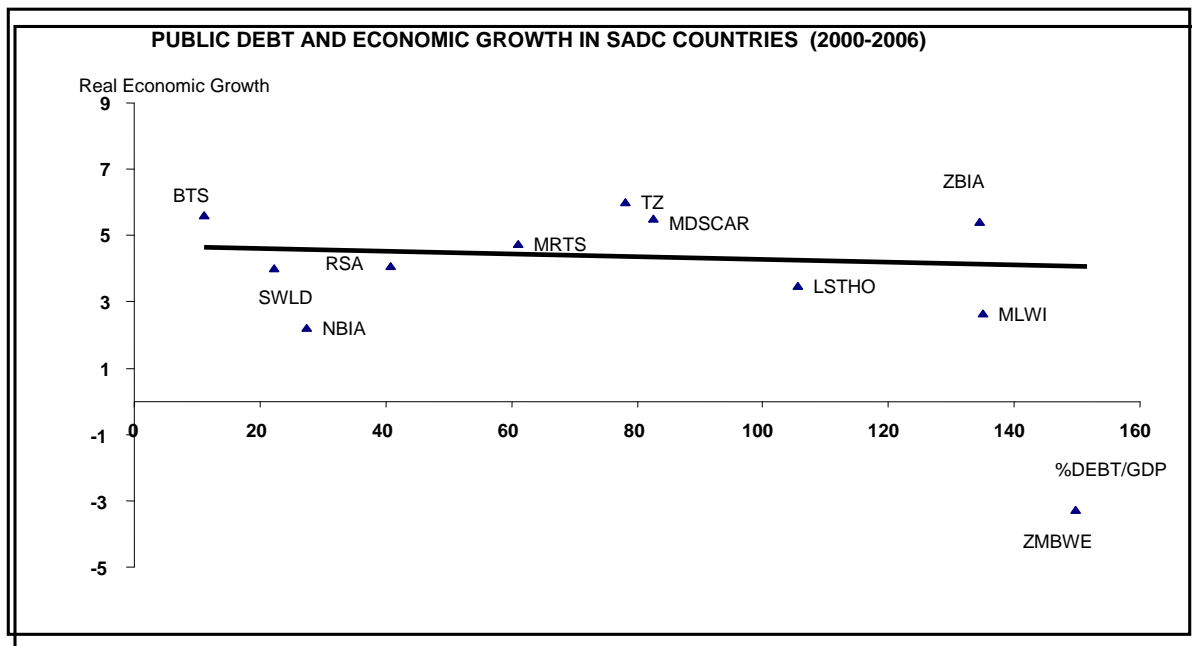
Brauninger (2002) confirmed the observed correlation between public debt and economic growth when he noted that after the explosion of public debt in Germany after the EU re-unification and in Japan during the 1990s, economic growth drastically declined in both countries.

The use of the debt ratio as a macroeconomic convergence indicator in the SADC integration initiative, therefore, makes practical sense. More rigorous econometric causality testing for relationships between public debt and inflation and public debt and economic growth have also been done in this paper.

CAUSALITY BETWEEN DEBT AND ECONOMIC STABILITY

The Granger causality test (Granger C W J, 1969), is used to investigate the direction of causality between public and publicly guaranteed debt and inflation as well as economic growth as proxies for economic stability. Nine out of the fourteen SADC countries are used[2].

The Granger causality approach is premised on the axiom that the past and present may cause the future but the future can not cause the past (Granger, 1980). Thus public debt Granger causes growth, if current economic growth can be predicted with better accuracy by using past values of debt rather than by not doing so, with other information remaining unchanged. This test assumes that the information relevant to the prediction of each of the three variables is contained solely in the time series data of these variables.

---

[2] Complete data set for the other five countries could not be obtained.

In testing causality, estimation of the two debt equation sets for each of the SADC countries is done using Ordinary Least Squares applied to the bivariate Granger causality systems using quarterly data for the period 1990 to 2006.

$$D_t = \Sigma^n_{i=1}\alpha_i INF_{t-i} + \Sigma^n_{j=1}\beta_j D_{t-j} + U_{1t} \qquad [1]$$

$$INF_t = \Sigma^m_{t=1}\delta_i INF_{t-i} + \Sigma^m_{j=1}\eta_j D_{t-j} + U_{2t} \qquad [2]$$

$$D_t = \Sigma^n_{i=1}\psi_i (\Delta GDP/GDP)_{t-i} + \Sigma^n_{j=1}\gamma_j D_{t-j} + U_{1t} \qquad [3]$$

$$\Delta GDP/GDP_t = \Sigma^m_{t=1}\theta_i(\Delta GDP/GDP)_{t-i} + \Sigma^m_{j=1}\lambda_j D_{t-j} + U_{2t} \qquad [4]$$

Results on causality between public debt and inflation are based on the statistical significance of $\Sigma\alpha_i$ and $\Sigma\eta_j$ If $\Sigma\alpha_i \neq 0$ and $\Sigma\eta_j = 0$, for example, there will be evidence of unidirectional causality from debt to inflation. The reverse represents causality from inflation to debt. Bidirectional causality between public debt and inflation exists when the sets of coefficients of D and INF are statistically not equal to zero in the two equations.

The same applies to the Debt-Growth relationships. Causality tests between public expenditure and national income have assumed two models. The Wagnerian model treats public expenditure as endogenously depending on income, with public expenditure as a percentage of income increasing as economic growth increases. Causality in the Wagner's law runs from national income to public expenditure.

In the Keynesian model, public expenditure is exogenously treated, with causality running from public expenditure to income. The Keynesian model thus takes public expenditure as a potential macroeconomic policy instrument that can be used to determine direction of economic growth. In both models, however, the relationship between growth and public expenditure- unidirectional or bidirectional, is assumed to be positive.

Both models, therefore, assume that current debt levels are low and sustainable. With high and unsustainable debt levels, the possibility of a negative relationship between public expenditure and growth can not be ruled out.

Stationarity and co-integration tests are done to all the variables used before estimation is done. This follows from recommendations by Bahmani-Oskooee and Alse (1993:536) that "Standard Granger or Sims tests are only valid if the original time series from which growth rates are generated are cointegrated".

Cointegration is relevant to the problem of the determination of long-run or equilibrium relationships between or among variables. Lack of cointegration between public debt and inflation or public debt and economic growth, for example, will mean that the variables have no long run relationships or that such a relationship is unpredictable.

Performing standard regression techniques on non-cointegrated or non stationary variables would yield invalid results. In testing for cointegration between and stationarity of public debt and inflation and public debt and economic growth, the Argumented Dickey Fuller tests are employed.

RESULTS OF STATIONARITY AND COINTEGRATION TESTS

Table 2 below shows the calculated t-values from the ADF tests for stationarity on each variable. Results of variables in second differences are also displayed if the variables are found to be non-stationary in levels.

Differenced values of public debt are used in all estimations, unless it is found to be stationary or cointegrated with inflation or economic growth.

31

Table 3: ADF Tests for Stationarity

	D	*G*	*INF*	*ΔD*	*ΔINF*
Botswana	-1.85 (0.07)	-3.43 (0.00)	-2.38 (0.02)	-4.07 (0.00)	-
Lesotho	-1.79 (0.07)	-3.84 (0.00)	-3.72 (0.00)	-3.28 (0.00)	-
Mauritius	-2.76 (0.01)	-5.61 (0.00)	-2.24 (0.03)	-	-
Malawi	-1.61 (0.11)	-5.51 (0.00)	-3.74 (0.00)	-4.19 (0.00)	-
Madagascar	-0.53 (0.61)	-5.57 (0.00)	-3.92 (0.00)	-3.42 (0.00)	-
South Africa	0.100 (0.92)	-3.483 (0.00)	-3.663 (0.00)	-3.80 (0.00)	-
Swaziland	-3.90 (0.00)	-3.65 (0.00)	-3.75 (0.00)		-
Tanzania	-2.66 (0.01)	-3.288 (0.00)	-2.675 (0.01)	-	-
Zimbabwe	-3.886 (0.00)	-4.23 (0.00)	2.91 (0.01)	-	-
Mozambique	-0.01 (0.58)	-0.25 (0.00)	-0.04 (0.09)	-0.37 (0.00)	-
Zambia	3.01 (0.01)	-2.63 (0.02)	-2.69 (0.02)	-	-
Namibia	0.17 (0.98)	-4.43 (0.0)	-1.14 (0.28)	-1.36 (0.01)	-4.44 (0.0)

RESULTS FROM GRANGER CAUSALITY TESTS

Results from the Granger Bivariate Causality Tests indicate that debt granger causes inflation in eight out of the ten SADC countries investigated. These are Botswana, Lesotho, Malawi, Madagascar, South Africa, Tanzania, Mozambique and Zimbabwe. Causality between public debt and inflation is stronger at 5% level of significance in Lesotho, Mozambique and Zimbabwe. Causality exists at 10%

in the other countries. There is lack of evidence on causality between public debt and inflation in Mauritius, Zambia, Namibia and Swaziland.

Table 4: Causality between Public Debt and Inflation

Country	Lag Length	F-Stat (D→INF)	F-Stat (INF→D)
Botswana	4	1.53 (0.10)**	0.37 (0.83)
Lesotho	5	2.81 (0.03)*	0.99 (0.43)
Mauritius	4	0.11 (0.97)	0.25 (0.90)
Malawi	4	1.30 (0.10)**	0.44 (0.77)
Madagascar	4	2.24 (0.08)**	0.17 (0.95)
South Africa	5	1.86 (0.10)**	0.89 (0.50)
Swaziland	5	0.51 (0.77)	3.59 (0.00)
Tanzania	4	2.07 (0.10)**	1.33 (0.27)
Zimbabwe	5	2.22 (0.04)*	0.37 (0.87)
Mozambique	5	7.83(0.00)*	2.51 (0.04)*
Zambia	4	3.97 (0.12)	30.1(0.01)*
Namibia	4	2.91 (0.16)	1.19 (0.44)

*Significant at 5%, ** Significant at 10%

Structured inflation equations in countries where evidence of causality between public debt and inflation exist were also estimated. The estimated equations indicate that the impact of debt on inflation is positive and significant in Botswana, Malawi and Zimbabwe while mild in Lesotho. For South Africa and Tanzania, though public debt positively correlates with inflation, the impact is insignificant.

