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A STATISTICAL ANALYSIS OF THE MACROECONOMIC PERFORMANCE OF THREE SELECTED SADC COUNTRIES

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Abstract

The purpose of the study was to investigate and analyse the economic performances of three SADC countries, Botswana, Namibia and Zambia before and after the signing of the MoU on Macroeconomic Convergence during the period of 1990 and 2007. Four macroeconomic indicators namely, budget deficit as a percentage of GDP, current account balance as a % of GDP, real exchange rate and external debt as a % of GDP were used. Using regression analysis techniques, the study found that there was fair favourable economic performance by Botswana and Namibia during 1990 and 2007. Zambia on the other hand had an unfavourable economic performance from 1990 until late 2002. From the estimate results, the study further concluded that the variables in most instances were useful for monitoring regional integration and determining the country's macroeconomic performance. Each country had a different variable that determined its economic performance better than the other did. Policies put in place to ensure that the set targets are being achieved are not as efficient yet as the impact of the MoU and its policies are yet to be felt. The study concluded by recommending that more research be done on all the indicators to allow policy implementers to recognise what the main focus should be in achieving regional integration and other SADC objectives. The researchers also recommended that more emphasis should also be placed on mobilising resources that would lead to the achievement of the regional bloc set targets.

Introduction

Macroeconomic performance is increasingly becoming more and more pertinent to all modern economies, especially in the face of the current global economic cum financial crisis. Indeed, favourable macroeconomic performance is and will remain an important driving tool for individual countries and regional blocs in attaining set objectives within the country and the bloc. Good macroeconomic performance is often characterised by improved standards of living, stable inflation rate, low unemployment rates, sustainable economic growth among others. Regional blocs all over the world in an attempt to accelerate economic growth also ensure that most of the other stated objectives are achieved simultaneously. With respect to the Southern African Development Community (SADC) it's main goals cover, inter alia, the following: poverty alleviation, enhancing the standard and quality of life, sustain peace and

security and to support the socially disadvantaged and ultimately to attain sustainable economic growth and development for the Southern African people.

In order to strengthen and ensure greater regional integration the fourteen members of the regional bloc in 2001, signed a Memorandum of Understanding (MoU) on macroeconomic convergence. The purpose of this macroeconomic convergence process was to facilitate the process of attaining macroeconomic stability within the economic bloc. Along the same line of reasoning, SADC in 2003 developed the Regional Indicative Strategic Development Plan (Bosl, Breytenbach, Hartzenberg, McCarthy and Schade, 2007). The RISDP outlined an agenda for regional integration, which included targets for achieving a Free Trade Area, Customs Union, Common Market, Monetary Union, and subsequently a Political Union. This RISDP was seen as another development towards a greater regional integration. The basic elements of macroeconomic stability included low and stable inflation rate, sustainable levels of debt, stable and sustainable exchange rates, and other sound macroeconomic policies. Through the MoU, member states agreed unequivocally that in order to achieve and maintain macroeconomic stability, there is the urgent need to converge in terms of the macroeconomic policies of the member states within the economic bloc. These policies relates to inflation rate, budget deficit as a % of GDP, exchange rate and external debt as a % of GDP. Besides, there were also other secondary policies selected which are; current account deficit as a % of GDP, external reserves, net central bank credit to government, domestic savings rate and growth rates. Convergence targets were set for each of these policies as shown on Table 1 below:

Table 1: Numeric Values of Target Indicators for SADC

Target Indicators	**2008**	**2012**	**2018**
Core inflation	< 9%	< 5%	< 3%
Budget deficit as a % of GDP	< 5%	< 3%	< 1%
External debt as a % of GDP	< 60%	< 60%	< 60%
Current Account deficit as a % of GDP	< 6%	< 9%	< 3%
Growth Rate	> 7%	> 7%	> 7%
External reserves (import cover in months)	> 3%	> 6%	> 6%
Net central Bank credit to Government)	< 10%	< 5%	< 5%
Domestic Savings Rates	> 25%	> 30%	> 35%

Source: Senaoana (2005)

Furthermore, the members agreed to launch a Free Trade Area (FTA), which was signed in August 2008. The implementation of the FTA started in 1996 with the signing of the Protocol on Trade. In August 2008, eleven of the 14 member states of SADC officially launched a free trade area (FTA). The agreement ushered a new era of economic integration and industrialisation for the sub-region. With the goal of eliminating tariffs and trade barriers among member countries, the FTA agreement was part of the SADC's ongoing efforts to deepen long-term regional integration in order to accelerate economic growth and reduce poverty for the millions of people living on the continent. As from August 2008, producers and consumers stopped paying import tariffs on an estimated 85% of all trade on goods between 11 countries: Botswana, Lesotho, Madagascar, Mauritius, Mozambique, Namibia, South Africa, Swaziland, United Republic of Tanzania, Zambia, and Zimbabwe. Angola, the Democratic Republic of Congo, and Malawi are expected to join the FTA later. In light of this, four primary macroeconomic indicators were selected and utilised to determine the economic performance of the three SADC countries under investigation