Table 5: Estimated Inflation

	C	D	BD	LR	MS	ΔMS	ΔD	ΔInf-1	ΔLR	ΔEX	EC	R^2	DW
Botswana	0.04	-	-	0.13	0.06	-	0.22	-	-	-	-0.02	0.4	1.9
	(0.82)	-	-	(0.74)	(0.8)	-	(0.06)	-	-	-	(0.74)		
Lesotho	-0.19	0.01	0.1	-	0.002	-	-	0.44	0.07	1.4	-0.1	0.5	1.8
	(0.66)	(0.2)	(0.2)	-	(1.0)	-	-	(0.0)	(0.33)	(0.01)	(0.5)		
Malawi	-1.75	-	-	-	0.48	-	0.02	0.60	-	0.3	0.16	0.4	2.3
	(0.1)	-	-	-	(0.1)	-	(0.1)	(0.0)	-	(0.3)	(0.0)		
S.Africa	-0.54	-	-	-	0.12	-	0.01	0.48	-	0.01	-0.07	0.4	2.2
	(0.05)	-	-	-	(0.1)	-	(0.9)	(0.0)	-	(0.1)	(0.1)		
T'zania	-3.0	-	-	0.06	0.07	-	0.01	-0.12	-	-	-0.1	0.2	1.9
	(0.1)	-	-	(0.4)	(0.04)	-	(0.8)	(0.4)	-	-	(0.1)		
Z'babwe	48.0	-	3.7	-	-	2.7	2.9	-	-0.2	-	0.15	0.2	1.9
	(0.02)	-	(0.2)	(0.04)	-	(0.0)	(0.0)	-	(0.6)	-	(0.7)		

Causality from public debt to economic growth is evident at either 5% or 10% levels of significance in Botswana, Lesotho, Mauritius, Malawi, South Africa, Swaziland, Mozambique and Zimbabwe. In Tanzania, Zambia, Namibia and Madagascar, there is no evidence of causality between public debt and economic growth.

Table 6: Causality between Public Debt and Economic Growth

Country	Lag Length	F-Stat (D→g)	F-Stat (g→D)
Botswana	4	3.28 (0.02)*	0.37 (0.83)
Lesotho	4	2.15 (0.10)**	0.71 (0.62)
Mauritius	5	3.87 (0.00)*	1.4 (0.24)
Malawi	4	0.35 (0.08)**	0.32 (0.86)
Madagascar	4	0.69 (0.60)	0.16 (0.98)
South Africa	4	2.12 (0.09)**	0.68 (0.61)
Swaziland	5	2.54 (0.04)*	4.19 (0.00)*
Tanzania	5	0.62 (0.69)	0.33 (0.89)
Zimbabwe	5	2.56 (0.05)*	1.56 (0.19)
Mozambique	5	4.82 (0.00)*	11.0 (0.00)
Zambia	4	1.97(0.35)	1.16 (0.47)
Namibia	4	0.68 (0.64)	0.39 (0.80)

*Significant at 5%, ** Significant at 10%

Estimated growth equations for Lesotho, Botswana, Malawi, South Africa, Zimbabwe, Mauritius and Swaziland indicate the existence of negative and significant relationship between public debt and economic growth in all the countries except Mauritius and Swaziland. Mauritius and Swaziland exhibited positive relationship between public debt and economic growth.

Table 7: Estimated Economic Growth

	C	D	BD	LR	MS	ΔD	ΔBD	ΔG-1	ΔMS	ΔEX	EC	R^2	DW
Botswana	8.5	-	0.01	-2.1	-0.2	-1.3	-	0.15	-	-	0.11	0.5	1.6
	(0.02)		(0.3)	(0.0)	(0.1)	(0.0)		(0.3)			(0.2)		
Lesotho	1.9	-0.01	-	-0.24	0.05	-	0.05	-	-	0.26	1.03	0.9	0.3
	(0.0)	(0.0)		(0.0)	(0.01)		(0.3)	-	-	(0.5)	(0.0)		
Malawi	1.5	-	0.04	-0.1	0.14	-0.02	-	-	-	-	0.6	0.7	1.2
	(0.4)	-	(0.9)	(0.0)	(0.0)	(0.0)					(0.0)		
S.Africa	0.19	-	-	-	-0.04	-0.02	-0.1	0.55	-	-	-0.07	0.4	2.2
	(0.4)	-	-	-	(0.4)	(0.0)	(0.2)	(0.0)	-	-	(0.2)		
M'ritius	1.1	0.02	0.10	-	0.02	-	-	-	-	-0.04	0.82	-	-
	(0.0)	(0.0)	(0.1)	-	(0.14)	-	-	-	-	(0.4)	(0.0)		
Z'babwe	0.5	-	0.1	-	-	-0.1	-	0.8	-0.01	-	-	0.7	1.9
	(0.51)		(0.3)			(0.04)		(0.0)	(0.2)				
S'ziland	3.2	0.03	-	-	-0.01	-	-	-	-	0.1	0.72	0.8	0.7
	(0.0)	(0.1)			(0.06)					(0.04)	(0.0)		

DEBT SUSTAINABILITY ANALYSIS FOR SADC COUNTRIES

The commonly used conventional debt ratios seek to measure a country's solvency and liquidity vis-à-vis its debt position. Debt analysis involves both debt stock and debt service concepts relative to a country's potential to repay. Sustainability indicators used include the debt-to-GDP, the debt-to-exports and the debt-to-Government revenue ratios. The debt service to export earnings or Government

revenue are used to measure a country's liquidity or ability to service its debt from its export earnings and domestic revenue sources, respectively.
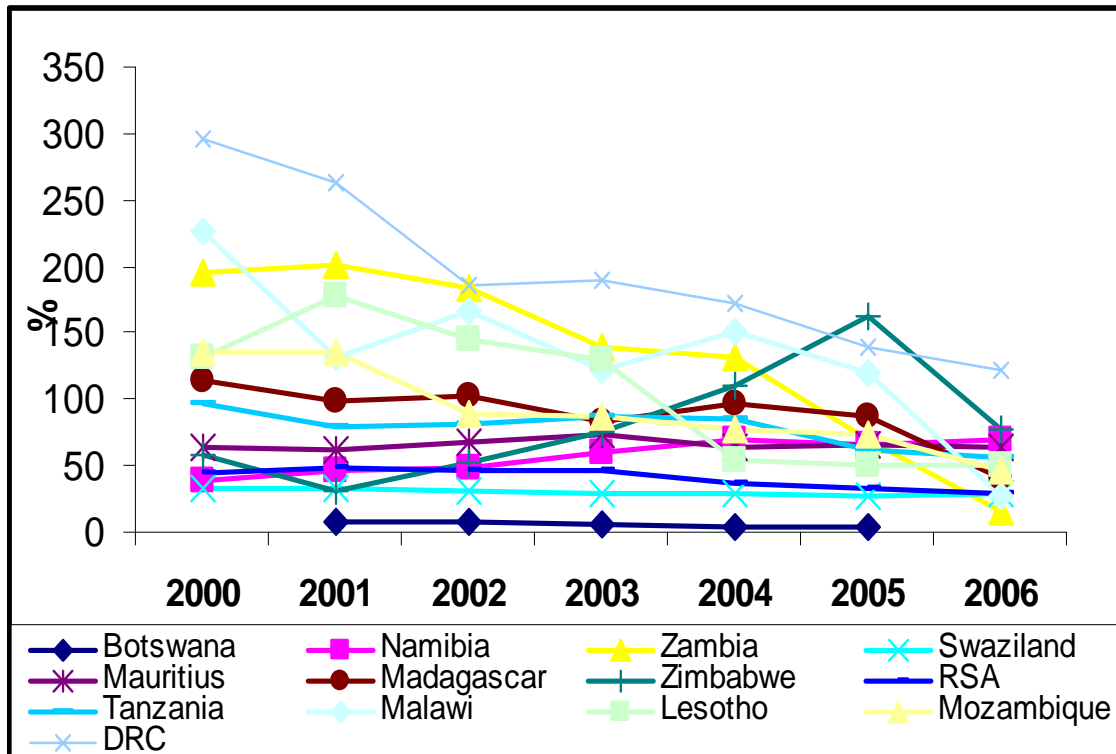
The Debt to GDP Ratio

In the World Bank fiscal sustainability hand book, Punam Chuhan (2005) argued that a persistently rising debt-to-GDP ratio leads to unsustainable debt in the long term. On the same note, Martin Brownbridge (2003) has argued that a debt-to-GDP ratio of more than 70% is considered unsustainable by the Bretton Woods Institutions.

Hopkin and Reddaway (1994), suggest that fiscal sustainability obtains with a primary deficit or surplus that keeps the debt to GDP ratio unchanged over time, thus implying that a sustainable debt ratio is one which does not rise over time but rather which falls or remains static. The weakness in this view is that it fails to attach importance to the current levels of debt, which can be high and unsustainable. Debt sustainability analysis should, therefore, consider both current debt levels and trends.

For the SADC region the average debt-to-GDP ratio over the period 2000 to 2006 was below 60% in four countries – namely Botswana, Namibia, Swaziland and South Africa and above 60% in the rest of the countries, excluding Angola whose data was not available. The average debt ratio over the period 2000 to 2006 was highest among the SADC countries at 195%. However, all the SADC countries, with the exception of Zimbabwe, had either almost stationary or declining debt to GDP ratios over the period.

Debt-to-GDP Ratio

The Debt to Government Revenue Ratio

The debt to Government revenue ratio links a country's debt burden to the ability of the government to raise income to redeem the debt. A lower or declining ratio is more favourable. The measure, however, assumes that external and domestic debts are substitutable in the budget of a country.

Madagascar, Zambia, Mauritius, Zimbabwe and Mozambique had average debt-to-Government revenue ratios in excess of 350% between 2000 and 2006. While the ratio trended downwardly in the rest of the SADC countries, Zimbabwe continued to have the challenge of an increasing ratio over the period 2000 to 2006.

Public Debt-to-Government Revenue
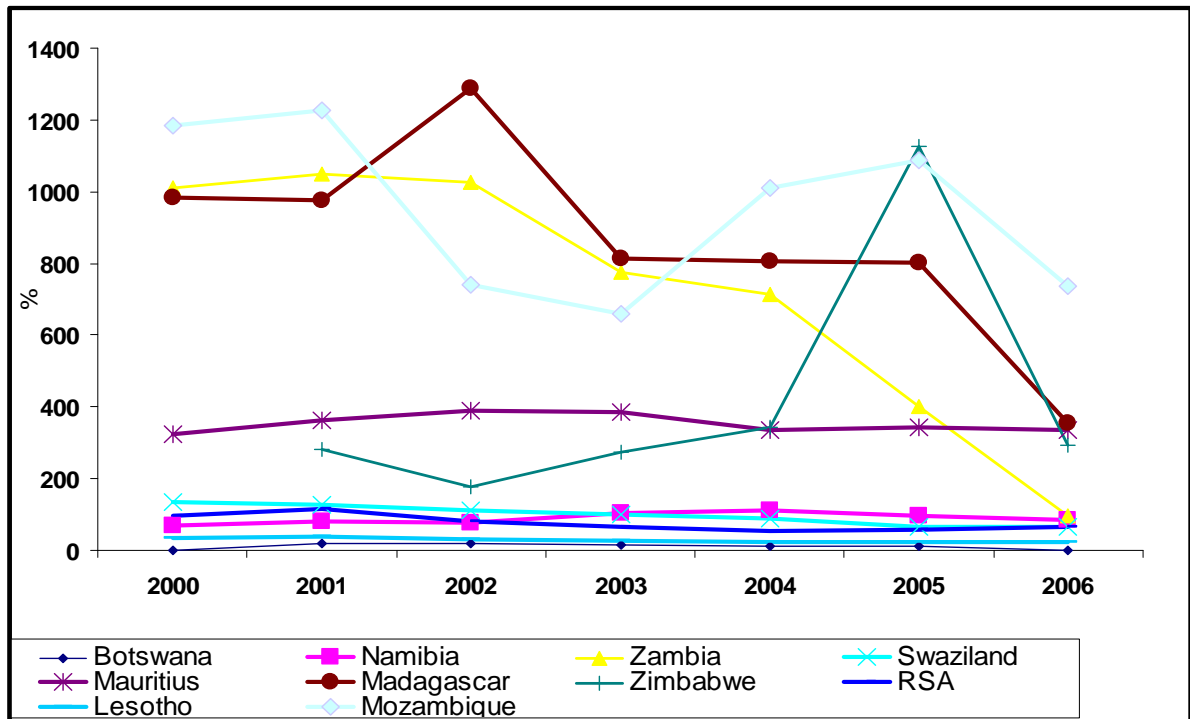
External Debt-to-GDP

An external debt-to-GDP ratio of less than 60% is acceptable by the IMF threshold. This ratio measures the level of external indebtedness against the level of internal economic activity. It reflects the extent to which external debt is covered by total domestic income.

Zambia, DRC, Madagascar, Zimbabwe, lesotho and Mozambique had average external debt-to-GDP ratios above 60% between 2000 and 2006. Except for Zimbabwe and Mozambique, the ratio of external debt to GDP declined in all the SADC countries over the same period. The DRC had the worst average external debt to GDP ratio of 195% over the period 2000 to 2006. Data for Angola, Malawi and Tanzania was not available.

External Debt-to-GDP
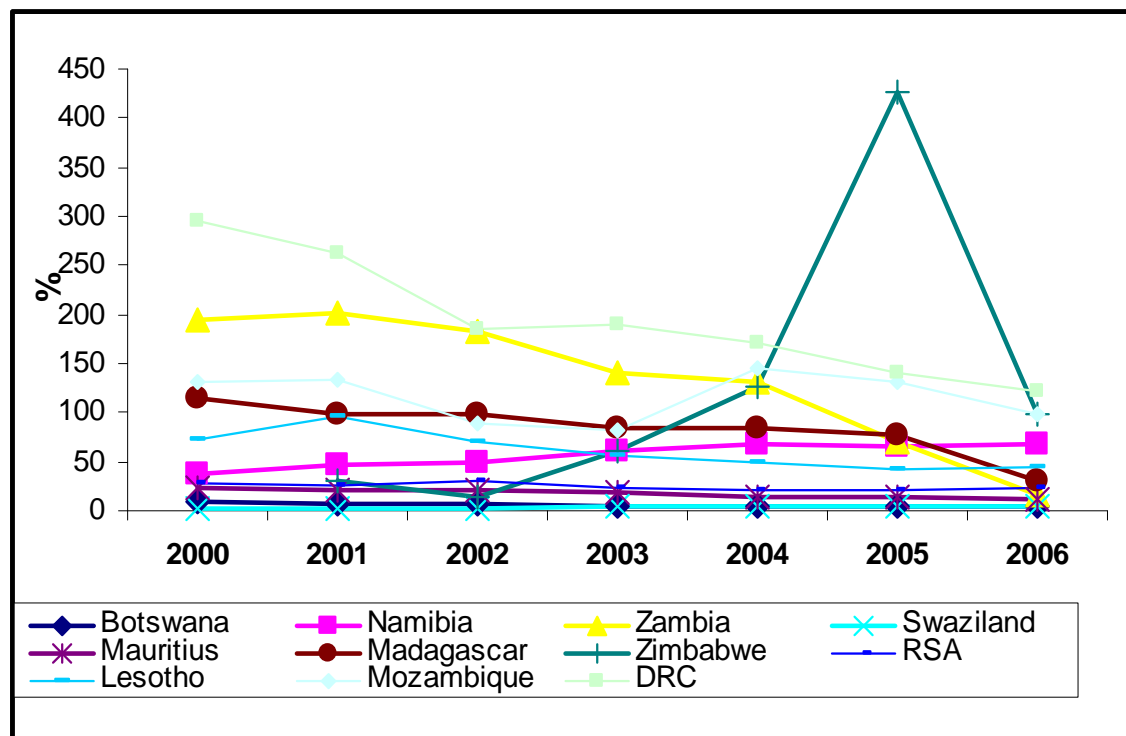
The External Debt to Export Earnings Ratio

The external debt to export earnings relates the stock of a country's external debt obligations to its foreign currency generation capacity. Higher external debt-to-export earnings ratios are an indication of a more vulnerable position, especially in the long-run. According to IMF thresholds, a ratio less than 150% is regarded is acceptable for a country. The ratio does not, however, show a country's short-term liquidity position. What is critical in the short-term is external debt service as opposed to the stock of the external debt.

For the SADC region, Madagascar, Zimbabwe, Namibia, Zambia, Malawi, Lesotho, Mozambique and DRC had external debt-to-export earnings ratios in excess of 150% over the 2000-2006 period. Botswana, Swaziland and Mauritius had ratios below 100%. The position of Madagascar, Malawi, Mozambique, Zimbabwe and the DRC remained highly vulnerable.

External Debt-to-Exports
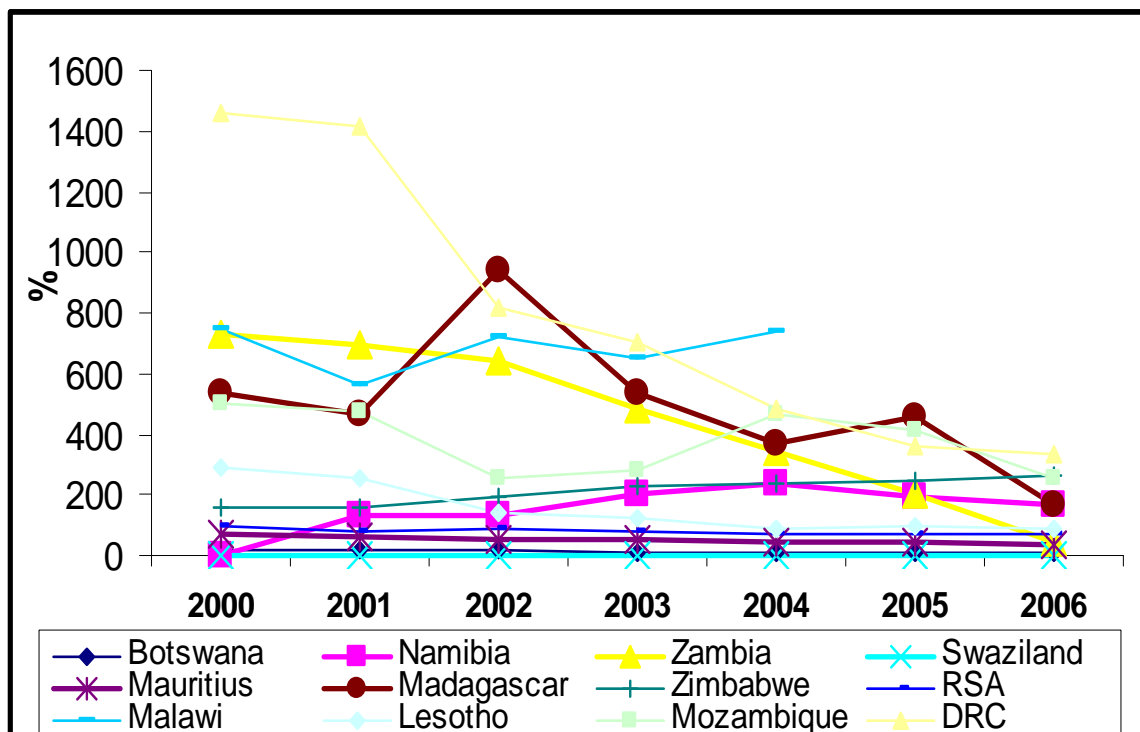
The External Debt Service to Export Earnings ratio

The external debt service to export earnings ratio measures a country's short term liquidity with regard to its external debt payments. A ratio of less than 20% is considered favourable. The higher the ratio, the more illiquid a country is.

More vulnerable situations prevailed in Zimbabwe, Malawi, Zambia and Madagascar, whose external debt service to export earnings ratios averaged 85%, 22.2%, 44% and 20%, respectively between 2000 and 2006. The ratio was low and healthy in the rest of the countries except Angola and Tanzania where data was not available.