Given this background, the primary objective of this study is to statistically analyse and determine the macroeconomic performance of SADC countries using Namibia, Botswana, and Zambia as laboratory test grounds. The rest of the study is segmented into four sections. Section II examines selected literature that are pertinent to the study, while in section III an attempt is made to develop the general model used in the study as well as specific equations .that would need to be estimated, including data sources. This model in addition to shedding some light on the main determinants of economic performance enables us to capture the responsiveness of economic performance due to changes in the regressors used in the study. The section IV presents the estimation, discussion and analysis of the regression results. Finally in section V, we summarise our main conclusions. The period of interest runs from 1990 to 2007.

Literature Review

Much has been written in the development economic literature about the features of well-performed economies. An attempt is made here to present some of these studies in a selective fashion.

Papanek (1972), using data for 85 developing countries, found a direct relationship between economic growth and the following selected macroeconomic variables that came under focus in the study: domestic savings, foreign aid, foreign private investment as well as other foreign inflows. Seeing that the usefulness of some of the variables chosen has caused disputes, this would be of particular help in determining other variables that have strong relationships with economic growth.

Sosa (1986) investigated the connection between external debt and the Philippines' economic growth. He wanted to see if developing countries would be better off in the absence of external debt in their quest for economic development. Using a simple version of the Harrod-Domar growth model, the study found a direct relationship between foreign capital and economic growth of the Philippines.

Ghura and Grennes (1993) confirmed the negative relationship between the real exchange rate (RER) misalignment and economic performance (economic growth, imports, exports, saving and investment) after Ghura and Grennes used pooled time-series and cross-section data for 33 countries in Sub-Saharan Africa (SSA). In this research, the researchers also stated that macroeconomic instability also slows growth and other variables of performance. Apart from this, other outcomes of the research were that higher levels of misalignment are accompanied by higher levels of macroeconomic instability and that both lower levels of RER misalignment and instability lead to better economic performance. Ghura and Grennes further concluded that the ED-Wards model of RER determination performs well for the region Sub Saharan Africa.

Karagöl (2002) investigated the long-run and short run relationship between economic growth and external debt service for Turkey during the period 1956- 1996. This study used multivariate co-integration techniques and employed a standard production function model. The Vector Auto- Regression (VAR) estimates of the system showed that there was a one co-integrating relationship in the long-run. Debt service was negatively related to economic growth in the long-run.

Saleh (2003) stated that the majority of these studies regressed a macroeconomic variable on the deficit variable. These studies were cross-country and utilise time series data. In general, the key outcomes from the studies presented in this paper indicated that both the method of financing and the components of government expenditures could have different effects. Therefore, it was crucial to distinguish between current and capital expenditure when evaluating the impact of fiscal policy on private investment and output growth. Even though,

the overall results from the empirical literature with respect to the impact of public investment on private investment and growth are ambiguous, the bulk of the empirical studies found a significantly negative effect of public consumption expenditure on growth, while the effects of public investment expenditure are found to be positive although less robust.

Schclarek (2005) empirically explored the relationship between debt and growth for a number of developing and industrial economies in a study. It was found that for developing countries, lower total external debt levels are associated with higher growth rates, and that this negative relationship was driven by the incidence of public external debt, and not by private external debt. Regarding the channels through which debt accumulation affects growth, it was found that this was mainly driven by the capital accumulation growth.

Nyamongo and Schoeman (2005) used the bivariate OLS and 2SLS, using these methods, the different relationships between the dependent and independent variables could be identified after using Panels A and B to observe the relationships. In addition, the report by Nyamongo and Schoeman identified the determinants of economic growth from the empirical point of view. The share of investment to GDP was often identified as important in economic growth models such as the ones estimated by Levine and Renelt (1992) and Pak Hung Mo (2001).

Tabengwa and Salkin (2006) explained that Botswana's economic performance has been favourable in the last 17 years. In terms of its inflation rate, the Bank of Botswana has managed to keep it under control. For 2005, the inflation rate ranged between 3 and 6%. The performance of this country in other variables has also been good. The last budget deficit as a % of GDP experienced in Botswana was in 1982. The favourable performance has been due to the tight monetary policy regime, the avoidance of the pro-cycle fiscal policy and the good performance in its diamond industry. Despite this, the country has experienced problems in achieving the targeted growth rate of 5.5% annually.