External Debt Service to Export Earnings
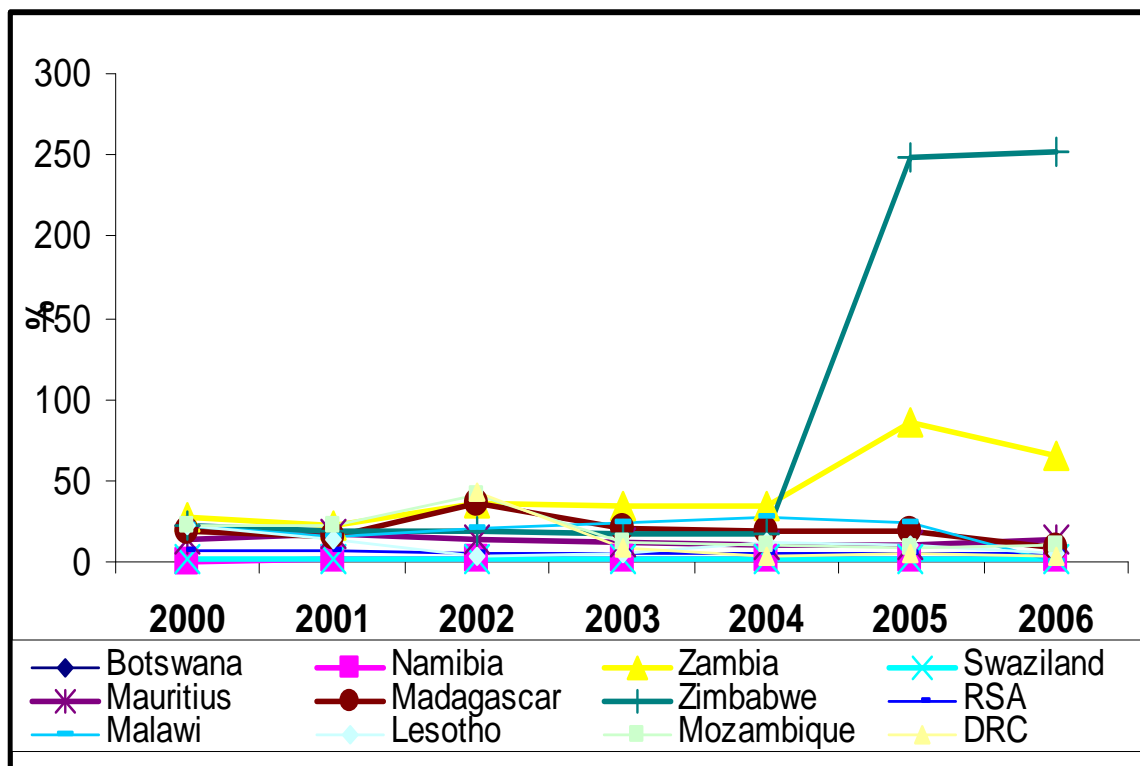
PUBLIC DEBT CONVERGENCE IN SADC

High public debt ratios as percentage of GDP are a significant feature of the developing countries and within the SADC Sub-region in particular. This scenario has triggered debate on the sustainability of such huge public debt, and the extent to which it can destabilize the economy.

Public and publicly guaranteed debt as an indicator of macroeconomic convergence centers on the sustainability of the debt. An unsustainable debt is debt that a country is not likely to be able to repay and or to service. Practically, the rule of thumb places such debt as any debt above 60% of a country's Gross Domestic Product. It has been argued that unsustainable public debt has de-stabilizing effects on an economy through its adverse effect on external reserves, money supply, country risk and inflation.

The following questions, however, remain to be answered: are the current levels and trends of the countries' debt sustainable? In the event that the debt is not sustainable, what prospects exist to ensure that it converges to the pre-set convergence benchmark?

One other question that will emerge is the impact of debt relief extended to some of the SADC member countries. While such relief may result in low debt ratios, the macroeconomic policies being pursued by the countries may continue to pose threats to the long-term sustainability of the public and publicly guaranteed debt.

Fedelino and Kudina (2003) noted that on the basis of current fiscal policies, debt levels will remain unsustainable in many African HIPCs even after they graduate from the HIPC initiative. Similar sentiments were echoed by Kraay and Nehru (2003), who found strong evidence that institutions and policies, as well as external shocks, are important in determining the levels of debt at which countries experience distress.

This paper investigates the possibility of debt convergence among the SADC countries, using debt sustainability ratios derived from Fischer and Easterly (2002)'s debt dynamics modeling. An econometric testing of debt convergence in ten SADC countries whose data set is complete for the period 1990 to 2006 is also done to support the sustainability ratio analysis.

As presented by Fischer and Easterly (2002) and Ferrucci and Penalver (2003), debt sustainability should be viewed in a dynamic form rather than in static form. Debt which balloons over time eventually becomes unsustainable. A falling sustainability ratio over time indicates converging debt, which in the long-run can become sustainable.

According to Fischer and Easterly (2002), the current year debt ratio can be approximated by the following model:

$$D_t = D_{t-1} + (r-g) D_{t-1} - PS_t \qquad\qquad [5]$$

Where D_t = Current year debt-to-GDP ratio;

$\quad D_{t-1}$ = Debt-to-GDP ratio in the previous year;

$\quad PS_t$ = Current year primary budget surplus/deficit;

$\quad r$ = Current year real interest rate of debt; and

$\quad g$ = Current year real economic growth

This relationship simplifies the build–up to a country debt stock as being made up of the past debt stock, the real interest, net of real economic growth accumulating on the debt stock and the current budget deficit or surplus.

The salient features of the above debt representation are as summed up below:

i. A country that runs higher primary budget surplus can have a higher initial debt stock and still manage to maintain long-term sustainability;

ii. A country with higher real growth rate can afford to have a lower budget surplus and still obtain sustainability; and

iii. A country that runs persistent primary budget deficits worsens its debt sustainability position.

The above debt convergence analysis is applied to the SADC region countries to ascertain the state of their debt positions over the period 2000 to 2006.

The analysis checks on historical trends of the countries' debt ratios. Diverging computed sustainability ratios over time will be interpreted to signify lack of policies and measures towards the attainment of fiscal convergence in the respective country, while ratios that converge over time signify commitment by the countries to attaining the convergence.

**Table 8: The Computed Debt Convergence Ratios***

	2000	2001	2002	2003	2004	2005	2006
Lesotho	226	197	234	218	172	88	46
Namibia	33	35	39	40	46	63	20
Tanzania	21	114	95	119	133	153	125
Mauritius	71	82	103	98	89	118	81
Swaziland	26	39	45	42	58	8	27
South Africa	66	74	67	69	98	51	45
Mozambique	215	145	136	89	87	77	73
Madagascar	157	200	93	255	97	111	62
Zimbabwe	81	59	34	52	72	97	163
Zambia	300	302	279	271	165	162	89
Botswana	14	3	21	14	9	5	2
Malawi	596	139	294	321	180	264	147

Computed from SADC Central Bankers Statistics: www.sadcbankers.org

* Computations for DRC and Angola could not be done due to data gaps

From the computed debt convergence ratios, seven countries in the SADC region exhibited converging debt between 2000 and 2006. These are Lesotho, Mauritius, South Africa, Mozambique, Madagascar, Botswana and Malawi. The rest of the remaining countries experienced exploding debt dynamics over the 2000 to 2006 period.

This paper authenticates the positive debt convergence developments in individual countries of the region by calculating debt standard deviation across all countries between 2000 and 2006. There is evidence of a decrease in the spread of the debt ratios among the countries, which effectively shows convergence of the debt ratios towards the average trend during the period. The cross-country standard deviation of the debt ratios is plotted below.
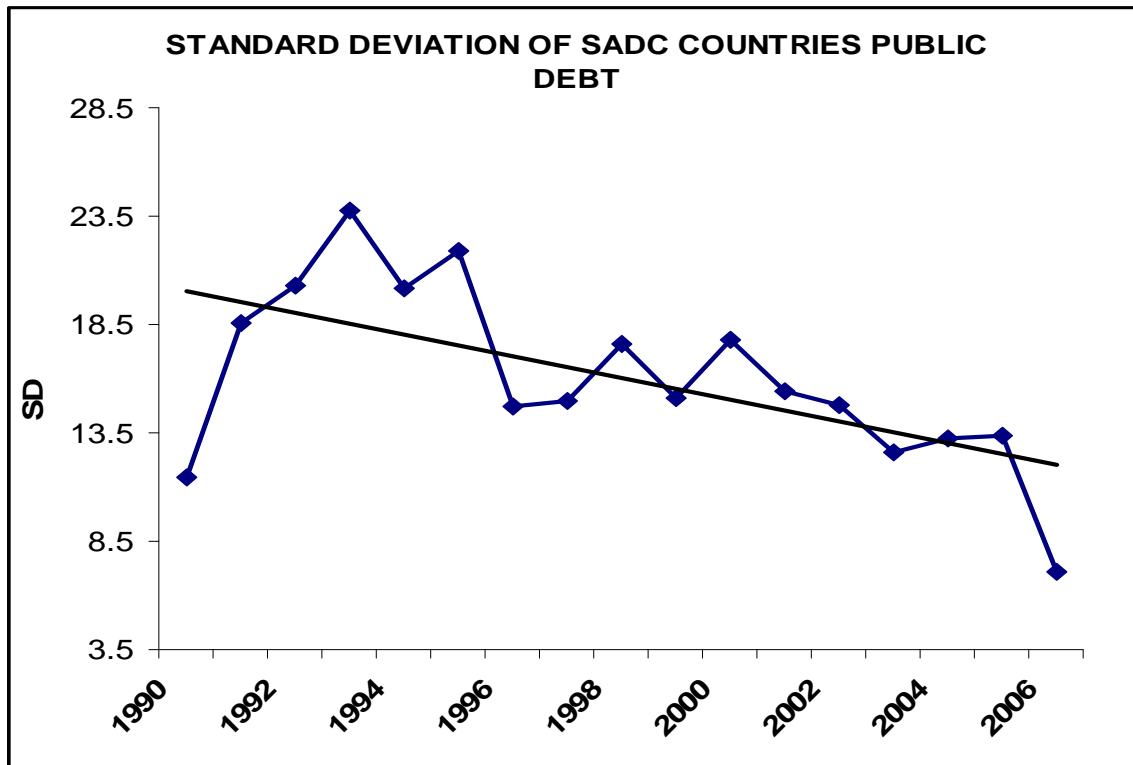
The decline in the spread of the debt ratios among the SADC countries suggests that it is possible to harmonize public debt and fiscal policies in the region in future.

Econometric Testing For Debt Convergence in SADC

While the above qualitative analysis suggests the existence of debt convergence and concentration among the majority of SADC countries, this paper further

econometrically investigates the magnitude and significance of the convergence of the debt in individual countries over time.

The paper utilizes the β-convergence test using the model of convergence introduced and used by Vogelsang (1998). The model assumes that each country's public debt is required to converge towards the debt benchmark of 60% of GDP set as the convergence target by the SADC region.

$$D_{60t} = \eta + \beta t + \mu_t \qquad\qquad\qquad [6]$$

D_{60t} is the difference between the actual public debt ratio of a country minus the SADC convergence benchmark of 60% at time t. η captures the initial level of debt deviation. Regressing D_{60} against time t makes it possible to check wether the debt deviation is falling (negative β) or increasing (positive β) over time.

The statistical significance of β indicates whether the fall or increase in the debt ratio is large enough to ensure high probability of debt convergence in each of the SADC countries that will be subjected to the test.

This convergence methodology will include structural breaks that allow for shifts in the trend functions of the debt ratio in the countries of study, where the existence of such breaks is evident. The break dates are estimated through visual inspection of debt ratio series in each country.

The convergence model [6] with structural breaks becomes:

$$D_{60t} = \eta_1 B_{1t} + \beta_1 T_{1t} + \eta_2 B_{2t} + \beta_2 T_{2t} + \mu_t \qquad [7]$$

B is a dummy representing structural changes in the debt trend. $B_1 = 1$ if $t \leq T_b$ (the break date) and zero otherwise; $B_2 = 1$ if $t > T_b$ and zero otherwise; $T_1 = t$ if $t \leq T_b$ and zero otherwise, and finally $B_2 = t - T_b$ if $t > T_b$ and zero otherwise.

To derive inference on debt convergence, the statistical significance of and opposite signs in the pair of coefficients
(η_1, β_1) and (η_2, β_2) is tested.

The model tests the null hypothesis that the trend coefficients are equal to zero (there is no trend in debt developments) against the alternative that the trend coefficients are statistically significant.

Results from twelve [3] SADC countries using quarterly data for 1990 to 2006 are shown in the following table.

---

[3] Complete data set for the other two SADC countries was not available

Table 9: Empirical Results on Debt Convergence

	T_1	B_1	T_2	B_2	Break Quarter
Botswana	0.64 (0.00)	-52.3 (0.00)	-0.59 (0.05)	-48.9 (0.00)	2002(1)
Lesotho	7.3 (0.00)	-33.5 (0.04)	-28.4 (0.00)	140.7 (0.00)	2000(2)
Mauritius	0.92 (0.00)	31.8 (0.00)	1.89 (0.00)	-8.1 (0.00)	1998(2)
Mozambique	-	-	-0.99 (0.00)	41.6 (0.00)	-
Madagascar	0.73 (0.5)	60.4 (0.00)	-10.0 (0.03)	86.3 (0.00)	1996(4)
Malawi	4.52 (0.00)	40.7 (0.00)	-94.5 (0.00)	155.0 (0.00)	2004(1)
S. Africa	2.99 (0.00)	-46.5 (0.00)	-5.49 (0.00)	-9.9 (0.00)	2002(2)
Swaziland	-0.81 (0.6)	-34.6 (0.00)	-53.6 (0.00)	-0.54 (0.9)	2002(3)
Tanzania	-6.70 (0.00)	7.5 (0.26)	1.94 (0.17)	-1.1 (0.24)	1998(2)
Zimbabwe	3.0 (0.02)	-53.1 (0.00)	13.6 (0.00)	33.4 (0.00)	2000(2)
Namibia	-	-	4.3 (0.0)	-16.4 (0.0)	-
Zambia	-	-	-8.9 (0.0)	46.7 (0.0)	-

Coefficients on B1 and B2 indicate that all the countries under study, except South Africa, Lesotho, Swaziland, Botswana and Zimbabwe had average debt ratios of more that 60% of GDP before break periods. After break period Botswana, Mauritius, South Africa, Tanzania, Namibia and Swaziland had average public debt ratios of below the 60% benchmark.

Results show that after the break period, trend coefficients are negative and significant in eight out of the twelve countries investigated - showing converging debt ratios in these countries after their break period. These are Botswana,

Lesotho, Mozambique, Malawi, Madagascar, South Africa, Zambia and Swaziland.

Before the break periods, debt ratios were increasing in all the ten countries except Tanzania and Swaziland. Trend coefficients in Mauritius and Zimbabwe remained positive after break, indicating an increase in these countries' debt ratios after break. The upward trends in debt ratios after break periods are statistically significant at 1% in Zimbabwe and Mauritius while insignificant in Tanzania. This could be indicative of loose fiscal management policies in these countries. Tanzania is the only country whose debt ratio shifted from a declining trend before the break period (1998:2) to an increasing trend afterwards.

Debt convergence after the break periods is statistically significant in Botswana, Lesotho, Mozambique, Madagascar, South Africa, Malawi and Swaziland.

CONCLUSION

Investigations from this paper indicate that public and publicly guaranteed debt is an important macroeconomic convergence indicator. It has been shown that there has been a noticeable link between public debt and inflation and economic growth in some SADC countries and in the region as a whole. This suggests that inflation and economic growth as well as other related macroeconomic variables can not be isolated from public debt management.

Results of this paper also show that it is feasible to use public and publicly guaranteed debt as an indicator of macroeconomic convergence. Definition and measurement differences across countries, however, have to be synchronized.

The paper observes that over the period 1990 to 2006, there has been noticeable improvement in public debt management in the majority of the SADC countries, except for Zimbabwe, Tanzania and Mauritius among the twelve investigated countries. These countries are urged to implement measures to retire their high debt ratios and at the same time limiting public sector borrowing.

It has also been shown that there have been positive developments and trends with regard to the harmonization of the debt ratio across the SADC countries. This is reflected by the fall in the spread of debt ratios across the SADC countries since 1990. This gives confidence for higher probability of debt convergence towards the 60% benchmark by the majority of SADC countries by 2008.

To this end, the success of macroeconomic convergence and regional integration in the context of SADC depends on sustainable and prudent fiscal policies which are inextricably linked to inflation, economic growth and wider macroeconomic stability.