Schade and Matomola (2006) elucidated that by being part of the CMA, the Namibian Dollar was pegged to the South African Rand and follows the South African monetary policy. This was a result of the domination of South Africa. By following the South African monetary policy, the Namibian bank rates are therefore set in line with those of South Africa. Between 1995 and 2001, Namibia's inflation rate fluctuated around 9%. By 2002, it had declined to 2.2%. The budget deficit as a % of GDP remained within manageable means. The country was doing well in most of the variables. However, it was lagging behind in terms of investment, growth, and foreign reserves.

Bank of Namibia (2006) prepared a study that highlighted the major economic developments in the SADC region and Africa as a whole in 2005. The study compared the actual performance against the agreed macroeconomic indicators and targets in the SADC macroeconomic convergence program. On average, most macroeconomic indicators recorded moderate performance in 2005 relative to the previous year, with a slight improvement in GDP growth, a higher rate of inflation, and a worsening of the current account imbalances in 2005 compared to 2004.

Mwanawina (2007) said that Zambia's performance on inflation and budget deficit as a % of GDP has improved over the years. The inflation rate, which stood at 49% in 1995, has been declining. By 2004, it stood at 18%. In terms of other variables, the country has performed poorly. The current account deficit has been increasing steadily; this was due to the high external debt of the country. Economic growth of the country has also been slow.

Chipeta and Schade (2007) analysed the differences between countries and sub groups of countries in the process comparing and contrasting their performance using four main variables namely, inflation, budget deficit as a % of GDP, growth, and external debt as a % of GDP. This study concluded that SACU (Namibia, Botswana, South Africa, Lesotho, and Swaziland) countries performed well in terms of inflation, budget deficit as a % of GDP, and external deficit. In terms of growth, only Mozambique performed well. The study concluded that there was still a need to do research on the determinants of economic growth and convergence in the economies of SADC member countries.

Other studies reviewed Nyamongo and Schoeman (2005) and Saleh (2003) presented rather conflicting views to the issue under review.

Model Building, Data Sources and Methods

Data Sources:

The data used in this research were obtained from a combination of various sources. These sources inter alia cover the following: the Namibian National Accounts publications, the National Planning Commission (NPC) in Namibia, Namibia Economic and Policy Research Unit (NEPRU), the World Bank website, World Economic Outlook (WEO) publications, The Bank of Namibia's quarterly publications, the Zambian Central Statistics Office in Lusaka, as well as the Botswana Statistics Office. All the data gathered from these institutions and

publications were secondary data in nature. The Interpolation and extrapolation techniques were relied upon in generating and filling missing data gaps for such years.

Model building and Specification:

The general model that was used in this research is implicitly shown as follows:

$$GDP_t = f(BD_t, ED_t, RER_t)$$

Where:

GDP	=	Gross Domestic Product (Annual % Growth)
BD	=	Budget deficit as a % of GDP
ED	=	External Debt as a % of GDP
RER	=	Real Exchange Rate
t	=	time factor

In light of the above model, the explicit equations that were derived and estimated are also shown in the following sequence:

$$GDP_t = \beta_0 + \beta_1 BD_t + U_t \quad (1)$$

$$GDP_t = \beta_0 + \beta_2 ED_t + U_t \quad (2)$$

$$GDP_t = \beta_0 + \beta_4 RER_t + U_t \quad (3)$$

$$GDP_t = \beta_0 + \beta_3 CAB_t + U_t \quad (4)$$

$$GDP_t = \beta_0 + \beta_1 BD_t + \beta_2 ED_t + \beta_3 RER_t + \beta_4 CAB_t + U_t \quad (5)$$

Since, we needed to establish, alternatively, capture the responsiveness of economic performance to changes in the explanatory variables the natural log transformations of the above equations were also specified in the following manner:

$$LogGDP_t = \beta_0 + \beta_1 LogBD_t + U_t \quad (6)$$

$$LogGDP_t = \beta_0 + \beta_2 LogED_t + U_t \quad (7)$$

$$LogGDP_t = \beta_0 + \beta_4 LogRER_t + U_t \quad (8)$$

$$LogGDP_t = \beta_0 + \beta_3 LogCAB_t + U_t \quad (9)$$

$$LogGDP_t = \beta_0 + \beta_1 LogBD_t + \beta_2 LogED_t + \beta_3 RER_t + \beta_4 LogCAB_t + U_t \quad (10)$$

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Estimation, Discussion and Analysis of the regression results