This paper argues that in most of the SADC countries central banks are practically not independent. Making public debt a macroeconomic convergence indicator will enforce commitment by SADC governments to stick to their borrowing and debt limits – henceforth lifting the pressure on central banks to print money to finance public expenditure.
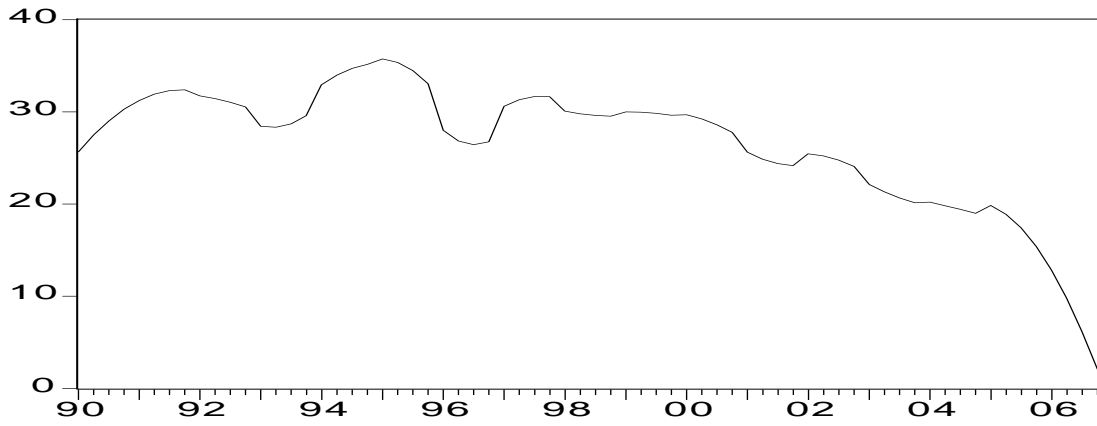
The use of public and publicly guaranteed debt as a macroeconomic convergence indicator, however, will require further investigation on the current fiscal policy thrust in the SADC countries. This will make it easy to forecast convergence or divergence over time. This follows from the fact that public debt sustainability does not only depend on the current static debt levels but on the dynamics of such debt as reflected in yearly fiscal budget deficits, inflation management and growth policies.
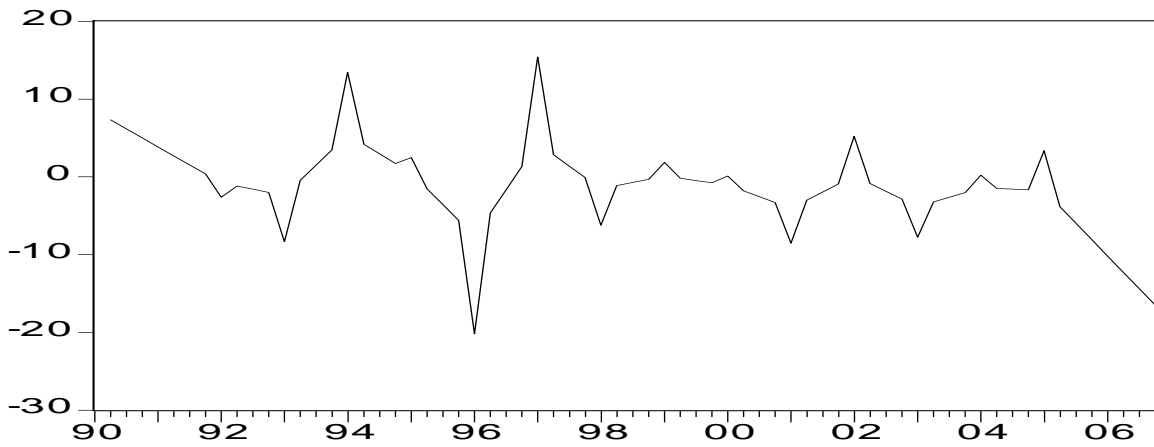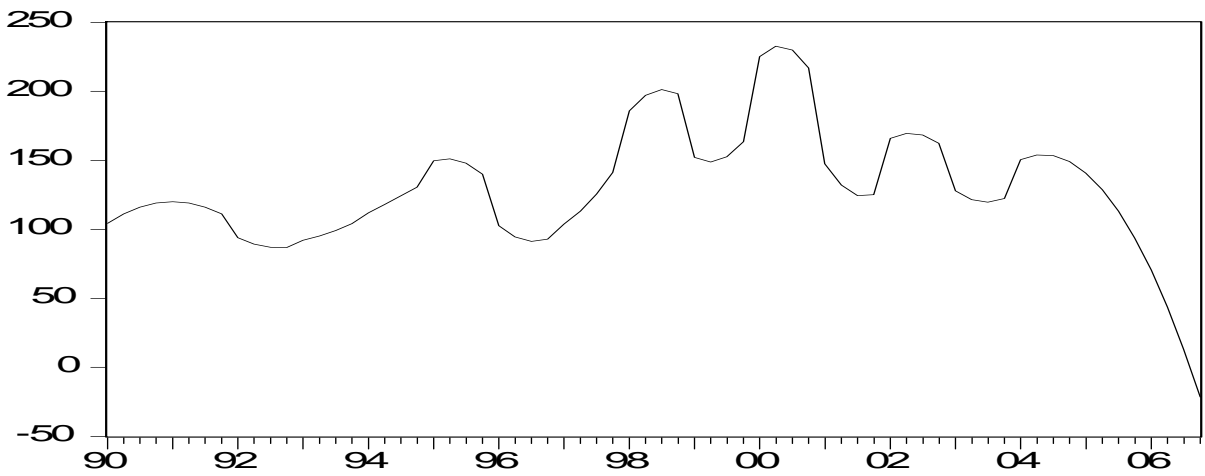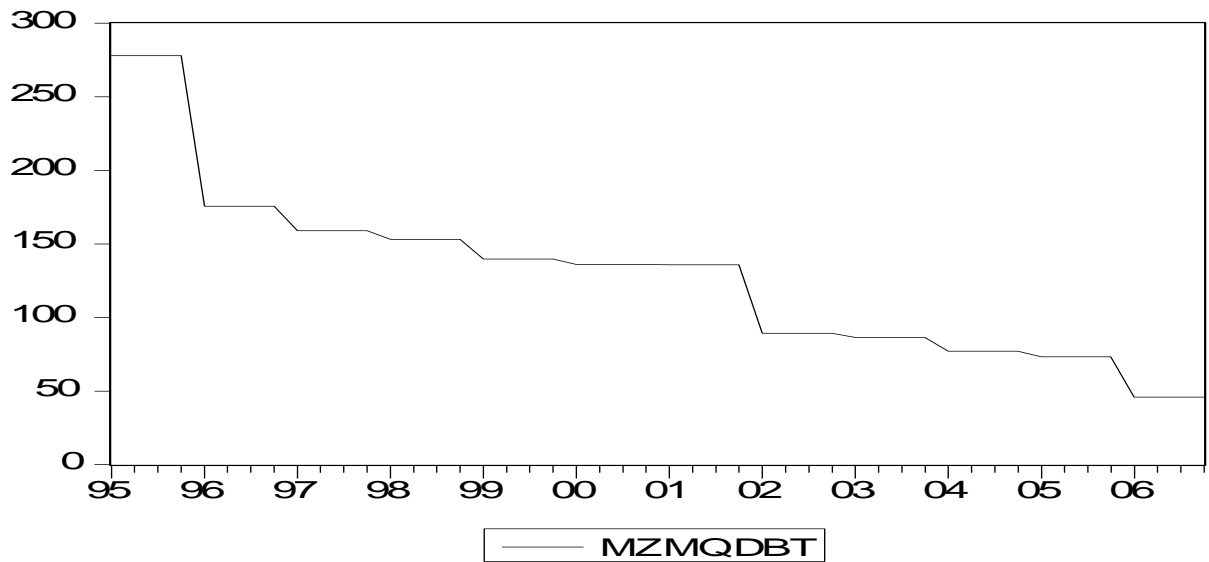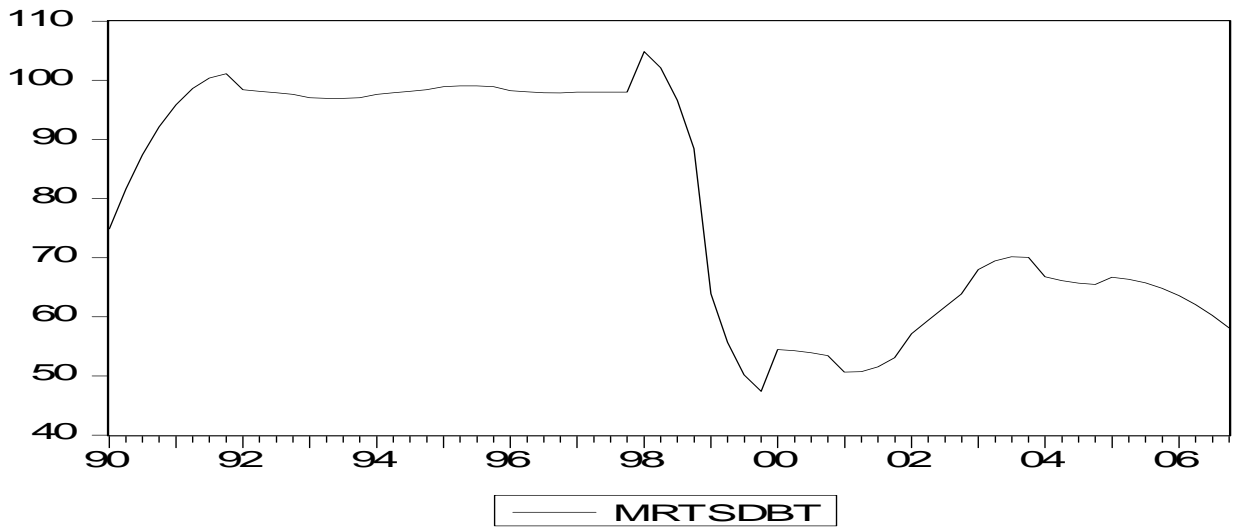
GRAPHS AND DATA TABLES ANNEX

GRAPHS

PUBLIC DEBT CONVERGENCE IN THE SADC REGION

INFLATION AND GDP GROWTH BEFORE 2000

INFLATION AND GDP GROWTH
AFTER 2000

Chart showing DEBT, INFLATION and GDP GROWTH with HIGH-DEBT COUNTRIES and LOW-DEBT COUNTRIES cones, % axis 0 to 100.

Line chart of BOTSDBT from 90 to 06, y-axis 6 to 18.

LSTHODBT

BOTSDDBT

54
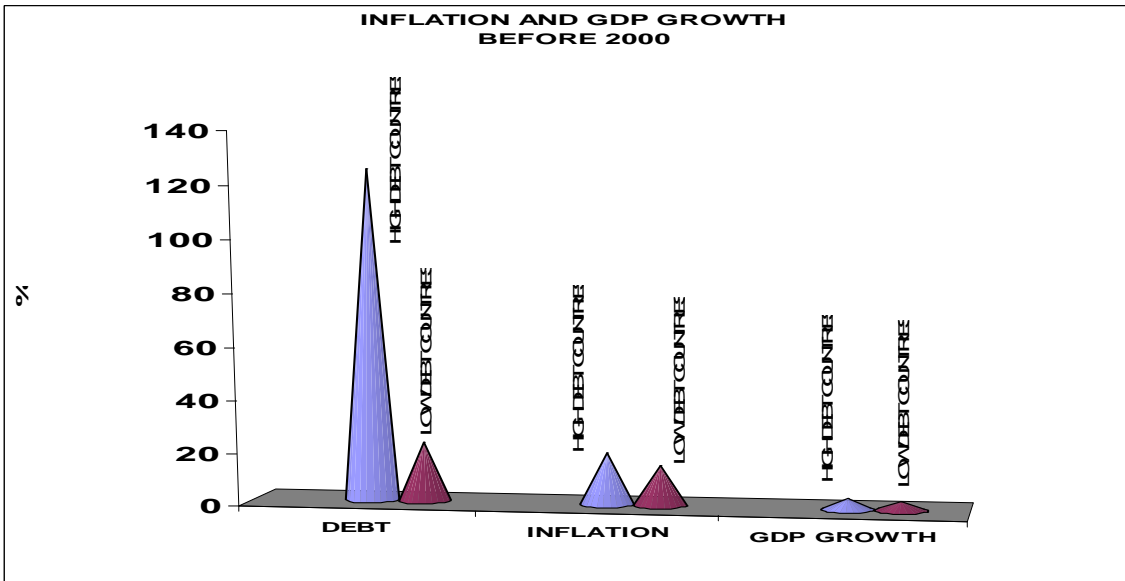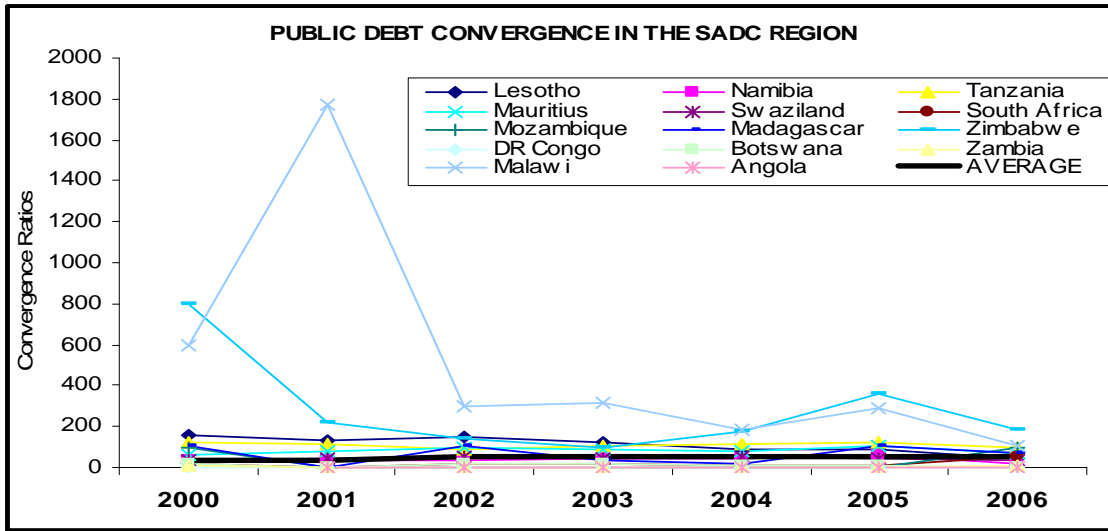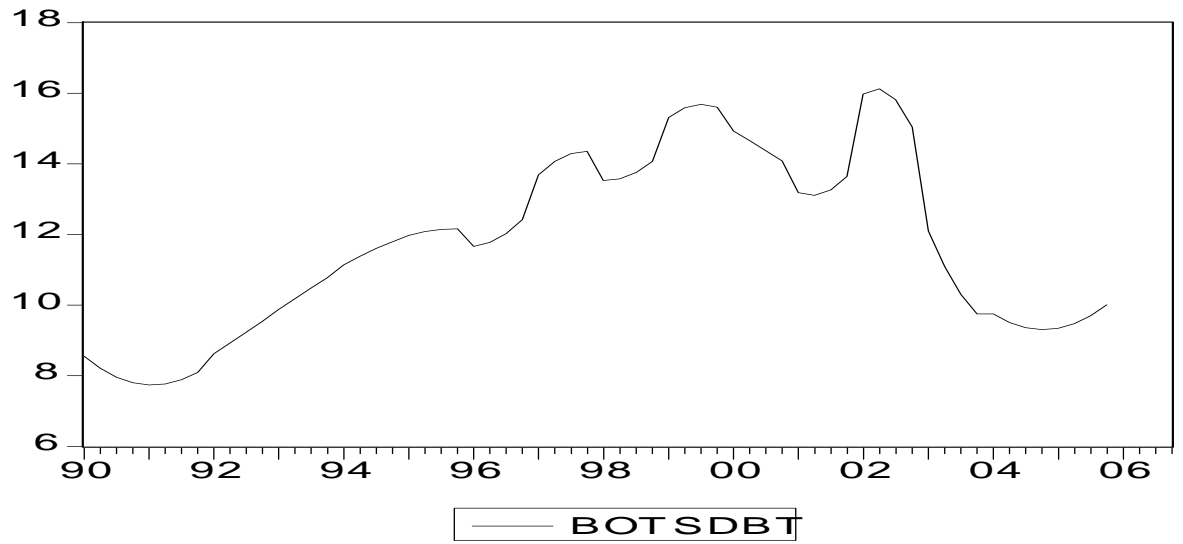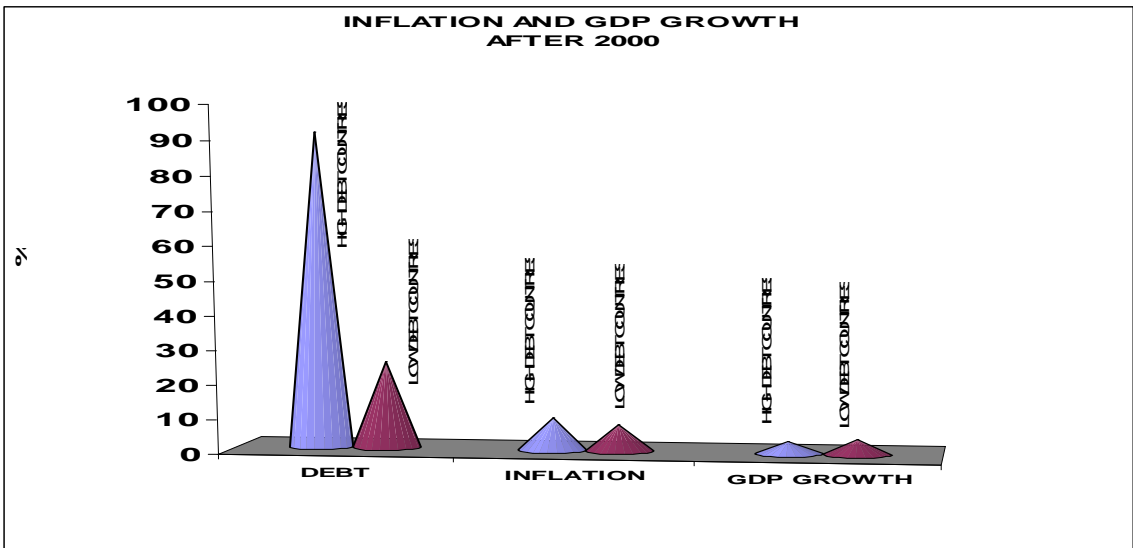
MDGSCARDBT