RESULTS AND DISCUSSION

In this study, we have tried to test empirically the validity of the proposition that fluctuation in economic performance are assumed to be influenced to a considerable extent by factors such as external debts, budget and exchange rate fluctuations. Various equations have been estimated in this study to authenticate the validity of this assertion. We report only the best fitting regression equations. The Ordinary Least Squares results were obtained through the use of a software package known as PcGive. The study was also concerned with isolating the effects of changes in the explanatory variables on economic performance, hence the use of natural logarithmic equations. Estimation of linear equation for economic growth yielded the following results with t ratios supplied in parentheses: In each equation, a two tail test was conducted. The overall goodness-of-fit of the equations to the data was measured by the coefficient of determination (R^2) as well as the adjusted coefficient of determination (R^{-2}). In carrying out the Durbin-Watson test for autocorrelation, three regions were defined as against five regions. The reason for using three regions was to suppress the two inconclusive regions. The natural log transformations were generated for the purpose of elasticity analysis. The estimated regression results regarding Botswana, Namibia and Zambia, which are reported in appendixes 1, 2 and 3 respectively are discussed below.

Botswana

An examination of equation 1 showed that the coefficient of BS conformed to theoretical expectations. In the case of a budget surplus, there would be positive implications on Botswana's economic growth as there would then be more funds available to be spent on other economic development projects and the development of the people of Botswana. Budget surplus was insignificant in determining economic growth. The regressor failed the significance test at 5% and 10% level. The goodness-of-fit of the model was rather low.

Budget surplus was able to account for 32% of the systematic variation in GDP. The D-W value of 1.11 showed that there was positive autocorrelation in the successive error terms.

Equation 2 showed that the coefficient conformed to short-run and long-run economic theory. In terms of this equation, the coefficient conformed to long-run expectations as eternal debt in the long-run has negative effects on economic growth. A country would have to spend more funds to finance the repayment of the debts as well as the interest for borrowing. The ED term was statistically significant at 5 % and 10% levels respectively. The goodness-of-fit was very low in terms of the coefficient of determination. External debt was able to account for 13.57% of the systematic variation in economic growth. The D-W value of 0.878 showed that there was positive autocorrelation in the successive error terms.

In equation 3, the coefficient of real exchange rate did not conform to economic knowledge but it was significant at the 5% and 10% levels. There was a positive relationship between GDP and real exchange rate. It was expected that due to the appreciation in the exchange rate the chances for trade would decrease as it would then be more expensive for other countries to trade with Botswana. However, it turned out that real exchange rate had opposite implications on economic growth. The goodness-of-fit of the equation was extremely low. Only 7.9% of the systematic variation in GDP could be explained by RER. The D-W value of 0.909 was an indication that the equation was positively correlated.

The coefficient of CAB did not conform to economic theory. Upon inspection of equation 4, it was found that a negative relationship between CAB and economic growth existed. The regressor passed the significance test at 5 % and 10% levels. The value of goodness-of-fit in terms of the coefficient of determination implied that only 7% of the systematic variation in GDP could be explained by current account balances. The D-W value of 0.904 showed that the successive error terms suffered from positive autocorrelation.

Budget surplus, external debt and current account balances conformed to economic knowledge. Real exchange rate on the other hand did not conform to theoretical expectations However; the coefficients of the regressors did not contradict prior knowledge. Only three of the regressors namely, real exchange rate, external debt and current account balances passed the significance test while budget surplus failed the significant test at the 5% and 10% levels. Budget surplus was therefore useless in determining economic growth while the other three regressors were useful for determining economic growth. The goodness-of-fit of the equation was rather high. The value of the adjusted coefficient of determination implied that 65% of

the systematic variation in GDP was explained by the four regressors all taken together. The D-W value of 2.32 indicated that the model was autocorrelation free.

The results from the tests showed that in equation 6, the coefficient of budget surplus conformed to economic knowledge. By implication, there was a direct relationship between budget surplus and economic growth. A 1% increase in Log BS implied that there would then be an increase of 0.3219 in economic growth. The budget surplus failed the significance level at 5% and 10% levels. The value of goodness-of-fit of this model allowed the researcher to infer that budget surplus was able to account for 23% of the systematic variation in economic growth. The D-W value of 0.958 indicated to the researcher that that there was positive autocorrelation in the successive error terms.

In equation 7, the coefficient conformed to economic theory and passed the significance test at 5% and 10% levels. There was a negative relationship as expected. A 1% rise in external debt led to a decrease of 0.19 in economic growth. External debt passed the significance level at 5% and 10% levels. The value of the coefficient of determination indicated that external dent explained 12.6% of the systematic variation in economic growth. The D-W value of 0.825 allowed the researcher to conclude that the successive error terms were not correlated.