MDGSACARDDBT

MLWDBT

MLWDDBT
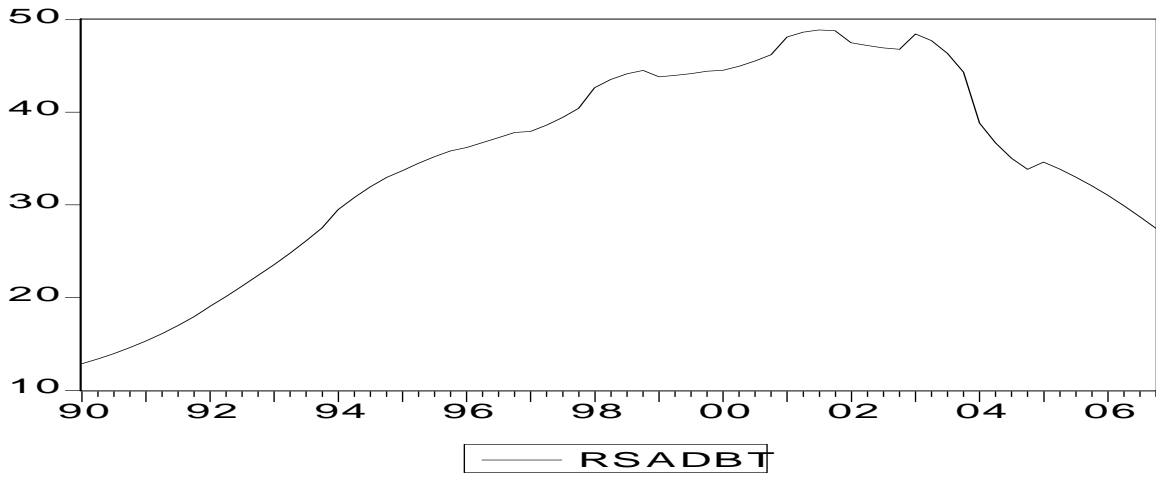

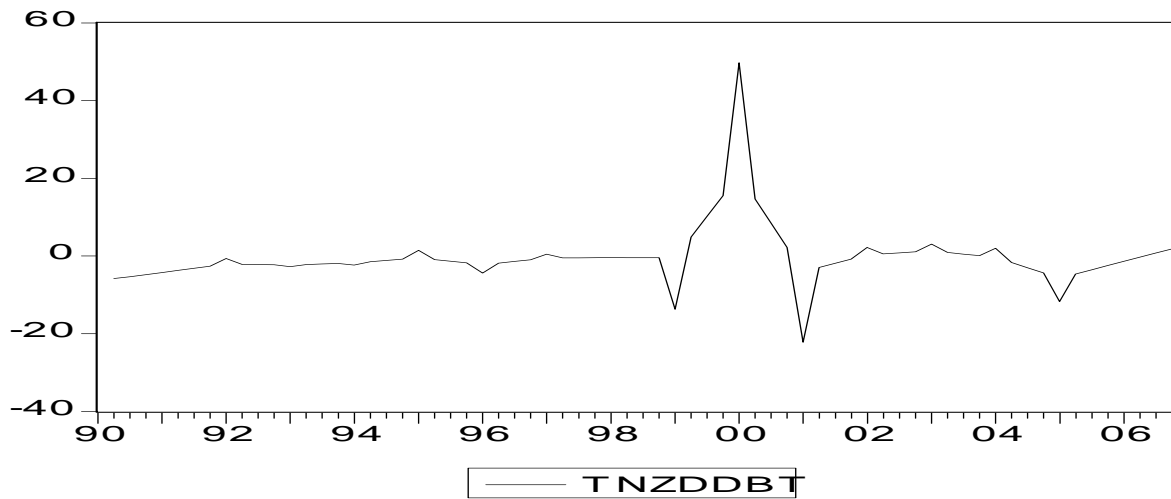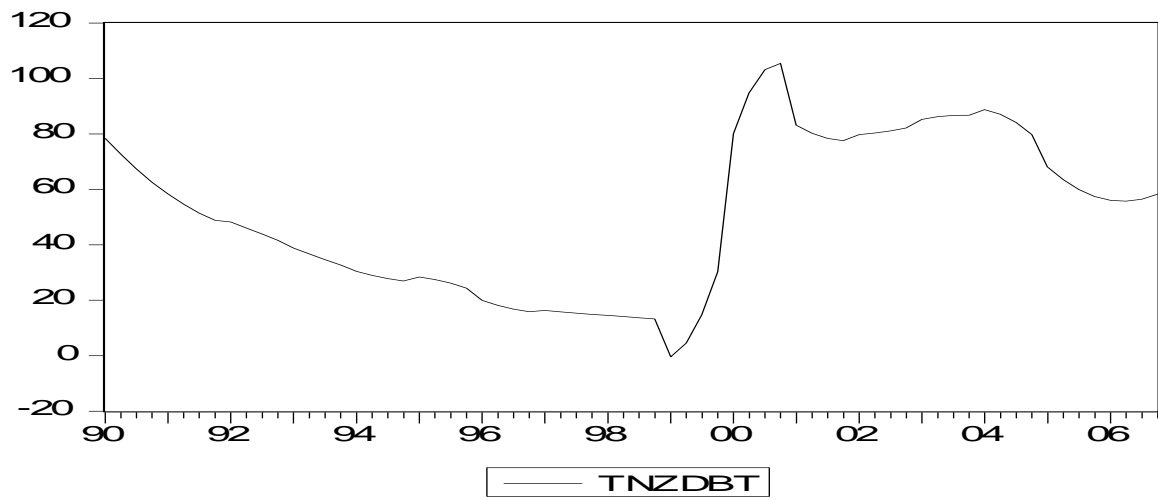MRTSDBT

MZMQDBT

RSADBT

RSADDBT

SWZNDDBT

57
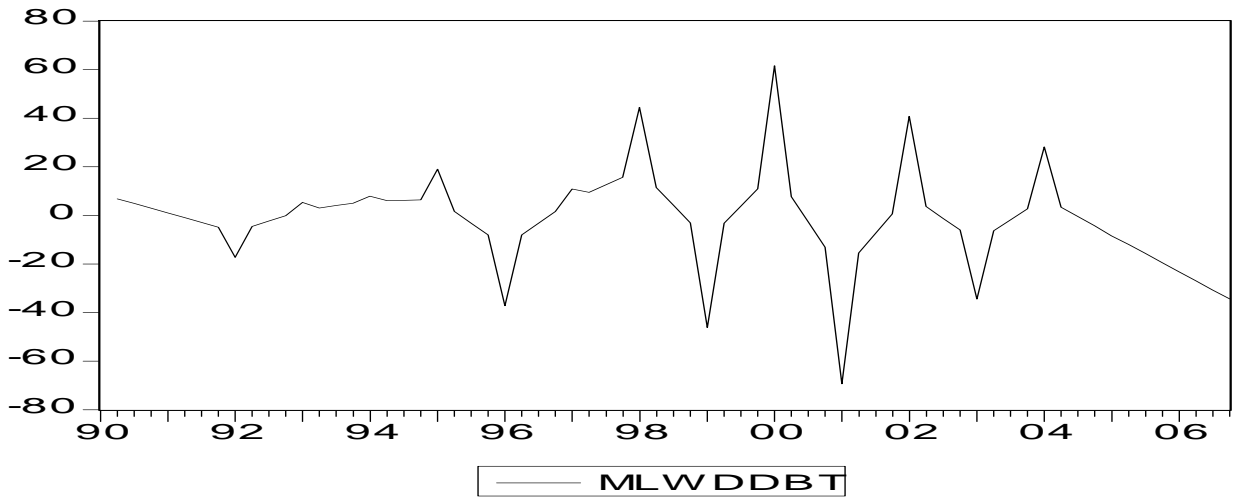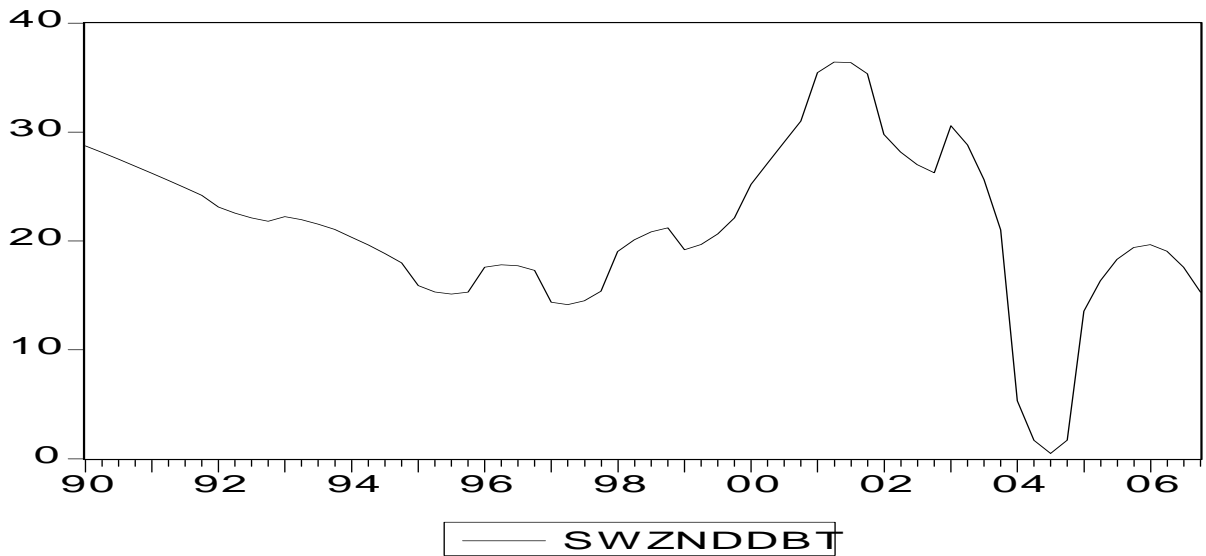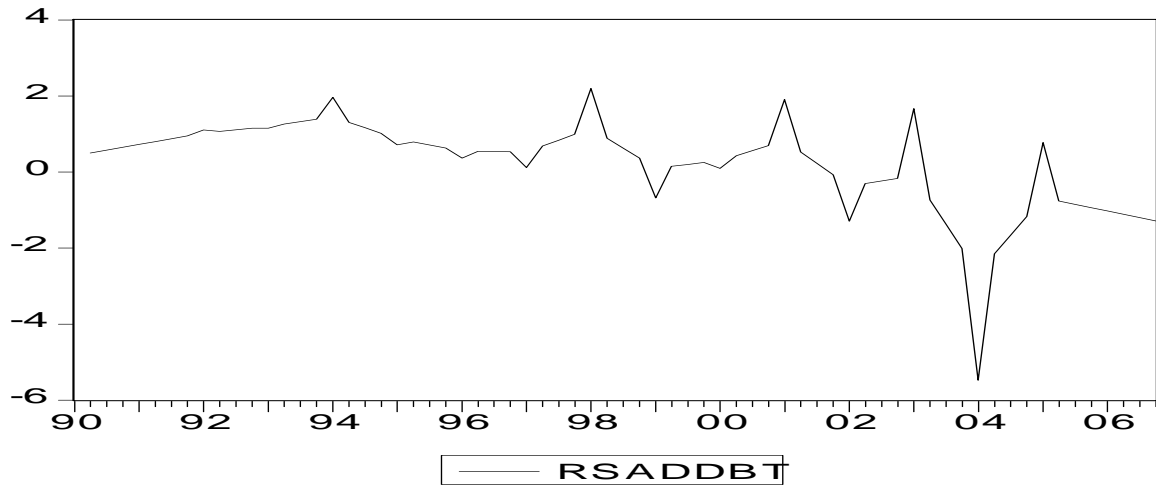
REFERENCES

Afxentiou P. C and Serletis A (2000) *Structural Characteristics of the Maastrcht Convergence Criteria,* Department of Economics Working Paper, University of Calgary

Banco de Moçambique, *South Africa's role in macroeconomic convergence in SADC*

Balmain-Oskooee, M and J Asle (1995), *Is there any Long-Run Relationship the Terms of Trade and the Trade Balance,* Journal of Policy Modelling: No. 17

Bernard, A. B and Durlauf, S. N (1996), *Interpreting Tests of the Convergence Hypothesis,* Journal of Econometrics

Brauninger, Michael (October 2002): *"The Budget Deficit, Public Debt and Endogenous Growth"* Universitaet der Bundeswehr Hamburg

Chowdhury, Abadur, R. (2001): *External debt and growth in developing countries: A sensitivity and causal analysis.* Paper presented at the WIDER conference on debt, Helsinki (17-18 August 2001)

Cohen, D, and J. Sachs (1986) *Growth, and External Debt under Risk of Debt Repudiation.* European Economic Review 30:3, 529–560

Cunningham Rosemary T. (1993): *The Effects of debt Burden on Economic Growth in Heavily Indepted Nations,* Development Economics, Cilt 18, ss. 115-126

Deshpande, Ashwini (1992): *The Debt Overhang and the Disincentive to Invest,* Journal of Development Economics, Cilt 52, ss. 169-187

Dwyer, Jr. Gerald P (1982), *Inflation and Government Deficits,* Economic Inquiry, Vol. XX (July), pp.315–29

Engen, Eric, and G. Glenn Hubbard (2004), *Federal Government Debts and Interest Rates,* NBER Working Paper Series No.10681 (Cambridge, Massachusetts: National Bureau of Economic Research)

Fedelino and Kudina (2003), *Fiscal Sustainability in African HIPC Countries: A Policy Dilemma?* IMF Working Paper No. **03/187**

Ferrucci, G and Penalver, A (2003) *Assessing Sovereign Debt Under Uncertainty,* Bank of England Financial Stability Review, December 2003

Fischer, Staley and William Easterly (1990), *The Economics of the Government Budget Constraint,* The World Bank Research Observer: 5(2): pp 127-42

Giannitsarou, and Scott (2006), *Inflation implications of Rising Government Debt,* Working Paper 12654 http://www.nber.org/papers/w12654

Gianluigi F and Penalver A (2003), *Assessing Sovereign Debt Under Uncertainty,* Financial Stability Review

Goohoon Kwon, Lavern McFarlane, and Wayne Robinson (2006), *Public Debt, Money Supply, and Inflation: A Cross-Country Study and Its Application to Jamaica,* IMF Working Paper, WP/06/121

Granger, C. W. J (1969), *Investigating Causal Relations by Econometric Models.*

Granger, C. W. J (1980), *Testing Causality: A Personal Viewpoint,* Journal of Economic Dynamics and Control 2: pp329-352

IMF (2005), "Staff Report for the 2005 Article IV Consultation", IMF, Washington, D.C, USA

Joseph Thullar (2006): *The Impact of Deficit Financing on Inflation in Sierra Leone*

unpan1.un.org/intradoc/groups/public/documents/IDEP/UNPAN023357.pdf

Kraay A and Nehru V (2003), *When is Debt Sustainable?* Paper presented at the IMF Research Workshop on Macroeconomic Challenges in Low Income Countries, Washington, DC, 23-24 October

Maruping M (2005), *Challenges for Regional Integration in Sub-Saharan Africa: Macroeconomic Convergence and Monetary Co-ordination,* www.fondad.org

McCarthy (2002), *Report to the Committee of Central Bank Governors,* www.sadcbankers.org

Pattillo, et al (2002), *"External debt and growth",* IMF, Working Paper 69

Rehana and Malik, *"Debt and Economic Growth in South Asia",* The Pakistan Development Review, 2001, 40: 4 Part II, pp. 677–688

Safa D (19990, *"Cointegration Analysis – Causality and Wagner's Law: The Case of Turkey, 1950-1990",* Discussion Papers in Economics, 99/3

Sawada Yasuyuki (1994): *Are the Heavily Indebted Countries Solvent? Tests of Inter-Temporal Borrowing Constraints,* Journal of Economic Development, Cilt 45, ss. 325-337

Smyth, David. J. and Hising, Yu (1995): *In the Search of an Optimal Debt Ratio for Economic Growth,* Contemporary Economics, Cilt 13, ss. 51-59

Savvides, Andreas, (1992): *Investment Slowdown in Developing Countries During the 1980s: Debt Overhang Or Foreign Capital Inflows,* Kyklos, Cilt 45, ss. 363-378

UNCTAD (2004), *Economic Development in Africa: Debt Sustainability: Oasis or Mirage?* UN, New York and Geneva

Vogelsang, T. J., (1998): *Trend Function Hypothesis Testing in the Presence of Serial Correlation,* Econometrica