Equation 8 showed that the coefficient did not conform to economic theory. Once again it was expected that real exchange rates have negative implications on economic growth. But surprisingly, the coefficient was positive. This also indicated that for each 1% increase in real exchange rate an increase of 3% would be felt in economic growth. The regressor real exchange rate was significant at the 5% and 10 % levels of significance. Real exchange rate was useful in determining economic growth. The goodness-of-fit of the equation was exceedingly small. Real exchange rate could only explain 8% of the systematic variation in economic growth. The D-W value of 1.02 indicated that the model suffered from positive autocorrelation.

The coefficient of current account balances conformed to economic theory. By implication, there was a direct relationship between current account balance and economic growth. When equation 9 was further inspected, the researcher found that a positive relationship between current account balance and economic growth existed. For each 1% increase in current account balance, an increase of 0.1097 was expected. Current account balance passed the significance test at the 5 % and 10% levels. The value of the coefficient of determination implied that 7.4% of the systematic variation in economic growth was explained by current

account balance. The D-W value of 0.974 indicated the researcher to conclude that there was positive autocorrelation in the successive error terms.

In equation 10 it was demonstrated that all the regressors apart from real exchange rate conformed to economic theory. In addition, the coefficients of all the regressors did not disagree with the last four equations. Budget surplus failed the significance tests while real exchange rate, external debt and current account balances all passed the significance tests at 5% and 10% levels. For 1% rise in budget surplus, there was an increase of 0.575% in economic growth. A 1% rise in external debt leads to a decrease of 0.188% in economic growth. A 1% increase in real exchange rate imposed an increase of 0.54% on economic growth. Finally, 1% rise in current account balance lead to a decrease of 0.05% in economic growth. The significance test in this equation agreed with the previous equations, external dent, real exchange rate and current account balance were significant while budget surplus was insignificant at 5% and 10% levels. The goodness-of-fit of the model was reasonably good. Atleast 53% of the systematic variation in economic growth were explained by all the four variables taken together. The D-W value of 1.95 was an indication of the absence of autocorrelation in the successive error terms.

Namibia

The estimated results of the linear equations for Namibia are reported and discussed in the following sequence:

The coefficient of budget debt conformed to theoretical expectations and passed the significance tests at 5% and 10% levels. On further inspection of equation 1, it was found that a negative relationship between economic growth and budget debt existed. Previous studies have shown that budget deficit have negative implications on economic growth. This equation also came to this similar conclusion in terms of Namibia's economic growth. The value of the coefficient of determination indicated to the researcher that 17.48% of the systematic variation in economic growth was explained by budget deficit. The D-W value of 2.4 showed that autocorrelation did not pose any threat in this equation.

Equation 2 showed that the coefficient of external debt conformed to theoretical expectations and was significant at 5% and 10% levels. It was not surprising that a negative relationship between external debt and economic growth of Namibia existed as fewer funds are injected into economic development activities but rather spent on the financing of external debts and their interests incurred. External debt was able to account for 6.85% of the

systematic variation in GDP. The D-W value was 2.45. This value lay within the grey region, but because the five regions were reduced to three regions, the researcher concluded that there was no autocorrelation in the successive error terms.

In equation 3, the coefficient of real exchange rate demonstrated that it did not conform to economic theory but this regressor passed the significance level at the 5% and 10% levels. It was expected that due to an appreciation in real exchange rate, Namibia's economic growth would be negatively affected as other currencies are able to buy less of Namibia's currency, hence able to buy fewer products than before. Surprisinlgy, in this study, real exchange rate had positive effects on Namibia's economic growth. The value of the coefficient of determination meant that 7.05% of the systematic variation in economic growth could be explained by real exchange rate. The value of the coefficient of determination was very weak. The D-W value of 2.43 suggested the absence of autocorrelation to the researcher.

On estimating equation 4, it was found that the coefficient of current account balance conformed to economic theory and passed the significance tests at 5% and 10% levels. The coefficient of the current account balance conformed to economic theory. The goodness-of-fit of the model in terms of coefficient of determination was incredibly weak. Current account balance alone accounted for 9.3% of the systematic variation in GDP. The D-W value of 2.67 implied that there was no autocorrelation in the successive error terms.

Equation 5 found that only two of the regressors namely, current account balance and budget deficit conformed to economic theory. Unlike other regressors, external debt contradicted prior knowledge. A negative relationship was exhibited in equation 2 while in this equation, a positive relationship was exhibited between economic growth and external debt. All of the regressors passed the significance tests at 5% and 10% levels. The goodness-of-fit of the equation in terms of the adjusted coefficient of determination indicated that all the variables taken together only explained 19.8% of the systematic variation in economic growth. The D-W value of 2.75 indicated that the model was free of autocorrelation.

In equation 6, the coefficient of budget deficit conformed to the economic theory and passed the significance tests at 5% and 10% levels. The coefficient implied that there was a negative relationship between economic growth and budget deficit. With each 1% increase in budget deficit, there was a 54.3% decrease in economic growth. The coefficient of determination meant that 6.7% of the systematic variation in economic growth was explained by budget deficit. The D-W value of 0.803 meant that the equation was not free of autocorrelation. The successive error terms suffered from positive autocorrelation.

Equation 7 revealed that the coefficient of external debt did not conform to the economic theory but passed the significance tests at 5% and 10 % levels. It was anticipated that when the external debts were experienced there would be negative implications on the economic growth of Namibia. This was however not the case in the estimation of this equation. The coefficient of external debt meant that there was a positive relationship between external debt and economic growth. A 1% rise in external debt leads to a 38.59% increase in economic growth. The goodness-of-fit in terms of the coefficient of determination was quite weak. External debt alone was able to explain only 9% of the systematic variation in economic growth. The D-W value of 0.868 indicated to the researcher the presence of positive autocorrelation in the successive error terms.

Upon estimating equation 8, it was found that the coefficient of real exchange rate conformed to theoretical expectations and also passed the significance test at 5% levels. It was anticipated that when real exchange rate increases then economic growth would decrease. This has been the case in this estimate. A 1% rise in real exchange rate lead to a decrease of 60.7% in economic growth. The fit of the equation was relatively low. Real exchange rate was able to explain 10.45% of the systematic variation in economic growth. The D-W value of 0.917 implied that there was autocorrelation in the successive error terms.

The Coefficient of current account balance did not conform to economic knowledge but it passed the significance test at 5% and 10% levels. It was expected that current account balance have positive implications on economic growth of Namibia however the appositive was exhibited in this estimate. A 1% jump in current account balance was associated with a decrease of 29.9% in economic growth. The goodness-of-fit of the model was rather low. Current account balance was able to explain 8.9% of the systematic variation in economic growth. The D-W value of 0.897 indicated that there was positive autocorrelation in the successive error terms.

In equation 10, the researcher found that external debt and budget deficit did not conform to theory expectations. It was expected that external debt have a negative implication on economic growth upon its increase however this estimate showed that external debt had a positive implication on economic growth. In the case of budget deficit, it was anticipated that increases in current account balances lead to increases in economic growth. But surprisingly a negative instead of positive effect on economic growth was exhibited. Real exchange rate and budget deficit on the other hand conformed to theoretical expectations. All the four regressors were statistically significant at 5% and 10 % levels of significance respectively. A 1% jump

in budget deficit was associated with a decrease of 45.4% in economic growth. A 1% rise in external debt leads to a 28% rise in economic growth. A 1 % jump in real exchange rate was linked to a decrease of 16.9% in economic growth while a 1% rise in current account balance lead to a 15% decrease in economic growth. The goodness-of-fit was rather very low for this equation. The regressors taken together all explained 4.9% of the systematic variation in economic growth. The D-W statistic was 0.893, meaning that there was positive autocorrelation in the successive error terms.

Zambia

The estimated results of the linear equations for Zambia are reported and discussed in the following sequence:

On estimating equation 1, it was found that the coefficient of budget deficit conformed to theoretical expectations. According to economic theory and past studies, budget deficit was expected to have negative implications on economic growth. When the equation was estimated it turned out to be true for Zambia. Apart from conforming to theoretical expectations, budget deficit was statistically significant at both the 5% and 10% significance levels. The goodness-of-fit was extremely low. Budget deficit was able to explain only 6.2% of the systematic variation in economic growth. The D-W value of 1.85 showed that autocorrelation did not pose any threat in the in the successive error terms.

Equation 2 demonstrated that the coefficient of external debt conformed to economic knowledge and failed the significance level tests at 5 % and 10% respectively. The coefficient of external debt also indicated that there was a negative relationship between economic growth and external debt. As anticipated, this estimate confirmed that when external debt increases Zambia's economic growth rate was likely to decrease. The goodness-of-fit of the model was reasonably low. External debt on its own was able to account for 32% of the systematic variation in economic growth. The D-W value of 2.29 implied that the successive error terms were free of autocorrelation.

The coefficient of real exchange rate did not conform to economic theory as it was expected that real exchange rate have negative implications on Zambia's economic growth. If the Zambian Kwacha had to appreciate, other countries would then be able to afford less of the Zambian Kwacha also meaning more expensive Zambian products. This would then discourage countries from trading with Zambia, thereby leading to a negative impact on the economic growth of Zambia. Surprisingly enough, the coefficient showed the opposite of the

theory. According to the coefficient when the real exchange rate increases, the implication was a positive effect on Zambia's economic growth. Apart from not conforming to economic theory, the coefficient was statistically insignificant at 5% and 10% significance levels. The coefficient of determination was very high. Real exchange rate was able to explain 30.9% of the systematic variation in economic growth. The D-W value of 2.5 implied the absence of autocorrelation in the successive error terms.

In equation 4 it was found that the coefficient of current account balance did not conform to economic theory. Expectations of the existence of a positive effect on economic growth were made however the opposite was the case. The regressor was statistically significant at both the 5% and 10% significance levels. The goodness-of-fit was very low. Current account balance was able to account for at least 15% of the systematic variation in economic growth. The D-W value of 2.27 was an indication of no autocorrelation in the successive error terms.

Equation 5 showed that real exchange rate and current account balances did not conform to economic theory however, budget surplus and external debt conformed. The coefficient of the real exchange rate implied that a direct relationship between economic growth and real exchange rate existed. A 1% jump in real exchange rate implied a jump of 0.124% in economic growth. The coefficient of external debt, budget deficit, and current account balances implied that there were inverse relationships between each individual regressor with economic growth. A 1% rise in external debt leads to a decrease of 1.3% in economic growth. A jump of 1% in budget deficit was associated with a decrease of 0.26% in economic growth. Finally, a 1% rise in current account balance was associated with a 0.39% decrease in economic growth. The value of the coefficient of determination meant that 20.3% of the systematic variation in GDP was explained by the four variables all taken together. The D-W value of 2.47 allowed the researcher to conclude that there was no autocorrelation in the successive error terms of this model. The natural logarithmic equations yielded the following results:

In equation 6, the researcher found that the coefficient of budget deficit did not conform to economic theory. According to economic theory, budget deficit was expected to have negative implications on economic growth as countries have to spend more the higher the budget deficit increases. The coefficient also meant that a positive relationship existed between economic growth and ED, implying that a 1% rise in budget deficit lead to a 0.46% rise in economic growth. The regressor budget deficit was significant at 5% and 10% significance levels. The goodness-of-fit was moderately low. Budget deficit explained 20.3%

of the systematic variation in economic growth. The D-W value of 1.98 was an indication of positive autocorrelation in the successive error terms.

Equation 7 showed that the coefficient of external debt conformed to theoretical expectations and it was also statistically significant at 5% and 10% levels. A 1% rise in external debt leads to a 1.06% decrease in economic growth. The coefficient of determination was low. External debt only explained 8.9% of the systematic variation in economic growth. The D-W value of 1.08 showed that positive autocorrelation posed a threat in the equation.

In equation 8, the coefficient of real exchange rate did not conform to economic knowledge and was statistically significant at 5 % and 10% significance levels. The coefficient of RER also implied that there was a direct relationship between economic growth and real exchange rate. For a 1% increase in RER, there was an increase of 0.58% in economic growth. 4778. The value of the coefficient of determination was fair. Real exchange rate alone was able to explain 49.9% of the systematic variation in economic growth. The D-W value of 1.72 indicated to the researcher that there was no autocorrelation in the successive error terms.

On estimating equation 9, it was found that the coefficient of the current account balance conformed to economic knowledge. When current account balances increase it had a positive effect on economic growth, in this estimate, a 1% rise in current account balance implied a 0.25% rise in economic growth. Current account balance was statistically insignificant at both the 5% and 10% significance levels. Atleast 15.6 % of the systematic variation in economic growth could be explained by current account balance. The D-W value of 1.14 implied that the model was not free of autocorrelation.

In this equation all the four variables did not conform to theoretical expectations. External debt and current account balance contradicted earlier estimates as well. In this equation, external debt exhibited a positive relationship with economic growth instead of negative. Current account balance on the other hand was positive in the earlier estimate. Budget deficit and real exchange rate did not contradict earlier knowledge. Despite not conforming to economic theory, the four regressors were however all statistically significant at the 5% and 10% levels. A 1% rise in BD implied a rise of 0.06% in economic growth. A 1% rise in ED leads to an increase of 0.06% in economic growth. For each 1% increase in real exchange rate economic growth would increase by 0.6. Finally, a 1% rise in current account balance lead to a 0.04% decrease in economic growth. The goodness-of-fit of all regressors taken together was high. The regressors were able to account for 50.0% of the systematic variation in

economic growth. The D-W value of 1.7 indicated no autocorrelation in the successive error terms.

Concluding Observations

In this study, we have made an attempt to analyse the macroeconomic performance of the SADC countries using Botswana, Namibia and Zambia as laboratory test grounds. Indeed, it was apparent from the study that none of the countries under investigation performed exceptionally well in terms of the four variables that were used in this study. We strongly recommend that in order to achieve greater convergence of macroeconomic policies and integration within the region, the SADC member states should commit more resources towards the process. Also, the issue of commitment and infrastructural development on the part of the member states in all its ramifications should be given a more practical expression.

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Appendix 1: Botswana's regression results

Dependent Variable	**Explanatory Variables**							
	β_o	**BS_t**		**ED_t**	**RER_t**	**CAB_t**		**R^2**
1 GDP_t	3.303 (1.02)	0.4707 (0.172)				0.320	0.280	1.11
2 GDP_t	6.958 (0.938)		-0.321 (0.202)			0.136	0.082	0.878
3 GDP_t	3.941 (1.65)			0.4157 (0.354)		0.079	0.0219	0.909
4 GDP_t	6.419 (0.824)				-1.072 (0.957)	0.071	0.015	0.904
5 GDP_t	-0.1754 (2.42)	0.6502 (0.145)	-0.1794 (0.205)	0.8477 (0.397)	-0.7746 (0.773)	0.732	0.649	2.32
$LogGDP_t$	0.5154 (0.104)	0.3219 (0.149)				0.226	0.178	0.890
$LogGDP_t$	0.422 (0.20)		-0.1879 (0.124)			0.126	0.072	0.825
$LogGDP_t$	0.535 (0.164)			0.3026 (0.259)		0.078	0.021	1.02
$LogGDP_t$	0.7546 (0.0586)				0.1097 (0.0974)	0.074	0.016	0.974
$LogGDP_t$	-0.280 (0.262)	0.575 (0.137)	-0.188 (0.136)	0.543 (0.369)	-0.04717 (0.094)	0.639	0.528	1.95

Appendix 2: Namibia's regression results

Dependent Variable	**Explanatory Variables**							
	β_o	**BS_t**		**ED_t**	**RER_t**	**CAB_t**		**R^2**
1 GDP_t	1.743 (0.54)	-0.2185 (0.119)				0.175	0.124	2.40
2 GDP_t	3.199 (1.490)		-0.08141 (0.0751)			0.069	0.010	2.45
3 GDP_t	0.1077 (1.570)			0.2901 (0.264)		0.071	0.012	2.43
4 GDP_t	0.9146 (0.84)				0.1514 (0.118)	0.093	0.037	2.67
5 GDP_t	-1.664 (6.60)	-0.201 (0.138)	0.07526 (0.181)	0.2101 (0.555)	0.1651 (0.161)	0.250	0.020	2.75
$LogGDP_t$	-151.8 (30.2)	-54.31 (50.60)				0.067	0.009	0.803
$LogGDP_t$	-155.2 (24.3)	38.59 (30.4)				0.091	0.031	0.917
$LogGDP_t$	-140.5 (32.4)			-60.71 (44.4)		0.105	0.049	0.917
$LogGDP_t$	-170.2 (16.1)				-29.99 (24)	0.090	0.032	0.897
$LogGDP_t$	-121.3 (43.5)	-45.4 (57.8)	28.6 (51.2)	-16.9 (75.9)	-15 (28)	0.198	0.049	0.893

Appendix 3: Zambia's regression results

Dependent Variable	**Explanatory Variables**							
	β_o	**BS_t**		**ED_t**	**RER_t**	**CAB_t**		**R^2**
1 GDP_t	1.265 (1.45)	-0.1436 (0.138)				0.063	0.004	1.85
2 GDP_t	11.86 (3.58)		-0.1436 (0.138)			0.317	0.274	2.29
3 GDP_t	-0.6652 (1.41)			0.001326		0.309	0.266	2.50
4 GDP_t	0.5098 (1.44)				-0.0543 (0.0322)	0.152	0.098	2.27
5 GDP_t	8.956 (7.48)	0.04885 (0.187)	-0.04193 (0.0322)	0.0001587 (0.00128)	-0.02271 (0.0588)	0.394	0.203	2.47
$LogGDP_t$	0.13 (0.199)	0.469 (0.232)				0.203	0.153	0.864
$LogGDP_t$	2.853 (1.93)		-1.06 (0.849)			0.089	0.032	1.08
$LogGDP_t$	-1.353 (0.462)			0.5848 (0.146)		0.499	0.468	1.72
$LogGDP_t$	0.766 (0.185)				0.4546 (0.207)	0.156	0.100	1.98
$LogGDP_t$	-1.55 (3.04)	0.058 (0.403)	0.0580 (0.988)	0.5800 (0.307)	-0.037 (0.394)	0.500	0.347	1.700